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ETF PARTNER COUNTRIES THROUGH THE LENS OF PISA

An ETF Thematic Monitoring Report

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FOREWORD

Every year, through initiatives such as KIESE and the Torino Process, the European Training Foundation (ETF) collects data to monitor policy and system performance, as well as trends in education, skills and employment across its 29 partner countries in south-eastern and eastern Europe, the southern and eastern Mediterranean and central Asia. These intelligence-gathering efforts culminate in the annual release of a flagship **cross-country monitoring report** which offers insights into national, regional and international developments in key areas of policy and practice.

The cross-country report is complemented by **country monitoring reports** for each ETF partner country and, starting in 2024, by thematic monitoring reports which focus on a single theme or type of data in the ETF monitoring framework across all countries.

ETF partner countries through the lens of PISA is the first thematic report in this intelligence and monitoring series. It presents key results from the analysis of PISA data included in the broader monitoring framework of the ETF.

The report covers all 16 ETF partner countries that participated in the 2022 round of the OECD assessment and presents insights about the characteristics of their student populations in PISA, the learning outcomes of students, as well as the factors that correlate with and may influence student performance in the three PISA domains: mathematics, reading and science.

CONTENTS

KEY TAKEAWAYS

- Who participated in PISA 2022: Sixteen ETF partner countries took part in PISA 2022. These included Albania, Azerbaijan (Baku), Georgia, Israel, Jordan, Kazakhstan, Kosovo[1], Moldova, Montenegro, Morocco, North Macedonia, Palestine[2], Serbia, Türkiye, Ukraine (selected regions) and Uzbekistan.

  The number of students and schools that participated in the PISA assessment was different for each country. Some PISA participants, like Palestine or Kosovo, included a large percentage of their student populations, while others, like Türkiye and Uzbekistan, involved only a small portion of their students. These differences reflect national decisions and challenges in organising the assessments.

  PISA data reveals that the gender distribution in the sample of countries is relatively balanced across ETF partner countries, averaging 50.3 % female students. However, the proportion of first-generation migrant students varies widely, from 15.1 % in Israel to below 1 % in countries like Ukraine and Uzbekistan. These disparities reflect migration patterns and socioeconomic contexts, shaping the specific educational needs of migrant learners.

- Student performance in PISA 2022: Students in ETF partner countries scored below the OECD average in mathematics, reading and science. Even the highest performers, like Israel, did not meet that OECD benchmark. The gap between ETF countries and OECD countries, as well as lower-performing EU members like Bulgaria and Romania, was significant. In some of the domains assessed, students in some ETF countries were up to 3 years behind, on average. Countries that performed well in one subject tended to perform well in others, while lower performers showed consistency across all subjects.

- Factors influencing performance: Student performance in ETF partner countries correlates strongly with the gender and socio-economic status of students, as well as with their likelihood of being at risk of exclusion from education. A number of systemic factors are associated with better or worse student performance too, for instance financial and human resources. Spending on education matters, but how effectively funds are used is just as important as the amount of money spent. Material and teacher shortages are significant issues in many ETF countries, and they do seem to affect the quality of education offered.

- Resilience and the impact of external shocks: The COVID-19 pandemic affected student performance negatively, particularly in the case countries in which long school closures were mandated. However, the decline in results was not solely due to the closures. Countries that performed well before the pandemic showed resilience, while those already struggling saw further declines. COVID-19 amplified existing challenges, making it harder for weaker systems to recover, while stronger systems managed better.

- Pointers for action: ETF partner countries show large gaps in student performance compared to OECD countries, often lagging by about three years. To address this, countries need to focus on improving education for disadvantaged and struggling students. Reforms should aim to make education fairer, ensuring all students have access to quality learning, regardless of their background.

  Gender differences also matter, especially in reading, where boys often perform worse. Special programmes to support boys in literacy can help close this gap. Improving teacher availability, training and working conditions is also key, as many countries face teacher shortages. More investment in digital tools and school infrastructure, particularly in rural areas, is needed.

[1] This designation is without prejudice to positions on status and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.
[2] This designation must not be construed as recognition of a State of Palestine and is without prejudice to the individual positions of the Member States on this issue – hereinafter 'Palestine'.

Supporting at-risk students early on, through mentoring and extra help, can keep them in school and improve their outcomes. Better planning and smart use of resources are essential for building a stronger, more inclusive education system.

1 INTRODUCTION

What is PISA and what does it deliver?

The Programme for International Student Assessment (PISA) is a global survey that evaluates the skills and knowledge of 15-year-olds in reading, mathematics and science. It takes place every three years and focuses on how well students who are near the end of their compulsory education can apply knowledge in real-life situations and not just within the school curriculum.

PISA is developed by the Organisation for Economic Co-operation and Development (OECD) and involves countries and economies worldwide. The programme helps compare education systems globally. Its declared goal is to offer insights that can guide policy decisions to improve learning outcomes. Each PISA cycle emphasises one of the three subjects – reading, mathematics or science – while the other two are assessed with less emphasis.

Beyond academic competencies, PISA also collects contextual data from students, schools and parents. These data help examine factors like socioeconomic background and school environment that may correlate with student performance. The data enables countries to compare the results of their students against the results of other countries and international benchmarks, so that they can better understand the relationship between education policies and learning outcomes. These two elements – learning outcomes and contextual data that may correlate with learning outcomes – form the foundation of what is commonly referred to as 'PISA analysis', a term often used in OECD reports and research published by participating countries and research entities.

The PISA analysis seeks to identify contextual factors that correlate with higher or lower student performance. PISA can reveal associations between student achievement and factors like family income, parental education, teacher quality and the availability of learning materials. While it does not establish causal relationships, this evidence can provide valuable insights into the conditions that tend to accompany better or worse outcomes in education, helping policymakers and educators consider ways to improve equity and quality in education systems (OECD, 2023).

However, the PISA approach and results are not without controversy. Critics argue that PISA is flawed due to cultural, Western-centric bias, with a narrow focus on testable outcomes in a few core subjects which promotes a limited view of what education should achieve[3] (Meyer & Ravitch, 2014). Criticism has also been raised against the assumptions, sampling and statistical methods used in PISA (Carnoy, 2019).

PISA has also been criticised for its impact on education policies, with concerns that the rankings create pressure to "teach to the test" and may lead to education reforms driven more by the desire to improve scores than by genuine improvements in education quality (Zhao, 2020).

Despite these criticisms, PISA is still a valuable tool for researchers, educators and policymakers. It delivers data on student performance and suggests ways to combine it with information about the backgrounds and school environments of students in a comparative and longitudinal perspective. In this way, PISA promotes policy dialogue and cooperation between countries, as well as peer learning and academic research. While there are challenges, PISA remains a strong foundation for education policy dialogue around the world.

Which countries participated in PISA?

The PISA 2022 sample included approximately 690 000 students from 81 countries and economies. This edition continued to focus on reading, mathematics and science, with mathematics serving as the main domain of assessment. Most countries participated in a computer-based version of the test,

[3] See Meyer, H.D., & Ravitch, D. (2014). Open letter to Dr Andreas Schleicher, at https://oecdpisaletter.org/ (accessed on 2 October 2024).

though a few countries, including Cambodia, Guatemala, Paraguay and Vietnam, used paper-based assessments.

Each country was required to sample at least 150 schools, and a minimum of 6 300 students participated from each education system. The sampling process was designed to ensure that results were representative of the target population, which included all 15-year-olds in the participating countries. The students selected were randomly sampled to ensure equal participation from eligible schools, with strict rules on substitution of schools to maintain consistency in the demographic characteristics.

PISA 2022 also introduced adaptive testing in mathematics, in which students were presented with testlets of varying difficulty based on their responses. This allowed for a more tailored assessment of their abilities. Additionally, some countries were granted adjustments to testing schedules or special accommodations to maximise participation and inclusivity.

In 2022, a total of 81 countries took part in the PISA assessment. Among these, 16 were partner countries of the ETF: Albania, Azerbaijan (Baku), Georgia, Israel, Jordan, Kazakhstan, Kosovo, Moldova, Montenegro, Morocco, North Macedonia, Palestine, Serbia, Türkiye, Ukraine[4] and Uzbekistan.

Despite ongoing criticism against PISA, the number of participating countries has grown steadily since the first round of the assessment. Initially, 43 countries participated (32 in 2000 and 11 in 2002). In 2003, the number of participants increased to 41, and in 2006, it rose further to 57. By the 2009 cycle, 75 countries were involved, with 65 participating in 2009 and 10 more joining in a “PISA plus” round in 2010. In 2012, the number remained at 65, before increasing to 72 in 2015, 79 in 2018, and finally, 81 countries in 2022 (OECD, 2019; OECD, 2023; National Center for Education Statistics [NCES], n.d.).

About this thematic report

OECD resources

As the curator of the PISA programme, the OECD is offering a range of resources to ensure that the vast amount of data collected through PISA is readily available, and that key insights based on that data are being communicated. These resources include comprehensive reports, thematic studies, interactive data tools and summaries[5].

Partner countries of the ETF which participate in PISA are included in these resources. There are also short country notes for each which summarise the key findings for each country. The notes compare their results in areas such as reading, mathematics and science with international averages. They also highlight trends, strengths, weaknesses, and a limited number of contextual factors like socioeconomic background or school environment that may influence performance[6]. The OECD also offers access to the raw data collected for each country[7].

Why a separate report for ETF partner countries?

While ETF partner countries are included in the OECD PISA resources, there is a need for a more tailored analysis of their PISA results. Firstly, this group of countries holds strategic importance for the European Commission services and the ETF. Secondly, they occupy a unique position in terms of needs and capacities for change.

The group of ETF partner countries consists mostly of high- and middle-income economies, placing them in a unique position regarding international cooperation. These countries are not entirely dependent on external partnerships for their education reform efforts, but they are also not fully self-

[4] Due to the war, the sample for Ukraine was limited to 18 out of 27 regions.
[5] See https://www.oecd.org/en/about/programmes/pisa.html
[6] See https://www.oecd.org/en/about/programmes/pisa/pisa-participants.html
[7] See https://www.oecd.org/en/about/programmes/pisa/pisa-data.html

sufficient. Their policy environment is often shaped by a mix of international collaboration and national initiatives, as they work to balance external support with local resources.

This creates a complex landscape where international cooperation – whether through funding, peer learning, participation in projects, or external expertise – is sometimes based on the assumption that these countries can manage certain areas independently, when in fact they still require partnerships and support. One such area is the use of PISA data. While many ETF partner countries have the resources and commitment to participate in PISA, their capacity to fully analyse and use the data at the national level is often limited.

Moreover, general OECD resources, though valuable, may not fully account for the specific challenges ETF partner countries face in translating PISA data into actionable policy. These countries often operate in environments where they must juggle external expectations with local realities, which in turn, necessitates a more tailored analysis of their PISA results.

A separate country note could therefore offer insights and actionable information that directly address the unique needs and circumstances of these countries, as well as provide strategic guidance to their international partners, such as the EC services and the ETF.

This thematic monitoring report *ETF partner countries through the lens of PISA* forms part of a broader effort by the ETF to produce annual, data-driven reports on education, training, skills and employment, with the next report scheduled for release in November 2024.

Structure of the report

After this introduction, the second chapter of the report presents an overview of participation in PISA 2022 in ETF partner countries, which includes the number of students and schools involved and the domains in which students were assessed.

The chapter also covers student performance in mathematics, reading and science, trends in learning outcomes and the impact of COVID-19. Additionally, it explores equity, focusing on gender, socio-economic background and students at risk, before examining how system-level factors, such as expenditure and resources, relate to performance.

The third and final chapter summarises the key findings and provides recommendations based on the analysis.

2. ETF PARTNER COUNTRIES: PISA RESULTS 2022

Participants in PISA: who took part and what were they assessed in

How many students and schools took part in PISA 2022 in ETF partner countries?

The PISA methodology sets a number of rules and standards for the sample of students to be included in the assessment[8]. The purpose of these rules and standards, like for any large-scale survey, is to ensure validity, comparability and statistical representativeness. Non-compliance with the technical requirements can even lead to the exclusion of a country from the official reporting of results. For instance, Kazakhstan was excluded from the official reporting of results in PISA 2015 due to issues with sampling and participation[9].

PISA typically employs a two-stage stratified sampling method. In the first stage, schools are selected based on their probability proportional to the size of their student population, ensuring that schools with more 15-year-old students have a higher probability of selection. This sampling design ensures comprehensive representation across schools. Schools are also stratified (grouped) explicitly by characteristics such as geographic region or school type to enhance the accuracy of the sample and to ensure a proportionate representation of schools across different strata (OECD, 2024).

Once schools are selected, a random sample of students is drawn from each school. The target size of the batch (cluster) of students per school varies slightly depending on whether the assessment is paper-based or computer-based (35 or 42 students, respectively). If a school has fewer than the target number of students, all eligible students in that school are included. Countries must ensure that at least 95 % of their PISA-eligible population is covered in the list of eligible students (the sampling frame) from which the actual PISA sample is drawn. Exclusions are kept to a minimum, generally limited to students with significant intellectual disabilities or severe language barriers, ensuring the sample closely mirrors the target population (OECD, 2024).

Table 1 offers a comparison of PISA 2022 sampling information for ETF partner countries and OECD countries. It shows important details such as the total number of 15-year-olds, the number of students selected for the survey and what percentage of the total student population was included in the sample. The table also highlights how many eligible students were covered, how many schools participated and the average number of students tested in each school.

[8] For more information, see (OECD, 2024).
[9] Specifically, the sample of students in 2015 in Kazakhstan did not adequately represent the full population of 15-year-olds in the country. There were concerns about the significant exclusion rates and the sample's overall representativeness, which led to the decision to exclude Kazakhstan's results from the official PISA reporting that year.

Table 1. PISA 2022: Student samples, population coverage and school participation by country

Country/Economy	Sample size[10]	Sample size (% of population aged 15)	Proportion of eligible students covered[11]	Average within-school sample size[12]
Albania	6 129	17.1 %	79.2 %	22.4
Baku (Azerbaijan)	7 720	18.5 %	73.3 %	43.4
Georgia	6 583	14.1 %	86.3 %	24.7
Israel	6 251	4.2 %	89.9 %	32.4
Jordan	7 799	5.1 %	94.0 %	30.0
Kazakhstan	19 769	6.8 %	93.4 %	34.6
Kosovo	6 027	24.7 %	86.3 %	26.3
Montenegro	5 793	84.9 %	92.9 %	92.0
Morocco	6 867	1.1 %	76.2 %	38.6
North Macedonia	6 610	36.2 %	90.7 %	59.5
Palestinian Authority	7 905	7.0 %	78.2 %	29.0
Republic of Moldova	6 235	21.0 %	97.4 %	23.5
Serbia	6 413	9.4 %	86.9 %	35.0
Türkiye	7 250	0.6 %	73.7 %	37.0
Ukraine (18 of 27 regions)	3 876	1.5 %	63.9 %	23.6
Uzbekistan	7 293	1.3 %	88.1 %	36.1
Totals for ETF partner countries	118 520	3.2 %	79.6 %	32.9
Totals for OECD countries	295 157	1.8 %	84.3 %	26.5

Sources: OECD, 2023a, 2023b, 2024.

ETF partner countries tend to sample a larger proportion of students and have slightly lower population coverage. Their larger, within-school sample sizes, on the other hand, could provide more detailed school-level data.

For example, participants like Palestine and Kosovo sampled a notably high proportion of their total 15-year-old population – 47.3 % and 32.7 % respectively. This stands in stark contrast to countries such as Türkiye (0.6 %) and Uzbekistan (1.3 %), which, despite their larger populations, rely on a much smaller sample size as a percentage of their total populations.

Such differences may be due to various factors. PISA uses a structured sampling approach to ensure that key subgroups, such as those based on region, school type or gender, are properly represented. In countries with diverse populations or where students are spread out geographically, a larger sample may be needed to cover these groups effectively. Participation rates among schools and students can also affect how many students are included in the final sample. In countries where participation is lower, more students may need to be sampled at the start to ensure enough ultimately take part in the assessment. Some countries may also choose to oversample certain regions or groups to make sure the results provide meaningful insights for national needs. This is often the case for countries with smaller or rural populations, where a larger sample helps ensure regional balance.

Finally, the size of the sample of each country is calculated according to international standards to guarantee statistical reliability. Larger countries, with more uniform populations, can achieve reliable

[10] Number of participating students.
[11] This is an index of the coverage of the 15-year-old population, and it is calculated by dividing the weighted number of participating students (i.e., the number of students in the nationally defined target population that the PISA sample represents) by the total population of 15-year-old students.
[12] Average within-school sample size is the sample size (Column 1) divided by the number of participating schools (Column 4).

results with smaller sample proportions, while smaller or more diverse countries may need to sample a higher percentage of students.

In terms of population coverage in the sampling frame, most ETF partner countries have good reach and many exceeding 90 %. However, Türkiye (74.0 %) and Ukraine because of the war (64.0 %) fall short of the OECD average (89.4 %). This could potentially introduce risks of underrepresenting certain groups of students, for instance those in rural or underserved regions.

Another significant aspect is the average within-school sample size. In some countries, like Montenegro (92.0) and North Macedonia (59.5), the within-school size of the sample is large. In such countries, more students are tested in each school. This can provide more detailed information about the performance of each school, but if more students are taken from fewer schools, it could limit the diversity of schools included in the overall sample. In other words, the results may deliver a deeper insight into each school, but they may miss out on capturing the differences between more schools.

On the other hand, countries like Albania (22.4) and the Republic of Moldova (23.5), with smaller within-school sample sizes, sample fewer students from each school, but this can allow for a larger number of schools to be included in the PISA sample. This approach captures a greater diversity of schools, but the insights from each individual school may be less detailed.

Overall, while ETF partner countries often sample a larger share of their student population compared to the OECD average, which may enhance representativeness, they may face challenges in terms of the number of schools participating and population coverage in the sampling frame. Larger within-school samples help offset these challenges by providing more detailed school-level insights, but they may also reduce the diversity of schools included in the study.

Who are the students who participated in PISA 2022 in ETF partner countries?

PISA collects background information on key characteristics of the students assessed, such as their gender, socioeconomic status and immigration background to ensure the sample is representative. This information is later examined for potential correlations between these factors and the assessment outcomes of students. This can provide insights into how demographic and contextual elements might influence student performance.

However, even without mapping it against performance, this data holds significant value. The PISA sample is statistically representative, which means it reflects the characteristics of the student population in countries participating in the assessment. In many ETF partner countries, where data on school education and VET is often lacking (ETF, 2023), such detailed demographic and contextual information on secondary-level students – including those in VET – is rarely available.

Table 2 provides and overview of the data in this respect. It tracks the distribution of two key student groups in the PISA sample for each ETF partner country. These groups include the percentage of female students and first-generation migrant students in the PISA sample. The table also shows the average for the ETF PISA sample, as well as the OECD average.

Table 2. Learners by gender and by immigrant background, share of total in the PISA sample (2022)

Country/Economy	Notes	Female students in the PISA sample	First-generation migrant students in the PISA sample
Albania		50.8 %	0.5 %
Baku (Azerbaijan)		51.2 %	1.4 %
Georgia		50.9 %	0.5 %
Israel	1	49.3 %	15.1 %
Jordan		51.0 %	10.0 %
Kazakhstan		50.7 %	1.8 %
Kosovo		50.6 %	0.4 %

Country/Economy	Notes	Female students in the PISA sample	First-generation migrant students in the PISA sample
Montenegro		50.5 %	0.8 %
Morocco		49.8 %	0.4 %
North Macedonia	1	50.2 %	2.0 %
Palestinian Authority	1	49.7 %	2.2 %
Republic of Moldova	1	50.4 %	1.8 %
Serbia	1	50.1 %	10.7 %
Türkiye		49.6 %	1.4 %
Ukraine (18 of 27 regions)		50.0 %	0.2 %
Uzbekistan		50.3 %	0.3 %
Average: ETF partner countries		**50.3 %**	**3.1 %**
OECD average		**49.4 %**	**4.6 %**

Notes: 1. Includes both first- and second-generation immigrant students.
Sources: OECD, 2023a, 2023b, 2024.

Female learners

In most ETF partner countries participating in PISA, the distribution of male and female students in secondary education is relatively balanced (50.3 % on average). Some slight variations exist, such as in Baku (Azerbaijan), where female students make up 51.2 %, and Israel, with a slightly lower percentage of 49.3 %, but overall, these differences are minor. The data reflects a broader trend of gender parity in non-tertiary, formal education across ETF partner countries. This is significant especially for countries where educational access or gender-based disparities might still be an area of concern. In such cases, gender equality efforts may need to focus more on subsequent stages of the educational and professional paths of female learners – such as the transition to employment and opportunities for lifelong learning post-graduation, including professional development.

The consistency in the gender distribution across ETF partner countries also ensures that the PISA samples are balanced in terms of gender representation. This is important for the validity of conclusions about correlations between gender and student performance in these countries.

Students with immigrant background (first generation)

PISA defines “migrant students” as those whose parents were both born outside the country where the student took the PISA assessment. This category can be further divided into two groups: first-generation migrant students, who were born outside the country themselves, and second-generation migrant students, who were born in the country of assessment but whose parents were born abroad (OECD, 2023a).

In its regular monitoring of trends and developments in education and training, the ETF prioritises first-generation migrant students. This is also the group in focus of this paper. These students often need to adapt to a new language, educational system and cultural environment, which brings a unique set of challenges and makes them particularly vulnerable to educational disparities. In contrast, the obstacles faced by second-generation migrant students are typically not as immediate or fundamental.

Table 2 which was quoted earlier also shows the percentage of first-generation migrant students in the PISA sample for each country, as well as the average percentages for ETF partner countries and OECD countries. Since the sampling methodology of PISA is designed to be representative of the population of 15-year-olds attending school in each country, we can reasonably interpret these figures as reflecting broader demographic trends in the student population.

With that in mind, the data in Table 2 reveals interesting patterns. In general, there is a wide disparity in the proportion of first-generation migrant students across ETF partner countries, which reflects differences in migration patterns and socioeconomic factors. Israel (15.1 %) and Serbia (10.7 %), for example, stand out with the highest proportions of first-generation migrant students. These figures

suggest that both countries have received a significant influx of migrants in recent years, which reflects broader demographic trends related to migration. Israel, for instance, has a long history of absorbing migrants, which likely explains its high percentage in international comparison. The figure for Serbia on the other hand could be influenced by migration flows within the region and also by the strengthening of forward-looking sectors of the economy such as ICT, which attract foreign talent.

Jordan (10.0 %) also has a relatively high proportion of first-generation migrant students. This is consistent with the role of Jordan as a major host country for refugees from neighbouring conflict zones, such as Syria, which forces the education system to absorb a substantial number of migrant learners. Countries such as Ukraine (0.2 %), Uzbekistan (0.3 %) and Kosovo (0.4 %) on the other hand have very low percentages of first-generation migrant students. These countries are traditionally countries of origin rather than destination countries and also that their education systems do not necessarily need to focus on integrating new arrivals.

On average, ETF partner countries have a lower proportion of first-generation migrant students (3.1 %) compared to OECD countries (4.6 %). This reflects broader global migration trends, where wealthier OECD countries are typically more frequent destinations for migrants due to greater economic opportunities and more established migrant networks. Most ETF partner countries in the ETF PISA sample, by contrast, continue to be countries of origin, with fewer migrants arriving and settling.

Still, the data suggest that there are important variations in the migration context of ETF partner countries in PISA 2022. An additional aspect to consider is that the reasons why people migrate – whether fleeing conflict, seeking employment, or moving for professional opportunities – play a role as well. The wide disparity in the proportions of first-generation migrant students across ETF partner countries underscores the need to contextualise the data. For instance, refugees in Jordan likely have different educational needs compared to expatriates in Israel or Serbia. These differing migration contexts can shape the specific needs of migrant students, which, in turn, may have implications for the education and training policies of each country regarding students with a migrant background.

What were students in ETF partner countries assessed in?

PISA assesses students across several domains, which include mathematics, reading and science. In addition to these, the 2022 edition of PISA assessed also creative thinking and financial literacy as innovative and optional domains, respectively. The primary focus of the 2022 PISA cycle was on mathematics, while reading and science served as secondary domains.

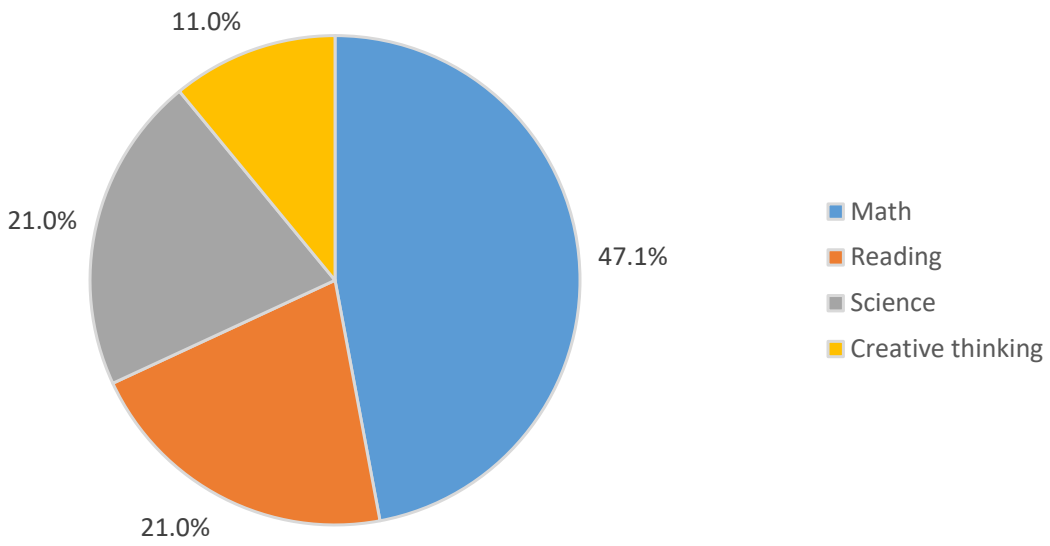
According to the OECD, the assessments are designed to minimise respondent burden while maximising the breadth of information collected about each domain (OECD, 2024). To that end, PISA uses a complex sampling method where students from different schools in each participating country are selected to take different sets of test items. In practice, this means that some students in 2022 were assessed in mathematics, while others were tested in reading, science, creative thinking or financial literacy, depending on the test design.

Although the decision about which students are assessed in which PISA domains follows a standardised methodology overseen by the PISA design team and is not influenced by individual countries, it may still be of help to look into the share of students assessed in each domain[13]. This will not only visualise how many students were assessed in each subject, but for optional domains, such as creative thinking, the allocations may be indicative of the priorities and interests of ETF partner countries which participated in PISA.

Since mathematics was the primary domain in the 2022 assessment cycle, most students from the ETF PISA sample (47.1 %) were assigned to this area of testing, similar to the pattern observed in OECD countries.

[13] In PISA 2022, mathematics was the major domain, with one hour of mathematics administered to most students in the main sample (96 % of those taking the Creative thinking assessment and 94 % of those who did not). Other domains, such as reading and science, were assigned to only a subset of students (OECD, 2024, Chapter 11).

Figure 1. Proportion of students assessed in mathematics, science, reading and creative thinking in PISA (average for ETF countries in PISA 2022)



Sources: (OECD, 2023a, 2023b, 2024).

Reading and science, as secondary domains, had fewer students assigned in comparison. On average, about 21 % of students from ETF partner countries were tested in each of these domains. However, in countries such as Georgia, Kosovo, Montenegro and Türkiye, which did not assess creative thinking, the share of students tested in reading and science was slightly higher, ranging from 25 % to 26 %. In contrast, countries that included creative thinking as part of their assessment had around 11 % of their student sample allocated to this innovative domain.

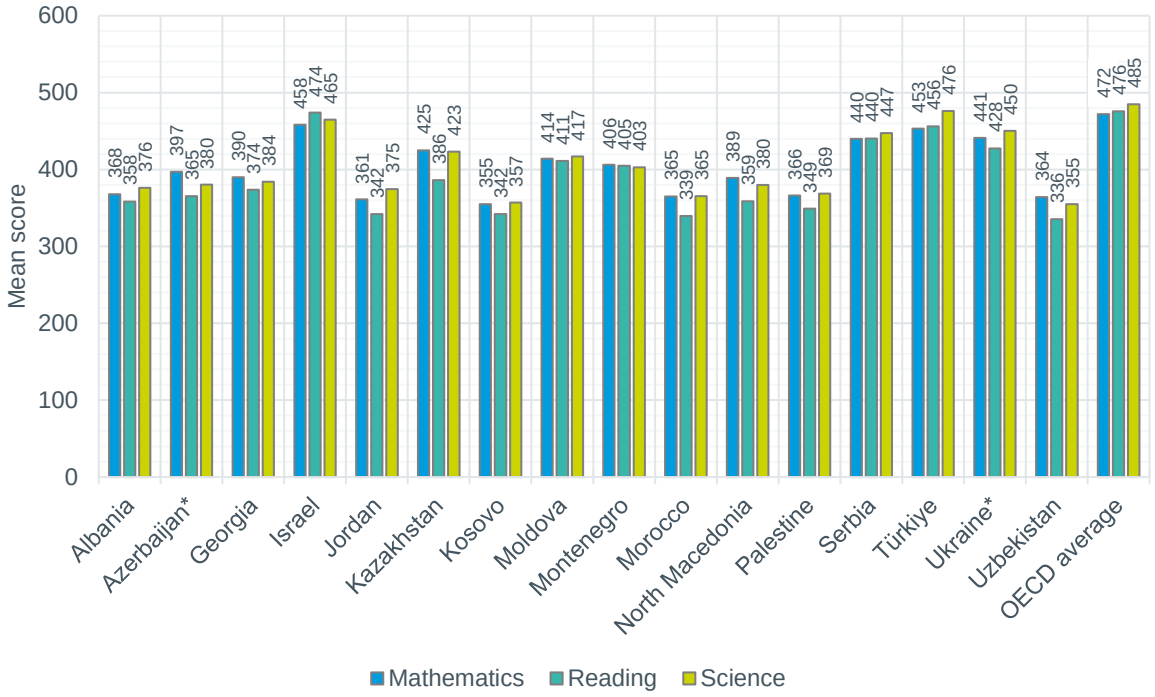
The inclusion of creative thinking by some ETF partner countries likely reflects a growing interest in fostering skills beyond the traditional academic subjects of reading, mathematics and science. On the other hand, countries that did not opt to include creative thinking may still be prioritising core academic competencies, possibly in response to persistent educational disparities. Decisions like these, which were left to the countries (unlike the distribution of the sample across core PISA domains), may provide some insight into how different ETF partner countries balance a long-standing commitment to traditional academic goals with the need to develop broader, more versatile skills in their students in secondary education and training.

Quality: what can students in ETF partner countries do?

Learning outcomes in mathematics, reading and science

Figure 2 shows the average scores of students in ETF partner countries in all three domains of the PISA 2022 assessment: mathematics, reading and science. It also shows the OECD average, while Figure 3 presents the score of the strongest (Estonia) and weakest (Bulgaria, Romania) performers in the EU.

Figure 2. Mean score and variation in mathematics, reading and science performance, ETF partner countries and OECD average (2022)



Source: OECD PISA 2022 database.

Figure 2 also suggests that within-country performance tends to be consistent across the three PISA domains. Countries that score higher in one domain generally perform similarly in the others, and the same is true for countries with lower scores.

For example, Israel shows strong performance across all three domains, with scores of 458 in mathematics, 474 in reading and 465 in science. Türkiye also follows this pattern, with consistently higher scores across the three domains (453, 456 and 476).

On the other hand, Kosovo and Uzbekistan have lower scores across the board, with results in each domain showing fairly consistent but lower averages. In Kosovo, students scored 355 in mathematics, 342 in reading and 357 in science on average, while their peers in Uzbekistan scored 364, 336 and 355, respectively.

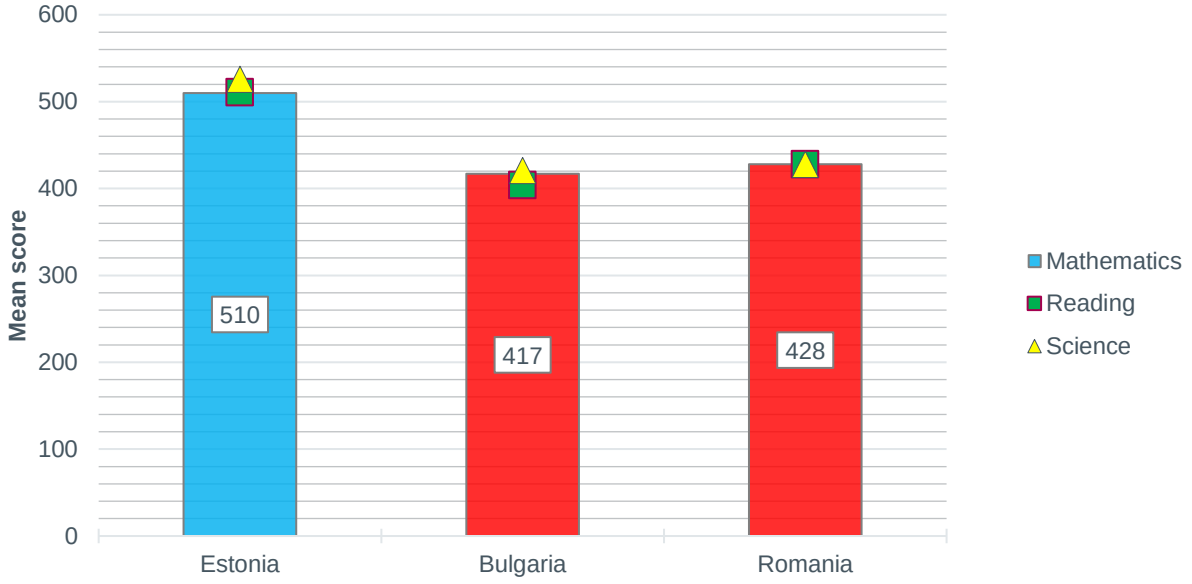
This consistency within countries is likely the consequence of factors in their respective education and training systems that influence learning outcomes in all three domains. Such factors may include the overall quality of instruction, access to resources and socio-economic conditions. The fact that countries with higher scores do well across all domains and countries with lower scores show similar performance consistency, suggests that these factors are not subject-specific but rather systemic in nature. The final section of this chapter – on system characteristics and student performance – will further discuss such factors and how they correlate with the PISA outcomes of students.

The PISA results of ETF partner countries are below average also in international comparison. None of them surpassed the OECD average in any of the three domains assessed. Even the highest-performing ETF partner country, Israel, scored below the OECD average in all domains, with scores of 458 in mathematics, 474 in reading and 465 in science.

Although Bulgaria and Romania had the lowest results among EU member states in PISA 2022 (Figure 3), their students still generally outperformed those in most ETF partner countries. Only a few countries, such as Israel, Türkiye, Ukraine and Serbia, had higher average scores than those of the low performing EU members. This comparison highlights the wide gap in learning outcomes between

students from these ETF partner countries and their peers in the EU, even in its lower-performing Member States.

Figure 3. Mean score and variation in mathematics, reading and science performance, Estonia, Romania, Bulgaria (2022)



Source: OECD PISA 2022 database

The differences between the average scores of ETF partner countries as a group and the OECD average in PISA are significant across all three domains: 72.5 points in mathematics, 90.3 points in reading and 83.3 points in science. In terms of years of learning[14], students in ETF partner countries are up to 2.4 years behind their OECD peers in mathematics, up to 3 years behind them in reading and 2.8 years in science. Overall, of the 81 countries assessed in PISA 2022, only 18 had scores above the OECD average in all 3 domains assessed and none of these was an ETF partner country[15].

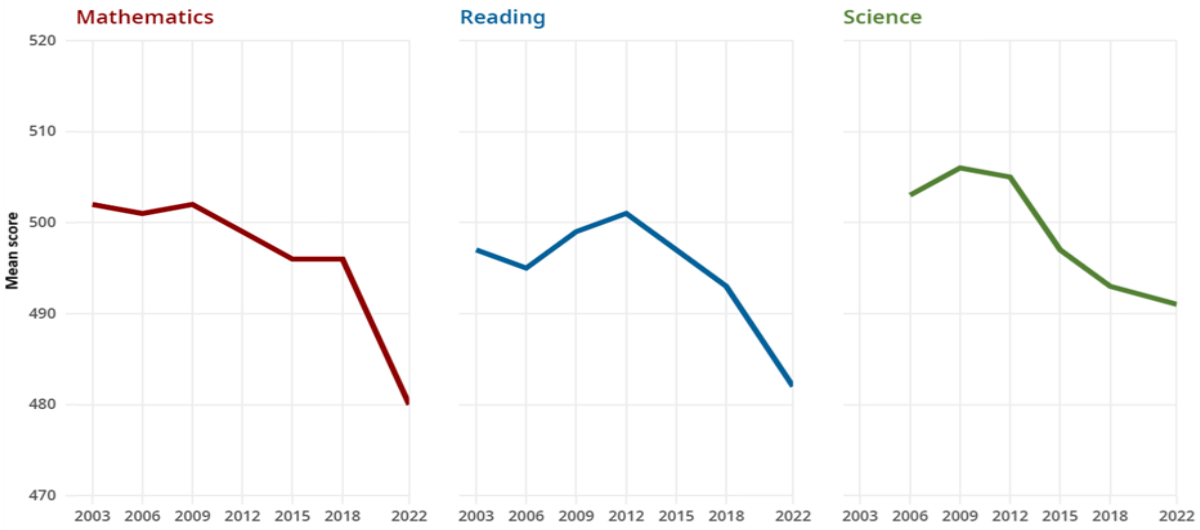
Global, long-term trends in student performance

The subpar results of ETF partner countries reflect a broader trend seen across the OECD. Since 2012, average student performance across OECD countries in mathematics, reading and science has been on a steady decline, as shown in Figure 4.

This decline is particularly pronounced in reading and science, where performance peaked around the 2012 PISA round, before beginning a significant drop. In mathematics, the decline began slightly earlier, following a period of relative stability. However, between 2018 and 2022, this downward trend accelerated at an unprecedented rate in the domains of reading and mathematics, while the drop in science, though still notable, slowed compared to earlier years.

[14] For more on this concept, see OECD, 2015.
[15] Notwithstanding the usefulness of a cross-country benchmark such as the average gain in achievement that students make from one year to the next, as well the frequent references to that benchmark in OECD publications ("years of schooling"), it is also important to keep in mind that the empirical evidence of how PISA score-point differences translate into such a metric, is limited (OECD, 2019).

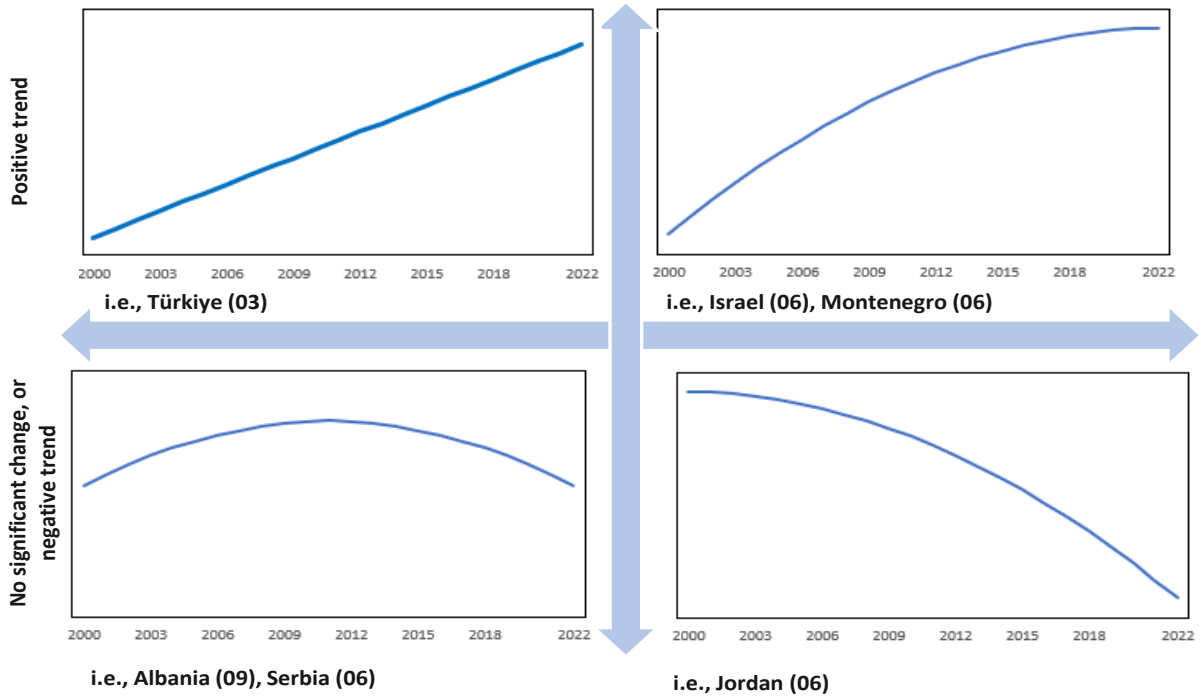
Figure 4: Performance trends in mathematics, reading and science, OECD average (2003-2022)



Source: OECD, 2023a.

The averages conceal some interesting country-specific trends, especially for the ETF PISA sample of countries (Figure 5). Some of them, like Türkiye (and Kazakhstan which is not shown in Figure 5), have defied the broader downward trend seen across OECD countries. Despite the challenges posed by COVID-19, these countries have shown resilience, with steady improvement in student performance over time, even amidst the difficult period between the PISA 2018 and 2022 rounds.

Figure 5. Patterns of country-specific trajectories in average student performance in mathematics (2000-2022)



Source: OECD, 2023a.

In other groups of countries, such as Israel and Montenegro, performance growth, which was evident until around 2015, began to slow, eventually reaching stagnation between 2018 and 2022. Figure 5 suggests that, unlike the broader pattern across the OECD, average student performance in these countries plateaued rather than declined.

At the other end of the spectrum, countries like Jordan, Albania and Serbia have experienced persistent declines in student performance, with no sign of recovery. In these cases, the drop in scores between 2018 and 2022 appears to be a continuation of a longer-term negative trend, rather than a sudden downturn caused by the pandemic.

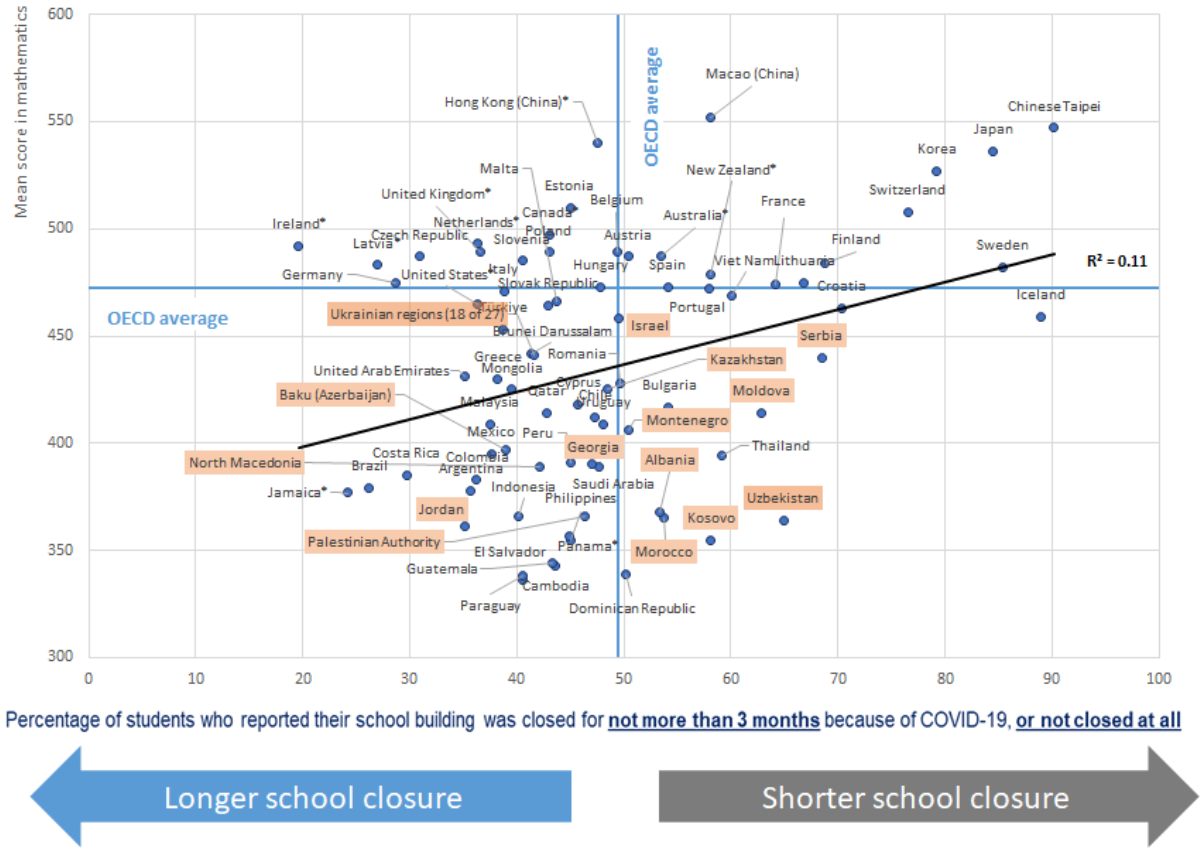
These observations are notable because they suggest that while COVID-19 had a significant impact on education systems worldwide, in many countries it was not the sole trigger of performance decline. As will be discussed in the next section on the impact of external shocks, COVID-19 acted as a reinforcing factor, accelerating or intensifying trends that were already in motion before the pandemic. This indicates that addressing only short-term disruptions is not enough. No matter how painful and demanding these shocks are, the long-term structural challenges that many countries continue to face require ongoing attention.

Impact of external shocks on learning outcomes: COVID19

The COVID-19 pandemic had a substantial impact on education systems and student learning outcomes worldwide. One widely used proxy for measuring this impact was data on school closures, including their duration, location and extent (full or partial). A closer look at how these closures affected student performance in PISA 2022 provides some interesting insights into the relationship between COVID-19 and student learning.

A commonly discussed factor in the impact of COVID on learning is the length of school closures in response to the pandemic. Figure 6 shows the relationship between two variables: the percentage of students whose schools were closed for three months or more (on the X-axis) and the mean score of students in mathematics in PISA 2022 (on the Y-axis). How do these two factors, i.e. school closure length and student performance in mathematics, relate, and how strong is this relationship?

Figure 6. Mean student performance and school closures during COVID19



Note: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met.
Source: OECD PISA 2022 database, OECD, 2023a.

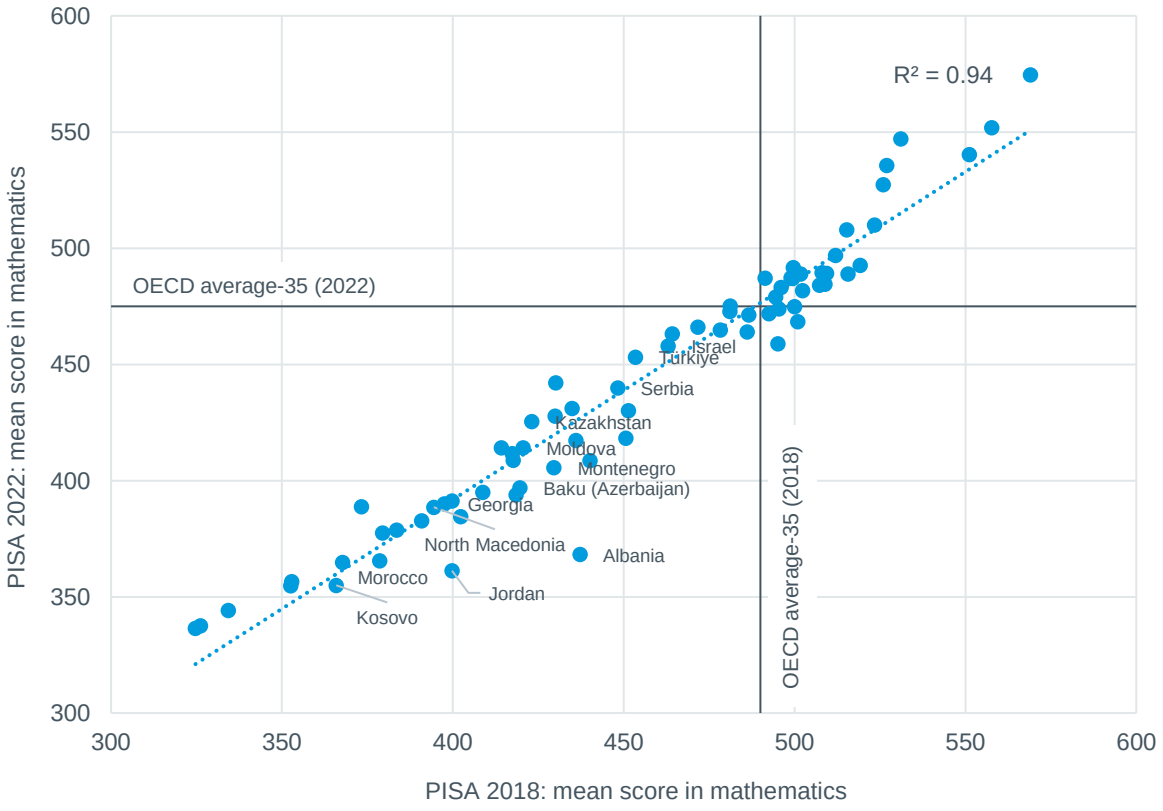
The data in Figure 6 suggests that longer school closures during the pandemic had a negative impact on student performance. Countries where students faced longer periods of remote learning or school closures tend to have lower mean mathematics scores in PISA 2022. This general trend indicates that extended school closures were likely disruptive to student learning outcomes.

However, the relationship is more nuanced than it may initially seem as there are two important, additional observations to consider. First, countries with shorter school closures tend to be those that were already high performing in PISA before the pandemic. This suggests that the better the performance of a country before COVID-19, the better its resilience in mitigating learning losses during the pandemic.

Second, the negative relationship between the length of school closures and student performance is relatively weak ($R^2 = 0.11$). This means that while there is a sizeable negative correlation between school closures and PISA scores, the length of closures explains only a small portion of the variation in student performance. Many other factors are likely contributing to the differences in learning outcomes; school closures alone do not provide a complete explanation for the decline in results observed in 2022 across ETF partner countries.

The finding that better-performing education systems according to PISA were less impacted by COVID is further supported when examining the relationship between math scores from PISA 2018 and 2022, regardless of school closures. Figure 7 reveals that there is a strong correlation ($R^2 = 0.94$) between the results from PISA 2022 and those from PISA 2018 for all countries in the assessment, also countries in the ETF PISA sample. This result indicates that countries which performed well or poorly in 2018 tended to maintain similar performance levels in the PISA 2022 round.

Figure 7. Mean student performance before and after COVID: participants in PISA (2018 and 2022)



Source: OECD PISA 2022 database, OECD, 2023a.

This consistency suggests that countries with stronger education systems before the pandemic were better able to maintain the quality of learning outcomes, while countries with historically lower scores

continued to struggle. However, this does not imply that COVID had no effect on education systems. The data instead points to the pandemic reinforcing existing trends. Countries that were already experiencing challenges saw their performance further decline, while those that were performing well demonstrated a degree of resilience and stability in the face of disruptions caused by the pandemic.

In countries where the quality of student learning has continued to deteriorate, COVID likely exacerbated pre-existing systemic issues. The pandemic may have accelerated trends that were already in motion, but it does not appear to have dramatically altered the relative position of countries and their students on the PISA scale.

A comparison between 2018 and 2022 shows that only 17 % of countries which participated in both PISA rounds saw an increase in their average score in mathematics. Among the ETF partner countries, only Kazakhstan recorded a slight improvement in the mathematics performance of its 15-year-olds since 2018. This contrasts sharply with the period from 2015 to 2018, when 67 % of countries which participated in both rounds experienced a rise in their mathematics scores.

What role did COVID19 play in the career choices of students?

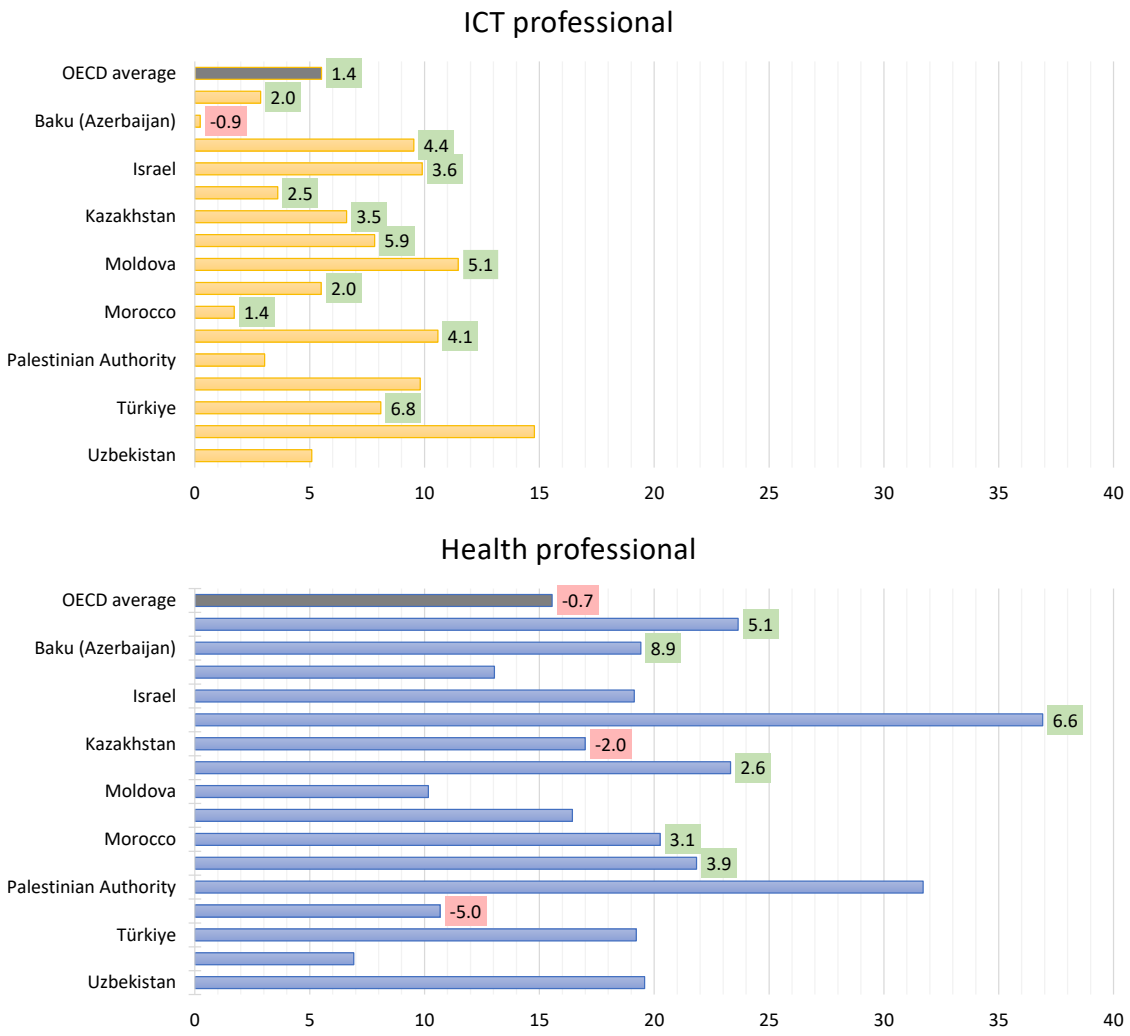
The pandemic affected not only the academic achievements of students, but also their perceptions of what their professional future may look like. There is data which allows for a closer look at the impact of COVID19 on both student learning and expectations, helping to better understand how the experiences of students during the pandemic might influence both their academic development and long-term career choices.

Figure 8 shows how career expectations of students in ETF partner countries have shifted between 2018 and 2022, with a focus on the health and ICT sectors. The data shows the proportion of students expecting to work in these fields by the age of 30, with significant changes in student preferences marked by red or green squares, indicating percentage-point changes between the two PISA rounds.

The ICT sector has become more attractive to students across most ETF partner countries, as well as the OECD average. Many countries, such as Kosovo, Türkiye and Kazakhstan, saw notable increases in the proportion of students aspiring to ICT careers, with percentage-point gains of 5.9, 6.8 and 3.5, respectively. This increase mirrors a broader global trend in the growing demand for ICT professionals.

The health sector, on the other hand, shows a more mixed pattern. There has been a decline in interest in pursuing health-related careers among students in the OECD, on average, as well as in specific ETF partner countries like Kazakhstan and Serbia, with decreases of 2.0 and 5.0 percentage points, respectively. This trend may reflect the impact of the COVID-19 pandemic, which has exposed some of the pressures and challenges associated with healthcare professions. However, many ETF partner countries, including Baku (Azerbaijan), Jordan and Albania, saw an increase in students aspiring to health careers, with gains of 8.9, 6.6 and 5.1 percentage points, respectively.

Figure 8. Career expectations of students before and after COVID in ETF partner countries: Statistically significant percentage-point change PISA 2022 – PISA 2018



Source: OECD PISA 2022 database; OECD, 2023c.

The OECD suggests that the decline in interest in health professions may be more pronounced in countries that experienced higher absolute COVID-19 case numbers and fatalities during the pandemic (OECD, 2023c). Nevertheless, country-specific factors also likely play a role, and further analysis is needed to fully understand the trends in each country.

Equity: how well do ETF partner countries manage diversity?

A significant part of what PISA aims to do goes beyond simply reporting on student performance; it also seeks to explore and explain various factors within the context of students that may correlate with their learning outcomes. While the primary goal of PISA is to provide a snapshot of how students perform in key domains like reading, mathematics and science, it also collects extensive contextual data on students, schools and even national education systems.

This contextual data includes a broad range of factors such as socioeconomic background, gender, immigration status, attitudes towards learning and the availability of resources in schools, among others. The collection and analysis of this PISA data provides policymakers, researchers and educators with insights into the broader environment in which students are learning. This, in turn, can

help develop a more comprehensive understanding of how different contexts might affect learning outcomes across different education systems.

For the purposes of this section, the background data on students is of particular interest. This aspect of the contextual information collected through PISA provides valuable insights into how well the education and training systems of ETF partner countries handle diversity and whether they promote equitable learning outcomes. Students bring diverse experiences and circumstances into the classroom. Understanding the impact of factors such as socioeconomic background, gender and immigration status matters when assessing how different learner groups experience and succeed in education.

Although correlation does not imply causation, the analysis of these factors is important because it highlights patterns and relationships that can raise awareness, reveal whether the needs of diverse student populations are being met, and inspire policy interventions. For instance, PISA often shows how students from disadvantaged backgrounds tend to perform worse on average, or how schools with more resources may correlate with better outcomes. These findings help identify areas where educational systems could improve, such as offering additional support for students from low-income families or investing in school infrastructure.

The next sections focus on key student characteristics – gender, socioeconomic background and students at risk of exclusion – to explore how these factors influence student performance and what this suggests about how well ETF partner countries manage diversity. Each section will examine how these factors relate to learning outcomes and consider what this suggests about equity in education in each country in the ETF PISA sample.

It is important to keep in mind that the observed disparities in performance may stem from multiple factors, many of which are outside the education system itself – such as community support or family environments. Consequently, while the following sections provide valuable insights into student performance and diversity, they are not meant to fully explain why certain groups perform better or worse than others, nor are they meant to definitively show the impact of individual policies on their learning outcomes.

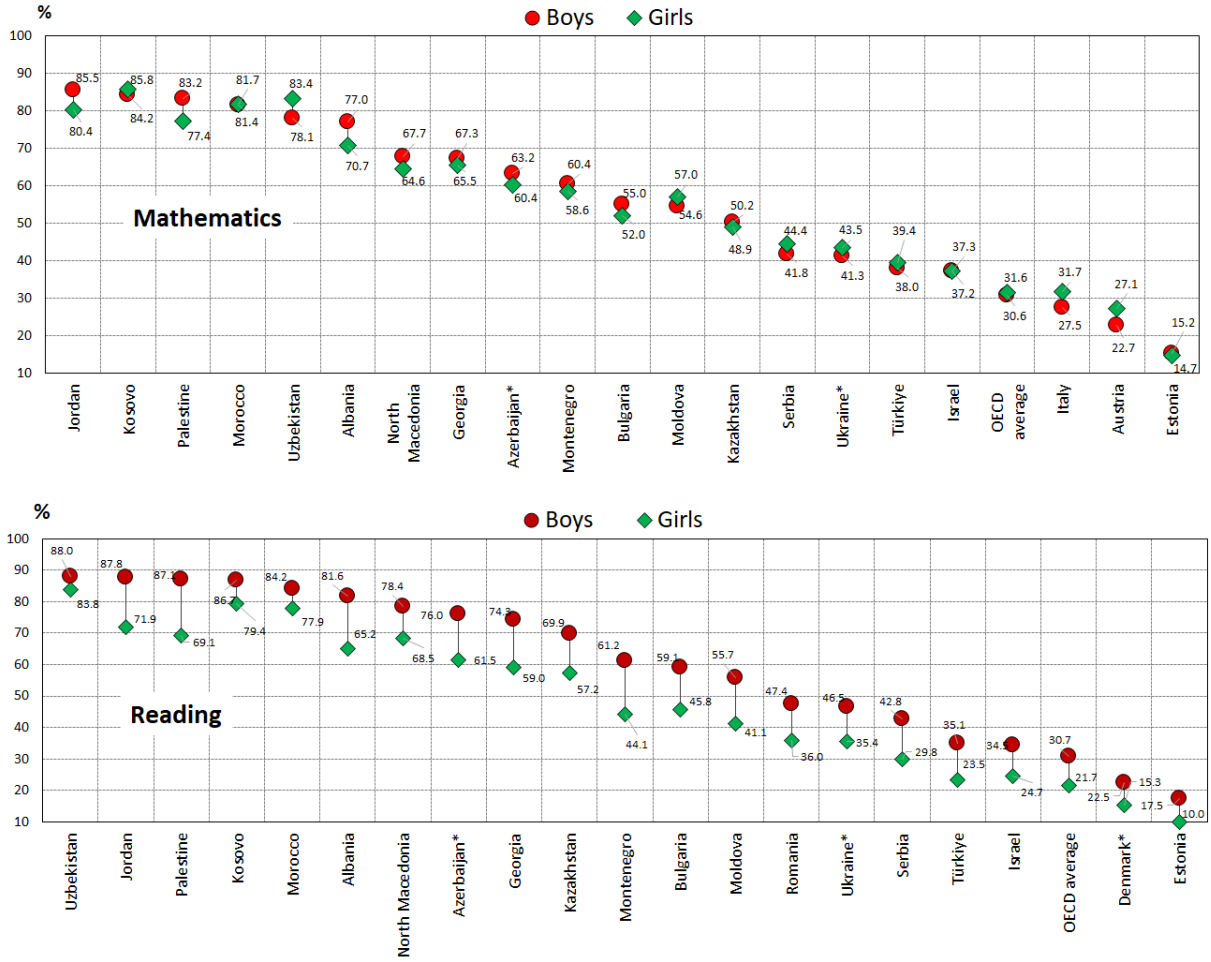
Learning outcomes and gender

Figure 9 shows the proportion of boys and girls scoring below proficiency Level 2 in mathematics and reading across ETF partner countries, a selection of high- and low-performing EU countries and the OECD average.

In PISA, low performance is defined as scoring below Level 2 on the assessment scales for mathematics, reading and science. Level 2 represents the baseline level of proficiency that students need to fully participate in society. For example, in mathematics, students at Level 2 can solve basic problems in familiar contexts, while in reading, they can identify the main idea in a text and find information based on explicit criteria.

Students scoring below Level 2 are considered low performers and are likely to struggle with everyday tasks that require basic interpretation and reasoning skills. In reading, those who fall below this level are described as functionally illiterate, meaning they lack the reading skills necessary to engage with written information in daily life. This group is at risk of not developing the skills needed for further education or successful integration into the workforce (OECD, 2023a).

Figure 9. Percentage of students who scored below proficiency Level 2 in mathematics and reading, by gender: ETF partner countries, selected EU countries and OECD average (2022)



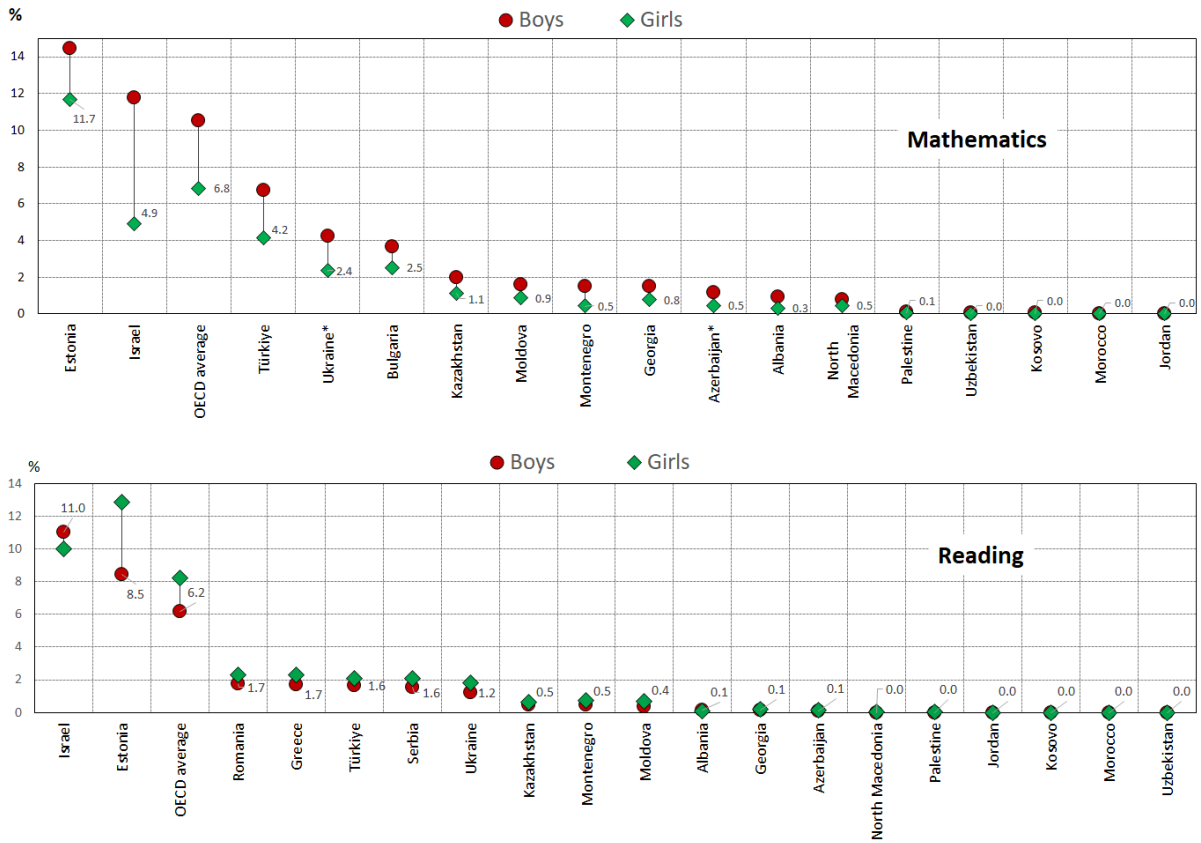
Note: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met. For both graphs, countries are ranked in descending order of the percentage of low-performing boys. There are statistically non-significant differences for Kosovo, Morocco, Georgia, Montenegro, Bulgaria, Moldova, Kazakhstan, Serbia, Ukraine*, Türkiye, Israel and Estonia in mathematics, and statistically significant differences in all countries in reading.
Sources: OECD PISA 2022 Database, Table I.B1.4.31 and Table I.B1.4.32.

ETF partner countries have a higher percentage of low performers in reading compared to the OECD average. In this domain, however, boys are more likely to struggle than girls. The gender gap in reading proficiency is pronounced across most ETF partner countries, with a slight exception in Uzbekistan, where the disparity is 4.2 %. The gap varies significantly, ranging from around 6–7 % in Morocco and Kosovo to as much as 17–18 % in Montenegro and Palestine. Notably, among all countries participating in PISA 2022, including ETF partner countries, Palestine exhibits the largest gender disparity, followed by Montenegro and Albania, which rank fourth and fifth, respectively.

ETF partner countries have a higher percentage of low performers also in reading compared to the OECD average. In this domain, however, boys are more likely to struggle than girls. The gender gap in reading proficiency is pronounced across most ETF partner countries, with notable exceptions in Uzbekistan, Morocco and Kosovo. The gap varies significantly, ranging from around 10 % in Israel and North Macedonia to as much as 17-18 % in Palestine and Montenegro.

How about gender and high student performers in the domains tested in PISA? Figure 10 shows the percentage of boys and girls reaching proficiency Level 5 or higher in mathematics and reading across ETF partner countries, in selected EU countries and in the OECD on average.

Figure 10. Percentage of students who scored at proficiency Level 5 or above in mathematics and reading, by gender: ETF partner countries, selected EU countries and OECD average (2022)



Note: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met.
Source: OECD PISA 2022 Database.

In ETF partner countries, the share of students reaching proficiency Level 5 or higher in both mathematics and reading is notably low, often below 2 % in mathematics and close to 0 % in reading. This contrasts sharply with the findings for OECD countries on average, where these percentages are higher. The data suggests that ETF partner countries may be facing significant challenges in fostering high academic achievement among the 15-year-olds.

In mathematics, countries such as Moldova, Georgia and North Macedonia which have high-performing students, show a statistically insignificant gender gap among top achievers. This suggests that while the number of high performers is small, gender does not significantly influence top-level performance in mathematics.

However, in other countries with high-performing students – Israel, Türkiye, Serbia, Ukraine, Kazakhstan, Montenegro, Azerbaijan and Albania – a statistically significant gender gap emerges, with boys consistently outperforming girls. Israel stands out as an exceptional case, where the gender gap among top performers in mathematics is not only significant and well above the OECD average but also one of the largest among all 81 countries participating in PISA 2022.

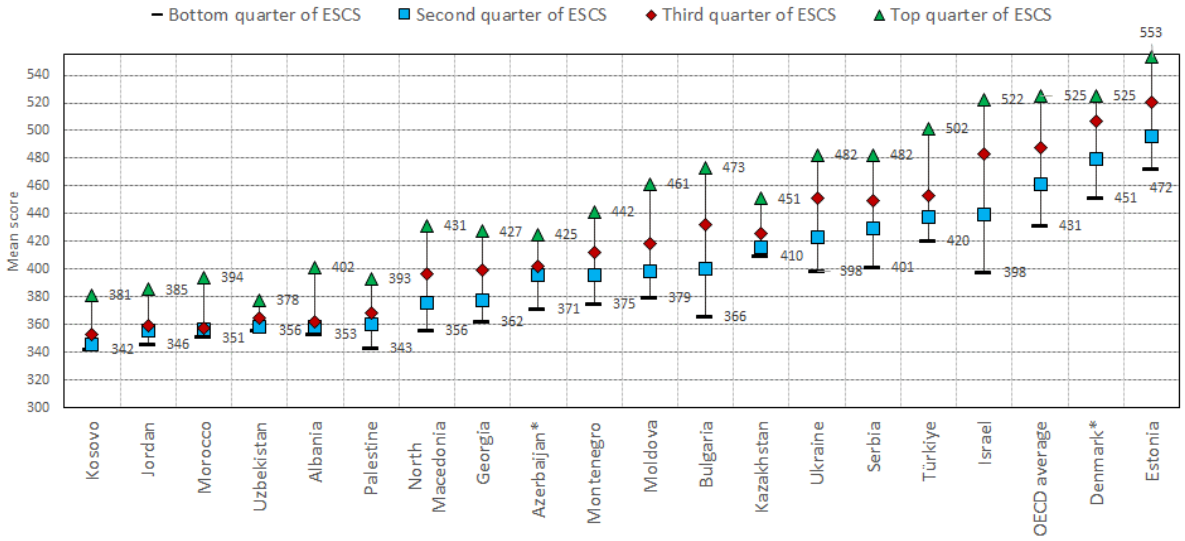
In reading, the situation is different. Many ETF partner countries have no top performers, with percentages close to zero. Where top performers do exist, their numbers are extremely low, except in Israel, and the gender gap remains statistically insignificant. This suggests that at the highest levels of reading achievement, gender differences become less pronounced.

Learning outcomes and socio-economic background

A previous section in this chapter described how PISA gauges the socio-economic background of students through the index of economic, social and cultural status (ESCS), where a higher index value corresponds to a higher socio-economic status. Performance differences between students from advantaged and disadvantaged backgrounds can indicate potential challenges with educational equity.

Figure 11 shows that in ETF partner countries, socio-economic disadvantage indeed correlates with student performance, as students from more advantaged backgrounds consistently score higher than their peers from disadvantaged backgrounds. This highlights the potential presence of challenges with educational equity in all countries, also in those which are OECD members.

Figure 11. Mean performance in mathematics, by national quarter of socio-economic status, ETF partner countries, selected EU countries and OECD average (2022)



Notes: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met. Only countries and economies with available data are shown. Countries are ranked in ascending order of mathematics performance for students in the second quarter of national socio-economic status.
Source: OECD PISA 2022 Database, Table I.B1.4.3.

However, the extent of this correlation varies across ETF partner countries. In Uzbekistan, Kosovo and Jordan, the difference in PISA performance between students from the lowest and highest socio-economic quartiles is relatively small – around 30-40 points, roughly equivalent to one year of schooling. However, these countries consistently perform at low levels across all socio-economic groups. This suggests that while socio-economic background influences performance, it may not be the primary driver of performance gaps, and other systemic factors could be at play.

In contrast, countries like Moldova, Serbia, Türkiye, and especially Israel, exhibit much wider performance gaps between socio-economic groups. In Israel, for example, students in the top socio-economic quartile scored over 120 points higher than those in the bottom quartile – equivalent to a gap of about 3 years of schooling. This indicates that socio-economic status plays a more significant role in shaping student performance, with wealthier students outperforming their disadvantaged peers. These disparities highlight the need for targeted interventions to bridge socio-economic gaps and ensure equal opportunities for success.

ETF partner countries differ significantly in how socio-economic background relates to performance. While some face large performance disparities, others show moderate variation, and a third group – despite smaller gaps – tends to rank among the lowest-performing countries in PISA 2022.

In the OECD countries, the gap is substantial as well, on average, with a difference of nearly 100 points between the highest and lowest quartiles, again equivalent to about 2 to 3 years of schooling.

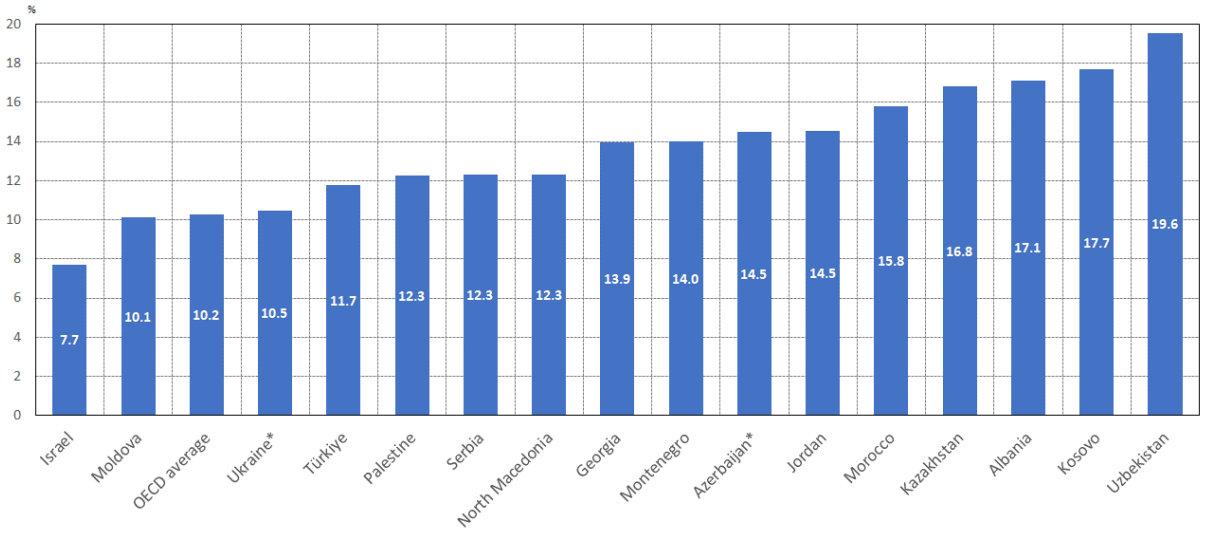
This highlights that socio-economic background is a consistent predictor of performance across countries, but that the magnitude of this gap differs, possibly because of differences in how education systems address inequalities related to students.

What do the results show when comparing the performance of students with similar socio-economic status across different countries using international deciles?[16] Data on the mean performance in mathematics by international decile of socio-economic status shows that, even when comparing students from higher socio-economic backgrounds in ETF partner countries to their peers in OECD countries, significant performance disparities remain. Advantaged students in ETF partner countries still tend to perform below the average of similarly advantaged students in OECD countries.

This indicates that in ETF partner countries, socio-economic advantage alone is not enough to guarantee good education. Despite having similar levels of socio-economic privilege, students in ETF partner countries do not achieve the same learning outcomes as their OECD peers in the top deciles by status. The disparity in performance suggests that, in ETF partner countries, even students from wealthier backgrounds may not have access to high-quality education, regardless of what they or their families can afford. This points to systemic issues that affect the entire education system, where good education is not guaranteed by socio-economic advantage alone.

Here it is important to note that not all students who are in the bottom quarter of the PISA index of economic, social and cultural status in their country, are low performers. In fact, some score in the top quarter in terms of performance, relative to other students in their country. PISA defines such students as “academically resilient” because they achieve high educational outcomes despite their socio-economic disadvantage (OECD, 2023a). Their presence in countries (see Figure 12) is a proof of the potential for disadvantages students to succeed despite contextual and systemic challenges.

Figure 12. Academically resilient students in mathematics, ETF partner countries and OECD average (2022)



Notes: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met. Only countries and economies with available data are shown. Socio-economic status is measured by the PISA index of economic, social and cultural status. Countries are ranked in ascending order of mathematics performance for students in the second quarter of national socio-economic status.
Source: OECD PISA 2022 Database.

This can be particularly relevant in the context of ETF partner countries, where overall performance is often lower than the OECD average. The presence of resilient students can help shift the narrative

[16] In contrast to national deciles of socio-economic status, which compare student performance within a country, international deciles divide students into ten groups based on socio-economic status across all PISA 2022 participants. This international decile analysis highlights global differences in student performance. The purpose is to use the ESCS index to compare students from similar socio-economic backgrounds across different countries.

from a purely deficit-based perspective to one that acknowledges the potential for success even in difficult circumstances.

The data on ETF partner countries shown in Figure 12 suggests that in most countries, the share of academically resilient students in mathematics – the core domain in PISA 2022, is higher than the OECD average of 10.2 %. There are also significant variations. In the figure below, resilient students in mathematics refer to the percentage of socio-economically disadvantaged students who scored in the top quarter of mathematics performance within their own country.

Uzbekistan (19.6 %), Kosovo (17.7 %), Albania (17.1 %), Kazakhstan (16.8 %) and Morocco (15.8 %) have a sizeable presence of academic resilience in their classrooms, while in others, like Jordan, Azerbaijan, Montenegro or Georgia, the share of resilient students is somewhat lower, albeit considerably higher than in OECD countries, on average. Only two ETF partner countries – Israel (7.7 %) and Moldova (10.1 %) – fall below the OECD average, but even these percentages are relatively close.

While this data is encouraging, it also highlights the broader issue of overall lower student performance in ETF partner countries. The higher proportion of resilient students does not entirely offset the systemic challenges that impact student performance across the board. Therefore, the sizeable share of disadvantaged students who are academically resilient should not distract from the pressing need to improve the educational outcomes for all students. This will help reduce the need for resilience in the first place.

Students at risk

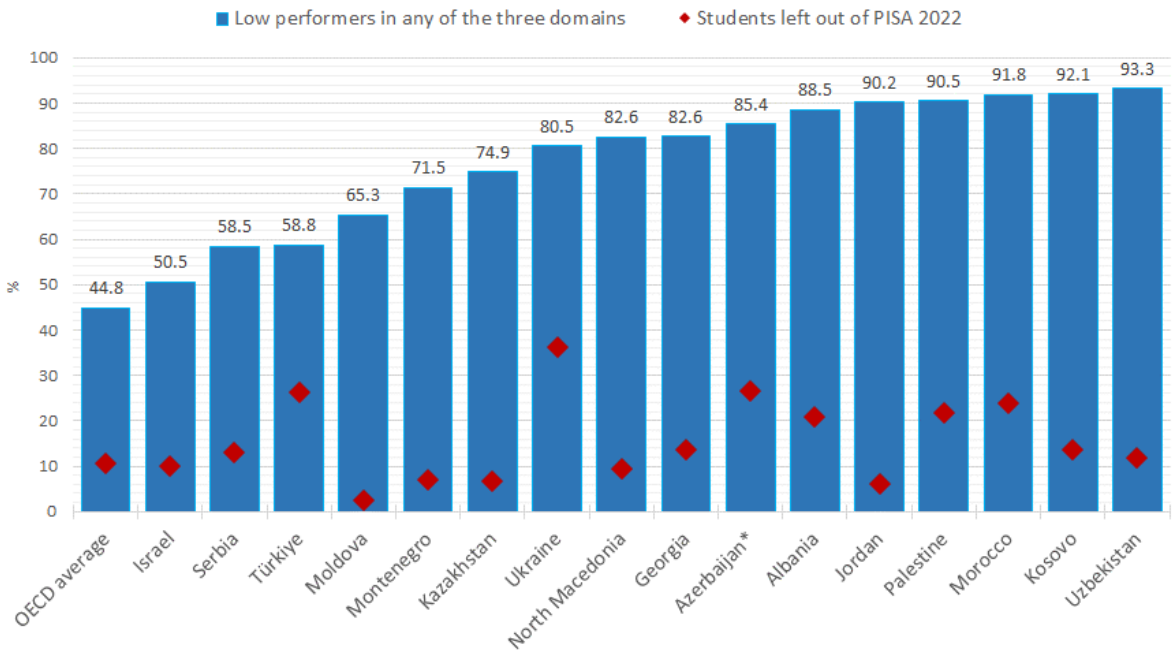
The concept of at-risk-students and exclusion risk used in this report is shaped by the type of data collected through PISA. It encompasses two main groups of students: those who underperform academically and are at risk of dropping out of education and/or later out of employment, and those who were not included in the PISA assessment despite being in the sampling frame, which is interpreted as a sign that they are not in education. While students-at-risk is a much broader notion than that, the more limited concept used here still offers insights into the challenges faced by education systems in ensuring inclusivity and support for all students.

Low academic performance indicates one dimension of exclusion risk for students. In OECD countries, an average of 45 % of 15-year-olds perform below proficiency in at least one subject, potentially putting them at risk of exclusion from future opportunities. This issue is even more pronounced in ETF partner countries, where over 70 % of students in the PISA sample fall below the baseline proficiency Level 2 in at least one subject (Figure 13). These students are at a higher risk of academic failure, which can lead to dropping out of school, limited employability, or exclusion from further education.

Academic underperformance is not the only factor contributing to exclusion in this context. A second group of students at risk consists of those who were not included in the PISA assessment at all. These students were either not enrolled in school, enrolled in grades below the expected level for their age, or excluded from the sample for reasons such as student exclusions from the PISA test, dropouts during the school year, etc. Often from disadvantaged backgrounds – such as rural areas, ethnic minorities, or lower socio-economic groups – these students are assumed by the OECD to perform similarly to low performers had they participated in the assessment. For this reason, they are counted alongside low performers to reflect the full scope of the challenge. This assumption is based on evidence that students who are behind in or excluded from school tend to struggle academically when they do attend.

For example, in Türkiye, 26.3 % of students were not included in PISA 2022, and in Ukraine, 36.1 % were left out. In Palestine and Morocco, the percentages were 21.8 % and 23.8 %, respectively. In contrast, countries like Moldova and Montenegro had much lower rates of exclusion, with only 2.6 % and 7.1 % of students not included. The OECD average is 10.6 % (Figure 13).

Figure 13. Students at risk of exclusion[17]: Percentage of 15-year-olds with low performance and students outside the PISA target population, ETF partner countries and OECD average (2022)



Note: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met. Countries and ranked in ascending order of the total percentage of students who are low performers in any of the three domains: mathematics, reading and science. The percentage of low performers in any of the three domains is the sum of low performers in reading, low performers in mathematics, low performers in science, low performers in reading and mathematics but not in science, low performers in reading and science but not in mathematics, low performers in mathematics and science but not in reading, low performers in all three domains.
Source: OECD PISA 2022 Database, Tables I.B1.4.1 and I.B1.4.45.

By considering both of these factors and groups of students – those who underperform and those excluded from the assessment – the data highlights the extent to which ETF partner countries are facing a challenge with inclusivity. A significant portion of the student population in these countries is at risk either because they are struggling academically or because they are not participating in education as expected.

System level factors and student performance

In addition to student characteristics, PISA also provides insights into a range of system-level factors that may correlate with learning outcomes. These factors can help explain the possible reasons why some education systems manage to support student success, especially in terms of equity and overall quality, while others struggle with that task.

System-level factors are also much more actionable than other aspects of the student and school context. While factors related to student background, such as socioeconomic status, may lie beyond the immediate control of people in education, system-level factors – like the allocation of resources and educational expenditure – are typically within the remit of policymakers and practitioners and offer a more direct and actionable basis for formulating policy responses. The analysis of how these areas may or may not correlate with learning outcomes is more likely to resonate with decision-makers who seek ways to improve education and training.

PISA covers many system-level factors, but this section focuses on three key areas: expenditure on education, material resources and human resources in education. These factors represent

[17] 15-year-olds not covered by the PISA sample are 15-year-olds who are not enrolled in school; or who are in school but in grade 6 or below, or who were excluded from the PISA sample due to student or school-level exclusions.

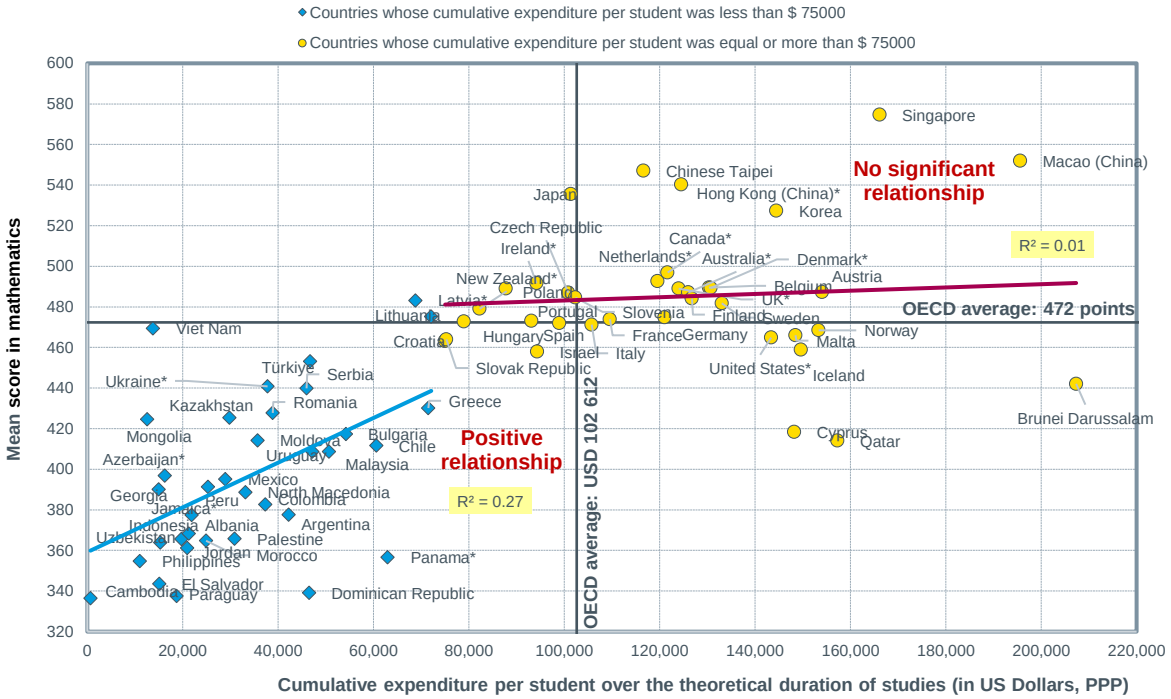
fundamental components of any education system and are critical levers for policymakers. They are also consistently covered in all rounds of PISA which allows for a more longitudinal analysis.

The following sections examine the potential impact of these three factors on student performance in the ETF PISA sample of countries. The sections explore whether investment in education infrastructure, school resources and teacher quality contributes to improved learning outcomes, as well as how these elements relate to equity in education across different ETF partner countries.

Expenditure on education and learning outcomes

For countries participating in PISA 2022, the relationship between investment in education and student outcomes is an important area of focus. Figure 14 provides insights into how cumulative spending per student, from age 6 up to 15 (in USD PPP), relates to average student performance in mathematics. The data reveals important trends in how resources are associated with educational outcomes.

Figure 14. Spending on education and performance in mathematics, countries participating in PISA 2022



Notes: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met. Only countries and economies with available data are shown.
Source: OECD PISA 2022 Database.

The figure shows that, after adjusting for differences in purchasing power, there is a positive association between higher per-student expenditure and better performance in PISA. This relationship holds true up to a threshold of around USD 75 000 PPP. Beyond this point, as shown in the upper-right quadrant of the figure, the connection between spending and performance becomes weaker, and the returns on educational investment start to diminish. In countries that spend above this threshold, improvements in student performance depend more on the efficiency and allocation of resources than on the amount of spending itself.

This trend has significant implications for countries with lower per-student expenditure, particularly those in the lower-left quadrant of the figure. All ETF partner countries, except Israel, fall within this group. For these countries, increasing educational spending is likely to have a positive impact on student performance, as the data suggests that spending more correlates with better outcomes. However, the graph also shows that spending alone is not enough – how resources are used is just as important. The efficiency of resource allocation becomes critical, as indicated by the wide variation in student performance among countries that spend similar amounts per student. In those countries,

increasing expenditure on education could help, but combining it with more effective deployment of resources is likely to make an even bigger difference in improving learning outcomes.

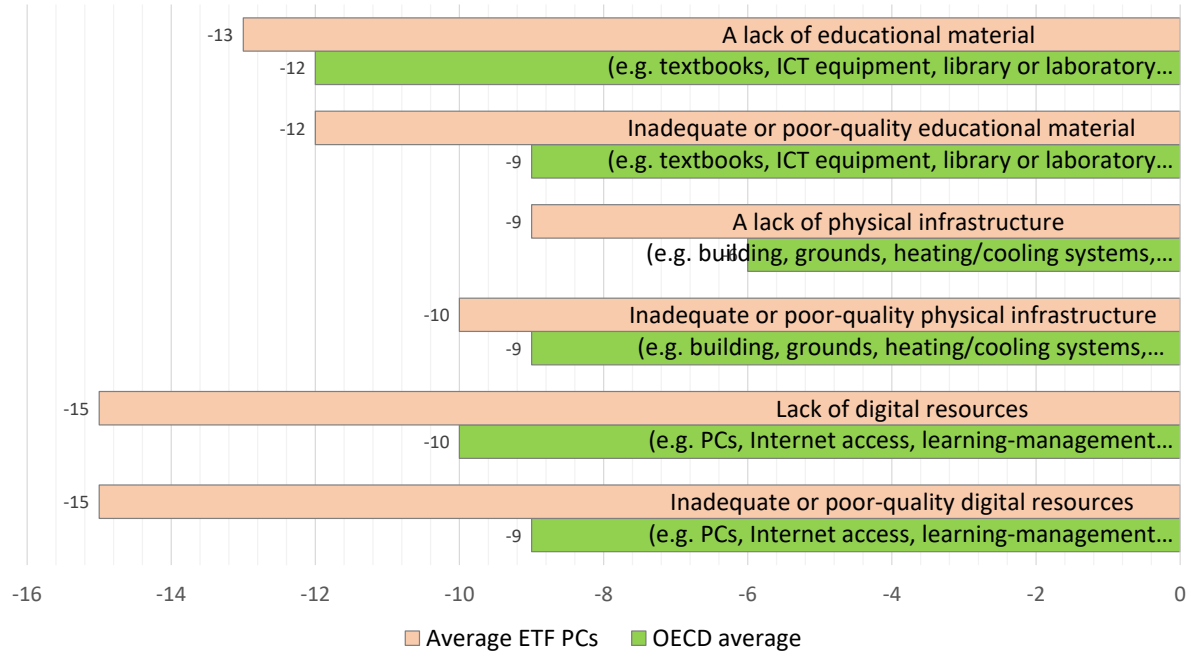
These discrepancies underline a dual challenge for ETF partner countries: while increasing spending on education is essential, ensuring that financial resources are used effectively and allocated where they are needed most, is equally important. For all ETF partner countries in the lower expenditure quartile, optimising resource allocation is just as important to improving student learning as is the need to invest more in education and training.

Material resources and learning outcomes

Material resources – such as digital tools, physical infrastructure and educational materials – play an important role in shaping student learning and performance. In PISA 2022, the principals of schools which were included in the sample were asked how resource shortages affect the ability of their institutions to deliver instruction. Their responses shed light on the extent to which such shortages may coincide with the quality of learning outcomes.

The data in Figure 15 indicates that, on average, schools in ETF partner countries experience more pronounced shortages of material resources compared to schools in OECD countries. For instance, principals in ETF partner countries reported a stronger negative impact from inadequate or poor-quality digital resources (e.g., PCs, internet access, learning-management systems) on the ability of their schools to deliver instruction (average score of -15, compared to -9 in OECD countries. This disparity points to a significant digital divide that may limit the access of students to modern educational tools and hindering their ability to engage fully with digital learning solutions.

Figure 15. Shortage of material resources and performance in mathematics, ETF partner country average and OECD average (2022)



Source: OECD PISA 2022 Database

Likewise, physical infrastructure shortages appear to have a greater perceived impact in ETF partner countries. The reported influence of poor-quality infrastructure (e.g., buildings, heating and cooling systems) on instruction was slightly higher in ETF partner countries than in OECD countries on average (a scoring of -10 and -9 respectively).

Additionally, the lack of educational materials such as textbooks, laboratory equipment and ICT tools was reported as another significant issue. These results suggest that ETF partner countries face not

only a greater shortage of materials, but also that the quality of materials available may be insufficient. This places a further strain on the capacity of schools to provide effective instruction.

Human resources and learning outcomes

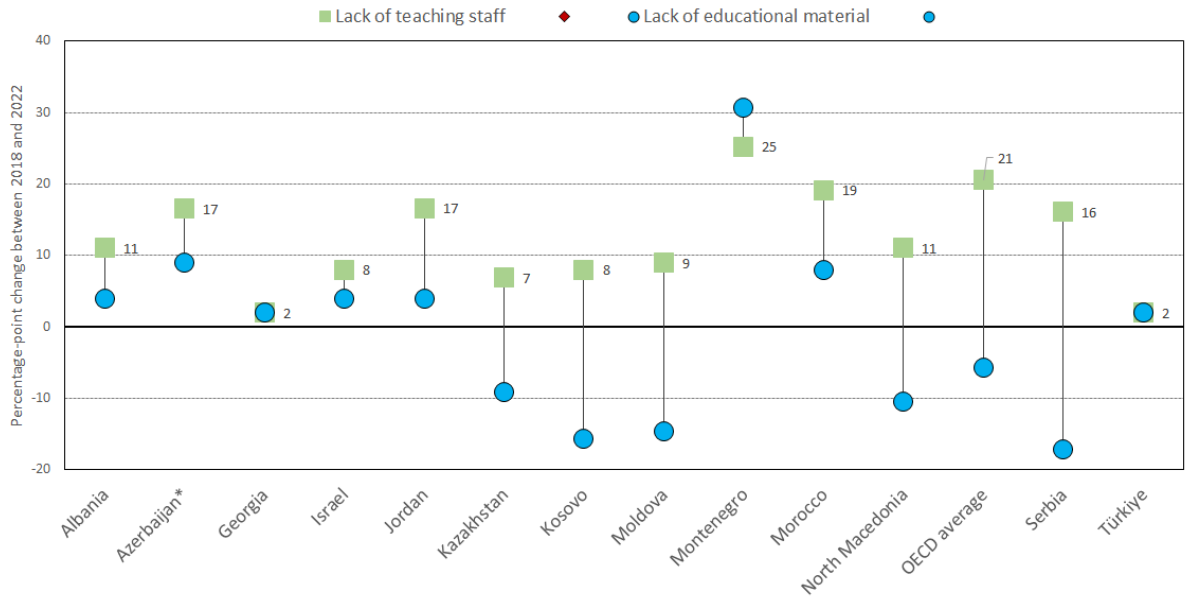
The availability of teaching staff and educational materials can have an outsized impact on the education students receive. A shortage of teachers and trainers can hinder the delivery of lessons, while inadequate educational materials can limit the ability of students to engage fully with the curriculum.

Between 2018 and 2022, many ETF partner countries experienced an increase in the percentage of school principals reporting shortages in teaching staff, according to PISA (Figure 16). This trend suggests growing concerns about the availability of teachers in these countries. For instance, North Macedonia reported a 21 percentage-point rise in teacher shortages, while countries like Montenegro and Albania also saw significant increases in the availability of teaching staff as a challenge.

At the same time, the issue of shortages in educational materials is mixed picture across countries. In some, such as Kosovo and Moldova, the reported lack of educational materials declined, indicating progress in addressing this issue. However, in others like North Macedonia, the shortage of materials remained a significant barrier to educational delivery, showing that material shortages continue to be a challenge in certain contexts.

Figure 16. Change between 2018 and 2022 in shortage of education staff and material resources

Percentage-point change of students whose principals reported that the school's capacity to provide instruction is hindered to some extent or a lot by lack of teaching staff and by lack of educational material (2022)



Note: *Caution is required when interpreting estimates because one or more PISA sampling standards were not met.
Source: OECD PISA 2022 Database

The results point towards two key issues: an increasing concern about the availability of teaching staff across many ETF partner countries; and a diversity of experiences regarding shortages of educational materials. This suggests that while addressing shortages of teaching staff has become more pressing, the importance of material resources remains context-specific, with some countries facing more acute challenges in this area than others.

3. CONCLUSIONS AND POINTERS FOR ACTION

The use of PISA in ETF partner countries

The value of PISA lies in the possibilities it offers for the comparison of student performance across countries, but also in the ability to gather evidence on factors like socioeconomic background and school environment that may be correlated with and possibly influence student performance.

PISA is not without limitations and controversy. Points can be raised about cultural bias and its focus on testable outcomes in core subjects only, which might not fully capture the broader goals of education. There is also criticism regarding the assumptions, sampling and statistical methods used in the assessment, and the rankings based on PISA may lead to pressure on countries to "teach to the test", prioritising PISA domains over other important educational areas – a phenomenon which is well-documented at the national level in countries that use high-stakes standardised assessments (Au, 2007).

Despite these criticisms, PISA is still a valuable tool for researchers, educators and policymakers. However, although ETF partner countries participate in the assessment, they do not necessarily benefit fully from the potential of the data they have paid for and receive. Many may not have sufficient capacity to analyse and fully use the information for policy dialogue and planning purposes. In part, this is because ETF partner countries belong to a group of economies which are not entirely dependent on external partnerships for their education reform efforts, as they are high- and middle-income countries, but neither are they fully self-sufficient.

Instead of assuming that all ETF partner countries can manage certain areas independently, such as data analysis and policy monitoring, the ETF interprets their situation as one that still requires partnership and support when it comes to gathering, organising and exploiting complex evidence such as that delivered by PISA. This report comes as a tangible result based on that interpretation. It shows that there are important insights to be gained into factors such as socioeconomic background and school environments that may influence student performance, and that these insights could potentially support countries in making informed decisions, promote dialogue between countries and inform the decisions and planning of international partners.

The analysis in this report extracted a very first set of observations from the PISA data of ETF partner countries. They are summarised once more below, together with a brief reflection on the possible implications for policy, practice and further research. Although the observations are rather basic and broad, they provide a good start for more in-depth analysis should it be required.

Addressing performance gaps

ETF partner countries lag behind the OECD average in all domains assessed by PISA (mathematics, reading and science). There is a significant performance gap, sometimes amounting to as much as three years of learning. A targeted focus on improving the quality of education, particularly for disadvantaged groups and low-performing students, would therefore be essential.

The efforts at reducing the gaps and boosting student results must start at the systemic barriers that hinder learning for certain groups of learners. Equity-focused reforms, particularly in support of low performers could help narrow these gaps and improve outcomes for all students, fostering a more inclusive educational environment.

This is also a way to strengthen the resilience of education and training systems. Indeed, the COVID-19 pandemic has exacerbated pre-existing challenges in education. The PISA data suggests that countries which were already performing poorly before the COVID-19 pandemic saw even more pronounced declines, while those with better-performing education systems were more resilient.

School closures and the sudden shift to remote learning worsened learning outcomes, particularly for disadvantaged students who lacked access to digital tools or adequate learning environments.

The role of gender and socio-economic background

PISA results show notable gender disparities, particularly in reading, where boys consistently perform worse than girls in many ETF partner countries. Addressing gender disparities should focus on enhancing literacy programmes specifically tailored to boys, incorporating diverse teaching methods that engage them more effectively.

Socio-economic background too remains a strong predictor of student performance in PISA. Students from disadvantaged backgrounds tend to score lower in all domains, often due to limited access to educational resources, less parental support and poorer school environments. Improving equity requires a holistic approach which focuses on early interventions for students from disadvantaged backgrounds. This could include tailored support such as after-school tutoring, mentoring programmes and increased access to educational resources for schools serving low-income communities.

Countries could also consider revisiting their policies and identifying those that may be perpetuating inequities, such as selective school admissions or underfunding in low-income areas. Promoting educational equity is essential not only for improving student outcomes but also for creating fair opportunities for students of all backgrounds.

Resource allocation and teacher shortages

Material and teacher shortages are common challenges faced by many ETF partner countries. Insufficient resources, including inadequate digital tools, poor infrastructure and a lack of high-quality teaching materials, substantially limit the capacity of schools to deliver good quality education. Teacher shortages further exacerbate this issue, leading to larger class sizes and lower student engagement.

Increasing spending on education is critical, but countries should also focus on ensuring that resources are used efficiently. Policies that address teacher shortages should include recruitment initiatives, better salaries and improved working conditions in order to attract and retain qualified teachers. Furthermore, investment in digital tools and infrastructure should be prioritised, particularly for schools in rural or underserved areas.

Policymakers must also consider long-term strategies for improving resource management and allocation. This includes regular assessments of material and staffing needs to ensure that schools are adequately equipped to provide quality education to all students.

Exclusion risks

A sizeable share of the student population sampled by PISA in ETF partner countries seem to be at risk of exclusion, either through poor academic performance or because they were excluded from the PISA sample for structural reasons. There is a need for a stronger focus on the inclusiveness of education policy and practice, for instance by identifying and supporting students at risk early on, helping them to remain engaged in education and to succeed academically. Tailored support, such as remedial education programmes, mentoring and additional resources for schools in high-need areas, could help these students to remain engaged and to improve their academic performance.

Ensuring that students at risk of exclusion are not left behind requires a concerted effort from both policymakers and education practitioners. By identifying and addressing the root causes of academic failure and school disengagement, countries can help reduce the number of students at risk and promote better educational outcomes for all.

ABBREVIATIONS

ESCS	economic, social and cultural status
ETF	European Training Foundation
HCD	human capital development
ICT	information and communication technology
KIESE	knowledge, innovation and skills for employment
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PPP	purchasing power parity
VET	vocational education and training

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