Education in the Eastern Partnership: Findings from PISA

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Abstract
The countries of the Eastern Partnership (EaP) – an initiative between the Member States of the European Union and Eastern European and South Caucasus countries – are navigating significant

challenges while striving for sustainable economic growth and social cohesion. Education plays a crucial role in unlocking the potential of digitalisation and the green transition, offering pathways for economic diversification and innovation. This report, developed in co-operation with the European Commission and UNICEF, analyses PISA data for the EaP countries and economies that participated in PISA 2022: Baku (Azerbaijan), Georgia, Moldova, and Ukrainian regions. It identifies the strengths and challenges within these education systems and provides recommendations on how to build more resilient, equitable, and high-performing systems to support economic and social goals. This report will be of particular interest to policymakers and stakeholders dedicated to advancing education across the Eastern Partnership region.

Read the report

Executive summary

The Eastern Partnership (EaP) is a joint initiative of the European Union, its member states and five countries in Eastern Europe and the South Caucasus: Armenia, Azerbaijan, Georgia, the Republic of Moldova and Ukraine. Launched in 2009, the EaP aims to foster sustainable reforms in these countries and strengthen their ties with the European Union.

Education is crucial for the region's economic development, social prosperity and integration. This report assesses the educational performance of EaP countries and economies participating in the 2022 OECD Programme for International Student Assessment (PISA), specifically Baku (Azerbaijan), Georgia, Moldova and Ukrainian regions. PISA is an international survey carried out every three years that assesses the knowledge and skills of 15-year-old students and provides data on student and school characteristics worldwide. This report leverages the comprehensive PISA dataset to identify strengths and challenges in the EaP education systems in view of generating ideas for policy on how to improve to ensure all students have the opportunity to learn and succeed.

The report centres on three critical aspects of education systems: performance and other student outcomes, equity in educational opportunities and the learning environment both in and outside school. It draws on a broad knowledge base to contextualise findings, including previous OECD reports on EaP education systems developed in collaboration with the European Commission and UNICEF, as well as supplementary research and data from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank and other sources.

Student learning, well-being and expectations for the future

Copy link to Student learning, well-being and expectations for the future

Results from PISA 2022 show that, while most EaP countries and economies bucked the trend and maintained their performance in mathematics between 2018 and 2022, performance in reading and science declined in all of these except for Georgia. In 2022, students from EaP countries and economies still trailed behind the average OECD student in all subjects. Students in Ukrainian regions perform best, while Baku (Azerbaijan) and Georgia perform lowest across domains. Most EaP students lack basic skills, and few excel at higher proficiency levels.

Beyond academic proficiency, PISA also examines student well-being and aspirations, which are often overlooked in policy discussions. Although over half of EaP students report a positive sense of belonging at school, this sense is weaker than in OECD countries, especially concerning student loneliness and social ties. Interestingly, students in Ukrainian regions report high perceived safety despite the ongoing war, contrasting with lower safety perceptions in Moldova and other EaP countries and economies.

Educational aspirations have risen across the EaP, except in Ukrainian regions, where they remain high but have decreased slightly. This raises questions about aligning these aspirations with opportunities in higher education and the labour market.

Equity in students' education opportunities

Copy link to Equity in students' education opportunities

The report examines equity in student performance based on socio-economic background, gender, location and language spoken at home. Although socio-economic gaps in performance are smaller in EaP countries and economies than in OECD countries, this is partly due to the low performance of advantaged students and inequities based on students' socio-economic background remain very large.

Gender gaps, while present across the region, vary in profile: girls in Baku and Georgia outperform boys in reading and match them in mathematics, while in Moldova and Ukrainian regions, boys excel in mathematics and girls in reading.

There are also gender disparities in educational aspirations, favouring girls (except in Moldova), and by socio-economic background, favouring advantaged students. However, on average, boys report a stronger sense of belonging at school than girls in three of the four EaP countries and economies, as is also the case on average across the OECD. Additionally, socio-economic status is linked to students' sense of belonging across EaP countries and economies, with students from more advantaged backgrounds typically feeling a stronger connection to their school environment than their disadvantaged peers.

Geographic location is another source of inequality, with urban students outperforming rural peers, particularly in Moldova. Much of this performance difference by geographic location is explained by urban students' and schools' higher socio-economic status. In Moldova, this seems to be associated with the small size of rural schools, with students performing worse than their peers in medium-sized and large schools. Linguistic diversity adds another layer of complexity. In Georgia and Moldova, students who speak a different language at home underperform in mathematics compared to those who speak the same language at home and school. Language background does not significantly affect performance in Baku and Ukrainian regions.

EaP countries and economies face more pronounced educational material shortages than human resources. While there has been some improvement in material resources over time in Georgia and Moldova, conditions have worsened in Ukrainian regions due to the ongoing war. Although there are no significant disparities in staff shortages between advantaged and disadvantaged schools or urban and rural schools in any EaP country or economy, equity issues related to material resources are evident in certain EaP countries and economies. Shortages are more severe in rural areas compared to cities in Georgia and Ukrainian regions and in disadvantaged schools compared to advantaged ones in Georgia.

Pre-primary attendance varies widely across the region, with the highest levels in Moldova and the lowest in Baku, where attendance is increasing but remains low. Pre-primary attendance is positively associated with student performance at age 15 in EaP countries and economies, except in Ukrainian regions. However, this association is largely explained by students' socio-economic status. Advantaged students are more likely to have attended pre-school in all EaP countries and economies, with particularly large disparities observed in Georgia and Ukrainian regions.

Learning environment in and outside of school

Copy link to Learning environment in and outside of school

PISA 2022 data show that the learning environment in EaP countries and economies is generally on par with the OECD average in terms of teacher support and disciplinary climate, except in Baku, where the disciplinary climate is poorer. However, truancy and lateness are more common in EaP countries and economies, being negatively associated with performance. While these issues have improved since 2018, further progress is needed. Digital devices in EaP schools are less effective than they could be, highlighting the need to limit distractions. Parental involvement is a strength in EaP countries and economies, though it declined between 2018 and 2022, except in Georgia. Strengthening school-family partnerships is crucial for maintaining and enhancing this involvement.

The report also analyses how learning continued during the COVID-19 pandemic in EaP countries and economies as an important context for understanding student learning and well-being as measured by PISA 2022. Moreover, looking at students' experiences during the pandemic allows for drawing lessons on strengths and weaknesses that are still relevant today for building more resilient and inclusive education systems in EaP countries and economies. As student reports suggest, fewer students in EaP countries and economies experienced prolonged school closures compared to OECD countries, likely mitigating learning losses. However, students experienced challenges with remote learning, such as self-motivation and understanding assignments, underscoring the need to prepare students for autonomous learning and to develop more supportive teaching practices.

Building blocks to improve student learning, equity and well-being

Copy link to Building blocks to improve student learning, equity and well-being

The report proposes seven building blocks that could form part of an ambitious policy agenda to improve student learning, equity and well-being in EaP countries and economies. While some of these will help lift the performance of all students, regardless of their current performance levels or background, specific groups of students are likely to benefit from specialised support, such as high-potential students, socio-economically disadvantaged students, rural students and students from minority language backgrounds. These building blocks are:

Focus on ensuring that all students master basic skills

: Focus on raising public investment, enhancing the teaching profession and creating better learning environments to lift all students, particularly those lacking basic skills. The potential rewards are significant as high-quality education is associated with a wide range of economic and social benefits for individuals and societies.

Support students in reaching top performance and in their transitions into tertiary education and high-skilled jobs

: Implement targeted measures to help high-potential students achieve academic excellence and ensure a smooth transition to tertiary education and the labour market, especially in fields critical for future economic growth, such as the digital and green economies.

Address socio-economic disparities in education opportunities

: Address the needs of disadvantaged students by promoting equity through school funding, investing in early childhood education and fostering positive attitudes toward learning. The high share of disadvantaged students who already perform among the highest performing students in their education system in EaP countries and economies suggests that such policies have a real chance to succeed.

Tackle gaps in education opportunities between rural and urban students

: Develop targeted policies for rural education, integrating these with regional and economic development strategies, leveraging digital technologies and reorganising school networks.

Support language minority students

: Enhance support for students from minority language backgrounds, specifically in Georgia and Moldova, through improved teacher education and dedicated support staff.

Expand access to secondary school

: Increase efforts to ensure that all students, specifically in Baku and Georgia, complete their secondary education, possibly through extending compulsory schooling, strengthening vocational education and implementing conditional cash transfers.

Foster student well-being at school

: Monitor student well-being and promote practices that improve teacher-student relationships, foster friendships and develop students' social-emotional skills.

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Foreword from the European Commission

Education is one of the most powerful tools at our disposal, ensuring an organised transmission of knowledge and skills. It is fundamental for accessible personal and professional development and a crucial element of resilient, inclusive and innovative societies. Quality education systems transcend national borders and boundaries. Job markets are increasingly global, learning mobility is more common in higher education institutions and technology travels freely worldwide thanks to the digital transition. Education is also a central pillar of the European Union's co-operation with international partners, particularly our Eastern Partnership (EaP) neighbours.

This study, developed in partnership with the OECD and UNICEF, offers an in-depth analysis of the basic skills performance of Baku (Azerbaijan), Georgia, Moldova and 18 out of the 27 Ukrainian regions in the OECD Programme for International Student Assessment (PISA), the most comprehensive cross-country comparison of learning outcomes in basic education. Importantly, these findings are not just statistics. They represent students' hopes, teachers' dedication and governments' ambition to strive for better opportunities for their citizens.

While circumstances differ for each country, region or city, it is clear that significant improvements have been achieved since EaP countries began participating in PISA. Yet, this study highlights a pressing need to strengthen basic skills, as a significant proportion of students lack proficiency in core areas such as reading, mathematics and science, which poses challenges for their future learning and employability. Moreover, external shocks, such as Russia's illegal war of aggression against Ukraine and the COVID-19 pandemic, have jeopardised recent successes and brought with them new challenges. The combination of these factors stresses the need to reinforce learning outcomes, accelerate learning recovery and ensure that all students succeed and learn in a safe and inclusive environment regardless of their background.

The road ahead demands targeted interventions to recover learning losses, build resilience and foster inclusive education systems. Only then can education be a true driver of economic development in the region. This report serves as a call to action, inviting governments, educators, communities and international partners to address its findings and implement its recommendations.

The European Commission will continue championing qualitative and inclusive education with EaP countries as we look to the future. We share the goal of equipping young people with the skills needed for the rapidly changing world they will inherit and encouraging lifelong learning. Education is the path to employability and personal growth. It is also the foundation for building a stable, prosperous and democratic future for all.

Pia Ahrenkilde-Hansen,

European Commission,

Director General for Education, Youth, Sport and Culture

Foreword from UNICEF

A lack of quality, inclusive learning opportunities threatens the future of children across Europe and Central Asia. All too often, it is the most marginalised children – those with disabilities, from minority groups or who come from rural, migrant or refugee backgrounds – who are left behind.

This new study, carried out by the European Union, OECD and UNICEF, contributes to the efforts being made by countries in the Eastern Partnership to bridge this gap and achieve inclusive, equitable and quality education for all children. Drawing on the large-scale data set collected by the OECD Programme for International Student Assessment (PISA) 2022 surveys, the study investigates the underlying challenges of promoting children's learning and skills development and provides insights into how we can collectively address the unmet learning needs of every child.

We hope that the findings from this study will contribute to informing policies and programmes that help build inclusive, equitable and resilient education systems and achieve the Sustainable Development Goals. UNICEF remains committed to supporting governments, stakeholders and education partners in Europe and Central Asia in improving education outcomes for all children.

Regina De Dominicis,

UNICEF Regional Director Europe and Central Asia,

Special Coordinator, Refugee and Migrant Response in Europe

Foreword from the OECD

The Eastern Partnership (EaP) region is at a critical juncture, with its countries striving to achieve sustainable economic growth and greater social cohesion amidst significant challenges. Digitalisation and the green transition offer new avenues for economic diversification and innovation. Education plays a pivotal role if these countries are to capitalise on these opportunities fully rather than be left behind. By equipping young people with high levels of knowledge and skills, EaP countries can build more competitive and diverse economies and create more inclusive societies. The aspirations of the EaP region are high and education is the cornerstone upon which these ambitions can be realised.

The OECD Programme for International Student Assessment (PISA) is a key tool for assessing educational progress and identifying areas for improvement. PISA provides valuable insights into how well students across the globe are acquiring the essential competencies needed to thrive in the modern world. In the EaP region, PISA results show improvements in educational participation and learning outcomes over time. However, the COVID-19 pandemic reversed some gains and EaP countries still lag behind those in the OECD. Many students in the region struggle to master basic skills, and significant inequities persist, hindering many young people from achieving their full potential.

Together with the European Commission and the United Nations Children's Fund (UNICEF), the OECD is strongly committed to supporting countries and economies in the EaP, helping them achieve their economic and social goals and building resilient and adaptable education systems – particularly at a time when countries continue grappling with the impact of Russia's full-scale invasion of Ukraine and with the aftermath of the COVID-19 pandemic. This study analyses PISA data to identify strengths countries can build upon and challenges they must address. Drawing on OECD knowledge of education policy and practice in the region and beyond, it highlights where policy makers should focus their efforts and provides pointers on how these areas can be improved.

We hope this report will serve as a valuable resource for policy makers, educators and stakeholders across EaP countries and economies and will contribute meaningfully to the ongoing debate on achieving excellent and equitable education systems. May this study further strengthen the OECD's ties to the countries and economies in the EaP and reinforce our valuable partnerships with the European Commission and UNICEF.

Andreas Schleicher,

Special Advisor on Education Policy to the Secretary-General,

Director for Education and Skills

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This report is the product of a collaborative effort between the Eastern Partnership economies participating in the OECD Programme for International Student Assessment (PISA), the OECD secretariat, the European Union and UNICEF.

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Table of contents

FIGURES

TABLES

BOXES

Abbreviations and acronyms

CCT	Conditional cash transfer
EaP	Eastern Partnership
EC	European Commission
ESCS	Economic, social and cultural status
EU	European Union
GDP	Gross domestic product
ICT	Information and communication technology
ISCED	International Standard Classification of Education
PISA	OECD Programme for International Student Assessment
PPP	Purchasing power parity
STEAM	Science, technology, engineering, arts and mathematics
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States dollars
VET	Vocational education and training

Executive summary

The Eastern Partnership (EaP) is a joint initiative of the European Union, its member states and five countries in Eastern Europe and the South Caucasus: Armenia, Azerbaijan, Georgia, the Republic of Moldova and Ukraine. Launched in 2009, the EaP aims to foster sustainable reforms in these countries and strengthen their ties with the European Union.

Education is crucial for the region's economic development, social prosperity and integration. This report assesses the educational performance of EaP countries and economies participating in the 2022 OECD Programme for International Student Assessment (PISA), specifically Baku (Azerbaijan), Georgia, Moldova and Ukrainian regions. PISA is an international survey carried out every three years that assesses the knowledge and skills of 15-year-old students and provides data on student and school characteristics worldwide. This report leverages the comprehensive PISA dataset to identify strengths and challenges in the EaP education systems in view of generating ideas for policy on how to improve to ensure all students have the opportunity to learn and succeed.

The report centres on three critical aspects of education systems: performance and other student outcomes, equity in educational opportunities and the learning environment both in and outside school. It draws on a broad knowledge base to contextualise findings, including previous OECD reports on EaP education systems developed in collaboration with the European Commission and UNICEF, as well as supplementary research and data from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank and other sources.

Student learning, well-being and expectations for the future

Results from PISA 2022 show that, while most EaP countries and economies bucked the trend and maintained their performance in mathematics between 2018 and 2022, performance in reading and science declined in all of these except for Georgia. In 2022, students from EaP countries and economies still trailed behind the average OECD student in all subjects. Students in Ukrainian regions perform best, while Baku (Azerbaijan) and Georgia perform lowest across domains. Most EaP students lack basic skills, and few excel at higher proficiency levels.

Beyond academic proficiency, PISA also examines student well-being and aspirations, which are often overlooked in policy discussions. Although over half of EaP students report a positive sense of belonging at school, this sense is weaker than in OECD countries, especially concerning student loneliness and social ties. Interestingly, students in Ukrainian regions report high perceived safety despite the ongoing war, contrasting with lower safety perceptions in Moldova and other EaP countries and economies.

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Equity in students' education opportunities

The report examines equity in student performance based on socio-economic background, gender, location and language spoken at home. Although socio-economic gaps in performance are smaller in EaP countries and economies than in OECD countries, this is partly due to the low performance of advantaged students and inequities based on students' socio-economic background remain very large.

Gender gaps, while present across the region, vary in profile: girls in Baku and Georgia outperform boys in reading and match them in mathematics, while in Moldova and Ukrainian regions, boys excel in mathematics and girls in reading.

There are also gender disparities in educational aspirations, favouring girls (except in Moldova), and by socio-economic background, favouring advantaged students. However, on average, boys report a stronger sense of belonging at school than girls in three of the four EaP countries and economies, as is also the case on average across the OECD. Additionally, socio-economic status is linked to students' sense of belonging across EaP countries and economies, with students from more advantaged backgrounds typically feeling a stronger connection to their school environment than their disadvantaged peers.

Geographic location is another source of inequality, with urban students outperforming rural peers, particularly in Moldova. Much of this performance difference by geographic location is explained by urban students' and schools' higher socio-economic status. In Moldova, this seems to be associated with the small size of rural schools, with students performing worse than their peers in medium-sized and large schools. Linguistic diversity adds another layer of complexity. In Georgia and Moldova, students who speak a different language at home underperform in mathematics compared to those who speak the same language at home and school. Language background does not significantly affect performance in Baku and Ukrainian regions.

EaP countries and economies face more pronounced educational material shortages than human resources. While there has been some improvement in material resources over time in Georgia and Moldova, conditions have worsened in Ukrainian regions due to the ongoing war. Although there are no significant disparities in staff shortages between advantaged and disadvantaged schools or urban and rural schools in any EaP country or economy, equity issues related to material resources are evident in certain EaP countries and economies. Shortages are more severe in rural areas compared to cities in Georgia and Ukrainian regions and in disadvantaged schools compared to advantaged ones in Georgia.

Pre-primary attendance varies widely across the region, with the highest levels in Moldova and the lowest in Baku, where attendance is increasing but remains low. Pre-primary attendance is positively associated with student performance at age 15 in EaP countries and economies, except in Ukrainian regions. However, this association is largely explained by students' socio-economic status. Advantaged students are more likely to have attended pre-school in all EaP countries and economies, with particularly large disparities observed in Georgia and Ukrainian regions.

Learning environment in and outside of school

PISA 2022 data show that the learning environment in EaP countries and economies is generally on par with the OECD average in terms of teacher support and disciplinary climate, except in Baku, where the disciplinary climate is poorer. However, truancy and lateness are more common in EaP countries and economies, being negatively associated with performance. While these issues have improved since 2018, further progress is needed. Digital devices in EaP schools are less effective than they could be, highlighting the need to limit distractions. Parental involvement is a strength in EaP countries and economies, though it declined between 2018 and 2022, except in Georgia. Strengthening school-family partnerships is crucial for maintaining and enhancing this involvement.

The report also analyses how learning continued during the COVID-19 pandemic in EaP countries and economies as an important context for understanding student learning and well-being as measured by PISA 2022. Moreover, looking at students' experiences during the pandemic allows for drawing lessons on strengths and weaknesses that are still relevant today for building more resilient and inclusive education systems in EaP countries and economies. As student reports suggest, fewer students in EaP countries and economies experienced prolonged school closures compared to OECD countries, likely mitigating learning losses. However, students experienced challenges with remote learning, such as self-motivation and understanding assignments, underscoring the need to prepare students for autonomous learning and to develop more supportive teaching practices.

Building blocks to improve student learning, equity and well-being

The report proposes seven building blocks that could form part of an ambitious policy agenda to improve student learning, equity and well-being in EaP countries and economies. While some of these will help lift the performance of all students, regardless of their current performance levels or background, specific groups of students are likely to benefit from specialised support, such as high-potential students, socio-economically disadvantaged students, rural students and students from minority language backgrounds. These building blocks are:

- **Focus on ensuring that all students master basic skills**: Focus on raising public investment, enhancing the teaching profession and creating better learning environments to lift all students, particularly those lacking basic skills. The potential rewards are significant as high-quality education is associated with a wide range of economic and social benefits for individuals and societies.
- **Support students in reaching top performance and in their transitions into tertiary education and high-skilled jobs**: Implement targeted measures to help high-potential students achieve academic excellence and ensure a smooth transition to tertiary education and the labour market, especially in fields critical for future economic growth, such as the digital and green economies.
- **Address socio-economic disparities in education opportunities**: Address the needs of disadvantaged students by promoting equity through school funding, investing in early childhood education and fostering positive attitudes toward learning. The high share of disadvantaged students who already perform among the highest performing students in their education system in EaP countries and economies suggests that such policies have a real chance to succeed.
- **Tackle gaps in education opportunities between rural and urban students**: Develop targeted policies for rural education, integrating these with regional and economic development strategies, leveraging digital technologies and reorganising school networks.
- **Support language minority students**: Enhance support for students from minority language backgrounds, specifically in Georgia and Moldova, through improved teacher education and dedicated support staff.
- **Expand access to secondary school**: Increase efforts to ensure that all students, specifically in Baku and Georgia, complete their secondary education, possibly through extending compulsory schooling, strengthening vocational education and implementing conditional cash transfers.
- **Foster student well-being at school**: Monitor student well-being and promote practices that improve teacher-student relationships, foster friendships and develop students' social-emotional skills.

1 Education in Eastern Partnership countries and economies

This introductory chapter provides an overview of the report and key educational system features in Eastern Partnership (EaP) countries and economies. It explains the purpose and structure of the report, which includes five chapters and focuses on three substantive topics: student outcomes, equity and learning environment within and outside of schools. The report draws on data from the OECD Programme for International Student Assessment (PISA) as its main sources of evidence. This chapter briefly describes the features of PISA and the methodology used to assess student performance and gather contextual information. It also provides an overview of the key features of EaP countries/economies and their education systems, focusing on the economic context and investment in education, the social and cultural context, and the educational landscape.

The Eastern Partnership (EaP) is a joint initiative of the European Union (EU), its member states and five countries in Eastern Europe and the South Caucasus – Armenia, Azerbaijan, Georgia, the Republic of Moldova (hereafter Moldova) and Ukraine.[1] It was launched in 2009 and has developed through consultations, summits and agreements. The EaP aims to strengthen and deepen the political and economic relations between EU member states and partner countries, and support sustainable reform processes in EaP countries. The policy agenda adopted for the EaP in 2020 identified five priority goals, with resilience at its core: economy and connectivity, good governance and the rule of law, environmental and climate resilience, support for digital transformation, and fair and inclusive societies (EC, 2020[1]).

While the EaP countries are different in many respects (e.g. population size, language, path to EU membership), they are also similar in important ways (e.g. they transitioned to market economies after the fall of the Soviet Union and currently face challenges of economic growth, diversification and poverty reduction). Education is a central building block of regional and national reform efforts, particularly in strengthening human capital to address the region's largest development challenges. The role of education in supporting green and digital transitions is especially critical as EaP countries look to equip their populations with the skills necessary for these emerging sectors. While there are signs of improvements in educational participation and learning outcomes over the last decades, educational progress has not been equitable across all population groups and many students still struggle to master basic competencies. Addressing these challenges will be crucial to the region's economic development, social prosperity and integration into Europe.

Purpose of the report and sources of evidence

This report aims to identify strengths, challenges and effective practices to improve student learning, equity and well-being in selected EaP countries/economies, drawing on data from the OECD Programme for International Student Assessment (PISA).[2] The EaP countries/economies forming part of the report are Baku in Azerbaijan, Georgia, Moldova and 18 of the 27 regions in Ukraine. The development of their participation in PISA is described further below. Armenia has not yet participated in PISA, although participation is underway for PISA 2025. Throughout the report, any reference to EaP countries and economies, as well as the EaP average, therefore specifically pertains to Baku, Georgia, Moldova and Ukrainian regions.

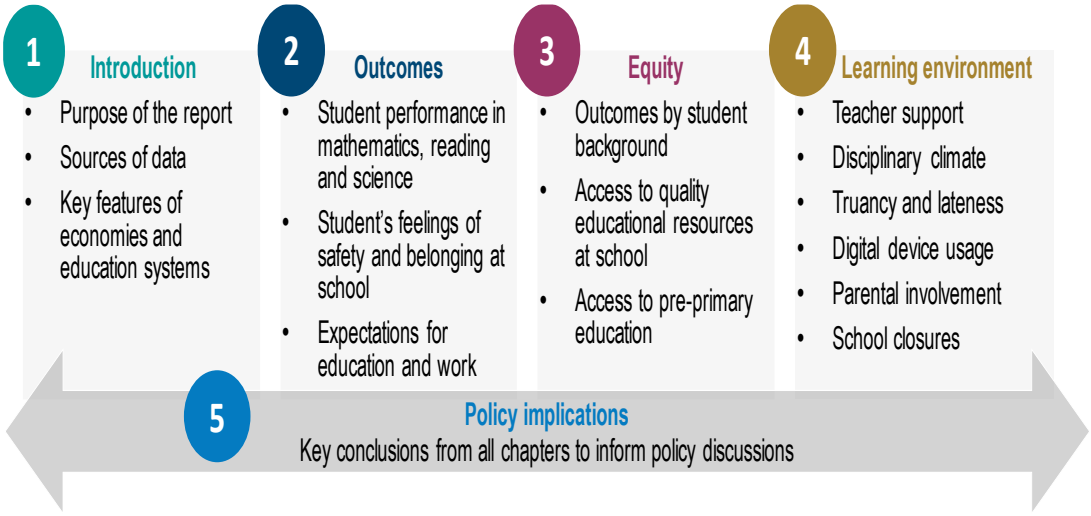
Large-scale assessments such as PISA provide a rich evidence base to drive necessary changes and improvements in education systems. The insights in this report are particularly relevant for secondary school as PISA primarily collects data at this level of education. **It seeks to generate policy ideas for the region and individual education systems** by comparing the performance of EaP countries/economies against selected international benchmarks. These benchmarks are chosen based on indicators of relevance and aspiration. For example, for the analysis of student outcomes in Chapter 2, Estonia and Singapore are used as aspirational benchmarks in addition to the OECD average, while for Chapter 3 on equity, Finland and Japan are used as benchmarks. The average for EU countries is typically similar to the OECD average on a number of indicators. For selected indicators, the report also highlights countries that have seen the greatest improvements or declines over time and identifies countries with performance levels similar to those of EaP countries/economies to help position their results.

The analysis focuses on three substantive topics as follows:

- **Chapter 2** focuses on student outcomes, including learning outcomes, students' feelings of safety and belonging at school, and expectations for education and work.
- **Chapter 3** examines equity in students' educational opportunities, exploring how these vary by student background and access to educational resources.

- **Chapter 4** investigates the learning environment within and outside of schools, including aspects such as learning during school closures, teacher support, disciplinary climate, truancy, digital device usage and parental involvement.
- **Chapter 5** synthesises the key conclusions from these chapters in a way that is intended to inform policy discussions in EaP countries/economies (Figure 1.1).

Figure 1.1. Report structure



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The report focuses on data that are relevant to all systems. Therefore, the analysis does not cover data that do not meet this criterion or significantly influence the overall educational performance in EaP countries/economies. This includes differences between students in public and private schools, between students in general and vocational tracks, and students from a non-immigrant and immigrant background:

- **Students in private schools**: Fewer than 2% of 15-year-old students attend private school in Baku, Moldova and Ukrainian regions. This is higher only in Georgia, where 9% of students attend private school, but still only half of the OECD average of 18%.
- **Students in vocational education**: Except for Ukrainian regions, where 19% of students are enrolled in a vocational programme, only 6% of students in Moldova and no students in Baku and Georgia attend such a programme. Across OECD countries, 13% of all 15-year-old students in the PISA sample are in a vocational programme.
- **Students with an immigrant background**: While students with an immigrant background represent 13% of the sample across OECD countries, they constitute only 1% in Georgia and Ukrainian regions, 2% in Moldova and 4% in Baku.

What is PISA? How have EaP countries and economies participated?

What is PISA?

PISA is an international survey that tests 15-year-old students[3] worldwide in the competencies essential for participating fully in society and the economy. With its focus on this age group, PISA offers a comprehensive picture of students' cumulative learning experiences from early childhood up to the age

of 15. These experiences encompass all aspects of a student's life, including schooling, home education and other external influences. This survey forms the basis of this report.

First implemented in 2000, PISA has been conducted every three years. The eighth iteration of the assessment, initially scheduled for 2021, was postponed to 2022 in response to the disruptions caused by the COVID-19 pandemic. The pandemic posed significant challenges to educational systems globally, affecting the implementation of the PISA 2022 assessment. Some countries and economies struggled to meet PISA technical standards for student sampling during this period. These specific countries and economies are marked with an asterisk throughout this report. Further details regarding these sampling issues are provided in Box 1.1.

Box 1.1. PISA in the pandemic

PISA 2022 collected data from 81 countries and economies. The test was originally planned to take place in 2021 but was delayed by one year due to the COVID-19 pandemic. The exceptional circumstances throughout this period, including lockdowns and school closures, led to occasional data collection difficulties. While the vast majority of countries and economies met PISA's technical standards,[1] a small number did not.

In prior PISA rounds, countries and economies that failed to comply with the standards could face exclusion from the main part of reporting. However, given the unprecedented situation of undertaking a survey during a pandemic, PISA 2022 results include data from all participating education systems, including those for which sampling issues were identified.

Thirteen adjudicated entities (i.e. countries, economies and regions within countries) did not meet one or more PISA sampling standards. Canada, Ireland, New Zealand, the United Kingdom (excluding Scotland) and Scotland (United Kingdom) submitted technically strong analyses, indicating that estimates may have significant bias due to low response rates (below PISA standards). Australia, Denmark, Hong Kong (China), Jamaica, Latvia, the Netherlands, Panama and the United States did not meet one or more PISA sampling standards and it is uncertain if there is more than minimal bias based on available data at the time. Caution is necessary when interpreting the estimates for these entities, some of which are used as benchmarks in this report.

1. Available at https://www.oecd.org/pisa/pisaproducts/PISA-2022-Technical-Standards.pdf.
Source: OECD (2023[2]), *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*, https://doi.org/10.1787/53f23881-en.

How have EaP countries/economies participated in PISA?

Since its inception, global participation in PISA has expanded considerably. From 43 countries/economies in the first assessment in 2000, participation grew to 81 by 2022.[4] Among these, EaP countries/economies have progressively increased their engagement, as shown in Table 1.1.

Georgia and Moldova began their participation in 2009 and have participated in four assessments since, except for the 2012 cycle. Azerbaijan joined PISA for the first time in 2006 but has only participated with its capital city, Baku, since PISA 2018. Ukraine was the last EaP country/economy to join, starting in 2018. However, following Russia's full-scale invasion of Ukraine, only 18 of the country's 27 regions were able to participate in the 2022 assessment.[5] Box 1.2 provides detailed information on Ukraine's participation.

Box 1.2. The participation of Ukraine in PISA 2022 in the context of war

Ukraine participated in PISA for the first time in 2018. For PISA 2022, there were significant changes in the survey implementation, most notably reduced participation following the start of the full-scale war. The 2022 survey was meant to include Ukraine's entire educational system. However, because of the war, only 18 out of the 27 jurisdictions were able to participate.

PISA technical standards permit countries/economies to exclude up to 5% of the target population – 15-year-old students enrolled in Grade 7 or higher – either by excluding schools or students within schools. In 2022, 16 countries and economies did not meet this standard.

In Ukraine, the exclusion rate was very high, at 36.1%, when computed with respect to the original sampling frame, covering the entire country.[1] However, the high exclusion rate was primarily due to the inability to complete survey operations successfully in regions severely affected by the war. Results from the 18 regions that participated in PISA 2022 can be deemed reliable for reporting. However, comparisons with previous data should be made with caution and with due consideration of the differences in target populations. The exclusion rate in Ukrainian regions was 14.9%.

The 18 regions that participated include Cherkasy, Kirovohrad, Poltava, Vinnytsia, Chernihiv, Kyiv, Sumy, the city of Kyiv, Zhytomyr, Odesa, Chernivtsi, Ivano-Frankivsk, Khmelnytskyi, Lviv, Rivne, Ternopil, Volyn and Zakarpattia oblasts.

The nine jurisdictions that could not participate were Dnipropetrovsk, Donetsk, Kharkiv, Luhansk, Zaporizhzhia, Kherson, Mykolaiv oblasts, the Autonomous Republic of Crimea, and the city of Sevastopol.

1. Detailed data on PISA target population and samples is available at: https://www.oecd-ilibrary.org/sites/53f23881-en/1/4/2/index.html?itemId=/content/publication/53f23881-en&_csp_=de697f9ada06fe758fbc0d6d8d2c70fa&itemIGO=oecd&itemContentType=book#tablegrp-d1e14601-fbbb2a911b.

Table 1.1. EaP countries/economies have continuously increased their participation in PISA

Participation of EaP countries/economies in PISA cycles

	Baku (Azerbaijan)	Georgia	Moldova	Ukrainian regions (18 of 27)
PISA 2000				
PISA 2003				
PISA 2006	X			
PISA 2009	X	X	X	
PISA 2012				
PISA 2015		X	X	
PISA 2018	X	X	X	X
PISA 2022	X	X	X	X

Note: Azerbaijan as a whole country participated in PISA 2006 and 2009; only Baku participated in PISA 2018 and 2022. Georgia and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. In Ukraine, almost the entire country participated in PISA 2018; only 18 of the country's 27 regions participated in PISA 2022.

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How does PISA measure student performance?

What does PISA assess?

PISA assesses the extent to which students have acquired the knowledge and skills in reading, mathematics and science required to succeed in life. Each PISA cycle prioritises one of these domains, dedicating nearly half of the total testing time to it. In the 2022 cycle, mathematics was the core area of focus.

PISA assesses what students know and examines how well students can extrapolate from what they have learned and apply their knowledge in real-life settings. To establish clear expectations for what it means to be proficient in each subject, PISA develops subject-specific assessment frameworks (OECD, 2023[2]). Annex 1.A provides a detailed overview of the 2022 assessment for mathematics. This information can help readers understand what it means to be proficient in mathematics in PISA. When interpreting PISA scores, readers can keep in mind that a 20-point difference is approximately equivalent to the typical annual learning gain of a 15-year-old, representing the average pace of learning for students of that age across participating countries (Avvisati and Givord, 2023[3]).

How does PISA assess?

PISA has transitioned from a paper-based to a computer-based assessment format in almost all participating countries/economies, including all EaP countries and economies (Table 1.2). Moldova and Ukraine adopted the computer-based mode of administration for the first time in 2022. Although efforts are made to make results from the two modes comparable, interpreting trends requires caution. Factors such as students' motivation levels can influence performance trends.

The assessment lasts a total of two hours for each student. In this time, they tackle a mix of multiple-choice and open-ended questions. Taking advantage of the flexibility of computer-based assessment, the mathematics and reading sections apply a multi-stage adaptive approach. This method adjusts the difficulty of test items based on a student's performance in preceding sections. Test items are grouped around passages that set out real-life scenarios. The full battery of test items is over 15 hours of content across the different domains, though each student only encounters a portion of these test items.

Table 1.2. Features of participation in PISA 2022

		Baku	Georgia	Moldova	Ukrainian regions (18 of 27)
Computer-based assessment		x	x	x	x
Creative thinking assessment/questionnaire		x	x[1]	x	x
Financial literacy assessment/questionnaire					
Optional questionnaires	ICT for students		x		x
	Parent		x		
	Teacher	x	x		
	Well-being				

Notes: Georgia took the PISA 2022 creative thinking questionnaire but not the creative thinking assessment. All other EaP countries/economies took both the creative thinking assessment and questionnaire.
The PISA 2022 assessment was administered on computers in 77 out of 81 countries/economies. The creative thinking assessment was conducted in 74 countries (10 of them only took the questionnaires but did not conduct the assessment) and the financial literacy assessment was conducted in 20. The information and communication technology (ICT) questionnaire was implemented in 52 countries/economies, the parent questionnaire in 17, the teacher questionnaire in 18 and the well-being questionnaire in 15 countries/economies.

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What additional information does PISA gather?

In addition to information about students' knowledge and competencies, PISA collects extensive information about students' educational context, including the learning environment and student attitudes, dispositions and experiences at home and school. These additional data help to better understand educational outcomes, learning quality and equity. All participating countries and economies, including EaP systems, distribute school and student questionnaires to collect these data.

Optionally, countries and economies can collect data on teaching practices through the teacher questionnaire and parental involvement via the parent questionnaire. In the EaP region, Baku and Georgia implemented the teacher questionnaire, with Georgia also opting to distribute the parent questionnaire.

In the context of the COVID-19 pandemic, the PISA 2022 cycle included a Global Crises Module in the school and student questionnaires. This addition aimed to capture insights into how education was managed during school closures. The findings from this module are discussed in Chapter 4 of the report. Readers should keep in mind, however, that many students did not respond to questions about COVID-19 school closures (i.e. high non-response rates) placed at the end of the student questionnaire, limiting these data's representative nature.

Analyses of EaP countries/economies

In partnership with the European Commission and the United Nations Children's Fund (UNICEF), the OECD has analysed education systems in EaP countries/economies through both quantitative data analyses and more qualitative methods in recent years. Insights from this other work inform this report and help contextualise data analysis findings. Additionally, secondary research and data, such as from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank and non-governmental organisations, are used to add perspective.

- The OECD and UNICEF have analysed PISA 2018 data for all four EaP countries/economies reviewed in this report as part of a broader report for Eastern Europe and Central Asia. The latter also covered six additional countries such as Belarus, Kazakhstan and Türkiye and analysed aspects that are not the focus of this report, such as student sorting across different programmes, learning time and teacher qualifications (OECD/UNICEF, 2021[4]). A separate report – developed by the OECD, the European Commission and UNICEF – analysed education in the Western Balkans (OECD, 2020[5]).
- Besides PISA, EaP countries/economies participate in other OECD surveys. Georgia participated in the 2018 Teaching and Learning International Survey (TALIS). Ukrainian regions participated in the 2023 Survey on Social and Emotional Skills.
- Together with UNICEF, the OECD has gathered more qualitative insights into the EaP education systems through dedicated studies, namely for Georgia in a *Review of Evaluation and Assessment in Education* (Li et al., 2019[6]), for Moldova through EU-funded policy perspectives on staff professional development and curriculum resources (OECD, 2023[7]) and the evaluation of vocational education and training (OECD, 2023[8]) and for Ukraine through an integrity assessment (OECD, 2017[9]). For Ukraine, the OECD has also published a number of policy briefs in response to the war, specifically with a focus on supporting Ukrainian refugee students.[6]

Key features of EaP countries/economies and education systems

In each participating country, PISA assesses a representative sample of students aged between 15 years 3 months and 16 years 2 months at the time of the assessment and having completed at least 6 years of

formal schooling. PISA only assesses young people attending an educational institution. The learning outcomes of 15-year-olds who are out of school are not captured in PISA.

Table 1.3. Characteristics of the students in the PISA 2022 sample

			Baku (Azerbaijan)	Georgia	Moldova	Ukrainian regions (18 of 27)	OECD average
How well does the sample of students who took the PISA test represent the population of 15-year-olds in each country/economy?	Number of participating students (i.e. students who took the PISA test)		7 720	6 583	6 235	3 876	-
	Number of students represented by the PISA sample[1]		30 529	40 416	28 879	165 592	-
	Percentage of the 15-year-old population covered by the PISA sample [2] (%)		73	86	97	64	-
What is the socio-economic background of students who took the PISA test?	PISA index of student economic, social and cultural status (ESCS)	All students	-0.51	-0.47	-0.52	-0.35	0
		Disadvantaged students[3]	-1.68	-1.67	-1.76	-1.47	-1.21
		Advantaged students[4]	0.70	0.73	0.70	0.73	1.09
		Advantaged - Disadvantaged (dif.)	2.38	2.39	2.46	2.20	2.31
What is the demographic background of students who took the PISA test?	Students who are girls (%)		47	49	47	50	50
	Students with an immigrant background (%)		4.4	1.1	1.8	0.9	12.9
	Students who speak a different language at home than at school (%)		13	8	9	15	11
	Students enrolled in schools located in (%):	Village or rural areas (fewer than 3 000 people)	1	26	39	21	8
		Towns (from 3 000 to about 100 000 people)	47	25	33	43	52
		Cities (over 100 000 people)	52	49	28	36	40
In which grade levels are the students who took the PISA test?	Modal grade (grade most represent by 15-year-olds)		10	10	9	10	9.8
	Students in upper secondary education (%)		66	93	14	97	60

Notes: Data cells are coloured when they contain information that makes it possible to calculate a statistical test for differences between countries (i.e. this is not the case in the first three rows of the table).
Percentage or value or difference in indicator is significantly above other EaP countries/economies.
Percentage or value or difference in indicator is significantly below other EaP countries/economies.
1. Weighted number of participating students, i.e. the number of students in the nationally defined target population the PISA sample represents.
2. The PISA Coverage Index 3 informs how well the PISA sample covers the 15-year-old-population. Low values in this index may be attributed to 15-year-olds who are no longer enrolled in school or who were held back in primary school. Coverage Index 3 may also be lower due to student exclusions from the PISA test and dropouts during the school year.
Socio-economically disadvantaged students among the 25% of students with the lowest values on the ESCS index in their country or economy.
3. Socio-economically advantaged students among the 25% of students with the highest values on the ESCS index in their country or economy.
Source: OECD (2022[10]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/6ndyfx

A two-stage sampling procedure is used within countries to select a sample of at least 150 schools and roughly 42 students within each of those schools. **EaP countries/economies assessed a similar number of students**, ranging from more than 6 000 in Moldova to almost 8 000 in Baku. Ukrainian regions had the lowest number of participating students with fewer than 4 000 (in 2018, when Ukrainian regions participated in PISA, except those under Russian occupation or controlled by the two self-declared break-away republics in the east of the country, the number of participating students in Ukraine was 5 998). These students represent about 165 000 fifteen-year-olds enrolled in school in Ukrainian regions, 40 000 in Georgia and 30 000 in Baku and Moldova (Table 1.3).

The national context of each country participating in PISA greatly affects the students sampled to participate in the survey. This section discusses some of the key contextual features of EaP countries/economies and how these are reflected in their PISA 2022 student samples (Table 1.3). Readers should keep these contextual factors in mind to interpret the analysis throughout this report. The association between these different contextual factors and students' learning and well-being are discussed in depth in Chapter 3 (e.g. differences between rural and urban students).

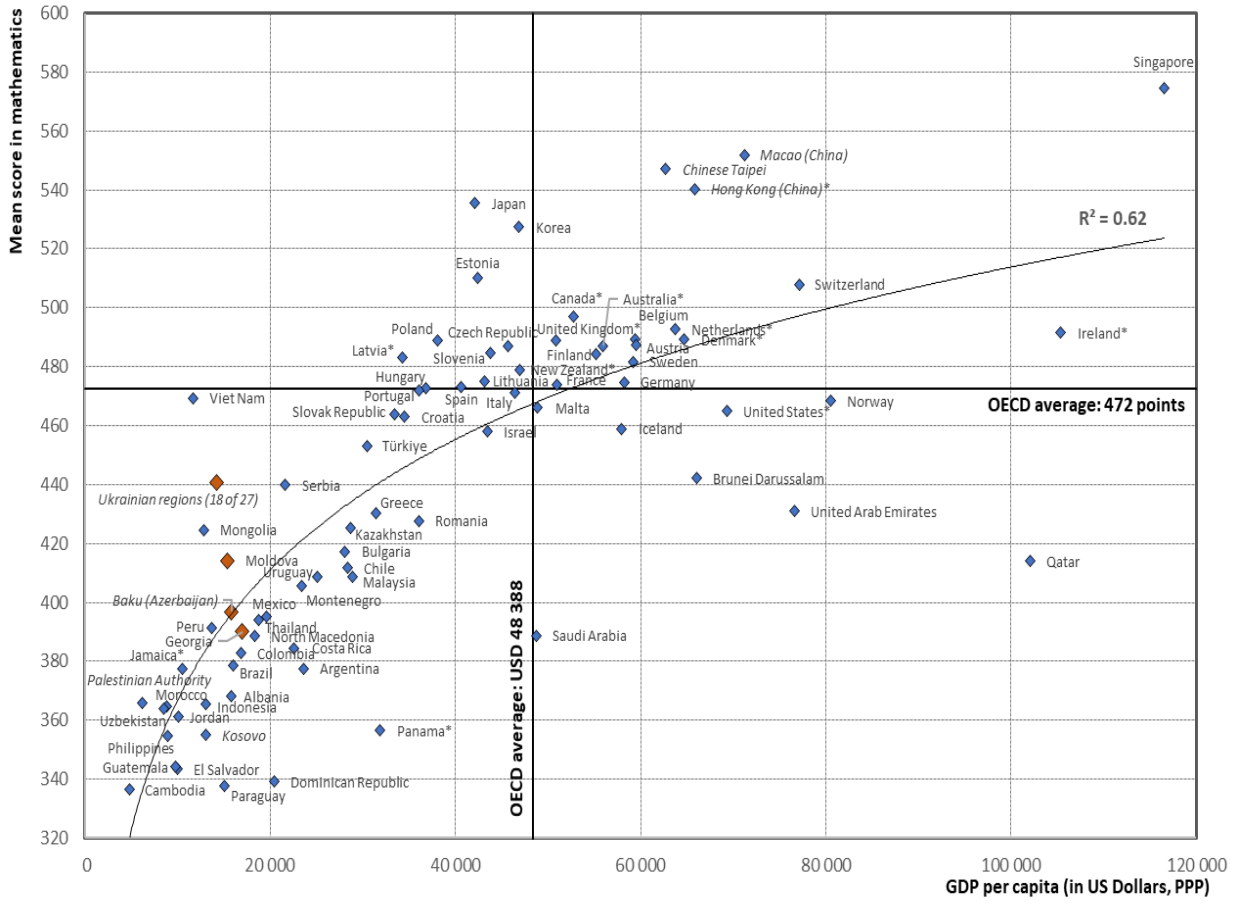
Economic context and investment in education

Wealth and education outcomes

While there is some variation in per capita gross domestic product (GDP) between EaP countries/ economies, **EaP countries/economies are less affluent than most OECD countries**. EaP countries/ economies had an average GDP per capita of USD 15 620 purchasing power parity (PPP) in 2022, compared to the OECD average of USD 48 388 (Figure 1.2).

Economic development levels should be considered when interpreting results from PISA. Across participating countries and economies, 62% of performance differences in mean mathematics scores between countries in PISA 2022 can be accounted for by national per capita income.

Figure 1.2. EaP school systems perform around what would be expected from their levels of economic development



Notes: Data on GDP per capita for Baku refer to the whole country of Azerbaijan and, for Ukrainian regions (18 of 27), refer to the whole country of Ukraine. EaP countries/economies are coloured in red.
* Caution is required when interpreting estimates because one or more PISA sampling standards were not met (see Box 1.1 in this chapter).
Source: OECD (2022[10]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Figure 1.2 shows the performance of education systems relative to their per capita GDP. **The EaP school systems perform around what would be expected from their levels of economic development**. Some EaP systems perform better than other countries with similar or higher income levels. For example, Moldova surpasses Colombia and Costa Rica in mathematics despite having a lower GDP. Meanwhile, Mongolia, with an even lower GDP, still does better than Baku, Moldova and Georgia in the same subject. This indicates the potential for policy to help overcome resource limitations.

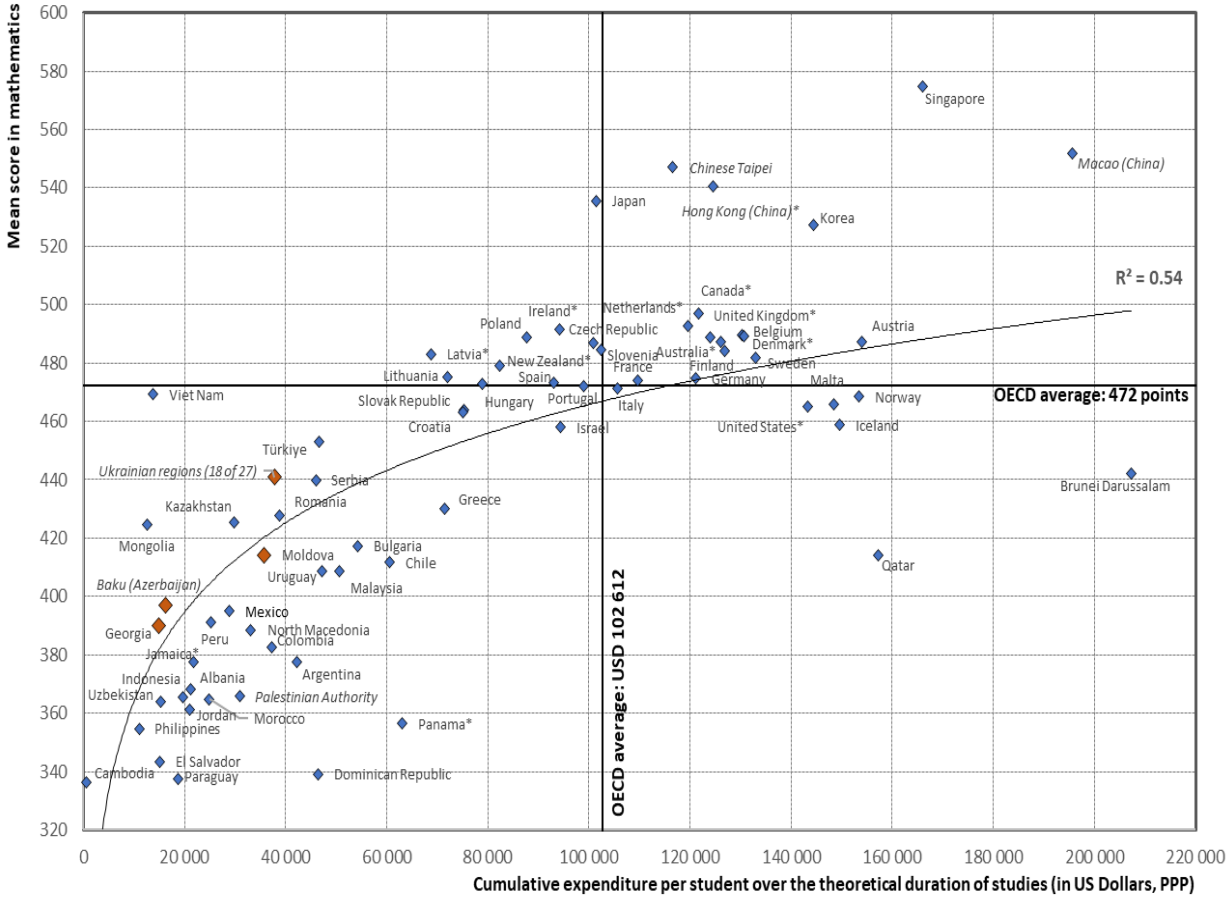
Spending and education outcomes

Overall educational spending per student in all EaP countries/economies is considerably lower than on average across OECD countries.[7] Spending among EaP systems is highest in Ukraine (USD 37 798) and Moldova (USD 35 686) and lowest in Azerbaijan (USD 16 237) and Georgia (USD 14 950).

EaP countries/economies also perform roughly what would be expected based on their spending on education per student. Nevertheless, Baku and Georgia perform slightly higher than might be expected from their expenditure levels.

Figure 1.3. EaP countries/economies are among those systems where additional spending on education could help lift outcomes

Total education expenditure on educational institutions per student and mathematics performance



Note: Educational spending refers to countries' cumulative spending per student from the age of 6 up to 15 after accounting for PPP. Data on educational expenditure for Baku refer to the whole country of Azerbaijan and, for Ukrainian regions (18 of 27), refer to the whole country of Ukraine. EaP countries/economies are coloured in red. Only countries and economies with available data are shown.
* Caution is required when interpreting estimates because one or more PISA sampling standards were not met (see Box 1.1 in this chapter)
Source: OECD (2022[10]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/yclbz2

As the PISA data suggest, educational spending makes a difference in student learning up to a certain point (Figure 1.3). That is, one can observe a relationship between spending and student achievement, but as spending levels increase, how funds are used plays an even more important role in shaping how well students learn (OECD, 2017[11]; OECD, 2023[12]). **EaP countries/economies are among those where increased spending could make a difference**. However, this does not imply that the limited available resources should not be used efficiently.

Social and cultural context

Students' economic, social and cultural status (ESCS)

An important concern for all countries is how students from disadvantaged backgrounds perform compared to their advantaged peers. This indicates the extent to which the school system provides equal opportunity to students regardless of socio-economic circumstances.

In EaP countries/economies, the average student typically has a lower socio-economic status than students in OECD countries (Table 1.3). PISA measures this through an ESCS index, which considers factors such as home possessions (indicative of family wealth), parents' education level and their employment. The ESCS index is standardised so that the OECD average is zero with a standard deviation of one. A lower ESCS value indicates lower average socio-economic status, while a higher value indicates higher socio-economic status.

Across EaP systems, the average socio-economic status of students is broadly similar in Baku, Georgia and Moldova. While slightly higher in Ukrainian regions, it is still well below the OECD average.

One can also consider how the most socio-economically advantaged and disadvantaged students in each EaP country compare socio-economically with their counterparts in other countries. Across EaP systems, **the most advantaged students**[8] **are found in Georgia and Ukrainian regions**. On average, **the most advantaged students in EaP countries/economies are less advantaged than the most advantaged students in OECD countries** (Table 1.3).

Conversely, across EaP systems, **the most disadvantaged students**[9] **are in Moldova**. Compared to the most disadvantaged students across OECD countries, **the most disadvantaged students in EaP countries/economies experience greater socio-economic disadvantage**.

Inequality in students' socio-economic status can be measured by the difference in socio-economic status between advantaged and disadvantaged students. **Socio-economic inequality is higher (by a small but statistically significant margin) in EaP countries/economies than on average across OECD countries, except for Ukrainian regions**. Here, socio-economic inequality is lower than the OECD average and lower than in other EaP countries/economies (Table 1.3).

Socio-economic inequality among 15-year-old students, however, does not necessarily mirror patterns of income inequality at the country level. This is partly because Baku and Ukrainian regions in PISA 2022 are not measures of the entire country. Among EaP countries, according to the Gini index[10] for 2020, income inequality is the highest in Georgia (Gini index = 40.21), followed by Moldova (30.17) and Ukraine (29.64). The lowest income inequality is measured in Azerbaijan (19.21). For comparison, the Gini index for high-income countries was 38.01 in 2020 (UNU-WIDER, 2022[13]).

Geographic location

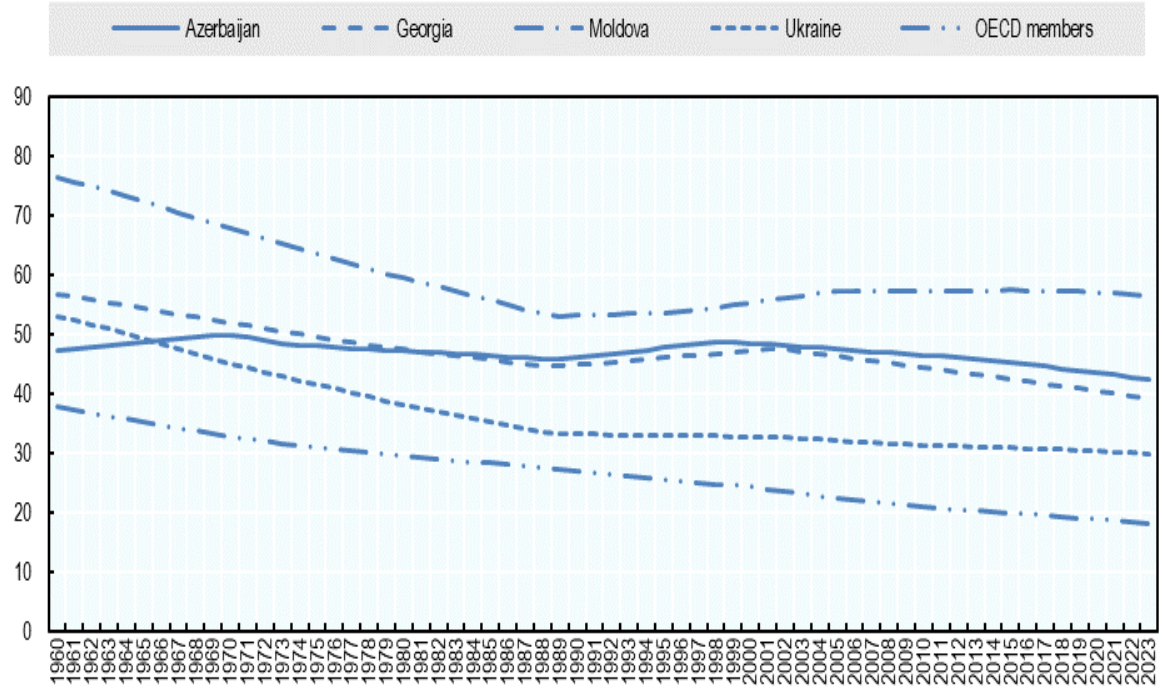
Research has shown that providing quality learning environments in rural environments can be more challenging. Rural schools may struggle to offer diverse and rich educational experiences because of limited resources and isolation from peer institutions (Echazarra and Radinger, 2019[14]; OECD, 2018[15]).

In EaP countries/economies, with the exception of Baku, a relatively high proportion of students attend schools in rural areas, as defined by PISA (populations of 3 000 people or fewer). Moldova has one of the highest percentages of students attending rural schools among the countries/economies participating in PISA 2022 – 39% – and the highest among EaP countries/economies.

The low number of rural students in Baku reflects the fact that only Baku, the main metropolitan area of the country, took part in PISA 2022; in PISA 2009, when students from all of Azerbaijan took the test, the share of students attending a school in rural areas was 32% (OECD, 2010[16]).

Again, data at the country level help further contextualise levels of rurality in EaP countries. Similar to OECD countries, the share of the rural population of the total population has been declining in EaP countries/economies since the 1960s. The decline has been steepest in Ukraine. However, the **rural population's importance remains much larger in all EaP countries/economies than in OECD countries**, with 30% in Ukraine, 39% in Georgia and 42% in Azerbaijan, compared to 18% in OECD countries. Levels of rurality in Azerbaijan and Georgia are similar to those in OECD countries like Poland and Slovenia (40% and 44% respectively). In Moldova, the share of the rural population has changed little since the 1990s: more than half of Moldovans lived in rural areas in 2023 (57%) (World Bank, 2023[17]).

Figure 1.4. Rural population remains much larger in all EaP countries/economies than in OECD countries, despite a decline in recent decades



Source: World Bank (2018[18]), *Rural Population (% of Total Population) - Azerbaijan, Georgia, Ukraine, Moldova, OECD Members, Poland, Türkiye*, https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=AZ-GE-UA-MD-OE-PL-TR&skipRedirection=true.

StatLink https://stat.link/m6hoge

Linguistic diversity

Linguistic diversity is an important factor in EaP education systems and is more prevalent than diversity based on immigrant background. The percentage of students who speak a different language at home compared to the one in which they sat their PISA assessment is highest in Baku and Ukrainian regions (in both economies, it is higher than on average across OECD countries) and lowest in Georgia and Moldova (in both countries, it is lower than on average across OECD countries). The share of students with an immigrant background is less than 5% in all EaP countries/economies whereas, on average, across OECD countries, it is 13%. Box 1.3 provides details on the languages spoken in EaP countries.

Box 1.3. Linguistic diversity in EaP countries/economies

In PISA, linguistic diversity can be captured through two different indicators. On the one hand, the PISA student questionnaire that each student responds to after taking the PISA test included asking students what language they usually spoke at home. Based on this information, the percentage of students who speak at home a language that is different from the language in which they took the PISA assessment is derived. On the other hand, PISA has information on the language in which each student took the PISA test. The latter is used in this box.

Official and minority languages and language of assessment in PISA 2022

In **Azerbaijan**, Azeri is the official language, Russian is widely spoken as a second language and minority languages include Avar, Georgian, Kurdish, Lezgin and Talysh. In PISA 2022, eight out of ten students in Baku took the PISA test in Azeri, while the rest took it in Russian.

In **Georgia**, Georgian is the official language, Russian is widely spoken, and minority languages include Armenian, Azeri, Mingrelian and Svan. In PISA 2022, 93% of students took the PISA test in Georgian, 5% in Azeri, while the rest took it in Russian.

In **Moldova**, Romanian is the official language, Russian is widely spoken, and minority languages include Gagauz, Russian and Ukrainian. In PISA 2022, 82% of students took the PISA test in Romanian, while the rest took it in Russian.

In **Ukraine**, Ukrainian is the official language, Russian is widely spoken, and minority languages include Belarusian, Bulgarian, Crimean Tatar, Gagauz, Hungarian, Romanian, Russian and others. There is evidence that language preferences have changed in the context of war in Ukraine, but all these languages remain current in the country. In PISA 2022, 99% of students in Ukrainian regions took the PISA test in Ukrainian, while the rest took it in Russian.

Source: Minority Rights Group (n.d.[19]), *Homepage*, https://minorityrights.org/.

Educational landscape

Coverage rates (percentage of 15-year-olds enrolled in school)

The coverage of an education system, that is, the share of the school-age population enrolled in schools, can be considered an important metric of educational inclusion. Inclusion refers to the objective of ensuring that all students, particularly those from disadvantaged backgrounds or traditionally marginalised groups, have access to high-quality education and attain at least a baseline level of skills. High coverage rates are important as students who leave formal schooling before age 15 tend to perform less well on cognitive tests than those who remain at school (OECD, 2023[20]).

In PISA, the coverage of an education system is measured by the proportion of the national population of 15-year-olds (enrolled and not enrolled in school) represented by the PISA sample (referred to as Coverage Index 3). PISA only assesses students who are enrolled in Grade 7 or above in an educational institution, be this full- or part-time, public or private, academic or vocational. A low Coverage Index 3 can be related to issues such as a high rate of early school leaving, grade repetition or exclusion from the PISA test (e.g. due to special needs or limited assessment-language proficiency).

Among EaP countries/economies, the coverage of the education system is virtually universal in Moldova, high in Georgia and relatively low in Baku (Table 1.3). In Moldova, coverage is similar to that

of countries such as Finland, Singapore and the United Kingdom (95% and higher). It is noticeable that Moldova has such a high coverage among 15-year-olds despite having compulsory education end at age 16; this is earlier than most other EaP countries. In Georgia, coverage is similar to that of countries such as Kosovo (86%) and Mongolia (87%). In Baku, coverage is similar to that of Türkiye (74%) and Romania (76%).

In Ukrainian regions, education system coverage measured by PISA was very low in 2022 (64%). However, this should be interpreted with caution in light of the administration of PISA in the context of war, as highlighted in Box 1.2. Also, students had to move due to the war, which made the population statistics outdated. In PISA 2018, the education system coverage in Ukraine was 87%.

Student grade level and compulsory education

To ensure comparability of the PISA target population across countries, PISA assesses students at a specific age rather than grade level. This approach is used because the grade level is linked to the structure of school systems, which varies significantly from country to country. The 15-year-olds in PISA may be distributed across different grade levels in different countries/economies. **In some systems, students may be in lower secondary education, while in others, they may be in upper secondary education**. In addition, 15-year-olds may move between these two levels and thus, students in the PISA sample may be from lower secondary and upper secondary.

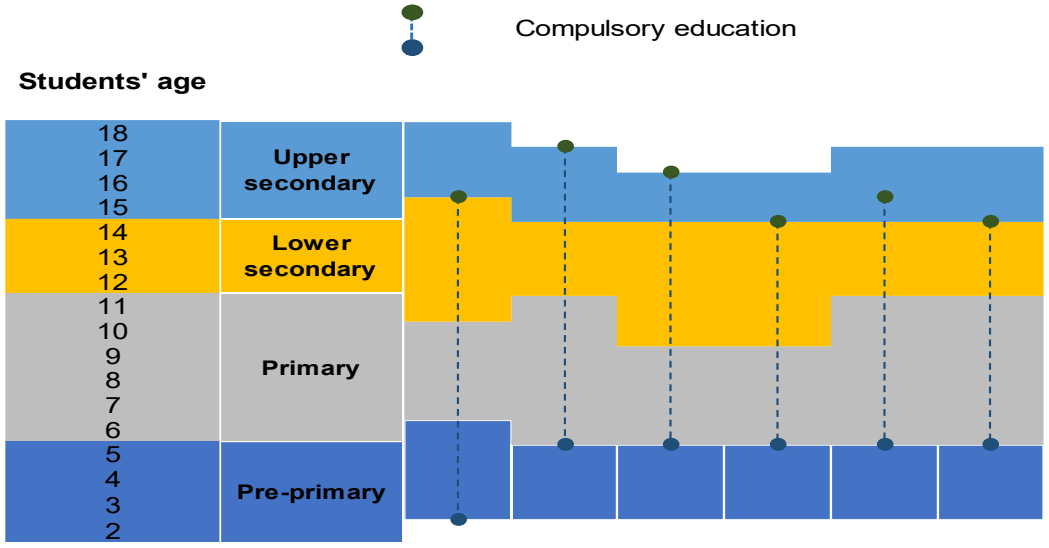
In Georgia and Ukrainian regions, significantly more students are in upper secondary education when they take PISA – 93% and 97% – compared to the OECD average of 60%. In Baku, 66% of students were in upper secondary education during testing (Table 1.3). In Azerbaijan, Georgia and Ukraine, 15-year-old students who have not repeated a grade are expected to be enrolled in Grade 10, which marks the beginning of upper secondary education in these countries (Figure 1.4). **The high percentage of 15-year-olds below the typical grade level may stem from issues in student progression, like grade repetition or delayed entry into primary school. In Baku's case, the primary reason is often a delayed start to primary education**. Over 30% of students reported starting school at age 7 or later, despite compulsory schooling beginning at age 5. Grade repetition rates are low, with only 3.8% of 15-year-olds repeating a grade during their schooling (compared to the OECD average of 8.9%).

By contrast, in Moldova, most of the students who took PISA are enrolled in lower secondary education (Table 1.3). In Moldova, 15-year-olds who have not repeated a grade are expected to be enrolled in Grade 9, the last year of lower secondary school (Figure 1.5). Students in Moldova are typically one grade level "behind" 15-year-old students in other EaP countries/economies because primary school starts one year later: in Moldova, children enter primary school at age 7, whereas in other EaP countries/economies, the age of entry into primary school is 6 (this is also the most typical in OECD and non-OECD countries participating in PISA).

The above means that by the age of 15, students in Moldova have been exposed to a school curriculum for a shorter period than students of the same age in other countries. However, Moldova's education system compensates for this apparent weakness by having children enter pre-primary education earlier. This level is compulsory in Moldova starting at age 2, whereas in other EaP countries/economies, no year of pre-primary education is compulsory. In addition, pre-primary education lasts longer in Moldova (four years) than in other EaP countries/economies and typical OECD and non-OECD countries. This is reflected in higher enrolment rates: according to student reports for PISA, 81% of 15-year-olds in Moldova had attended pre-primary education for more than 3 years, whereas in other EaP countries/economies, the corresponding shares are much lower.

Figure 1.5. The vertical structure of EaP education systems

Theoretical starting age and theoretical duration of pre-primary, primary and secondary education for students in general programmes



Education system	Moldova	Georgia	Ukraine	Baku (Azerbaijan)	Typical[1] OECD school system	Typical non-OECD school system
Number of years of compulsory schooling	13	12	11	9	10	9

Notes: Theoretical starting age is when students are expected to enter an education level according to national law or regulation. The theoretical duration is the number of years of schooling a student is expected to complete before graduating from an education level according to law or regulation.

Countries and economies are shown in descending order of the number of compulsory years of schooling.

1. Typical is based on modal values across countries and economies.

Source: OECD (2022[10]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/xkzsc8

Annex 1.A. How does PISA 2022 conceptualise mathematics competencies?

PISA develops subject-specific frameworks that define what it means to be proficient in mathematics, reading and science. These frameworks organise the subject according to key processes, contents and contexts that are measured in the assessment. The mathematics framework was updated for PISA 2022.

Mathematics assessment framework

The PISA 2022 mathematics framework considers that being mathematically proficient is less about reproducing routine procedures and more about using mathematical reasoning, which requires a clear understanding of foundational mathematical concepts. Mathematics competency is defined as students' capacity to reason mathematically and formulate, employ and interpret mathematics to solve problems in various real-world contexts. It includes concepts, procedures, facts and tools to describe, explain and predict phenomena.

Students at all levels of mathematics proficiency can demonstrate mathematical reasoning. At high levels of proficiency, students understand that a problem is quantitative in nature and can formulate complex mathematical models to solve it. At lower proficiency levels, mathematical reasoning is displayed by students who may not know much about formal mathematics but can intuitively spot a problem and solve it in informal ways using elementary mathematics.

To develop students' ability to reason mathematically, schools and education systems need to go beyond teaching and evaluating routine mathematical procedures: students need to be ready to address unfamiliar real-world problems and apply the mathematical tools they have in new ways.

Mathematical processes and content subscales

In addition to the overall mathematics scale, PISA 2022 developed mathematics subscales for specific mathematical processes and mathematical contents.

Mathematical processes

PISA 2022 considers four distinct mathematical processes. For each of these, a distinct mathematics subscale is developed. Each PISA mathematics test item is then designed to capture one of the processes. Students are not necessarily expected to use all four to respond to each test item.

The four process subscales include the following:

- Mathematical reasoning.
- Formulating situations mathematically.
- Employing mathematical concepts, facts and procedures.
- Interpreting, applying and evaluating mathematical outcomes.

Mathematical content

PISA 2022 also captures competencies in mathematics in four content domains and has again developed a subscale for each of these domains.

- **Quantity**: Number sense and estimation; quantification of attributes, objects, relationships, situations and entities in the world; understanding various representations of those quantifications and judging interpretations and arguments based on quantity.
- **Uncertainty and data**: Recognising the place of variation in the real world, including having a sense of the quantification of that variation and acknowledging its uncertainty and error in related inferences. It also includes forming, interpreting and evaluating conclusions drawn in situations of uncertainty. The presentation and interpretation of data are also included in this category, as well as basic topics in probability.
- **Change and relationships**: Understanding fundamental types of change and recognising when they occur in order to use suitable mathematical models to describe and predict change. Includes appropriate functions and equations/inequalities as well as creating, interpreting and translating among symbolic and graphical representations of relationships.
- **Space and shape**: Patterns; properties of objects; spatial visualisations; positions and orientations; representations of objects; decoding and encoding of visual information; navigation and dynamic interaction with real shapes as well as representations, movement, displacement and the ability to anticipate actions in space (OECD, 2023[2]).

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Notes

[1] In line with the European Council Conclusions of 12 October 2020 and in light of Belarus' involvement in the launch of Russia's full-scale invasion of Ukraine, recognised in the European Council Conclusions of February 2022, the European Union has stopped engaging with representatives of Belarus public bodies and state-owned enterprises.

[2] The report uses the terms "countries and economies" or "countries/economies" to account for the fact that in PISA 2022, only certain jurisdictions within Azerbaijan and Ukraine participated in the assessment.

[3] In PISA reports, "15-year-old students" is used as a shorthand. However, in practice, the PISA target population is based on an age window: PISA assessed students who were at least 15 years and 3 complete months old and who were at most 16 years and 2 complete months old at the beginning of the assessment period, with a tolerance of 1 month on each side of this age window.

[4] This includes 37 out of the 38 OECD countries, with Luxembourg being the exception, and 44 partner countries and economies.

[5]Statement of the OECD Council on the Russian aggression against Ukraine, 24 February 2022, https://www.oecd.org/en/about/news/press-releases/2022/02/statement-of-oecd-council-on-the-russian-aggression-against-ukraine-.html

[6] For more information, see the OECD Ukraine hub at https://www.oecd.org/ukraine-hub/en/.

[7] Educational spending refers to countries' cumulative spending per student from the age of 6 up to 15 after accounting for PPP.

[8] Socio-economically advantaged students are those among the 25% of students with the highest values on the ESCS index in their country or economy.

[9] Socio-economically disadvantaged students are those among the 25% of students with the lowest values on the ESCS index in their country or economy.

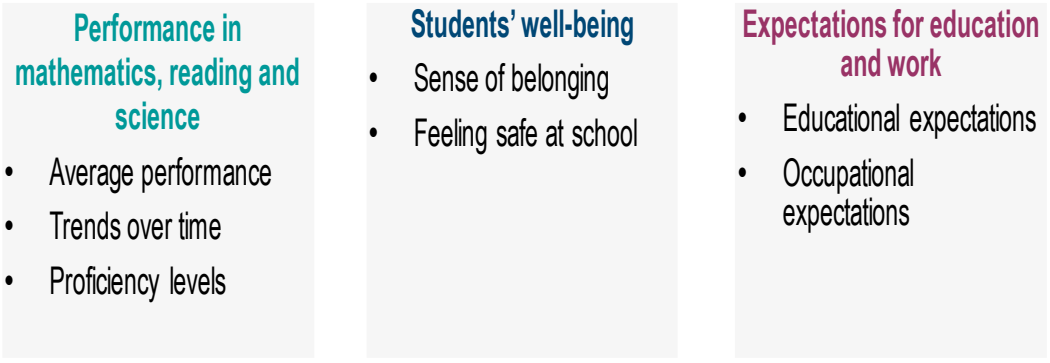
[10] Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

2 Student learning outcomes, well-being and expectations for the future

This chapter discusses student learning outcomes, well-being and expectations for the future in Eastern Partnership (EaP) countries and economies. It first focuses on student performance in mathematics, reading and science, including OECD Programme for International Student Assessment (PISA) 2022 results and trends over time. It then examines student well-being by looking at their sense of belonging and feelings of safety at school. Finally, the chapter explores students' expectations about their level of education attainment and aspirations for their future occupation.

This chapter analyses student learning outcomes, well-being and expectations for the future in Eastern Partnership (EaP) countries and economies as measured in the OECD Programme for International Student Assessment (PISA) data for 2022 (PISA 2022) (see Figure 2.1).[1] Student learning is analysed for 2022 and over time, relative to the OECD average and Estonia and Singapore as selected aspirational benchmarks. The average for European Union (EU) countries is typically similar to the OECD average on a number of indicators. The analysis highlights that EaP students trail behind the average OECD student as well as students in Estonia and Singapore as selected aspirational benchmarks. The average for European Union (EU) countries is typically similar to the OECD average on a number of indicators. The analysis highlights that EaP students trail behind the average OECD student as well as students in Estonia and Singapore in all subjects. Among the EaP countries/economies, Ukrainian regions (18 of 27)[2] perform best, while Baku (Azerbaijan)[3] and Georgia show the lowest performance across all domains.

Figure 2.1. Student learning outcomes, well-being and expectations as covered in this report



StatLink https://stat.link/eoh2ut

All EaP countries/economies have a large proportion of 15-year-olds who lack basic skills in one, two or all three subjects assessed by PISA, and only a small minority of students who perform at the highest proficiency levels. Notably, EaP countries/economies maintained their mean performance in mathematics – the main assessment domain in PISA 2022 – between 2018 and 2022, except for Baku, where students' mathematics performance declined. However, mean performance in reading and science declined in all EaP countries/economies except Georgia.

Additionally, the chapter examines students' perceptions of belonging and safety within schools, and students' educational aspirations. Overall, the sense of belonging at school is lower among EaP countries/economies than on average across OECD countries. However, looking at specific indicators of student belonging reveals a more differentiated picture across EaP countries/economies. Surprisingly, in the current context, students in Ukrainian regions report exceptionally high levels of perceived safety in and out of schools, contrasting with Moldova and other EaP countries, where students feel less safe compared to the OECD average. With regards to student expectations, key findings include a significant increase in educational aspirations across all EaP countries, except Ukrainian regions, where aspirations decreased, remaining high nonetheless. This raises questions about how these aspirations match opportunities for tertiary education and the labour market.

Student belonging and safety are all measures of student well-being, defined in terms of the environment a student is exposed to at school and outside of school (OECD, 2019[1]). Other dimensions of student well-being, including their social relationships with teachers and family and their engagement with school – indicated by behaviours like skipping school or the classroom disciplinary climate – are discussed in depth in Chapter 4 of the report. Box 2.1 provides a summary of these and selected additional aspects of students' school experience that sometimes receive less attention in policy discussions.

Box 2.1. Student well-being in EaP countries/economies

The analysis of student well-being in this report focuses on some important dimensions, including a sense of belonging to school and feeling safe at school, discussed in depth in this chapter. However, the information on student well-being collected by PISA goes beyond the dimensions covered in depth in this report. Table 2.1 summarises results for some of these and other aspects of student well-being for EaP countries/economies as proposed by work by PISA on a comprehensive framework of student well-being (Cignetti and Piacentini, 2024[2]). According to these data, the levels of psychological and social well-being, as well as students' resilience, are often comparable to or better than the OECD average in EaP countries/economies.

- **Psychological well-being**: Table 2.1 highlights three selected dimensions of psychological well-being. More students in Baku report having "emotional control" (the ability to manage emotions to achieve goals, complete tasks or control and direct behaviour) than the OECD average. Students in EaP countries/economies (excluding Baku) report higher "life satisfaction" than the OECD average. Regarding a "sense of purpose" (the capacity to find meaning or purpose in life), more students in EaP countries/economies agree with the statement that "My life has clear meaning or purpose" compared to the OECD average.
- **Resilience**: Resilience, defined as the ability to encounter adversity or stress and achieve positive outcomes, is generally higher among students in EaP countries/economies, with less "fear of failure" reported compared to their OECD peers, except in Baku. Students in Baku report higher levels of "belief in self" (self-perceived ability to handle difficult situations or solve complex issues) than the OECD average, whereas the opposite is true in Moldova.
- **Social relationships**: Students in EaP countries/economies report similar levels of belonging at school to the OECD average (a more detailed analysis on this dimension is provided later in this chapter). Students in Georgia report better relationships with their teachers compared to other EaP countries and the OECD average, and students in Baku and Georgia indicate higher levels of family support than the OECD average (a more detailed analysis on this dimension is provided in Chapter 4).

Table 2.1. Levels of psychological and social well-being are often comparable to or better than the OECD average in EaP countries/economies

			Baku (Azerbaijan)	Ukrainian regions (18 of 27)	Moldova	Georgia	OECD average
Psychological well-being	Emotional control	Share of students who have an index value above OECD average	68	58	54	59	55
	Life satisfaction	Share of students who report a score of life satisfaction of 7 or above	60	70	66	73	61
	Sense of purpose	Share of students who report agreeing or strongly agreeing with the statement "My life has clear meaning or purpose"	84	76	85	78	69
Resilience	Fear of failure	Share of students who have an index value above OECD average	52	39	5	37	50
	Learning autonomy		55	54	50	47	51
	Belief in self		57	36	39	41	43
Social relationships	Sense of belonging	Share of students who have an index value above OECD average	48	41	41	46	45
	Student-teacher relationships		43	48	44	53	45
	Family support		50	45	45	47	43

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Student performance in mathematics, reading and science

Average performance in PISA 2022

Learning outcomes in EaP countries/economies trail behind international standards, including the OECD average and countries like Estonia and Singapore that lead in PISA 2022 results (Figure 2.2). Ukrainian regions come closest to matching OECD averages in all subjects. Baku and Georgia have the most room to improve.

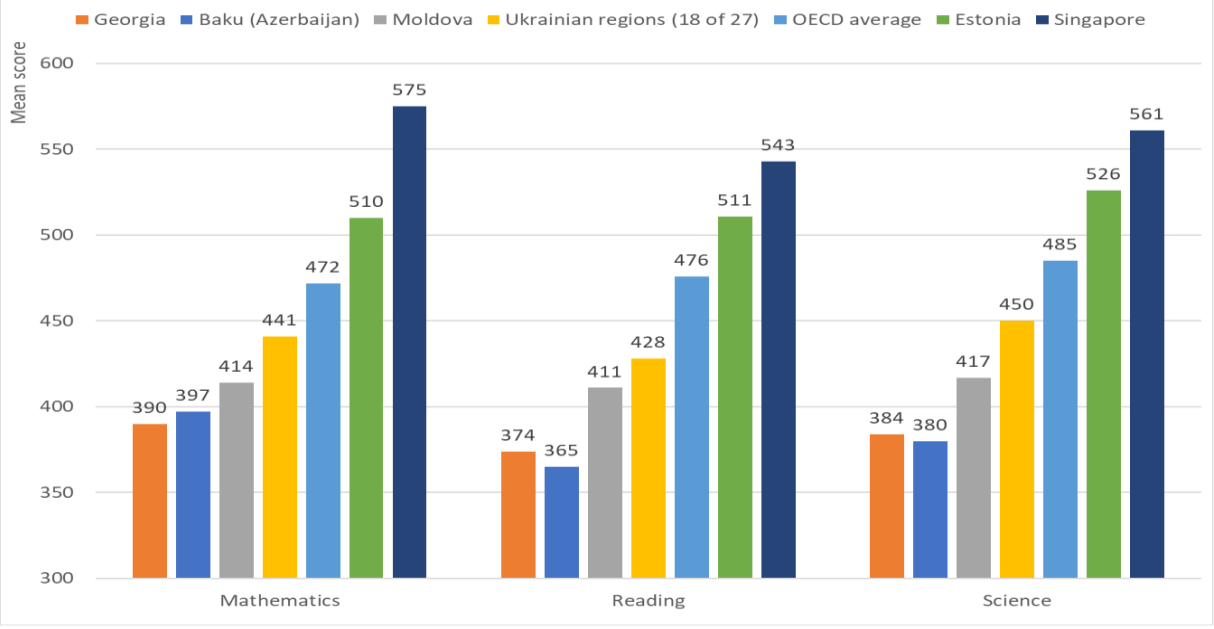
The learning gap relative to OECD countries is smallest in mathematics and science and largest in reading for all EaP countries/economies. In mathematics, the main domain assessed in PISA 2022, Ukrainian regions scored 31 points below the OECD average. In Moldova, the score point difference was 58, in Baku 75 and in Georgia 82.

By contrast, in reading, Ukrainian regions score 48 points behind OECD countries, a learning gap equivalent to about 2.4 years of schooling by an average 15-year-old student in an OECD country.[4] The difference in reading was more than twice as large in Baku and Georgia. Only 10 systems performed lower than Baku out of all 81 participants in PISA (OECD, 2023[3]).[5]

Considering their economic development, EaP countries/economies perform as expected based on their per capita gross domestic product (GDP). This is analysed in depth in Chapter 1. Indeed, they perform better than other countries with similar or even higher income levels. For example, Baku and Moldova surpass Colombia and Costa Rica in mathematics despite having a lower GDP. Meanwhile, Mongolia, with an even lower GDP, still does better than Baku, Georgia and Moldova in the same subject.

Figure 2.2. Students in EaP systems trail behind international benchmarks in all domains, with the largest gap with the OECD average observed in reading

Performance in mathematics, reading and science in PISA 2022



Notes: The mean score in science is not statistically significantly different between Baku and Georgia. All other differences between countries/economies, and between countries/economies and the OECD average, are statistically significant.
Scores can be compared within each domain but not between different domains (e.g. math scores are not comparable to reading scores).
Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/u01lvj

Table 2.2. shows countries with PISA 2022 scores similar to those of the EaP countries/economies.[6] The differences in the countries being compared are small enough that they could have occurred by chance. For instance, in mathematics, the scores of the Ukrainian regions matched those of Brunei and Serbia. Georgia's scores were comparable to Colombia, Costa Rica, Mexico, North Macedonia, Peru, Saudi Arabia and Thailand.

Table 2.2. List of countries/economies with similar mean performance to the EaP countries/economies in mathematics, reading and science

	Mathematics		Reading		Science	
	Mean score	Countries/economies with similar performance in this subject[1]	Mean score	Countries/economies with similar performance in this subject[1]	Mean score	Countries/economies with similar performance in this subject[1]
Ukrainian regions (18 of 27)	441	Brunei Darussalam, Serbia	428	Iceland, Uruguay, Brunei Darussalam, Romania	450	Serbia, Iceland, Brunei Darussalam, Chile
Moldova	414	Cyprus, Bulgaria, Qatar, Chile, Uruguay, Malaysia	411	Mexico, Costa Rica, Brazil, Jamaica*, Colombia, Peru, Bulgaria	417	Bulgaria, Malaysia, Mongolia, Colombia, Costa Rica
Baku	397	Mexico, Thailand, Peru	365	El Salvador, Indonesia	380	Panama*, Georgia, Indonesia, North Macedonia, Albania, Jordan
Georgia	390	Mexico, Thailand, Peru, Saudi Arabia, North Macedonia, Costa Rica, Colombia	374	Thailand, Mongolia, Guatemala, Paraguay	384	Panama*, Indonesia, Baku (Azerbaijan), North Macedonia

Notes: Countries and economies are listed in descending order of their mean score within cells.
Countries and economies are ranked in descending order of mean performance in mathematics.
1. Countries and economies whose mean score is not statistically significantly different from the EaP comparison country's/economy's score.
* Caution is required when interpreting estimates because one or more PISA sampling standards were not met (see Box 1.1 in Chapter 1).
Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/nuqrty

Trends over time in student performance

EaP countries/economies have participated in various PISA cycles, as detailed in Chapter 1. These data allow for the analysis of student performance trends over different periods. Short-term trends are examined through the 2022 and 2018 results, while long-term trends are drawn from earlier assessments.

Analysing short-term trends in student performance against long-term patterns, where the availability of the data makes this possible, is particularly important in the context of the disruptions caused by the COVID-19 pandemic. This helps to understand the potential impact of the pandemic on education while accounting for deeper, longer-term processes or factors that might influence student performance.

Georgia and Moldova have participated consistently in PISA since 2009, except in 2012, allowing for an analysis of long-term performance trends. Baku[7] and Ukraine only participated in PISA 2018 and 2022, limiting the analysis to short-term trends.

The case of Ukraine is unique, as almost the entire country participated in PISA 2018,[8] but only 18 of its 27 regions participated in PISA 2022 (see Box 1.1 in Chapter 1). To account for this change, comparisons

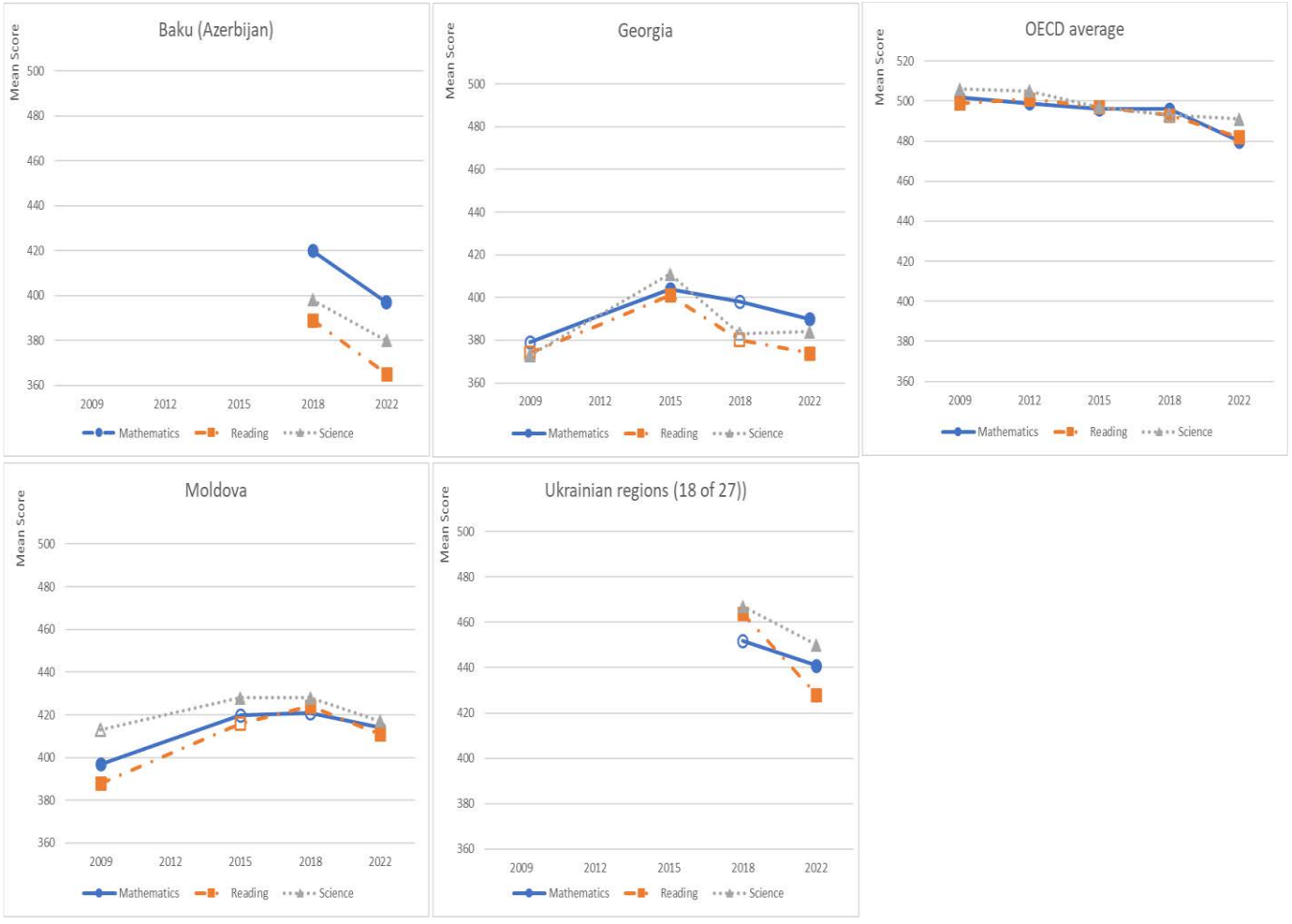
between the two cycles in this section are based on data from the 18 regions that participated in both cycles.

Short-term trends in student performance

Trends in student performance between PISA 2018 and PISA 2022 varied widely in direction (whether improving, declining or stable) and magnitude (how large these changes are) across different domains in EaP countries/economies (Figure 2.3).

Figure 2.3. Trends vary widely in direction and magnitude across different domains in EaP countries/economies

PISA performance in mathematics, reading and science across cycles



Notes: White markers (dots, squares or triangles) indicate mean performance estimates that are not statistically significantly above/below PISA 2022 estimates.

The OECD average in this figure is the arithmetic mean across all OECD member countries excluding Austria, Chile, Colombia, Costa Rica, Estonia, Israel, Lithuania, Luxembourg, the Netherlands, the Slovak Republic, Slovenia, Spain, Türkiye, the United Kingdom and the United States. It includes only 23 member countries with non-missing values across all of the assessments between 2009 and 2022. This average is used to report on a consistent set of OECD countries.

Sources: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html; OECD (2018[5]), *PISA 2018 Database*, https://www.oecd.org/en/data/datasets/pisa-2018-database.html; OECD, PISA 2009, 2012 and 2015 databases.

StatLink https://stat.link/7xkeai

In mathematics, EaP countries/economies generally maintained their performance between 2018 and 2022, contrasting with the average decline across OECD countries. In Georgia, Moldova and Ukrainian regions, the mean score in mathematics did not change significantly.[9] Conversely, OECD member countries experienced a notable decrease in mathematics, with an average drop of 15 points. This decline was the largest ever observed in PISA history. To put this drop into perspective, until 2018, the change observed in mathematics in the OECD average had never exceeded four score points.

However, Baku aligns with the broader downward trend between 2018 and 2022. With a drop of more than 20 points, the decline in performance in Baku exceeded the average decline in performance across OECD countries. On average, mathematics remained the strongest domain in Baku since performance also declined in the other two subjects. Alongside Baku, 18 other education systems saw similar declines of at least 20 points. Some countries nevertheless experienced even more significant decreases, exceeding 30 points: Albania, Jordan, Iceland, Norway and Malaysia in descending order.

While most EaP countries/economies bucked the international trend for mathematics, they generally mirrored the short-term global decline in reading. In fact, most EaP countries/economies exceeded the drop in the OECD average.

The decline was most acute in Ukrainian regions, with a 36-point drop. Baku saw a 24-point drop, while Moldova saw a smaller but still substantial drop of 13 score points. For comparison, on average, the fall amounted to 10 score points across OECD countries. **Georgia was the exception, with stable reading performance between 2018 and 2022**.

In science, all EaP countries, except Georgia, experienced a decline, although less severe than in reading. The drop was again larger in Baku (18 points) and Ukrainian regions (17) than in Moldova (11). Science performance did not change significantly across OECD countries, similar to the situation in Georgia.

Long-term trends in student performance

Among the four EaP countries/economies covered in this report, **only Georgia and Moldova have sufficient PISA data to analyse long-term trends in student performance**. In these two countries, performance had increased from low overall scores since their first participation in 2009. However, this trend began to shift in Georgia starting in 2015 and in Moldova in 2018 (Figure 2.3).

In Moldova, the overall trajectory has shown significant long-term improvement with a recent reversal of this pattern. From the country's first participation in PISA in 2009 up to 2018, performance had been improving in all subjects. However, between 2018 and 2022, as discussed, performance declined in reading and science, although mathematics scores remained stable. Despite these recent declines, Moldova's average scores in PISA 2022 in mathematics and reading were still higher than in 2009. In science, scores returned to levels close to those of 2009.

In Georgia, the overall trajectory has been somewhat more uneven, with significant improvements again in earlier cycles followed by a reversal and decline, which appears to be stabilising. From 2009 to 2015, the country experienced a large increase in mean performance across all subjects. This period of improvement was followed by a sharp decline in reading and science and a gradual decline in mathematics. As discussed above, performance in all subjects remained stable between 2018 and 2022. Overall, when considering all PISA assessments in the country, average PISA 2022 scores are close to those observed in 2009 but below those observed in 2015.

The positive long-term trend in Georgia and Moldova up to 2015 and 2018 respectively contrasts with a longer-term declining trend in OECD countries. As discussed above, OECD countries experienced an unprecedented decline in mathematics and reading performance between 2018 and 2022.

However, average scores had already declined before 2018 in many OECD countries. In reading and science, performance peaked in 2012 and 2009 respectively, before starting a downward trend.

This perspective also underscores the complexity of understanding the relationship between the COVID-19 pandemic and performance trends. **While the pandemic may have influenced recent developments, other factors are likely at play**. This is also suggested by the considerable variation across countries in how short-term trends compare with previous performance trends.

For some countries and economies, the changes in PISA performance observed between 2018 and 2022 are significantly different from the trend observed in previous assessments. This seems to be the case for Moldova (where a positive long-term trend may be reversing) and Georgia (where a negative trend may now be stabilising). For others, they confirm or reinforce a trend that started before 2018.

Proficiency levels

In the previous section, student performance was measured in terms of average score points on the PISA scale; however, average scores do not indicate what students are capable of doing in each subject or the variation in capabilities across the student population. In this section, PISA scores are translated into proficiency levels to provide a meaningful interpretation of the types of tasks that students with higher or lower PISA scores are able to complete successfully.

In mathematics and reading, PISA 2022 categorised student performance into eight different proficiency levels, ranging from the highest (Level 6) to the lowest proficiency (Level 1c) (see Table 2.3).[10] In science, PISA 2022 categorised performance into seven proficiency levels. Level 2 is considered the "baseline" level of proficiency across domains, the minimum level of knowledge and skills students need to acquire to progress in their education and participate fully in society. At this level, students begin to demonstrate the ability and initiative to use mathematics in simple, real-life situations. A high share of students below the baseline proficiency level can hinder long-term economic growth, productivity and innovation, as an under-skilled workforce may struggle to adapt to changing technological and economic demands. Annex 2.A illustrates the types of tasks students were confronted with in PISA 2022 to demonstrate proficiency at Levels 1a and 2 in mathematics.

Table 2.3. Summary description of the eight levels of mathematics proficiency in PISA 2022

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (OECD average)	Characteristics of tasks
6	669	2.0	At Level 6, students can work through abstract problems and demonstrate creativity and flexible thinking to develop solutions. For example, they can recognise when a procedure that is not specified in a task can be applied in a non-standard context or when demonstrating a deeper understanding of a mathematical concept is necessary as part of a justification. They can link different information sources and representations, including effectively using simulations or spreadsheets as part of their solution. Students at this level are capable of critical thinking and have a mastery of symbolic and formal mathematical operations and relationships that they use to clearly communicate their reasoning. They can reflect on the appropriateness of their actions with respect to their solution and the original situation.
5	607	8.7	At Level 5, students can develop and work with models for complex situations, identifying or imposing constraints, and specifying assumptions. They can apply systematic, well-planned problem-solving strategies for dealing with more challenging tasks, such as deciding how to develop an experiment, designing an optimal procedure, or working with more complex visualisations that are not given in the task. Students demonstrate an increased ability to solve problems whose solutions often require incorporating mathematical knowledge that is not explicitly stated in the task. Students at this level reflect on their work and consider mathematical results with respect to the real-world context.

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (OECD average)	Characteristics of tasks
4	545	23.6	At Level 4, students can work effectively with explicit models for complex concrete situations, sometimes involving two variables, as well as demonstrate an ability to work with undefined models that they derive using a more sophisticated computational-thinking approach. Students at this level begin to engage with aspects of critical thinking, such as evaluating the reasonableness of a result by making qualitative judgements when computations are not possible from the given information. They can select and integrate different representations of information, including symbolic or graphical, linking them directly to aspects of real-world situations. At this level, students can also construct and communicate explanations and arguments based on their interpretations, reasoning and methodology.
3	482	45.6	At Level 3, students can devise solution strategies, including strategies that require sequential decision making or flexibility in understanding of familiar concepts. At this level, students begin using computational-thinking skills to develop their solution strategy. They are able to solve tasks that require performing several different but routine calculations that are not all clearly defined in the problem statement. They can use spatial visualisation as part of a solution strategy or determine how to use a simulation to gather data appropriate for the task. Students at this level can interpret and use representations based on different information sources and reason directly from them, including conditional decision making using a two-way table. They typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships.
2	420	68.9	At Level 2, students can recognise situations where they need to design simple strategies to solve problems, including running straightforward simulations involving one variable as part of their solution strategy. They can extract relevant information from one or more sources that use slightly more complex modes of representation, such as two-way tables, charts or two-dimensional representations of three-dimensional objects. Students at this level demonstrate a basic understanding of functional relationships and can solve problems involving simple ratios. They are capable of making literal interpretations of results.
1a	358	87.6	At Level 1a, students can answer questions involving simple contexts where all information needed is present and the questions are clearly defined. Information may be presented in a variety of simple formats and students may need to work with two sources simultaneously to extract relevant information. They are able to carry out simple, routine procedures according to direct instructions in explicit situations, which may sometimes require multiple iterations of a routine procedure to solve a problem. They can perform actions that are obvious or that require very minimal synthesis of information, but in all instances the actions follow clearly from the given stimuli. Students at this level can employ basic algorithms, formulae, procedures or conventions to solve problems that most often involve whole numbers.
1b	295	97.4	At Level 1b, students can respond to questions involving easy to understand contexts where all information needed is clearly given in a simple representation (i.e. tabular or graphic) and, as necessary, recognise when some information is extraneous and can be ignored with respect to the specific question being asked. They are able to perform simple calculations with whole numbers, which follow from clearly prescribed instructions, defined in short, syntactically simple text.
1c	233	99.7	At Level 1c, students can respond to questions involving easy to understand contexts where all relevant information is clearly given in a simple, familiar format (for example, a small table or picture) and defined in a very short, syntactically simple text. They are able to follow a clear instruction describing a single step or operation.

Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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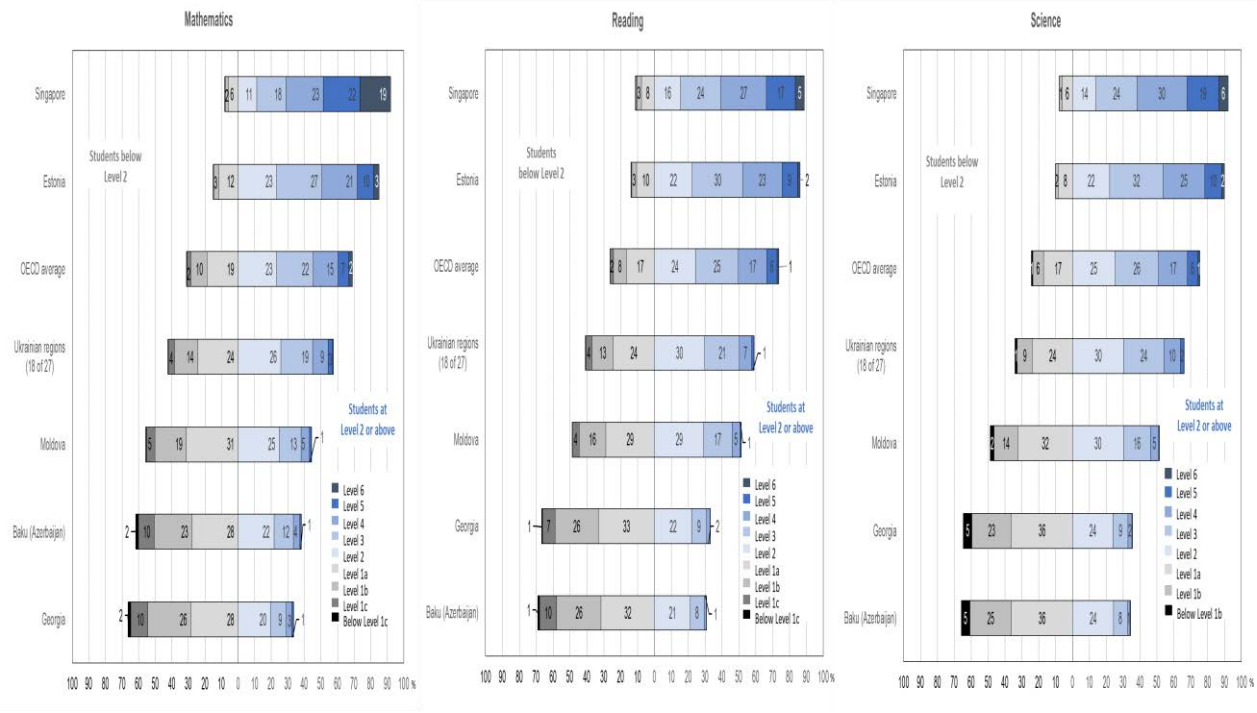
As shown in Figure 2.4, **the proportion of students who scored below Proficiency Level 2 (i.e. "low-performing students") in PISA 2022 is greater in every subject in all EaP countries/economies than on average across OECD countries**. They are also far from the EU-level targets set out in the European

Education Area strategic framework (adopted by the Council of the European Union in February 2021) (European Union, 2021[6]). These aim for fewer than 15% of 15-year-olds to be low achievers in reading, mathematics and science by 2030. In mathematics, the percentage of low-performing students ranges from 42% in Ukrainian regions to 66% in Georgia. In contrast, the average across OECD countries is 31%. In reading and science, approximately two-thirds of students score below Level 2 in Baku and Georgia.

In EaP countries/economies, most students who perform above baseline proficiency levels in mathematics, reading and science perform at Proficiency Levels 2, 3 and 4. **Only a small minority of students in EaP countries/economies perform at the top levels of proficiency (Levels 5 and 6)**. Students who attain Proficiency Level 5 or 6 are commonly referred to in PISA reports as "top performers". In Ukrainian regions (the top-performing EaP country), the share of top performers was 3% in mathematics and 2% in reading and science. In Baku, Georgia and Moldova, the proportion of top performers was 1% in mathematics and less than 1% in reading and science. By contrast, 9% of 15-year-old students across OECD countries were top performers in mathematics, 7% in reading, and 8% in science.

Figure 2.4. In all EaP countries/economies, a large proportion of students do not reach basic proficiency and only a small minority of students perform at the highest levels of proficiency

Percentage of students scoring at different levels of proficiency in mathematics, reading and science



Notes: *Countries and economies are ranked in descending order of the percentage of students who performed at or above Level 2.*
"Basic proficiency" is defined as students achieving Proficiency Level 2 or above in a subject.
Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/q0hbla

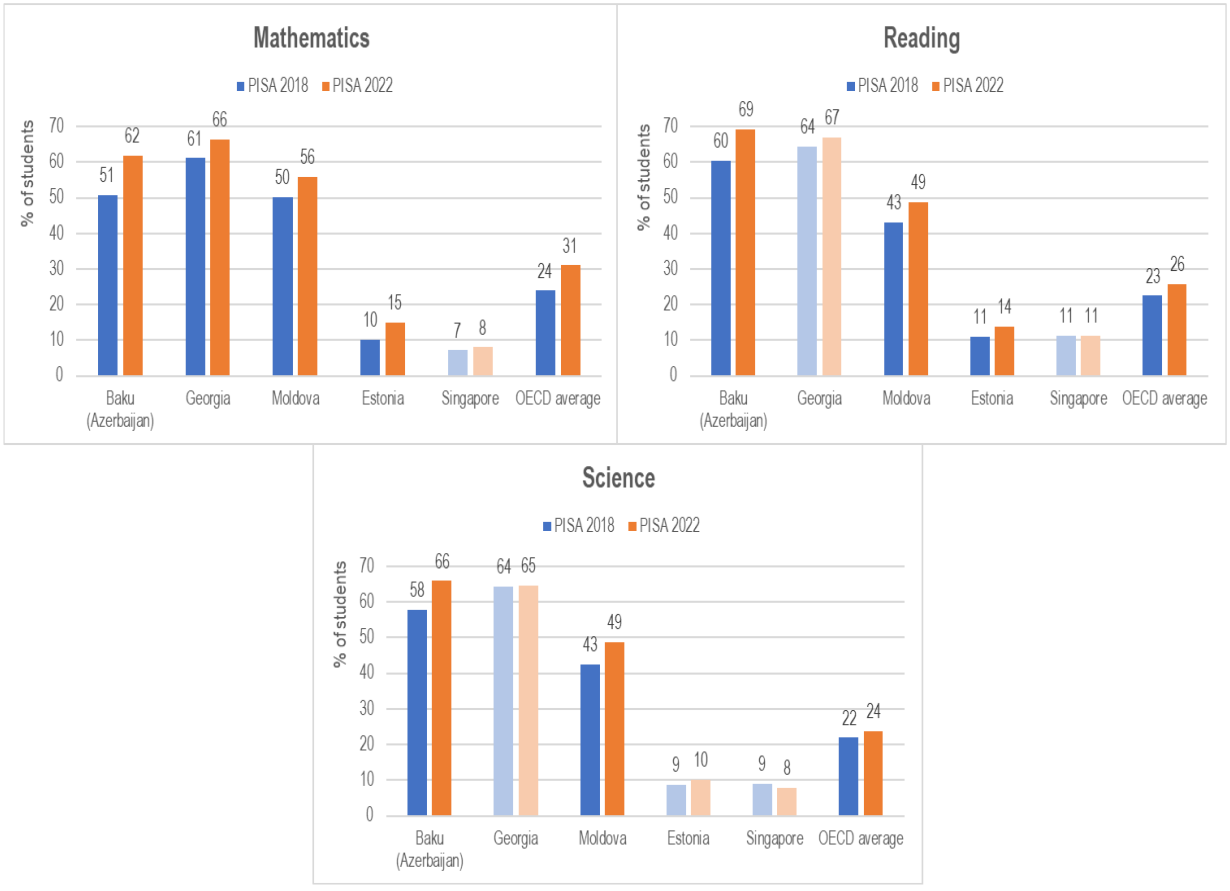
Figure 2.5 shows that **the share of students not mastering basic skills generally increased in EaP countries/economies between 2018 and 2022**. In mathematics, the share of these students increased by 5 and 6 percentage points in Georgia and Moldova. This increase is also observed on average across OECD countries and Estonia, for example. In Baku, the increase in the share of low performers in

mathematics was about twice as large (11 percentage points). Analysis for Ukraine is impossible due to reduced participation in PISA 2022 compared to PISA 2018.

In Georgia, the share of students scoring below Level 2 in reading and science stayed consistent between 2018 and 2022, indicating that it is possible to prevent further students from falling behind in challenging periods such as the COVID-19 pandemic. This is also evident in top-performing systems like Singapore, which maintained a stable proportion of low performers.

Figure 2.5. Low performance in mathematics, reading and science increased between 2018 and 2022 in all EaP countries/economies, except Georgia

Percentage of students who score below Proficiency Level 2 in each subject



Notes: Statistically significant differences between 2018 and 2022 are shown in a darker tone. The change between 2018 and 2022 is not statistically significant in reading and science for Georgia: is not significant in mathematics, reading and science for Singapore; it is not significant in science for Estonia.

The OECD average in this figure is the arithmetic mean across all OECD member countries, excluding Costa Rica, Luxembourg and Spain. It includes 35 OECD member countries with non-missing values in PISA 2018 and PISA 2022.

Sources: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html; OECD (2018[5]), *PISA 2018 Database*, https://www.oecd.org/en/data/datasets/pisa-2018-database.html.

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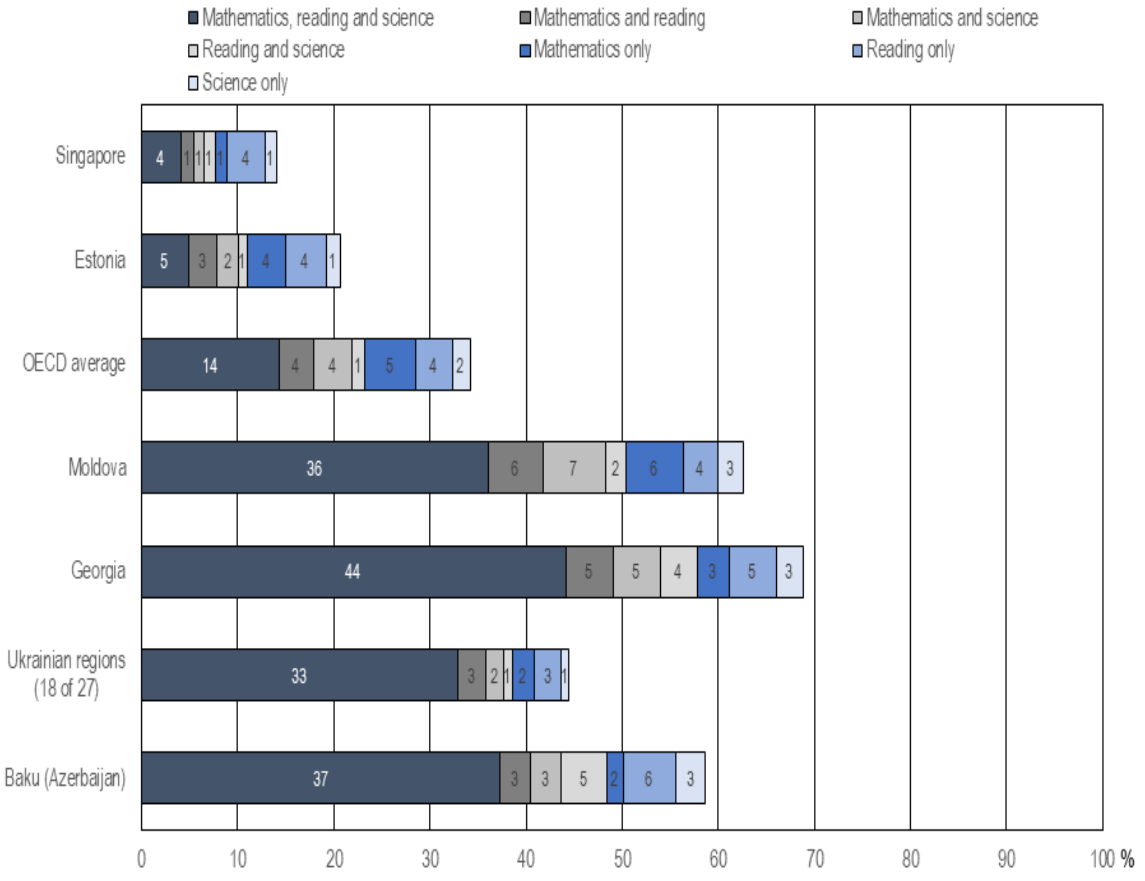
Overlap of low performance and coverage of the education system

Understanding the true extent of low performance requires looking at the overlap of low performance across subjects because students who perform poorly in one subject often perform poorly in other subjects as well. Also, the implications of being a low performer in all three subjects are significant because it signals a more systemic issue within the education system, requiring comprehensive reforms. **In all four EaP countries/economies, more students lack basic skills in all three subjects assessed by PISA 2022 than in two subjects or one subject** (Figure 2.6).

Figure 2.6. Many 15-year-old students lack basic skills in all three subjects assessed by PISA

Overlap of low performers in mathematics, reading and science



Note: *Countries and economies are ranked in ascending order of the total percentage of 15-year-olds who are low performers in at least one subject.*
Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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In Georgia, for example, 20% of all 15-year-olds lack basic skills in one or two subjects, whereas more than twice that share lack basic skills in all three subjects. By contrast, **in OECD countries, the overlap of low performance is not as pronounced as in EaP countries/economies**. On average, across OECD countries, the share of 15-year-olds who lack basic skills in all three subjects assessed by PISA is about the same as those who lack basic skills in one or two subjects.

In addition, to understand the low performance of a system more broadly, it is important to consider the coverage of the education system because PISA does not test 15-year-olds who are not enrolled in school or who are severely delayed in their school-grade progression. Research shows that these individuals are more likely to lack basic skills in all three subjects assessed by PISA than their peers who are enrolled in and progressing through school (OECD, 2023[3]).

As discussed in Chapter 1, **the coverage of the education system is comparatively low in Baku, high in Moldova and similar to the average across OECD countries in Georgia** (see Table 1.3 in Chapter 1). In Ukrainian regions, education system coverage was very low in 2022, as measured by the coverage of the PISA sample. However, this should be interpreted with caution since schools in several regions of Ukraine were not accessible in 2022 due to the war. In PISA 2018, the coverage of the education system in Ukraine was higher and similar to the average across OECD countries (Coverage Index 3[11] was 86.7% in Ukraine in 2018). **In Moldova, education system coverage was high in PISA 2015** and has increased by a small margin since then (Coverage Index 3 was 92.9% in 2015 and 97.4% in 2022).

In Georgia, education system coverage increased by 7.6 percentage points between 2015 and 2022 (Coverage Index 3 was 78.7% in 2015). **This increase brought education system coverage in Georgia closer to the average across OECD in PISA 2022**.

Students' sense of belonging and safety in school

Sense of belonging at school

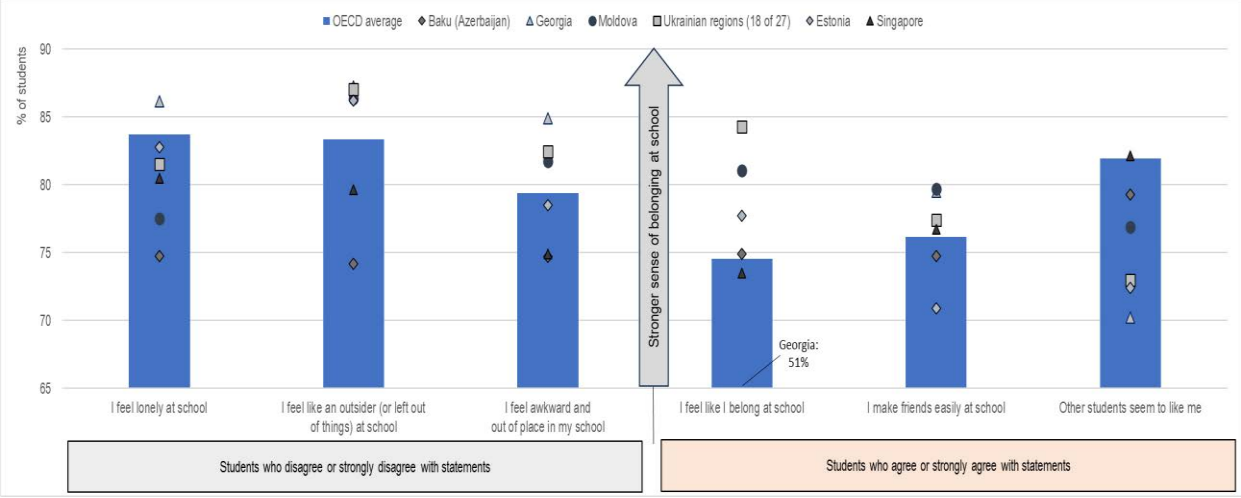
PISA also provides insights into students' sense of belonging and social experiences at school. To measure students' sense of belonging at school, students were asked whether they agree ("strongly disagree", "disagree", "agree", "strongly agree") with the six school-related statements included in Figure 2.7. Some of these statements are "negatively" worded (e.g. I feel lonely at school), meaning that disagreement with the statement indicates a higher sense of belonging at school. These statements were combined into an overall index of sense of belonging at school, the average of which is zero across OECD countries. According to this index, **students' sense of belonging at school is lower among EaP countries/economies than on average across OECD countries**. However, except for Baku, it is stronger than in Singapore than in Estonia.[12]

This picture has not changed much since the last PISA survey in 2018. **Sense of belonging at school remained largely unchanged in both EaP countries/economies and, on average, across OECD countries**.[13] More substantial changes were observed between 2015 and 2018. During this period, the sense of belonging worsened in Georgia and Moldova.[14]

Figure 2.7 shows specific aspects of students' sense of belonging at school. **Across EaP countries/economies, Moldova and Ukrainian regions stand out in that four out of five students agree or strongly agree with the statement: "I feel like I belong at school"**. In Baku, three out of four students feel they belong at school, which is similar to the OECD average and Singapore.

Figure 2.7. Students' sense of belonging at school in PISA 2022

Percentage of students who disagreed/strongly disagreed or agreed/strongly agreed with statements about a sense of belonging at school



Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/yf439a

Georgia has a significantly lower share of students who feel that they belong at school (51%). Moreover, a relatively modest share of students in the country feel liked by their peers (70%). Yet, on average, Georgian students are less likely to report feeling lonely or like an outsider at school than their counterparts in other EaP countries/economies and OECD countries.

In Baku, students experience relatively high levels of sense of isolation and discomfort at school. About one in four students reported feeling lonely, like an outsider (or left out of things), or awkward and out of place at school. This exceeds the OECD average and is higher than in all of the other EaP countries/economies. It is also higher than in Singapore, where these feelings of isolation are already quite common.

Across all EaP countries/economies, making friends is a common experience, according to PISA data. Over three-quarters of students feel at ease making new friends in all EaP countries/economies. This is in line with the OECD average (76%).

Feeling safe at school

PISA 2022 also asked students about their perceptions of safety in different environments, which can influence students' stress levels, willingness to attend school and ability to concentrate while at school (Lacoe, 2016[7]). While no causal claims are possible, higher levels of perceived safety at school are associated with higher mathematics performance, life satisfaction and sense of belonging at school on average across OECD countries and in Baku, Georgia and Ukrainian regions.[15]

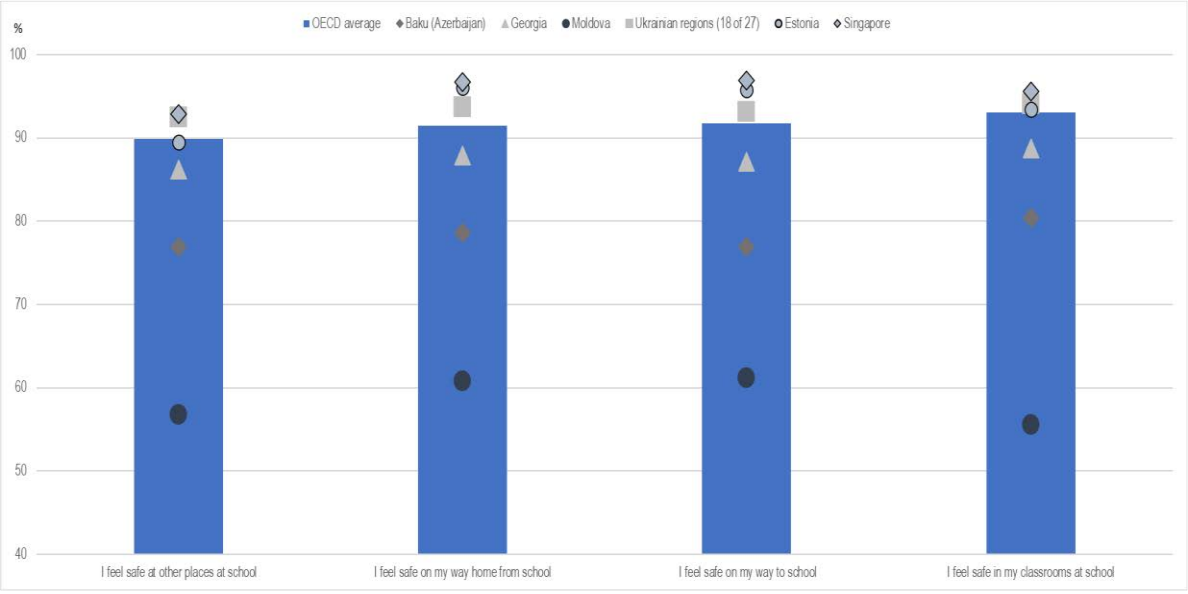
The data show a clear hierarchy of perceived safety in and out of school. **Students from the regions of Ukraine feel the safest and most secure compared to the OECD average, followed by students from Georgia, Baku and Moldova**.

Ukrainian regions show exceptionally high levels of perceived safety, with over 92% of students feeling safe in the classroom, elsewhere at school and when travelling to and from school. It is plausible that schools and school communities became a source of social-emotional protection for students in the

context of war, which could explain the perception of schools as a safe space. All other EaP countries/economies fall below the OECD average in terms of students' perceptions of safety.

Figure 2.8. Feeling safe at school in PISA 2022

Percentage of students who agree or strongly agree with the statements below



Note: *Items are ranked in ascending order at the OECD average.*
Source: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/3tbseq

In Moldova, around 40% of students feel unsafe not only on their way to and from school but even in their classrooms. In Baku, still, around 20% of students feel unsafe in their classroom. This contrasts with other school systems, including high-performing ones such as Estonia and Singapore, where less than 5% of students feel unsafe in their classroom or other places at school.

Student expectations for education and work

PISA 2022 surveyed students on their expected highest education level and anticipated occupation at age 30.

Educational expectations

In the EaP countries/economies, the share of students expecting to complete tertiary education (International Standard Classification of Education [ISCED] Level 5 or above) has increased significantly between PISA 2018 and PISA 2022, except in Ukrainian regions. By contrast, across OECD member countries, the share of students expecting to complete tertiary education has remained stable at almost 70% between PISA 2018 and PISA 2022.

Baku experienced a very large increase in educational aspirations (17 percentage points). **While the share of students expecting to complete tertiary education in Baku was lower than the OECD average in**

PISA 2018, it now exceeds the OECD average. Four out of five students expect to complete tertiary education in Baku in 2022.

Moldova also experienced a significant increase (14 percentage points) but from a much lower base. In Moldova, the share of students expecting to complete tertiary education remains below the OECD average in PISA 2022.

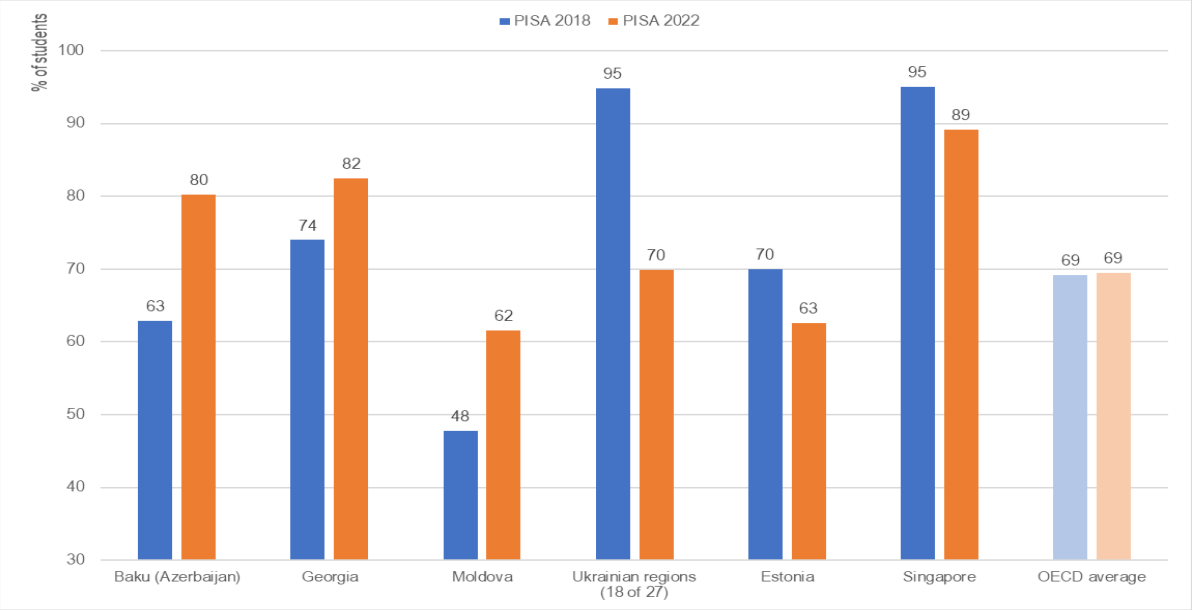
Baku and Georgia were the EaP country/economy with the highest educational expectations in PISA 2022. In Georgia, the share of students expecting to complete tertiary education increased moderately between 2018 and 2022. As in Baku, this share is above the OECD average.

Ukrainian regions show a decline, probably related to the upheaval caused by the war, affecting young people's views on the feasibility and value of pursuing tertiary education. **The proportion of students expecting to complete tertiary education in Ukrainian regions fell by 25 percentage points**. Almost all 15-year-old students (95%) are expected to complete tertiary education in 2018, as opposed to 70% in 2022. **Educational expectations nevertheless remain relatively high and are now similar to the OECD average**.

In EaP countries/economies where aspirations have been increasing, this has a positive dimension as these might fuel students' motivation to invest in school and beyond. It theoretically also provides the pool of young people that EaP countries/economies require for social and economic transformation. At the same time, they raise important questions. First, there is still a gap between students' high educational aspirations and their actual academic performance. This might make it difficult for students to achieve their goals. Where students succeed in entering tertiary education, they might drop out, which would result in costs for themselves and society. Second, it might require a substantial increase in the number of places available in tertiary education institutions in EaP countries/economies. In Azerbaijan, for example, higher education opportunities have been expanded but remain low (World Bank, 2020[8]). Finally, the labour markets in EaP countries/economies might not yet be prepared to offer skilled jobs to a growing number of highly educated young people.

Figure 2.9. The proportion of students expecting to complete tertiary education has increased significantly in all EaP countries/economies, except in Ukrainian regions

Percentage of students who expect to complete tertiary education (ISCED Level 5 or above) in 2018 and 2022



Notes: Statistically significant differences between 2018 and 2022 are shown in a darker tone. The change between 2018 and 2022 is not statistically significant for the OECD average.
The OECD average in this figure is the arithmetic mean across all OECD member countries, excluding Costa Rica, Luxembourg and Spain. It includes 35 OECD member countries with non-missing values in PISA 2018 and PISA 2022.
Sources: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html; OECD (2018[5]), *PISA 2018 Database*, https://www.oecd.org/en/data/datasets/pisa-2018-database.html.

StatLink https://stat.link/qpda5l

Occupational expectations

The following analysis contrasts the future occupational aspirations of 15-year-olds, focusing on two key sectors: health (including doctors, nurses and veterinarians) and information and communication technology (ICT)-related fields (such as software and web developers and data miners).

The health sector, spotlighted during the COVID-19 pandemic for its professionals' critical and challenging work, has been subject to mixed perceptions. The recognition of the essential nature of this work came alongside awareness of the intense demands and stress it involves, as well as the relatively low remuneration for nursing and support roles. These factors have influenced student interest differently across countries.

Among EaP countries/economies, Baku stands out with a marked increase in students' interest in health professions (+9 percentage points). Along with Panama, this is the largest increase of all PISA-participating countries/economies. Nevertheless, Baku started from a small pool of interested students. Only 11% of the population is expected to work as a health professional in 2018.

Conversely, Georgia, Moldova and Ukrainian regions all saw a decline in students' interest in health careers, but only in Ukrainian regions was this decrease statistically significant (-3 percentage points). This reflects broader global patterns. On average, across OECD countries, interest in health careers declines slightly by 1 percentage point, with the percentage of interested students dropping to 16% in 2022.

The share of students interested in working as health professionals decreased in 17 out of 73 countries/economies with available data between 2018 and 2022 (OECD, 2023[9]).

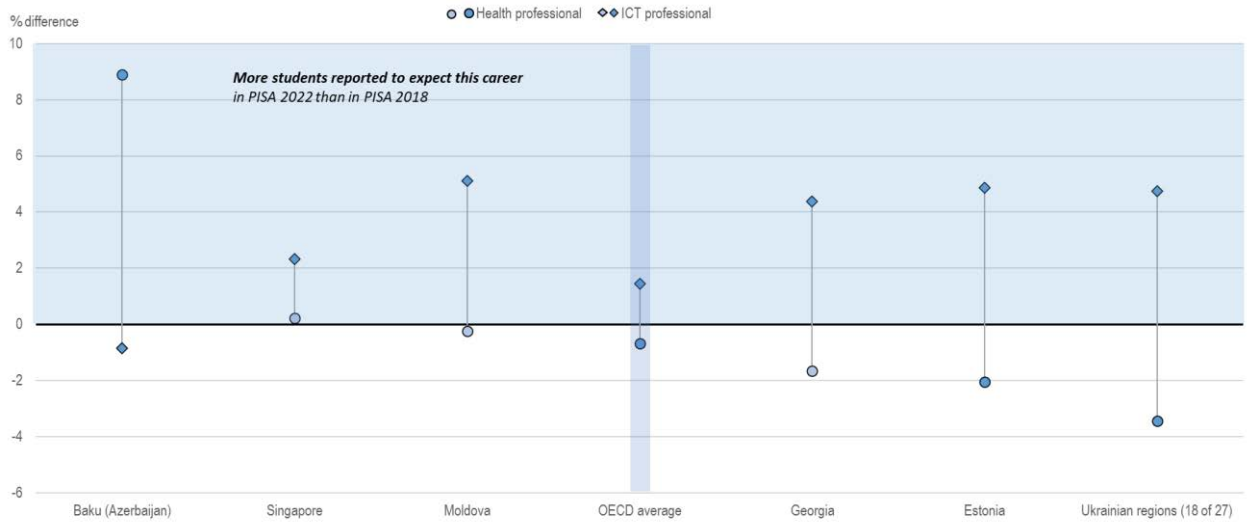
For ICT careers, Baku is again an outlier but in the opposite direction, with a slight decrease in student interest (-1 percentage point). This makes it one of only two PISA-participating countries, alongside the Netherlands, to see a dip in this otherwise growing field of interest. ICT careers can be attractive to students seeking rewarding professional paths. The ongoing digital transformation is creating new and exciting career opportunities, often associated with higher salaries due to the increasing demand for skilled professionals (OECD, 2020[10]). The share of students interested in working as ICT professionals increased in 39 out of 73 countries/economies with available data between 2018 and 2022 (OECD, 2023[9]).

All other EaP countries/economies experienced an uptick in interest for ICT occupations in PISA 2022, surpassing the overall OECD trend. Moldova and Ukrainian regions saw an increase of 5 percentage points, while Georgia experienced a 4-percentage point rise.

In PISA 2022, Georgia, Moldova and Ukrainian regions are among the top ten participating countries/economies for the proportion of students reporting a desire to work in ICT. All three had more than 10% of students showing this interest, nearly double the OECD average of 6%. Ukrainian regions had, together with Estonia, the highest share of students interested in this field across all PISA 2022 countries/economies: 15% of 15-year-old students aspired to an ICT career.

Figure 2.10. In Georgia, Moldova and Ukrainian regions, student interest has increased for ICT careers and decreased for health careers; Baku shows the opposite trend

Percentage-point change of students who expect to work as the following when they are approximately 30 years old between 2018 and 2022



Notes: Statistically significant differences between PISA 2018 and PISA 2022 (PISA 2022 - PISA 2018) are shown in a darker tone.
The OECD average in this figure is the arithmetic mean across all OECD member countries, excluding Costa Rica, Luxembourg and Spain. It includes 35 OECD member countries with non-missing values in PISA 2018 and PISA 2022.
Countries and economies are ranked in descending order of the change between 2018 and 2022 in the percentage of students who expect to work as health professionals.
Sources: OECD (2022[4]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html; OECD (2018[5]), *PISA 2018 Database*, https://www.oecd.org/en/data/datasets/pisa-2018-database.html.

StatLink https://stat.link/iz4aoc

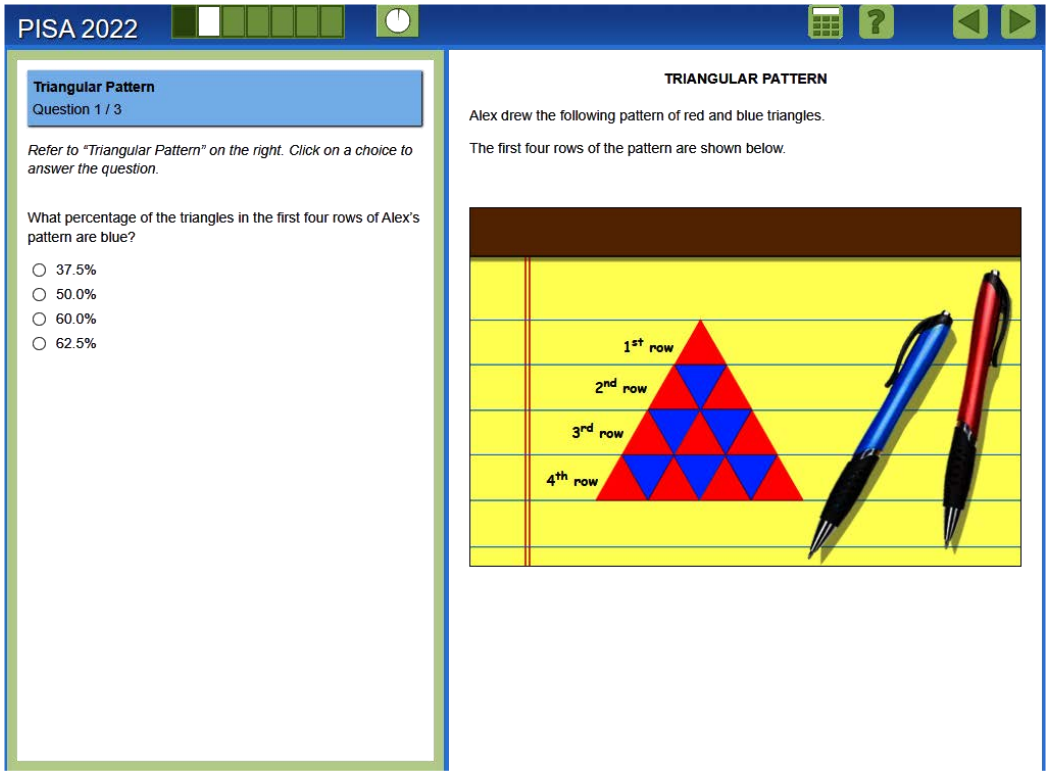
Annex 2.A. Illustrative example of mathematics item measuring Proficiency Level 2

The following examples illustrate the types of tasks students were required to solve to demonstrate Levels 1a and 2 of proficiency in mathematics within the "Triangular Pattern" unit. This unit of assessment has three questions. In all questions, students are presented with a drawing that consists of rows of alternating red and blue triangles. The same image is used across all three items in the unit (OECD, 2023[3]).

First item (Proficiency Level 1a)

- **Task**: Students are asked to compute the percentage of blue triangles shown in the first four rows of the pattern.
- **Process**: Students count the blue triangles, which number 6, out of a total of 16 triangles. Using these data, they calculate the percentage of blue triangles as 37.5% (6 ÷ 16 = 0.375).
- **Focus**: This is an easy item, designed to engage students in basic pattern recognition and mathematical calculation using a straightforward algorithm with all information shown.

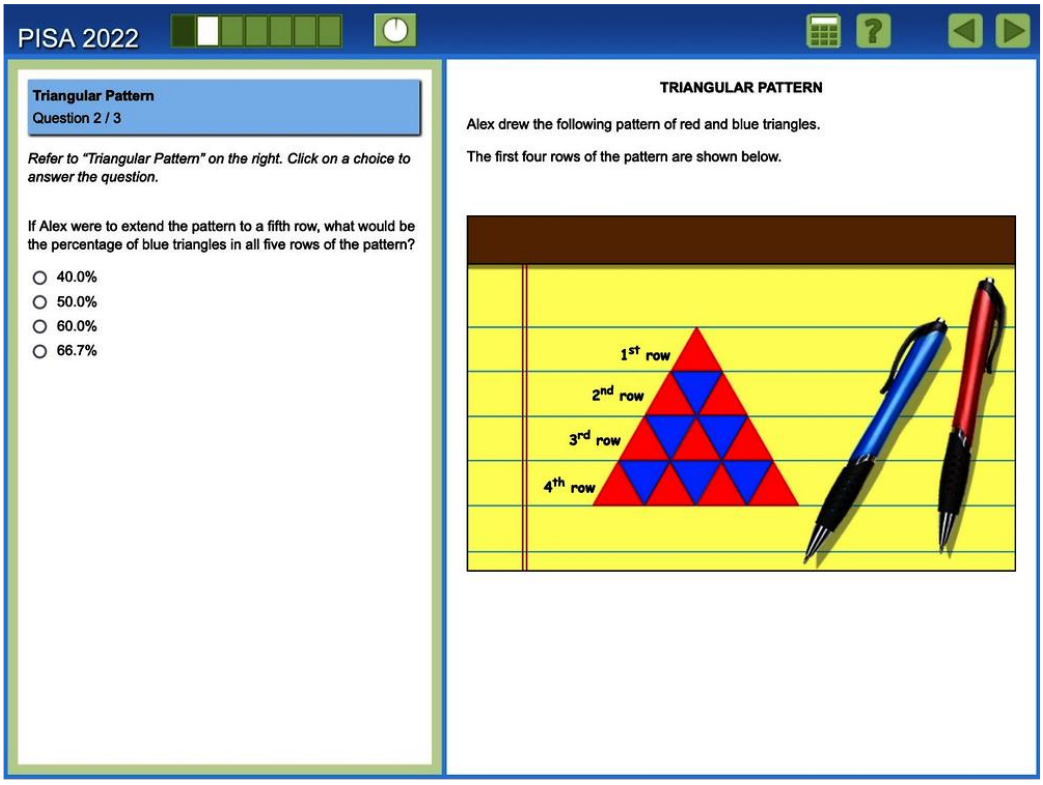
Annex Figure 2.A.1. Triangular Pattern unit, released item #1



Second item (Proficiency Level 2, equivalent to baseline proficiency):

- **Task**: The second item in the unit builds off the first item by again asking students to compute the percentage of blue triangles, but this time based on five rows of the pattern.
- **Process**: Since the fifth row is not shown, students have to extend the pattern by one row to determine new values for the number of blue triangles and the total number of triangles. With 5 rows, the percentage of blue triangles is 40.0% (10 blue triangles ÷ 25 total triangles).
- **Focus**: This item is intended to be easy and to get students thinking about extending the pattern beyond what is shown but not extending the pattern so that it requires generalisation. This is a Level 2 item, so it is slightly more difficult than the first item in the unit, possibly because it requires working with a part of the pattern that is not shown; it is still an overall easy item for students. This is the baseline level of proficiency as assessed by PISA 2022.

Annex Figure 2.A.2. Triangular Pattern unit, released item #2



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Notes

[1] The EaP countries/economies forming part of this report are Baku in Azerbaijan, Georgia, Moldova and 18 of the 27 regions in Ukraine. Any reference to EaP countries/economies, as well as the EaP average, specifically pertains to Baku, Georgia, Moldova and Ukrainian regions. Armenia is also part of the EaP but has not yet participated in PISA, although participation is underway for PISA 2025.

[2] Ukraine joined PISA for the first time in 2018. However, in the context of war, only 18 of the country's 27 regions were able to participate in the 2022 assessment. Box 1.2, included in Chapter 1, provides detailed information on Ukraine's participation.

[3] Azerbaijan joined PISA for the first time in 2006 but has only participated with its capital city, Baku, since PISA 2018.

[4] According to estimates based on PISA data, 20 score points is approximately equivalent to the typical annual learning gain by students around the age of 15 across OECD countries (Avvisati and Givord, 2023[11]).

[5] These countries/economies were the following (in descending order of their mean score): North Macedonia, Albania, the Dominican Republic, the Palestinian Authority, the Philippines, Kosovo, Jordan, Morocco, Uzbekistan and Cambodia.

[6] A difference in mean scores (or in other population-level estimates of performance in PISA) is called statistically significant if it is unlikely that such a difference could be observed when, in fact, no true difference exists in the populations from which student samples were drawn.

[7] Azerbaijan as a whole country participated in PISA 2006 and PISA 2009.

[8] PISA 2018 was not conducted in the break-away regions of eastern Ukraine, the Autonomous Republic of Crimea or the city of Sevastopol, all of which were outside the control of the government.

[9] Again, a difference in mean scores is called statistically significant if it is unlikely that such a difference could be observed when, in fact, no true difference exists in the populations from which student samples were drawn. Statistical uncertainty in trend comparisons has three different sources: the sampling of students and schools; the design of PISA tests (measurement precision); and the use of a common scale to report the results of tests that were scaled independently. Link errors represent uncertainty around scale values ("is a score of 432 in PISA 2022 the same as 432 in PISA 2018?"). These three independent sources of uncertainty are combined in the estimates of standard errors for trend indicators. Standard errors are then used to construct "confidence intervals", a range of values that excludes only 5% of the differences that would be observed in the absence of true change.

[10] For a description of the levels of reading and science proficiency in PISA 2022, see Chapter 3 in OECD (2023[9]).

[11] PISA's Coverage Index 3 captures the proportion of the national population of 15-year-olds (enrolled and not enrolled in school) represented by the PISA sample. Low values of Coverage Index 3 may be attributed to 15-year-olds who are no longer enrolled in school or who were held back in primary school.

Coverage Index 3 may also be lower due to student exclusions from the PISA test and dropouts during the school year.

[12] In PISA 2022, values in the PISA index of sense of belonging are the following: -0.05 in Georgia; -0.06 in Moldova; -0.08 in Ukraine regions (18 of 27); and -0.17 in Baku. By contrast, the value of the index is and -0.14 in Estonia and -0.22 in Singapore.

[13] Statistically significant changes of small magnitude in the BELONG index did occur between 2018 and 2022 (OECD, 2023[9]). Sense of belonging improved by 0.06 index points or less between 2018 and 2022 in Baku and Georgia. By contrast, sense of belonging decreased by 0.02 index points on average across OECD countries and by 0.06 index points in Singapore. The sense of belonging did not change significantly in Moldova between 2018 and 2022.

[14] Values in the BELONG index declined by 0.30 in Georgia and by 0.10 in Moldova between 2015 and 2015. No change occurred on average across OECD countries for the same period. No data are available for Baku or Ukraine.

[15] For Moldova, these data are reported missing.

3 Equity in students' education opportunities

Equity in education means that all students, regardless of background, should have the opportunity to fulfil their potential. This chapter discusses equity in student performance by looking at four dimensions of student background: socio-economic status, gender, geographic location and language spoken at home. Socio-economic disadvantage remains the key factor driving inequitable access to quality education in the Eastern Partnership (EaP) region, though other factors also play a significant role in some EaP economies. In addition, the chapter analyses how student background relates to their expectations and sense of belonging at school. The third and last section examines equity in access to human, material and digital resources at school, as well as to pre-primary education.

Equity in education is a fundamental goal of education policy. It means that all students, regardless of background, should have the opportunity to fulfil their potential.

Students have no control over circumstances such as their family socio-economic status, gender or language background. Education systems are therefore considered equitable when student outcomes (such as performance, well-being or expectations for future education and careers) are independent of or not strongly related to background circumstances. Furthermore, all students need access to quality educational resources to achieve equity in education. Equity requires that all students, especially disadvantaged students and those with special learning and socio-emotional needs, receive sufficient support so that they have a fair chance to realise their full potential.

In this chapter, the first section looks at equity in student performance. The second explores equity regarding students' future expectations and their sense of belonging at school. The third examines equity in terms of access to human and material resources at school and learning time through pre-primary education. The full scope of the chapter is shown in Figure 3.1.

The analysis of equity focuses on mathematics performance, the main subject assessed in the OECD Programme for International Student Assessment (PISA) 2022. Several education systems participating in PISA, such as Finland and Japan, are recognised for their high equity. Both countries combine high average performance with low disparities influenced by students' socio-economic backgrounds. In this chapter, these countries are considered aspirational benchmarks. Additionally, other benchmarks are highlighted where relevant to provide context for the data concerning Eastern Partnership (EaP) countries and economies[1], such as countries that have shown the most significant improvement.

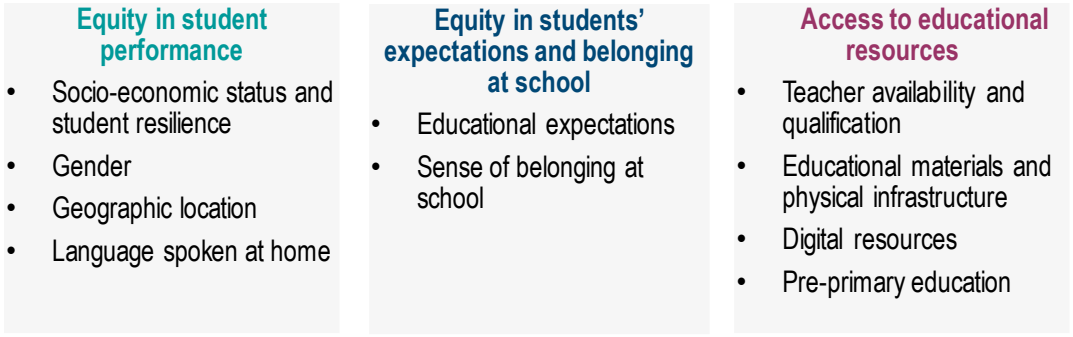
EaP countries/economies have smaller socio-economic gaps in performance than on average across OECD countries but this is partly explained by the low performance of socio-economically advantaged students. These socio-economic gaps in performance have remained relatively stable over time.

When it comes to gender gaps, girls tend to perform better in Baku (Azerbaijan) and Georgia than in Moldova and Ukrainian regions (18 of 27). In Baku and Georgia, girls perform on par with boys in mathematics and excel significantly in reading. By contrast, in Moldova and Ukrainian regions, girls underperform boys in mathematics and outperform boys in reading less than in Baku and Georgia. However, there is room to improve the extent to which EaP countries/economies take advantage of girls' skills in adult economic life. While academic performance in school translates into higher enrolment rates in tertiary education among women, the reverse is found when it comes to women's labour market participation.

Other relevant findings emerging from this chapter include the following:

- Stark gaps in performance by geographic location in favour of students in urban (compared to rural) schools, particularly in Moldova, but also Georgia and Ukrainian regions.
- Stark differences in educational aspirations by gender in favour of girls (except for Moldova) and by socio-economic background in favour of advantaged students.
- More pronounced shortages in educational materials than in human resources, with variation in the specific types of shortages that are most acute in different systems; also, some improvement over time for material resource shortages in Georgia and Moldova but increased concerns in Ukrainian regions in the context of war.
- Large variation in overall pre-primary attendance of 15-year-olds, with the highest in Moldova, increasing but still extremely low in Baku. Pre-primary attendance is positively associated with student performance at age 15 in EaP countries/economies, except in Ukrainian regions, but students' socio-economic status largely explains this association. Advantaged students are more likely to have attended pre-school in all EaP countries, with particularly large differences in Georgia and Ukrainian regions.

Figure 3.1. Equity in student outcomes and access to quality education resources at school, as covered in this report



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Differences in performance by student background

This section considers four dimensions of student background: socio-economic status, gender, geographic location and language spoken at home. These factors are crucial because they influence the educational opportunities available to students in EaP countries and economies. However, they do not shape these opportunities equally or in the same way. Some dimensions may be more influential in creating inequities in student learning outcomes in certain countries or economies. Understanding these differences is important for policy makers who aim to prioritise student needs effectively.

Equity-related policies might want to focus on factors most strongly associated with student performance. One way to set priorities among socio-economic, gender, geographic and linguistic equity dimensions is to compare the performance gaps related to each. For instance, how does the gap in PISA test scores between socio-economically advantaged and disadvantaged students compare to the gender gap between girls and boys? Additionally, how do these gaps compare to students in urban versus rural schools or between students who speak different languages at home and at school?

As shown in Table 3.1, socio-economic disadvantage is the primary factor associated with inequitable learning outcomes in the EaP region. In each EaP country/economy, the gap in mathematics performance between advantaged and disadvantaged students is substantial (between 50 and 85 score points).[2] By comparison, the relationship between other equity dimensions and student performance is weaker or inconsistent across EaP countries and economies.

The gender gap in reading performance is also notable: all EaP countries and economies have a medium (between 10 and 29 score points) or large (between 30 and 49 score points) gap in favour of girls in reading. However, the gender gap in mathematics is less of an issue: it is not significant in Georgia and Moldova and is small (lower than 10 points) in favour of girls in Baku. In contrast, boys largely overperform girls in Ukrainian regions. These variations show that addressing equity in education requires different strategies in different countries.

The performance gap favouring urban over rural schools is also large or very large in all EaP countries/economies with available data.[3] Finally, the language spoken at home is significantly related to learning outcomes only in Georgia and Moldova.

The following sections will examine these dimensions in greater detail to explore how they affect learning outcomes.

Table 3.1. Inequity in learning outcomes is most pronounced across EaP countries and economies in relation to socio-economic status, followed by gender, geographic location and language spoken at home

Size of the performance gap by dimensions of student background

Performance gap		Baku (Azerbaijan)	Georgia	Moldova	Ukrainian regions (18 of 27)
Socio-economic gap (advantaged - disadvantaged)					
Gender gap (girls - boys)	In reading[1]				
	In mathematics	In favour of girls			In favour of boys
Gap by geographic location of school (urban - rural)		..			
Gap by language spoken at home (speak same at home and school: yes - no)					

Notes: The performance gap is the score-point difference in the PISA test between two groups of students. All performance gaps in the table refer to mathematics, except for the gender gap in reading.
.. : Missing value or not available.
1. All differences in reading are in favour of girls.
Very large gap - Score difference between 50 and 85 points.
Large gap - Score difference between 30 and 49 points.
Moderate gap - Score difference between 10 and 29 points.
Small gap - Statistically significant difference of less than 10 points.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Socio-economic status and student resilience

The socio-economic gap in student performance in PISA 2022

Socio-economic disparities in student performance can be measured by comparing the average mathematics performance of students from socio-economically advantaged and disadvantaged backgrounds. This difference is called the "socio-economic gap". A smaller gap indicates less disparity in performance between these two groups, while a larger gap indicates greater disparity.

Students from advantaged backgrounds in all EaP countries/economies are less well-off than the average student in OECD countries (see Table 1.3 in Chapter 1). **Those from disadvantaged backgrounds are worse off than the average OECD student**. Disadvantaged students in Moldova are worse off than the other three EaP countries/economies. In Ukrainian regions, disadvantaged students are comparatively better off. The socio-economic status of advantaged students is similar across all four EaP countries/economies.

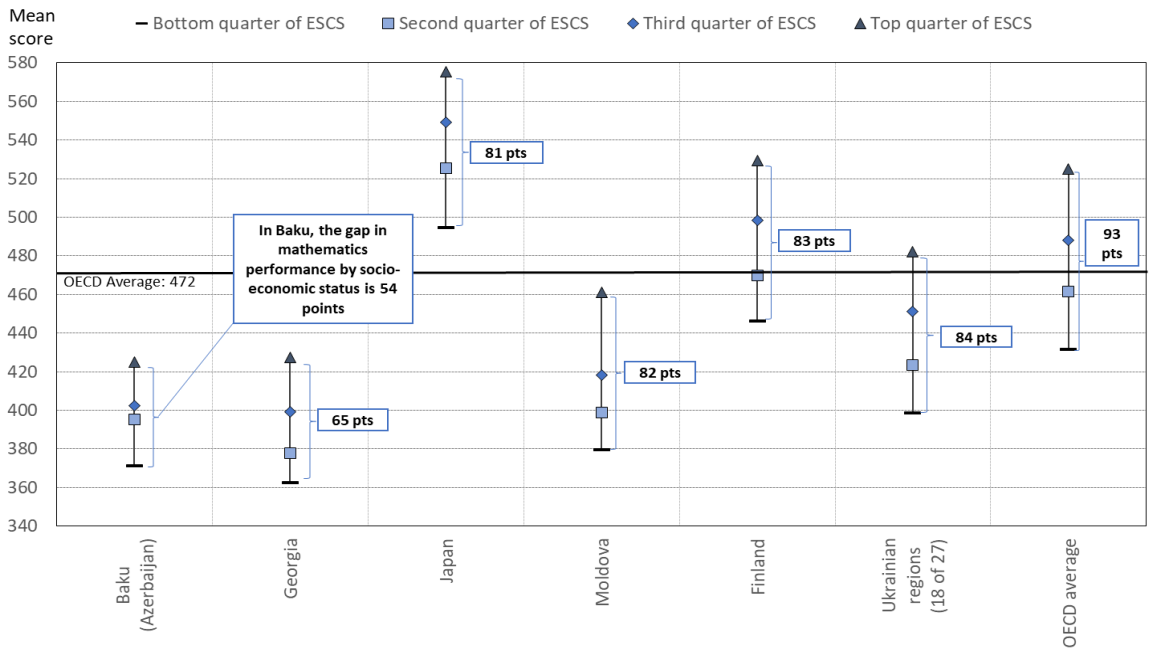
Looking at differences in mathematics performance by socio-economic background, **the socio-economic gap is at least 50 score points in mathematics in EaP countries/economies. This is smaller than average across OECD countries, where the gap is over 90 points**. Indeed, the gap in EaP countries/economies is similar (in Moldova and Ukrainian regions) or smaller (in Baku and Georgia) than in highly equitable systems such as Finland and Japan (Figure 3.2).

The low performance of advantaged students in EaP countries/economies can partly explain the comparatively small socio-economic gap. Advantaged students in EaP countries/economies have a higher socio-economic status than the average OECD student.[4] For this reason, one would expect advantaged students in EaP countries/economies to score higher than the OECD average. However,

advantaged students in Baku, Georgia and Moldova score below this threshold. The exception is Ukrainian regions, where the performance of advantaged students is not significantly different from the OECD average.

Figure 3.2. The socio-economic gap in mathematics performance is smaller in EaP countries/economies than on average across OECD countries

Mean performance in mathematics in PISA 2022, by national quarter of socio-economic status



Notes: Socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS).
Countries and economies are ranked in ascending order of score difference in mathematics between students in the top and bottom quarters of national socio-economic status.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Trends over time in the socio-economic gap in student performance

The socio-economic gap in student performance over time can be analysed for Baku, Georgia and Moldova. Analysis for Ukraine is not possible due to reduced participation in PISA 2022 (see Box 1.3 in Chapter 1 for details).

In Baku, Georgia and Moldova, the socio-economic gap in mathematics remained unchanged from PISA 2018 to PISA 2022, as shown in Figure 3.3. This trend is also seen in most other countries with available data, including Japan. In contrast, the gap increased on average across OECD countries and in 12 countries/economies, including Finland. It only decreased in five countries.

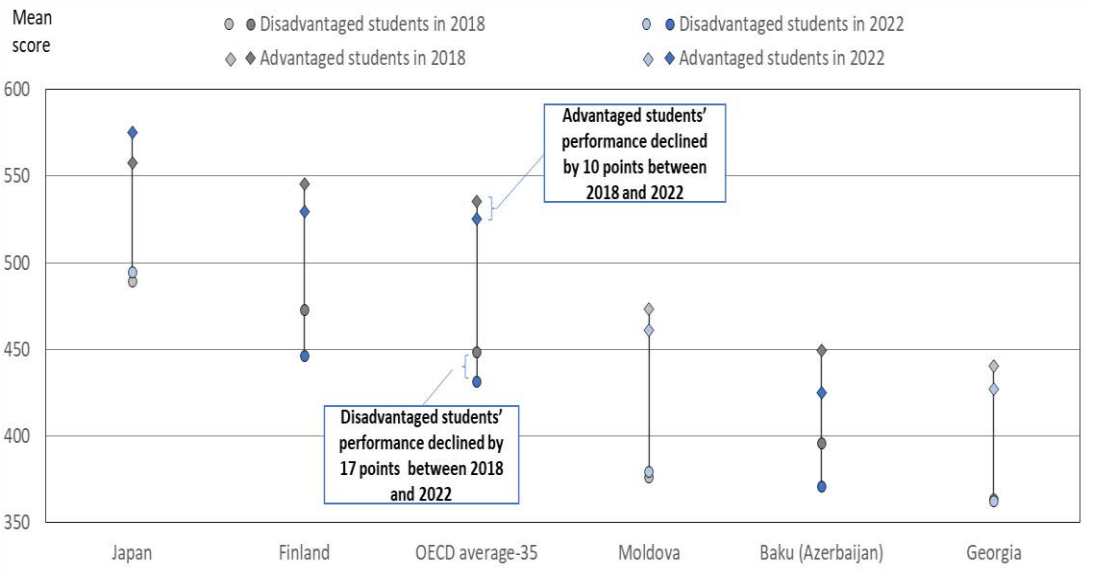
Socio-economic gaps can shift based on changes in the performance of both advantaged and disadvantaged students. This can lead to the gap narrowing, widening or remaining the same. For example, the gap increased on average across OECD countries and Finland because disadvantaged students' performance declined more than advantaged students. While the reasons for this are unclear and PISA data do not allow for strong conclusions to be drawn, one reason might be that disadvantaged

students found it more difficult to adapt to remote learning during the COVID-19 pandemic. Among the five countries where the performance gap narrowed, this occurred in Chile and the United Arab Emirates because the performance of advantaged students declined while the performance of disadvantaged students remained the same.

Among EaP countries/economies, the socio-economic gap did not change for various reasons. In Georgia and Moldova, the performance of both advantaged and disadvantaged students remained stable between 2018 and 2022, so the socio-economic gap did not change. **In Baku, both disadvantaged and advantaged students experienced a decline** of 25 score points in mathematics during this period. This is more than the equivalent of 1 year of school learning, estimated at around 20 score points. The socio-economic gap stayed the same since both groups declined by the same score points. The decline in disadvantaged students' performance could also partly explain why a larger proportion of students in Baku failed to achieve basic proficiency levels in PISA 2022 compared to 2018 (as analysed in Chapter 2, see Figure 2.4).

Figure 3.3. The socio-economic gap in mathematics performance remained unchanged in Baku, Georgia and Moldova between PISA 2018 and PISA 2022

Change between 2018 and 2022 in mean performance in mathematics, by national quarter of socio-economic status



Notes: Statistically significant differences are shown in a darker tone.
The difference in mathematics performance between advantaged and disadvantaged students (i.e. the socio-economic gap) changed significantly between 2018 and 2022 in Finland and the OECD average-35. The change in the socio-economic gap is not statistically significant in Baku, Georgia, Japan and Moldova.
OECD average-35 refers to the average across OECD countries, excluding Costa Rica, Luxembourg and Spain.
The PISA index of ESCS measures socio-economic status. Socio-economically advantaged students are those among the 25% of students with the highest values on the ESCS in their own country or economy. Socio-economically disadvantaged students are those among the 25% of students with the lowest values on the ESCS index in their country or economy.
Countries and economies are ranked in descending order of the mean score in mathematics of socio-economically disadvantaged students in 2022.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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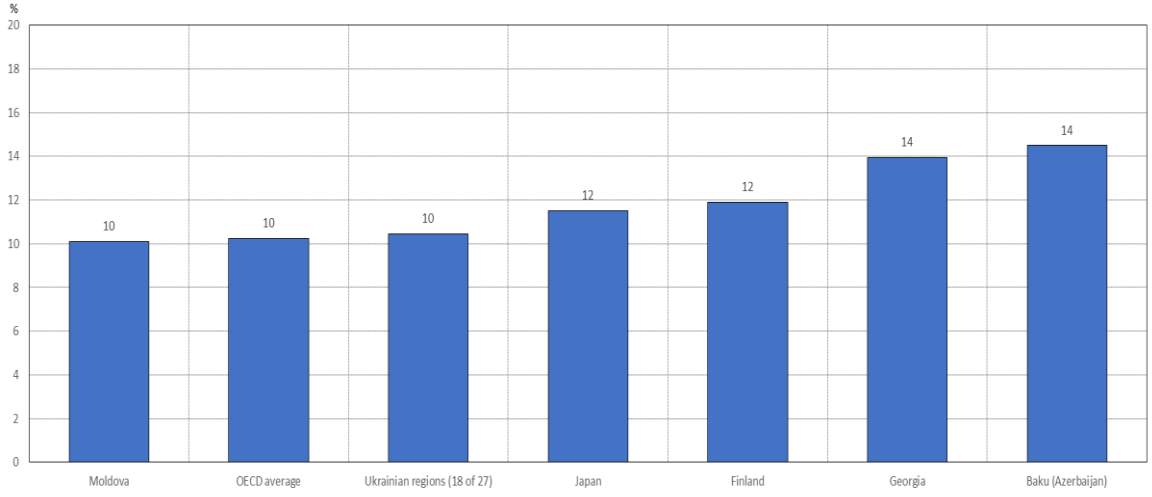
Resilient students

PISA categorises academically resilient students as those who achieve scores in the top quarter of their national performance metrics despite being in the bottom quarter of their country or economy's ESCS index. This classification underscores their educational success in the face of socio-economic challenges. Resilience might be shaped by a range of factors, such as individual determination and a growth mindset, as well as supportive structures and environments (OECD, 2011[2]; 2021[3]).

As pointed out above, disadvantaged students in EaP countries/economies face greater levels of adversity (i.e. socio-economic disadvantage) than their OECD counterparts. However, **a similar or higher proportion of students in EaP countries/economies demonstrate academic resilience than the OECD average** (Figure 3.4)**.** Baku and Georgia have a slightly higher percentage of disadvantaged students who are academically resilient in mathematics than Finland and Japan. However, there are still systems with an even higher share of resilient students, such as Albania and Kosovo (more than 15%). In Moldova and Ukrainian regions, the percentage of academically resilient students is the same as the OECD average.

Figure 3.4. EaP countries/economies have a similar or higher proportion of resilient students than OECD countries

Percentage of socio-economically disadvantaged students who scored in the top quarter of mathematics performance in their own country/economy



Notes: The PISA index of ESCS measures socio-economic status.
Countries and economies are ranked in ascending order of percentage of resilient students.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Gender

Gender gaps in education can have long-term consequences for the personal and professional lives of both girls and boys. For boys, reading difficulties might hinder their further education or employment opportunities. For girls, their under-representation among top achievers in science and mathematics partly explains their under-representation in science, technology, engineering and mathematics (STEM) careers

(OECD, 2015[4]). For PISA data, the "gender gap" is analysed as the score difference between boys and girls in average performance.

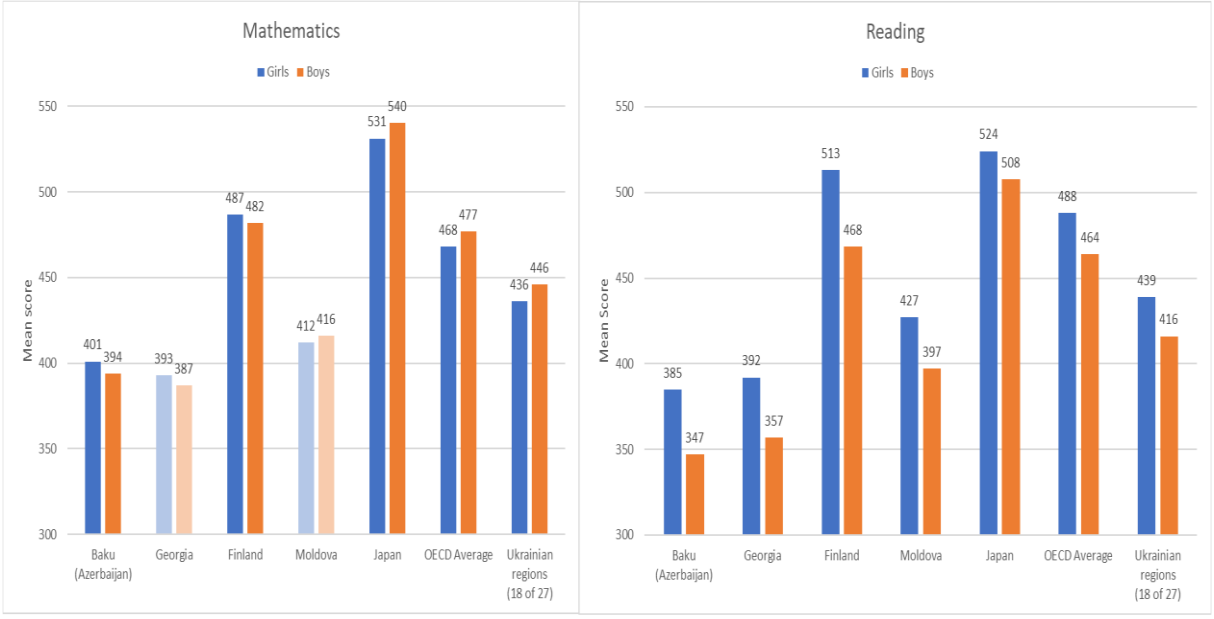
In mathematics, the gender gap generally favours boys, who tend to outperform girls in most OECD and PISA-participating countries. **Ukrainian regions also show this pattern, with a difference in mathematics performance in favour of boys**. Boys outperform girls in Ukrainian regions by 10 points, which is similar to the gap in favour of boys observed in OECD countries and Japan (Figure 3.5).

Conversely, **in Georgia and Moldova, boys and girls perform at about the same level in mathematics, on average**. This is similar to 24 other countries and economies that took part in PISA 2022, including Bulgaria, Greece, Romania and Türkiye.

Baku is 1 of the 17 countries or economies that took part in PISA 2022 where girls outperformed boys in mathematics. In Baku, this marks a reversal from PISA 2018, when boys outperformed girls. Since then, although both boys and girls saw a decline in their mean scores, the drop was larger for boys (30 points) than for girls (15 points) (Figure 3.6).

Figure 3.5. Girls consistently outperform boys in reading across EaP countries/economies but in mathematics the gender gap varies

Mean performance in mathematics and reading in PISA 2022, by gender



Notes: Statistically significant differences between boys and girls are shown in a darker tone. All differences in mean scores between boys and girls are statistically significant except for Georgia and Moldova in mathematics.
Countries and economies are ranked in ascending order of the score difference between boys and girls in mathematics.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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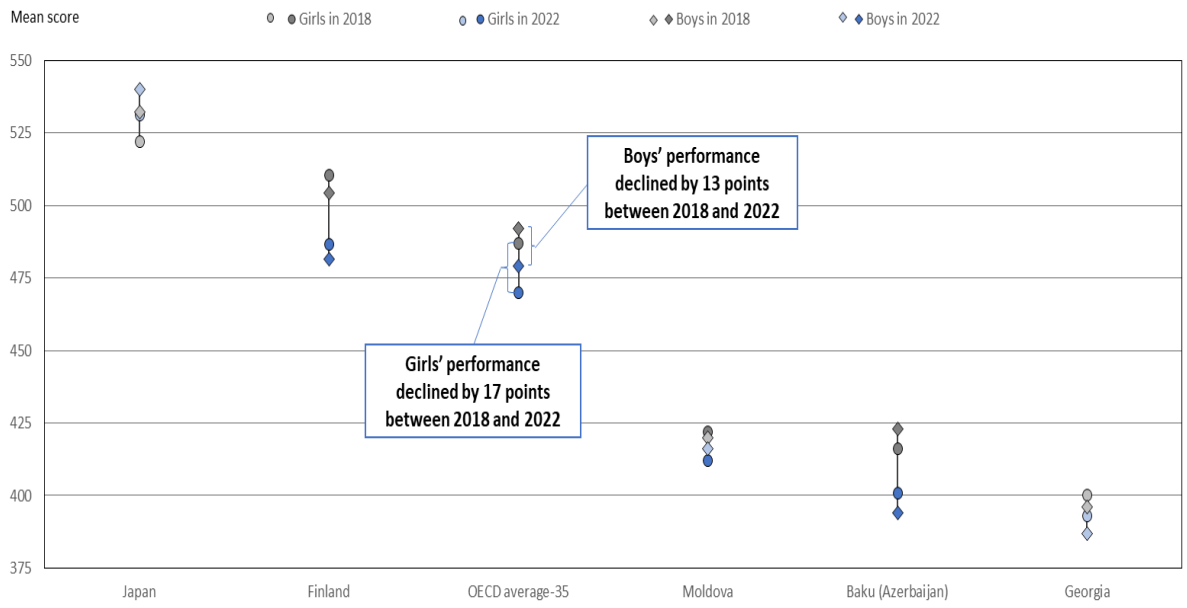
Figure 3.6. Different to the trend observed across OECD countries, where the gender gap in mathematics widened, it remained the same in Georgia and Moldova and reversed in Baku

Change between 2018 and 2022 in mean performance in mathematics, by gender



Notes: Statistically significant differences are shown in a darker tone.
OECD average-35 refers to the average across OECD countries, excluding Costa Rica, Luxembourg and Spain.
Countries and economies are ranked in descending order of the mean score in mathematics for girls in 2022.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Looking at Georgia and Moldova, there was no significant change in mathematics performance by gender between PISA 2018 and PISA 2022 in either country. In Georgia, both boys and girls maintained their performance levels. In Moldova, boys' performance did not change, while girls' performance declined. However, this decline was insufficient to cause a significant change in the gender gap in this country.

These trends in EaP countries/economies differ from those observed across OECD countries, where the gender gap in mathematics favouring boys widened slightly. This was due to a steeper decline in girls' scores than boys' scores between 2018 and 2022.

When it comes to reading, the pattern in all EaP countries/economies mirrors that of OECD countries: girls significantly outperform boys. This gap is especially large and wider in Baku and Georgia than in OECD countries, even if some, such as Finland, have even larger gaps (Figure 3.5).

Overall, in Baku, girls perform better than boys in mathematics and reading. Conversely, in Georgia and Moldova, girls and boys perform at similar levels in mathematics and girls outperform boys in reading. In Ukrainian regions, girls underperform boys in mathematics and their advantage in reading is less pronounced than in Baku and Georgia.

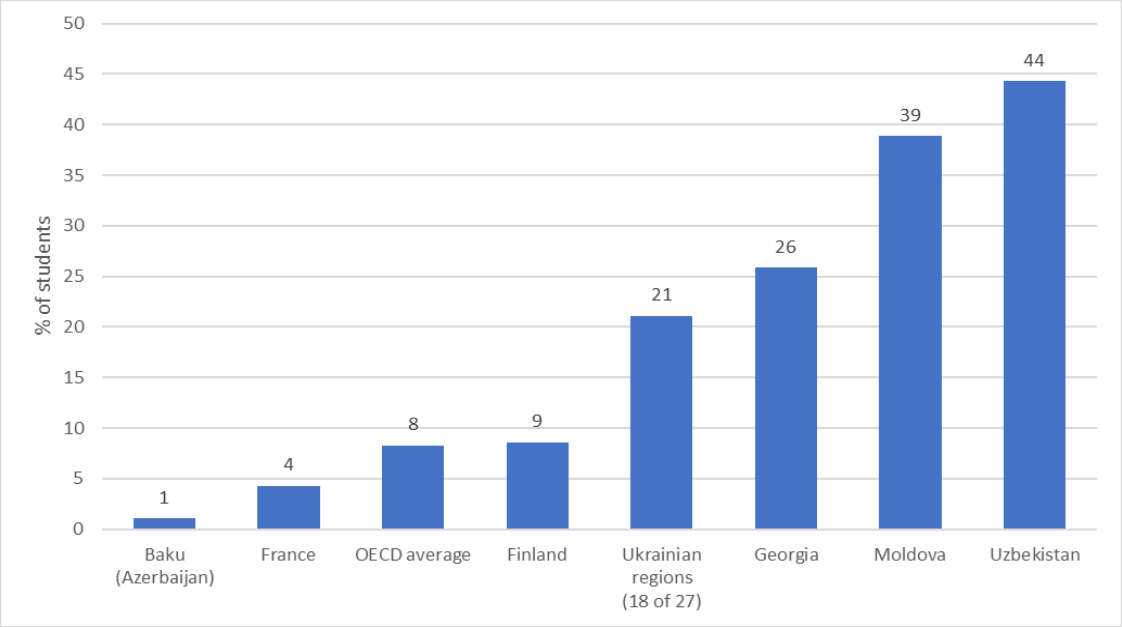
Geographic location

As highlighted in Chapter 1, **a large share of EaP country/economy students go to school in rural areas, except for Baku**. The share of rural students is particularly high in Georgia and Moldova. Indeed, both countries are among the ten countries participating in PISA 2022 with the highest share of rural

students. Moldova has the highest share after Uzbekistan (Figure 3.7). By contrast, only five countries, including Japan, have a similar or lower share of rural students than Baku. Since the share of rural students is very low in Baku, the following analysis focuses on Georgia, Moldova and Ukrainian regions.

Figure 3.7. A relatively large share of students in EaP countries/economies attend schools in rural areas, except for Baku

Percentage of students attending schools in rural areas in PISA 2022



Notes: Rural areas are places with fewer than 3 000 people.
Countries and economies are ranked in ascending order of percentage of students attending schools in rural areas.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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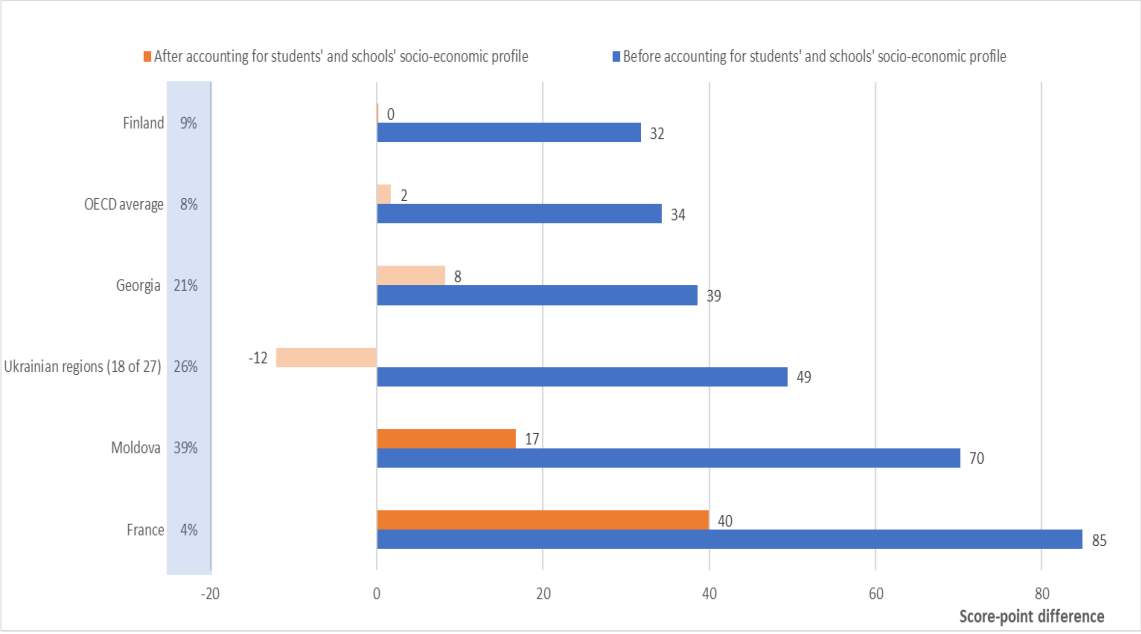
In most countries and economies participating in PISA, students in urban areas perform above those in rural areas. This holds true for the EaP countries/economies as well. In Moldova, which has the highest share of rural students among EaP systems, the gap in average mathematics performance between rural and urban students is particularly large (70 score points). This gap is one of the largest globally, although it is still lower than in France, where the gap is 85 points. The rural-urban performance gap in Ukrainian regions is also considerable at 49 points. In Georgia, the gap is similar to the OECD average (Figure 3.8).

Much of this performance difference by geographic location is explained by the higher socio-economic status of urban students and the more advantaged socio-economic average profile of urban schools rather than intrinsic differences in student capability or education quality. After accounting for students' and schools' socio-economic profiles, students in urban and rural schools perform similarly in mathematics in most countries and on average across OECD countries. This is also the case in Georgia and Ukrainian regions. This indicates that rural students perform as well as urban students on a level socio-economic playing field.[5] By contrast, in Moldova (as is also the case in France), the difference in favour of urban students holds even after accounting for socio-economic factors. This suggests that other factors also explain differences in performance between urban and rural students (Figure 3.8). While

the reasons for this persistent gap in Moldova are not fully clear, they seem partly driven by the small size of rural schools, as analysed in the next paragraphs.

Figure 3.8. Large differences in performance between students in urban and rural schools are largely accounted for by the more advantaged socio-economic profile of urban students and schools

Difference in mathematics performance between students in urban and rural schools



Note: The share of students attending school in a rural area is displayed on the x-axis. For Baku, the sample is too small for rural areas. Statistically significant differences in mathematics performance between students in urban and rural schools are shown in a darker tone. The difference after accounting for students' and school's socio-economic profile is not significant in the OECD average, Georgia, and the Ukrainian regions (18 or 27).
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/x4ru9m

School size is an important dimension to consider when analysing performance differences between rural and urban schools. While smaller rural schools may benefit from smaller class sizes, more personalised attention and closer-knit communities, they can also face challenges, such as difficulties in managing multigrade classrooms and limited opportunities for peer learning among teachers.

School sizes differ greatly across countries and a large school in one country might be considered small in another (OECD, 2018[5]). To compare school sizes across countries, schools can be divided into three groups based on national quartiles: the bottom quarter as small schools, the top quarter as large schools and the middle half as medium-sized schools. **This approach reveals that small schools in EaP countries/economies are generally smaller than the average small school across OECD countries**. Among EaP countries/economies, the average number of students in small schools is lowest in Georgia and Moldova (fewer than 150 students per rural school in each) and largest in the Ukrainian regions (177 students per rural school). In contrast, the OECD average for small schools is 278 students. The average school size of large schools ranges from 1 275 students in Moldova to 1 735 in Baku, compared to an OECD average of 1 396 students (calculations based on 2022 PISA database (OECD, 2022[1])).

Looking at the distribution of students across schools of different sizes by location shows that **in rural secondary schools, a large majority of students attend small schools, with very few attending large schools**. This is observed in all EaP countries/economies (except Baku, where data are not available) and, on average, across OECD countries (Table 3.2). Conversely, in urban areas, most students in EaP countries/economies and OECD countries attend medium-sized or large schools. For example, more than 70% of rural students in Georgia attend small schools, whereas only 4% of urban students do so.

Table 3.2. In rural areas most students attend small schools, whereas in urban areas most students attend large or medium schools

Percentage of students in small, medium or large schools, by school geographic location

	Rural schools			Schools located in towns			Urban schools		
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
France	86	14	0	24	53	23	16	45	39
Finland	76	24	0	25	56	19	10	47	43
Ukrainian regions (18 of 27)	73	25	2	13	70	17	13	41	46
Georgia	72	27	2	16	73	11	4	51	45
OECD average	71	26	3	26	53	21	16	50	34
Moldova	58	40	2	5	73	22	2	36	62
Baku (Azerbaijan)	..	..	..	23	43	34	28	56	17

Notes: Cells coloured in grey indicate statistically significant differences between urban and rural schools. For example, the percentage of students enrolled in medium-sized schools is significantly different between urban and rural areas in France but not in Finland or EaP countries/economies.
Small schools are in the bottom quarter of the national distribution of school size, calculated as the total number of students in a school. Medium-sized schools are in the second and third quarters of the national distribution of school size. Large schools are in the top quarter of the national distribution of school size.
The sample size of students in rural areas is too small to provide reliable estimates in Baku (Azerbaijan).
Countries and economies are shown in descending order of the percentage of rural students attending small schools.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/kovpui

How, then, does student performance in mathematics differ by school size? **On average across OECD countries, students in large schools outperform their peers in medium-sized and small schools in mathematics, even after accounting for students' and school's socio-economic profiles**. This pattern is reflected in Moldova but not in Georgia and Ukrainian regions. In Moldova – a country with persistent rural-urban inequities in educational outcomes – students in small schools (more common in rural areas) perform worse in mathematics than those in medium-sized and large schools. Medium-sized schools also perform below large schools in the country. These performance differences persist after accounting for socio-economic factors, with one exception: students in small and medium-sized schools perform similarly when socio-economic differences are considered.

In Ukrainian regions, small schools perform similarly to medium-sized schools but both perform worse than large schools. However, after accounting for socio-economic profiles, small schools in Ukrainian regions perform significantly better than medium-sized and large schools, and the performance advantage of large schools over medium-sized schools also disappears. In Georgia, large schools perform better in mathematics than small schools but there are no significant differences in mathematics performance by school size once socio-economic factors are considered.

Table 3.3. Students in large schools outperform students in medium-sized and small schools due in part to their higher socio-economic profile

Difference in mathematics performance between students in large, medium-sized and small schools, before and after accounting for students' and schools' socio-economic profile

	Large schools - small schools		Large schools - medium schools		Medium schools - small schools	
	Before accounting for socio-economic factors	After accounting for socio-economic factors	Before accounting for socio-economic factors	After accounting for socio-economic factors	Before accounting for socio-economic factors	After accounting for socio-economic factors
Baku (Azerbaijan)	14	8	-1	4	16	4
Finland	**15**	3	0	0	**15**	3
Georgia	**23**	0	12	4	11	-5
OECD average	**39**	**12**	**14**	**3**	**26**	**9**
Ukrainian regions (18 of 27)	**42**	**-16**	**29**	4	13	**-20**
France	**61**	**20**	14	4	**47**	**16**
Moldova	**72**	**13**	**46**	**13**	**26**	0

Notes: Significant score changes are shown in a darker tone.
Small schools are in the bottom quarter of the national distribution of school size, calculated as the total number of students in a school. Medium-sized schools are in the second and third quarters of the national distribution of school size. Large schools are in the top quarter of the national distribution of school size.
Countries and economies are ranked in ascending order of score difference in mathematics performance between students in large and small schools before accounting for students' and schools' socio-economic profile.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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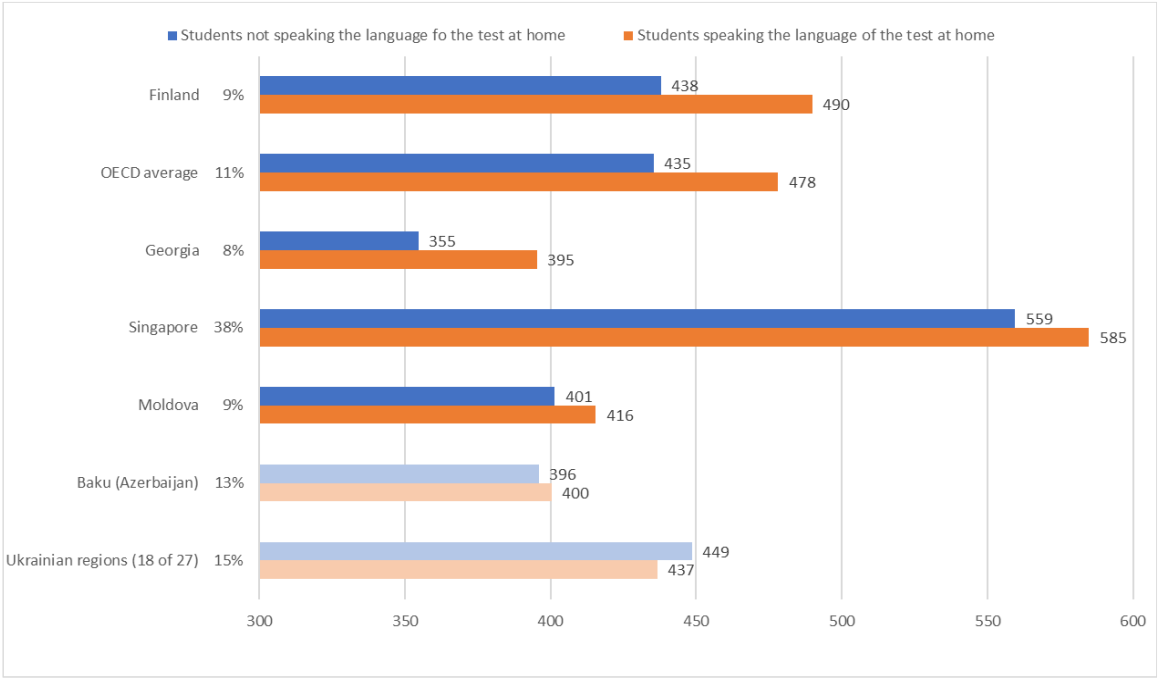
Language spoken at home

As mentioned in Chapter 1, **linguistic diversity is an important factor of diversity in the education systems of EaP countries/economies**. The percentage of students speaking a different language at home compared to the one they sat their PISA assessment is slightly above 10% in Baku and Ukrainian regions, and just under 10% in Georgia and Moldova (Table 1.3 in Chapter 1). On average, across OECD countries, 11% of students speak a different language at home than at school.

In Georgia and Moldova, students who speak a different language at home than at school perform lower in mathematics than those who speak the same language at home and school. This amounts to a 41-point difference in Georgia, a gap similar to Finland and the OECD average but larger than in some high-performing countries such as Singapore. In Moldova, the difference in mathematics performance is smaller (14 points) (Figure 3.9). By contrast, **there is no significant difference in mathematics performance in Baku and Ukrainian regions based on language background**.

Figure 3.9. Students who speak a different language at home than at school perform lower in Georgia and Moldova but not in Baku and Ukrainian regions

Mean performance in mathematics in PISA 2022, by language spoken at home



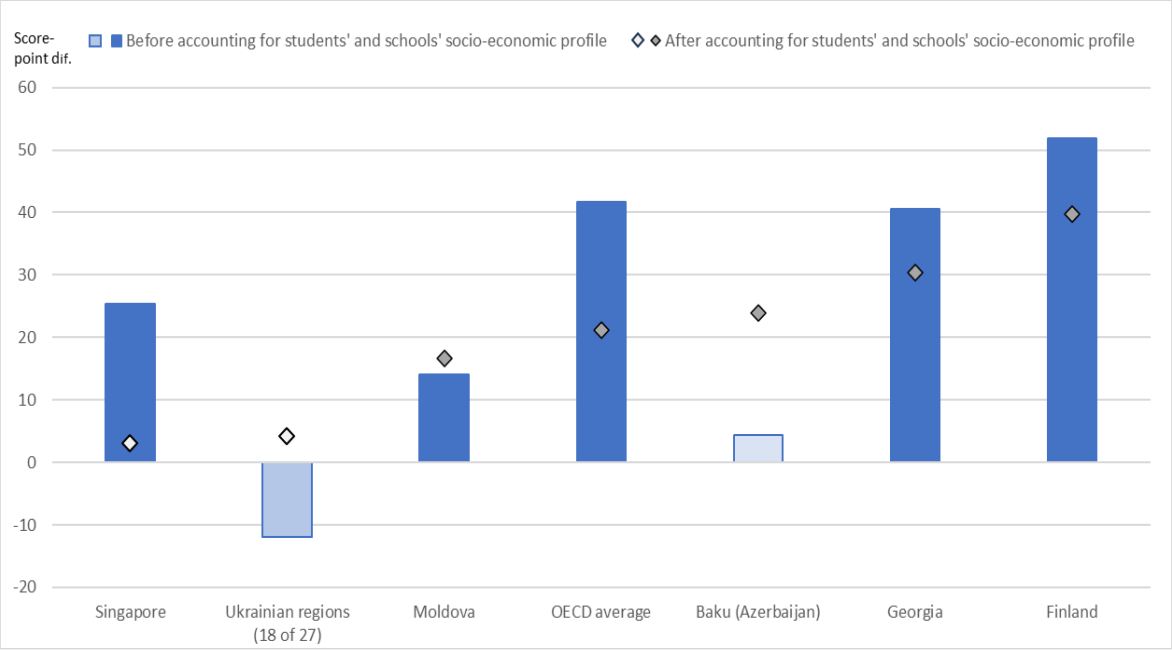
Note: The share of students speaking a different language at home than at school is displayed on the x-axis.
Statistically significant differences in mathematics performance between students who speak and those who do not speak at home the language of the PISA assessment are shown in a darker tone. In Baku (Azerbaijan) and Ukrainian regions (18 of 27) the difference is not significant.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/dq3ihg

This picture changes slightly once the socio-economic profiles of students and schools are accounted for (Figure 3.10). Performance differences by language spoken at home continue to be significant in Georgia and Moldova, although they become smaller in Georgia and larger in Moldova. Students with different language backgrounds also continue to perform similarly in Ukrainian regions. By contrast, **in Baku, students who speak the same language at home and school perform better once socio-economic factors are accounted for**. This is because in Baku, students who speak a different language at home have a higher average socio-economic status than students who speak the same language at home as at school.

Figure 3.10. Differences in performance by language spoken at home only partly accounted for by socio-economic profile of students and schools

Difference in mathematics performance between students who speak and those who do not speak at home the language of the PISA assessment



Note: *Countries and economies are ranked in ascending order of score difference in mathematics performance between students who speak and those who do not speak at home the language of PISA assessment after accounting for students' and schools' socio-economic profiles.*
Statistically significant differences in mathematics performance between students who speak and those who do not speak at home the language of the PISA assessment are shown in a darker tone.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Differences in students' educational expectations and sense of belonging by student background

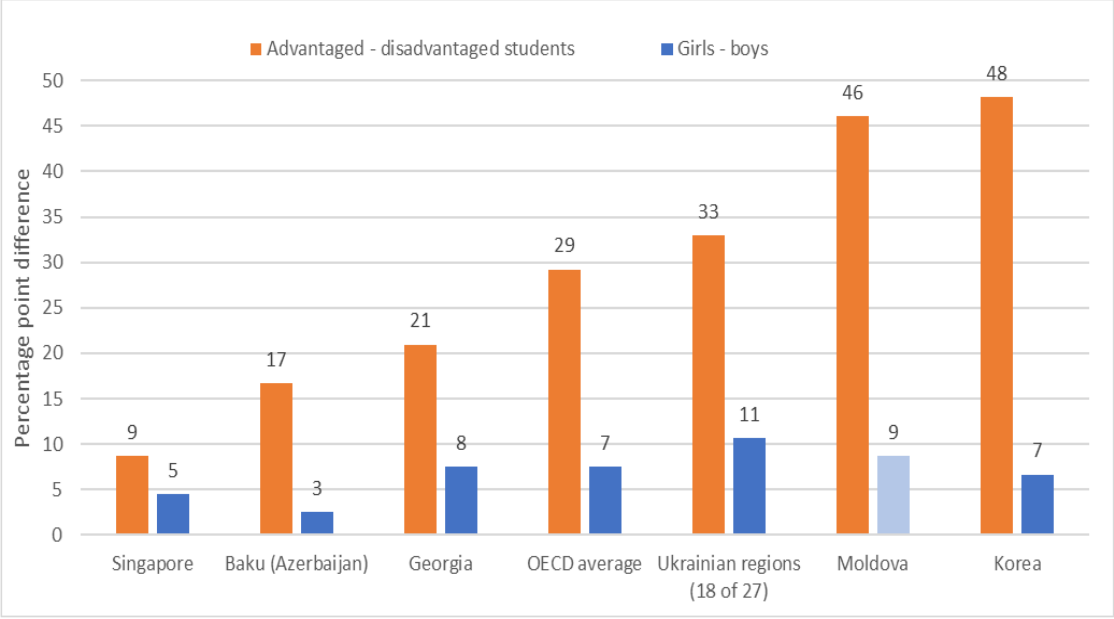
Educational expectations

As discussed in Chapter 2, educational expectations among 15-year-old students in EaP countries/economies have risen considerably. The exception is Ukrainian regions, where the share of students expecting to complete tertiary education dropped. How do these expectations differ by students' socio-economic background and gender?

In all EaP countries/economies, socio-economically advantaged students are more likely to expect to complete a tertiary degree than their disadvantaged peers. This is also observed on average across OECD countries. The gap in expectations is particularly large in Moldova and Ukrainian regions and smaller in Baku and Georgia compared to the OECD average. In Moldova, the gap is only slightly smaller than in Korea, which has the largest difference among OECD countries. In countries like Singapore and Türkiye, the socio-economic gap in educational expectations is narrower than in Baku (Figure 3.11).

Figure 3.11. Advantaged students and girls are more likely to expect to complete a tertiary degree than disadvantaged students and boys in EaP countries/economies

Difference in the percentage of students who expect to complete tertiary education, by socio-economic status and gender



Notes: Student socio-economic status is measured by the PISA index of ESCS. The advantaged-disadvantaged differences are the differences between the top and the bottom quarter of the ESCS index.
Statistically significant differences in the percentage of students who expect to complete tertiary education are shown in a darker tone. All differences are significant except for those between girls and boys in Moldova.
Countries and economies are ranked in ascending order of the difference in the percentage of advantaged and disadvantaged students who expect to complete tertiary education.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/7lipft

Girls generally have higher educational aspirations in all EaP systems, reflecting again the picture observed in OECD countries. In Baku, the gender gap in favour of girls in terms of expectations is smaller, similar to the gap in Singapore. It matches the OECD average in Georgia and Korea, while it is somewhat larger in Ukrainian regions. Notably, in Moldova, there is no significant difference in educational expectations between girls and boys.

Contrasting these educational expectations with actual opportunities in higher education and the labour market, girls achieve their aspirations at least in tertiary education but less so when it comes to work. According to a recent report by the World Economic Forum, enrolment in tertiary education is greater among women than men in all EaP countries (WEF, 2023[6]). In Moldova, the share of women enrolled in higher education is 21 percentage points greater than the share of men; in Georgia, it is 12 percentage points greater and in Azerbaijan, only 7 percentage points greater.

However, EaP countries/economies vary regarding economic participation and opportunity. Moldova shows remarkably high levels of gender equality in labour force participation, relatively even for men and women compared to other countries. Both Georgia and Azerbaijan, by contrast, show a larger gender gap in favour of men in labour force participation rates.

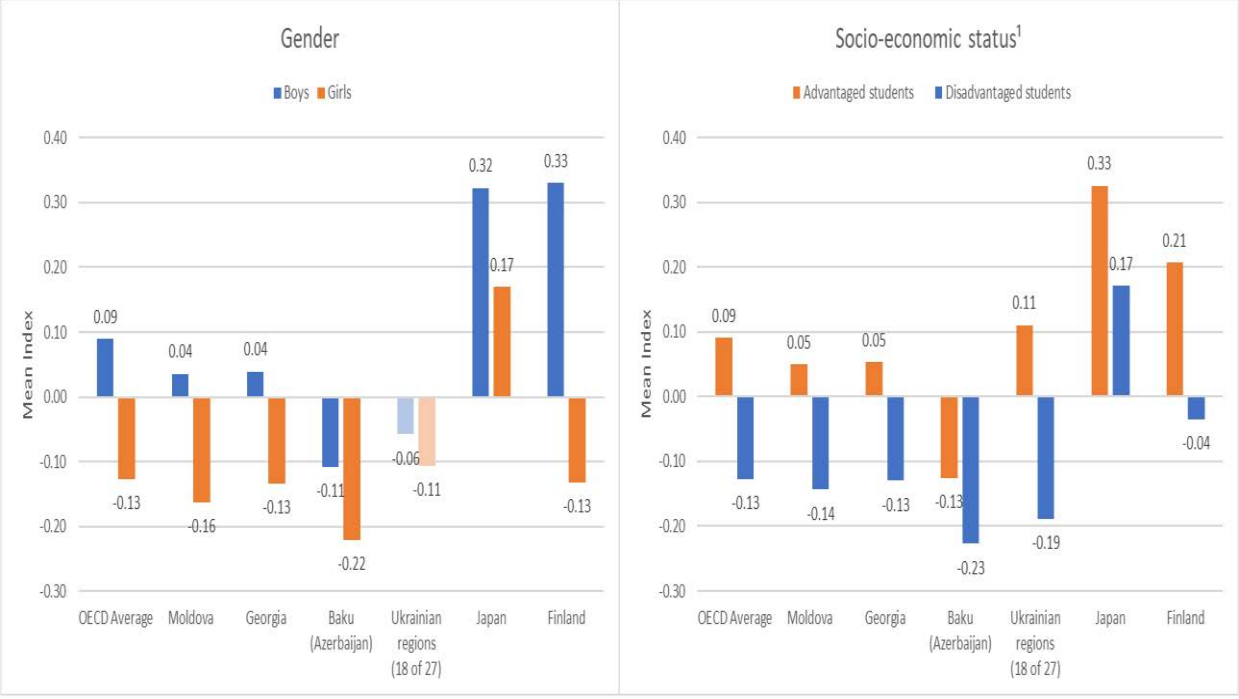
Sense of belonging at school

Students' sense of belonging at school varies widely between countries. In PISA, this is measured by students' responses to statements about their school experience, combined into an index (also see Chapter 2). The average score on this index across OECD countries is zero, meaning a positive value indicates a stronger sense of belonging than the average OECD student.

On average, boys report a stronger sense of belonging at school than girls across OECD countries, as well as in Finland and Japan. **This gender gap in favour of boys is also observed in three out of the four EaP countries/economies** (Figure 3.12). In Georgia and Moldova, boys score positively on the sense of belonging index, while girls score negatively, similar to the pattern seen in Finland. In Baku, both boys and girls score negatively but boys still report a stronger sense of belonging than girls. In Japan, both genders report a stronger sense of belonging than the average OECD student, with boys feeling even more connected than girls.

Figure 3.12. Sense of belonging at school is stronger for girls than for boys and for advantaged students than for disadvantaged students in most or all EaP countries/economies

PISA index of sense of belonging at school, by student gender and socio-economic status



Notes: Statistically significant differences in PISA index of sense of belonging at school are shown in a darker tone. All differences are significant except those between girls and boys in Ukrainian regions (18 of 27).
Socio-economically advantaged (disadvantaged) students are those among the 25% of students with the highest (lowest) values on the ESCS in their own country or economy.
1. The PISA economic, social and cultural index measures socio-economic status.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/9ovcgh

However, this picture is not universal. In Ukrainian regions, there is no statistically significant difference between boys and girls in their sense of belonging: both report a weaker sense of belonging compared to the OECD average.

Socio-economic status is consistently related to students' sense of belonging across EaP countries/economies and OECD countries. On average, students from more advantaged backgrounds feel a stronger sense of belonging at school than disadvantaged students. This gap is particularly pronounced in Ukrainian regions. In Georgia and Moldova, the gap is similar to the OECD average. In Baku, the gap is smaller: both advantaged and disadvantaged students report a relatively low sense of belonging but disadvantaged students feel even less connected.

Differences in performance by access to education resources

Transforming educational funding into high-quality resources for schools is crucial for educational achievement. This includes not only hiring qualified and motivated staff and supporting them in forming strong professional communities but also providing adequate facilities and materials (OECD, 2018[5]; 2019[7]).

PISA collects data on both human, material and digital resources in schools. Human resources refer to teachers and support staff, while material resources encompass educational materials and school infrastructure. PISA 2022 asked school principals about the extent to which different resource shortages hinder instruction at their schools. The findings from this analysis are mostly indicative of the resource situation in secondary schools, as are findings from the report overall. However, depending on the context, schools may offer lower levels of education as well. In this case, reports on resource shortages might also indicate shortages in earlier levels. Throughout, the analysis compares the overall resourcing of schools as reported by principals relative to OECD countries and selected benchmarking countries, and differences between different types of schools. The section also analyses how resources are associated with mathematics performance, as measured by PISA.

In addition, this section delves into the time resources that 15-year-old students were provided with as part of their cumulative learning experience that influenced their PISA scores. To do so, the section analyses students' attendance in pre-primary education.

Teacher availability and qualification

Teachers and other educational staff are arguably the most important resource for school systems. However, schools worldwide are grappling with teacher shortages (OECD, 2019[7]). The importance of staff resources for student learning and well-being is also borne out of analysis of PISA data. Across education systems, PISA 2022 results show that high-performing education systems are staffed with high-quality teaching and non-teaching staff in sufficient numbers (OECD, 2023[8]).

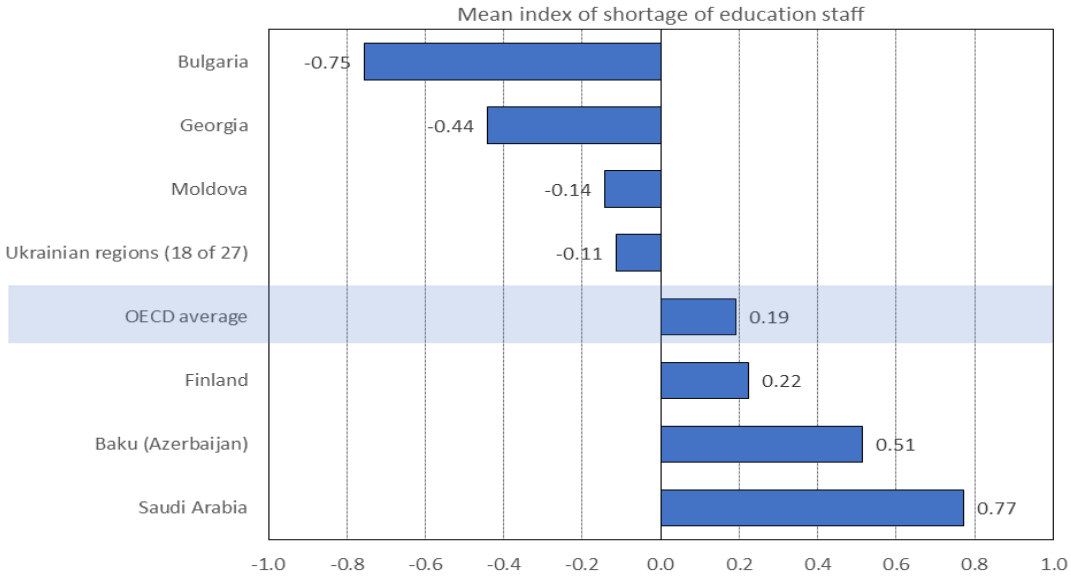
PISA uses an index of staff shortages based on school principals' responses to four key statements concerning the lack of staff and the qualifications of teaching and assisting personnel. An index mean of zero indicates the average level of staff shortages across OECD countries; values above zero suggest more significant shortages than average across OECD countries.

Figure 3.13 shows that **school principals in Baku report the most severe shortages in educational staff among EaP countries/economies**. The level of concern is higher than the OECD average, similar to those reported by principals in Italy and the Netherlands*[6] and lower than in nine countries/economies, including Saudi Arabia (shown in the figure). Previous research has warned about the declining status of the teaching profession in Azerbaijan and other countries in the Caucasus regions; for example, students entering pre-service teacher education programmes have lower results on university examinations

compared to other higher education programmes, thus further undermining the prestige of the teaching profession and the quality of education (Silova, 2009[9]).

Figure 3.13. Shortages of education staff are most pronounced in Baku and least pronounced in Georgia, with moderate shortages reported for Moldova and Ukrainian regions

PISA index of shortage of education staff, based on principals' reports



Notes: Higher values in the index indicate greater shortages of education staff.
Countries and economies are ranked in ascending order of the index of shortage of education staff.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/mkvf61

In Baku, the biggest issue appears to be shortages in the number of staff, though concerns about teacher qualifications are also high (Table 3.4). In terms of what type of staff are lacking, shortages are more pronounced for teachers than for assisting staff**:** 59% of students are enrolled in schools whose principal reported that the school's capacity to provide instruction is hindered to some extent or a lot by a lack of teaching staff.

Principals in Georgia reported the least shortages of human resources among EaP countries and economies, comparable with systems like Qatar, Singapore and Switzerland. Only six systems had lower levels of concern, including Bulgaria, as measured by the index of staff shortages. In Georgia, concerns are more about the qualifications and adequacy of teaching staff rather than their numbers. This is likely related to the nature of the teacher labour market, with a large supply of teachers who continue teaching beyond retirement. In TALIS 2018, Georgia had the oldest teaching population out of any country that participated in the survey (OECD, 2019[10]). An OECD policy review of the country found that the high share of older teachers limits the availability of full-time teaching posts, especially those available for new entrants, and reduces teachers' real salaries (Li et al., 2019[11]). Georgia, however, reports more of a shortage of assisting staff: 22% of students are enrolled in schools whose principal reported that the school's capacity to provide instruction is hindered to some extent or a lot by the inadequate or poorly qualified assisting staff.

Moldova and Ukrainian regions both experience modest levels of staff shortages, which are less severe than the OECD average and similar to countries like Brazil, Iceland and Thailand. In both countries, the primary issue is the lack of teaching staff rather than concerns about their qualifications or the availability and quality of assistant staff: the share of students who are enrolled in schools whose principal reported that the school's capacity to provide instruction is hindered to some extent or a lot by a lack of teaching staff is 38% in Moldova and 30% in Ukrainian regions.

Table 3.4. Principals' perception of key human resources

Percentage of students in schools whose principal reported that the school's capacity to provide instruction was hindered to some extent or a lot by the following

	A lack of teaching staff	Inadequate or poorly qualified teaching staff	A lack of assisting staff	Inadequate or poorly qualified assisting staff
Baku (Azerbaijan)	59	41	41	23
Saudi Arabia	55	39	54	39
OECD average	47	25	37	19
Moldova	38	14	15	16
Ukrainian regions (18 of 27)	30	22	19	13
Lithuania	27	4	15	5
Finland	23	13	40	25
Bulgaria	18	9	6	5
Georgia	7	12	22	17

Note: *Countries and economies are ranked in descending order of the lack of teaching staff.*
40% or more
More than 20% and less than 40%
20% or less
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/ozmjed

No significant disparities in staff shortages are found between advantaged and disadvantaged schools, or between urban and rural schools in any EaP country or economy. Additionally, school principals' perception of shortages of education staff does not correlate with student mathematics performance in EaP countries/economies. This differs from what is observed on average across OECD countries and might indicate relatively weak teaching effectiveness.

Across OECD countries, both concerns about a lack of teaching staff and inadequate or poorly qualified teaching staff worsened from PISA 2018 to PISA 2022. Concerns increased the most for the lack of teaching staff. Such trends can be analysed for Georgia and Moldova. In both these countries, no statistically significant changes can be observed.

Educational materials and digital resources

Educational materials and physical infrastructure

Providing appropriate facilities and materials is essential for teachers to fully utilise their teaching skills and create effective learning environments with their students. For example, outdated infrastructure or low-quality textbooks can harm students' teaching and learning (OECD, 2018[5]). In PISA, as with the approach used for evaluating human resource shortages, principals are asked how much shortages and poor quality of educational materials and physical infrastructure obstruct learning. Table 3.5 provides the detailed results for each of these aspects, which are again integrated into an index measuring overall

shortages in educational materials. The index could not be calculated for Moldova because of data limitations.

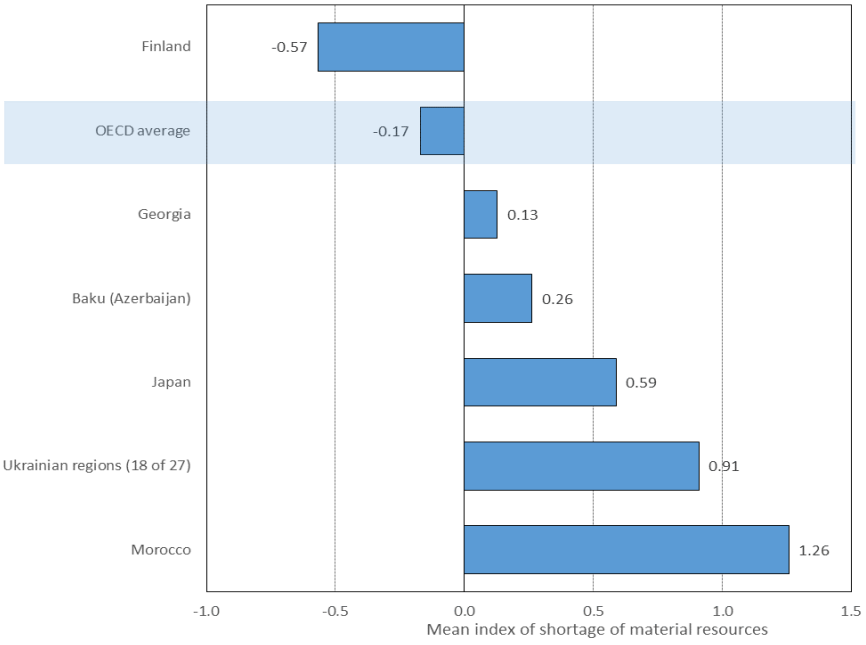
The situation with educational materials and resources in EaP countries/economies stands in contrast to the availability and quality of human resources. **While, except for Baku, shortages of education staff are less severe across EaP countries/economies than in OECD countries, shortages of educational materials are more acute**. The most severe shortages, as perceived by school principals, are found in Ukrainian regions, followed by Baku. Georgia experiences the least severe problems among EaP countries/economies, as measured by the index (Figure 3.14). These shortages concern both a lack of material and inadequate or poor-quality educational material (Table 3.5).

Ukrainian regions rank among the top ten countries in PISA with the most significant material shortages. In only six countries/economies, including Morocco, school principals reported greater shortages of educational materials than in Ukrainian regions. The situation in Baku is comparable to that in Portugal and Thailand, while the reports of principals in Georgia are similar to those in the Slovak Republic and Uruguay.

Unlike human resources**, there are also apparent equity issues related to material resources in some EaP countries/economies**. Shortages are more pronounced in rural areas than in cities within Georgia and Ukrainian regions, and in disadvantaged schools compared to advantaged ones in Georgia. In Baku, analysing the rural-urban disparities is not meaningful due to the small proportion of rural students.

Figure 3.14. Concerns about material resource shortages are more pronounced in EaP economies than in OECD countries

PISA index of shortage of material resources, based on principals' reports



Notes: Higher values in the index indicate greater shortages of educational materials.
Countries and economies are ranked in ascending order of the index of shortage of educational material.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/8bjzhl

Looking at changes in specific dimensions of shortages in material resources, the situation has improved in some respects in Georgia and Moldova and deteriorated in Ukrainian regions. Between 2018 and 2022, **the lack of physical infrastructure and the quality of educational materials deteriorated in Ukrainian regions**. As shown in Figure 3.15, the decline in educational materials was particularly severe, yet the share of students in schools where principals reported that a lack of physical infrastructure hinders instruction also increased considerably (by more than 10 percentage points). This illustrates the challenges created by the ongoing war, which has strained resources, crowded schools with internally displaced students and damaged or destroyed educational facilities (Human Rights Watch, 2023[12]).

In Georgia, concerns about the lack of physical infrastructure have decreased since 2018, indicating some improvement in this area (Figure 3.15). However, 40% of students in Georgia are still enrolled in schools where the principal reports that the lack of physical infrastructure hinders instruction (Table 3.5). **In Moldova, concerns about the lack of educational materials have also diminished**. However, 44% of students in Moldova are still enrolled in schools where the principal reports that the lack of educational materials hinders instruction, highlighting that problems persist (Table 3.5).

Table 3.5. Principal's perception of key educational materials

Percentage of students in schools whose principal reported that the school's capacity to provide instruction was hindered to some extent or a lot by the following

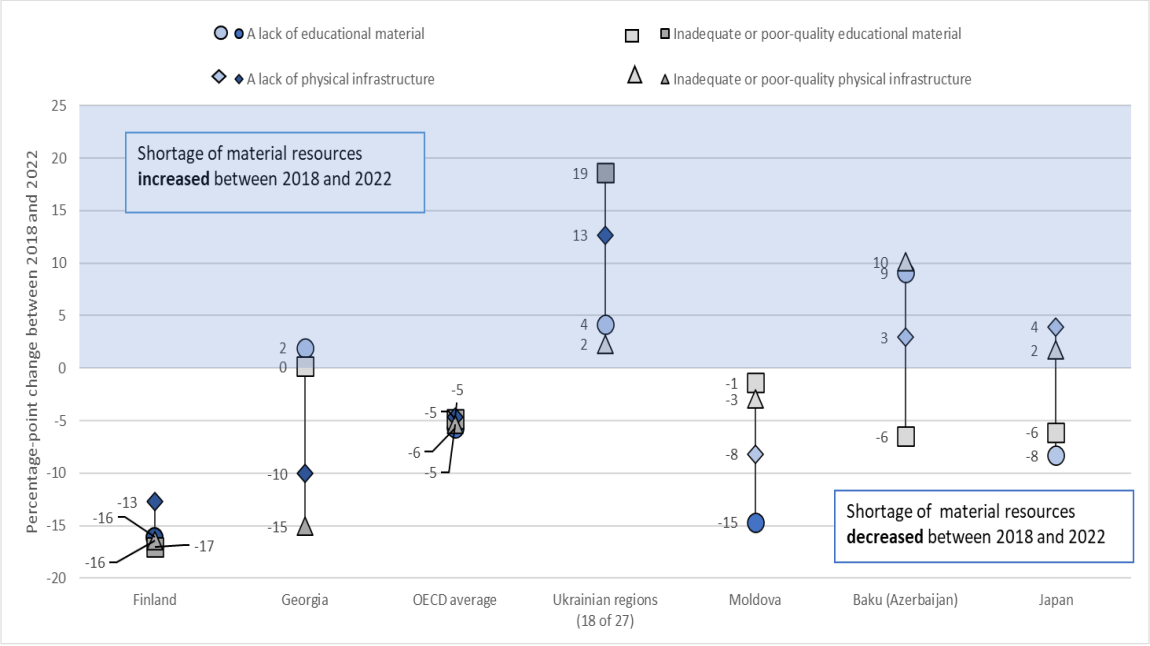
	A lack of educational material (e.g. textbooks, ICT equipment, library or laboratory material)	Inadequate or poor-quality educational material (e.g. textbooks, ICT equipment, library or laboratory material)	A lack of physical infrastructure (e.g. building, grounds, heating/cooling systems, lighting and acoustic systems)	Inadequate or poor-quality physical infrastructure (e.g. building, grounds, heating/cooling systems, lighting and acoustic systems)
Ukrainian regions (18 of 27)	75	70	52	45
Moldova	44	43	23	28
Saudi Arabia	43	40	46	45
Georgia	40	35	36	34
Baku (Azerbaijan)	33	47	50	48
OECD average	24	22	29	28
Finland	11	11	13	18
Bulgaria	10	13	24	20
Lithuania	10	12	20	16

Notes: ICT: Information and communication technology.
Countries and economies are ranked in descending order of the lack of educational materials.
40% or more
More than 20% and less than 40%
20% or less
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/14xf0v

Figure 3.15. Shortages of physical infrastructure or educational materials have worsened in Ukraine regions but improved in Georgia and Moldova

Change between 2018 and 2022 in the percentage of students in schools whose principal reported that the school's capacity to provide instruction is hindered to some extent or a lot by the lack of or poor-quality educational materials and physical infrastructure



Notes: Significant differences between 2018 and 2022 are shown in a darker tone.
Countries and economies are ranked in ascending order of the change in lack of physical infrastructure between 2018 and 2022.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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Digital resources

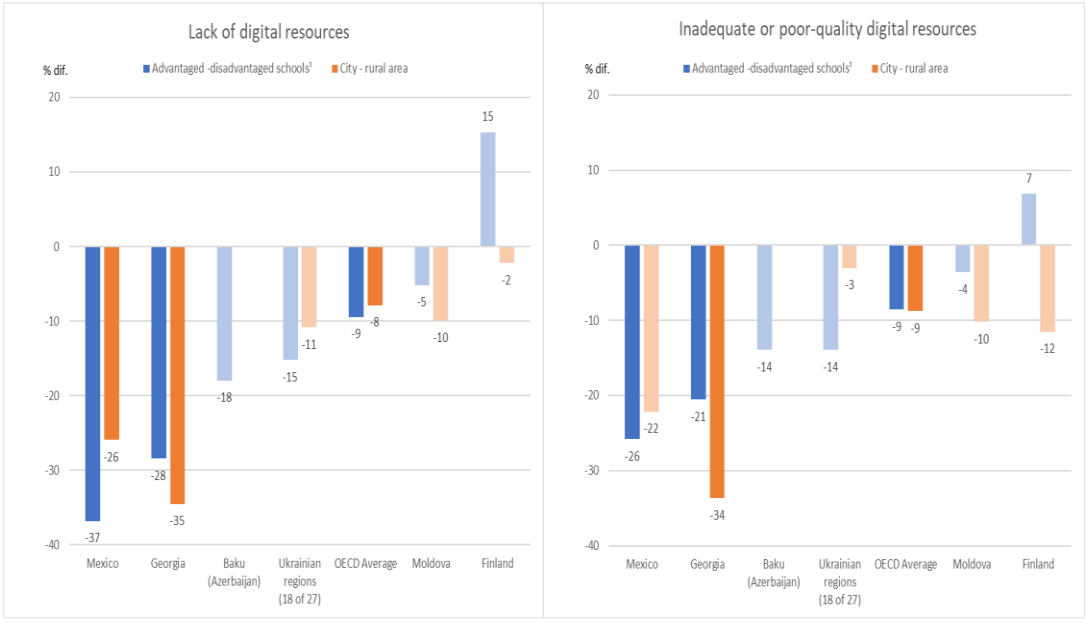
Awareness of the potential benefits and risks of using digital resources in education has grown globally, especially since the COVID-19 pandemic. PISA 2022 measured both the availability and quality/adequacy of digital resources such as desktop or laptop computers, Internet access, learning management systems or school learning platforms. On average, across OECD countries, about a quarter of students were enrolled in schools whose principal reported that a lack of digital resources hinders the school's capacity to provide instruction. A similar proportion attended schools where the inadequacy or poor quality of the digital resources hinders instruction.

As shown in Figure 3.16, availability and quality/adequacy shortages are more pronounced in socio-economically disadvantaged schools than advantaged schools and schools located in rural areas than in urban schools, on average across OECD countries. Mexico is an OECD member country that exemplifies such a pattern. In Finland, however, the availability and quality of digital resources are not significantly different between schools of different socio-economic profiles and geographic locations.

Among EaP countries/economies with the available data, inequities in the availability and quality of digital resources are large in Georgia. In Baku and Moldova, no differences between advantaged and disadvantaged schools are observed.

Figure 3.16. Georgia shows large disparities in the availability and quality of digital resources in favour of socio-economically advantaged and urban schools

Percentage of students in schools whose principal reported a lack of digital resources or inadequate or poor-quality digital resources, by school socio-economic profile and geographic location



Notes: Digital resources include desktop or laptop computers, Internet access, learning management systems and school learning platforms.
Statistically significant differences are marked in a darker tone.
For Baku, the sample size is too small for rural areas.
Countries and economies are ranked in ascending order of the percentage of students in schools whose principal reported a lack of digital resources.
1. The PISA index of ESCS measures the socio-economic profile. Socio-economically advantaged (disadvantaged) students are those among the 25% of students with the highest (lowest) values on the ESCS index in their own country or economy.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

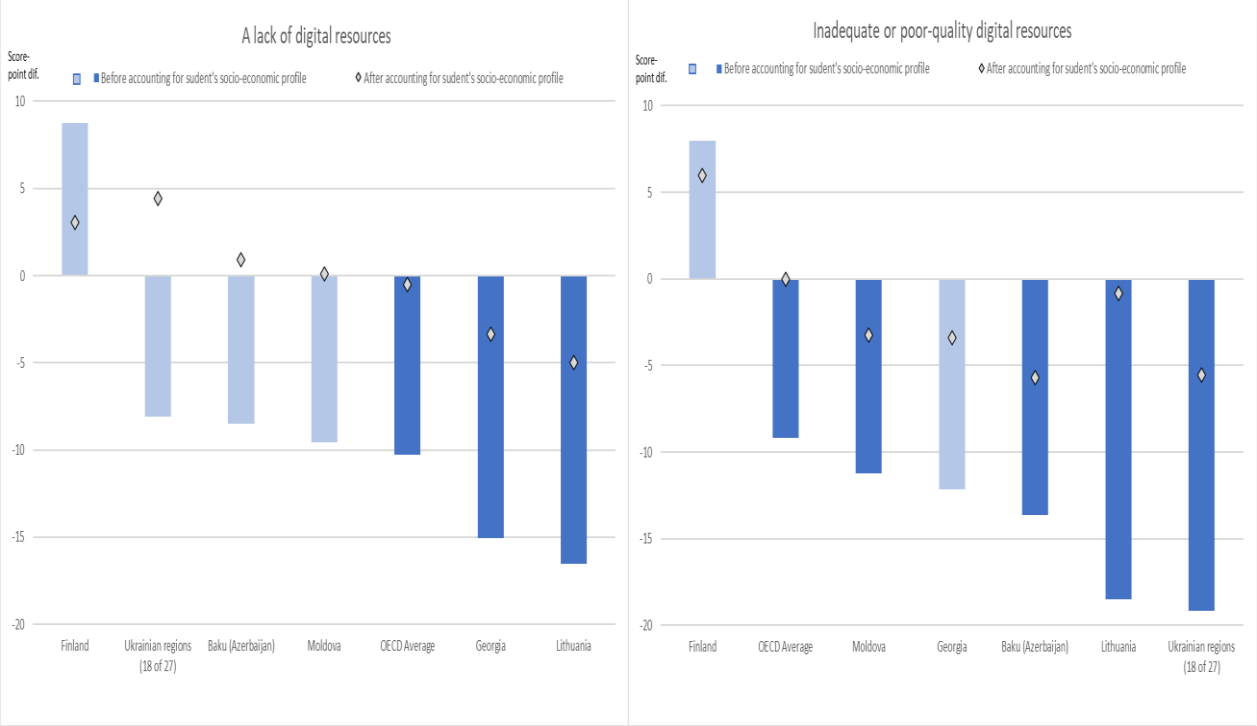
StatLink https://stat.link/lsytgo

A lack of or poor-quality digital resources is linked to lower mathematics performance in EaP countries and economies, similar to OECD countries (Figure 3.17). In Ukrainian regions, the association between shortages in digital resources and lower scores is particularly strong. In Baku and Moldova, the link is significant mainly for poor-quality digital resources and this relationship is also stronger than on average across OECD countries but less so than in Lithuania. In Georgia, the lack of digital resources primarily correlates with lower performance, again more strongly than typically seen across OECD countries.

However, after accounting for the socio-economic profile of students and schools, the association disappears in all cases in EaP countries/economies. This shows that, in EaP countries/economies, students in schools with more shortages of digital devices score lower because they come, on average, from families of lower socio-economic status. Also, disadvantaged schools have disadvantages in other aspects such as teacher shortage, materials resources, etc. As PISA 2022 results at the system level also suggest, higher-performing systems ensure that every student has access to a digital device (computer or tablet). Still, the availability of these devices does not, in itself, indicate their capacity to enhance teaching and learning (OECD, 2023[8]). The use of digital devices in schools and classrooms is further analysed in Chapter 4.

Figure 3.17. A lack of or poor-quality digital resources is negatively associated with mathematics performance in EaP economies but this is due to socio-economic factors

Change in mathematics performance associated with principals reporting that the school's capacity to provide instruction is hindered to some extent or a lot by the shortage of digital resources



Note: Significant score changes are shown in a darker tone.
Countries and economies are ranked in ascending order of the change in mathematics performance associated with principals reporting that a lack of digital resources hinders the school's capacity to provide instruction.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/z61v83

Pre-primary education attendance

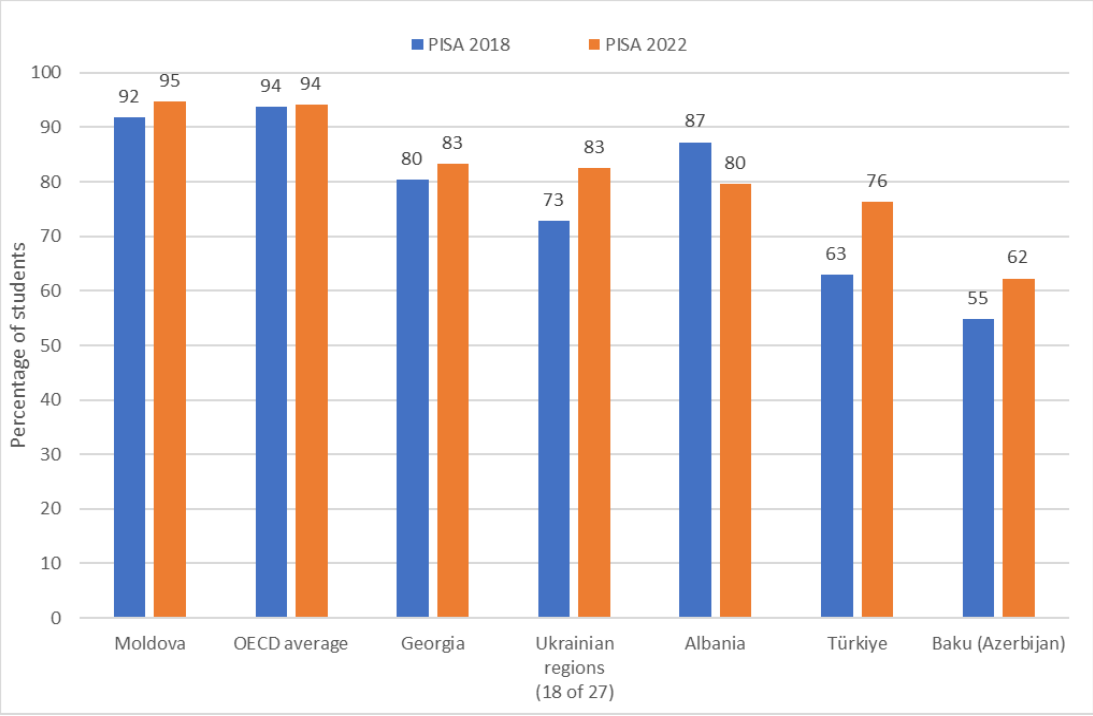
Pre-primary education has increasingly become a standard and often mandatory phase in students' educational paths (OECD, 2017[13]). In all EaP systems, children typically start pre-primary education at the age of three, according to system-level data from PISA, although only in Moldova are years in pre-primary education compulsory (Figure 1.3, Chapter 1). **According to students' reports, the actual attendance in pre-primary education varies widely between EaP countries/economies** (Figure 3.18).

In Moldova, 95% of 15-year-olds attended pre-primary school for at least 1 year in PISA 2022. In Moldova, pre-primary education today is compulsory for four years. This is longer than in most other systems and is typical in OECD countries, where pre-primary education usually lasts three years.

In Baku, only about 60% of today's 15-year-old students have attended pre-primary education. This is among the lowest rates among PISA-participating countries, similar to Cambodia, Kazakhstan and North Macedonia. **Students in Georgia and Ukrainian regions both report higher pre-primary education attendance rates**, comparable to those from Croatia and the Philippines.

Figure 3.18. Fifteen-year-olds' attendance in pre-primary education increased between 2018 and 2022 in all EaP economies

Percentage of students who had attended pre-primary education for at least a year



Notes: All differences between 2018 and 2022 in the percentage of students who reported they attended pre-primary education for at least a year are statistically significant.
Countries and economies are ranked in descending order of the percentage of students who had attended pre-primary education in 2022.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/ezw425

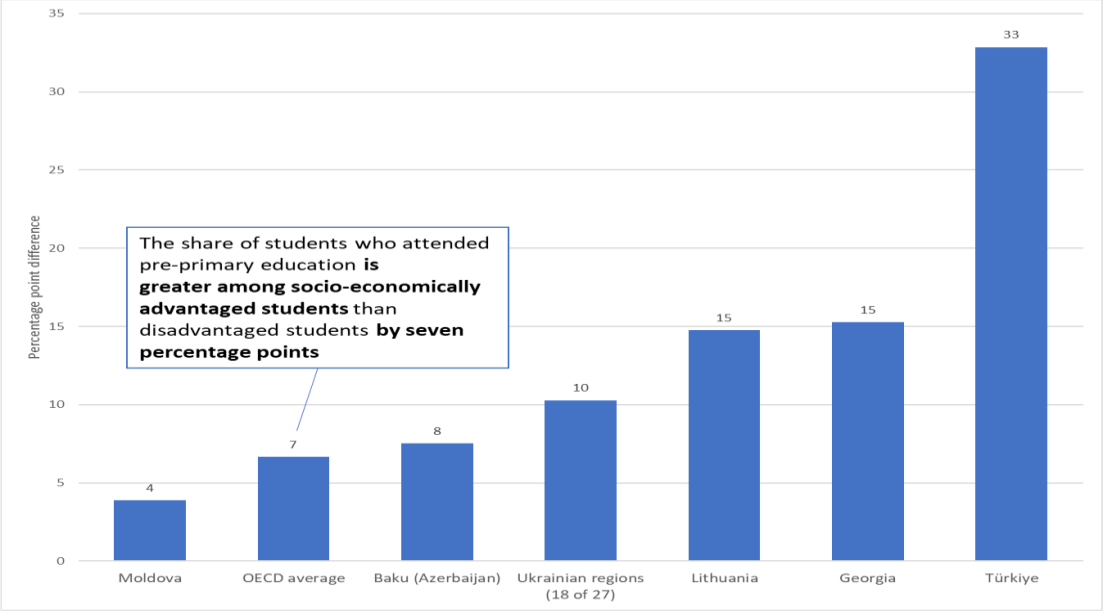
Between 2018 and 2022, attendance in pre-primary education has increased in EaP economies. Ukrainian regions experienced the largest improvement with 10 percentage points. For comparison, in Türkiye, a country with one of the largest improvements, pre-primary attendance, as reported by students, increased by 13 percentage points. In Baku, pre-primary attendance increased by 7 percentage points and, in Georgia and Moldova, by 3 percentage points each (Figure 3.18). Whereas pre-primary attendance in Georgia and Ukrainian regions lagged behind Albania in 2018, it now surpasses pre-primary attendance in that country. Albania had the largest drop in pre-primary attendance between 2018 and 2022, demonstrating that gains can also be reversed.

Disparities in access to pre-primary education by socio-economic status and geographic location

The socio-economic gap between advantaged and disadvantaged students in pre-primary attendance is wider in Georgia and Ukrainian regions than on average across OECD countries. Yet, it is narrower than in Türkiye and other countries/economies (Figure 3.19). The gap in pre-primary attendance by socio-economic status is less pronounced in Moldova, which aligns with the OECD average.

Figure 3.19. The socio-economic gap between advantaged and disadvantaged students in pre-primary attendance is wider in Georgia and Ukrainian regions than on average across OECD countries

Difference in the percentage of socio-economically advantaged and disadvantaged students[1] who had attended pre-primary education for at least a year



Notes: All differences are statistically significant.
1. The PISA index of ESCS measures the socio-economic profile. Socio-economically advantaged (disadvantaged) students are those among the 25% of students with the highest (lowest) values on the ESCS in their own country or economy.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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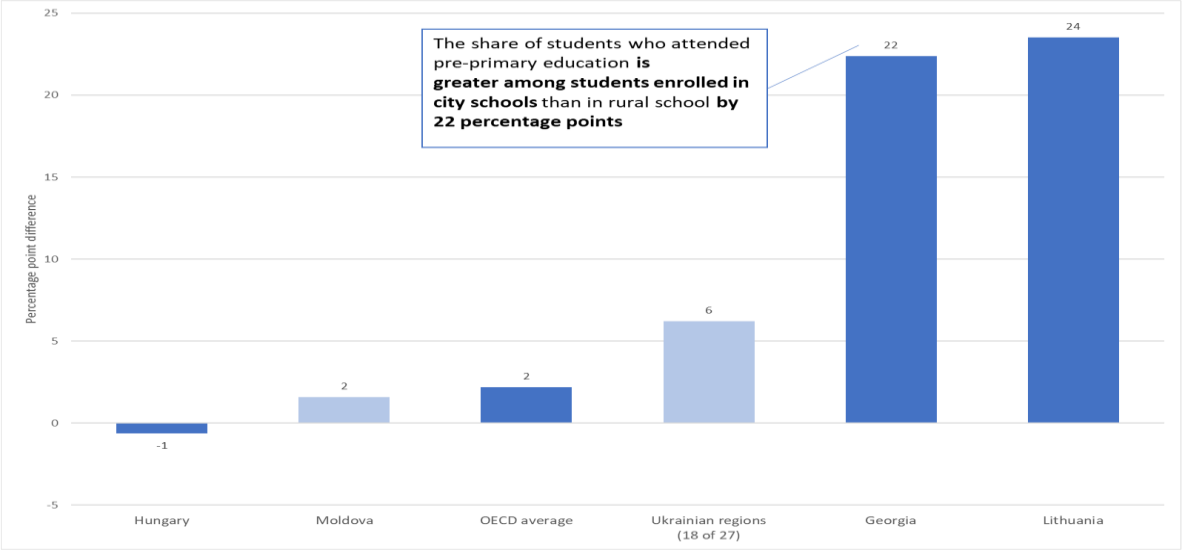
Georgia also shows large urban-rural differences in pre-primary attendance, a gap not observed in other EaP countries/economies. As noted in Chapter 1, 26% of the PISA sample in Georgia comes from rural areas. The disparities in attendance between urban and rural areas in other countries can often be attributed to differences in demand and supply, as well as varying family models in these settings (Echazarra and Radinger, 2019[14])

Figure 3.20. Large urban-rural differences in pre-primary attendance in Georgia but not in other EaP countries/economies

Difference in the percentage of students enrolled in urban and rural schools who had attended pre-primary education for at least a year



Notes: Statistically significant differences are coloured in a darker tone. The difference is not significant in Moldova and Ukrainian regions (18 of 27).
Baku is not included in the figure as the sample size in rural areas is too small.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/y4q8j1

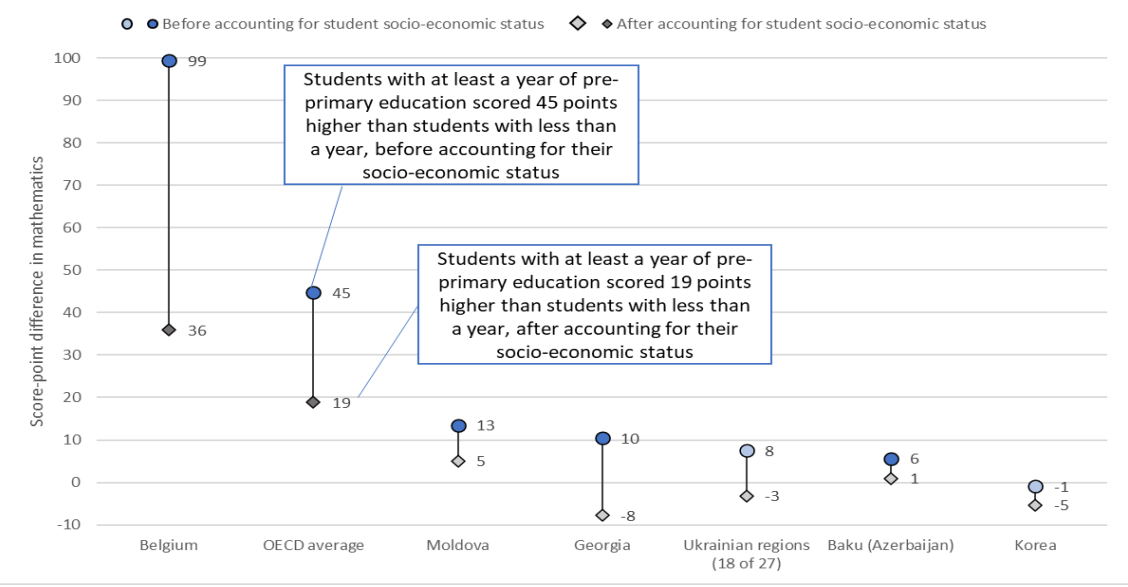
Access to pre-primary education and student performance at age 15

Pre-primary attendance is positively associated with student performance at age 15 in all EaP countries/economies except Ukrainian regions. This association is particularly strong in Georgia and Moldova. As highlighted above, pre-primary attendance in Ukrainian regions increased substantially between 2018 and 2022.

However, the performance advantage linked to pre-primary attendance is less pronounced in EaP countries/economies than in OECD countries. In Figure 3.21, Belgium represents the OECD country with the strongest association and Korea the OECD country with the weakest. Moreover, **once the socio-economic profiles of students and schools are accounted for, any performance differences due to pre-primary attendance are not observed in EaP countries**. This shows that disadvantaged students were more likely not to attend pre-primary education and also that these students tend to perform lower. By contrast, on average, pre-primary attendance is positively associated with student performance across OECD countries even after accounting for socio-economic factors.

Figure 3.21. Socio-economic factors in EaP countries/economies can explain better performance among students with more pre-primary education

Change in mathematics performance when students had attended pre-primary school for at least one year, compared to having attended for less than a year



Notes: Statistically significant differences are coloured in a darker tone.
Countries and economies are ranked in descending order of the change in mathematics performance before accounting for student ESCS.
Source: OECD (2022[1]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/nys0b6

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Notes

[1] The EaP countries/economies forming part of this report are Baku in Azerbaijan, Georgia, Moldova and 18 of the 27 regions in Ukraine. Any reference to EaP countries/economies, as well as the EaP average, specifically pertains to Baku, Georgia, Moldova and Ukrainian regions. Armenia is also part of the European Union EaP but has not yet participated in PISA, although participation is underway for PISA 2025.

[2] The socio-economic gap in EaP countries/economies is not larger than in OECD countries, as mentioned later in the chapter. Nevertheless, the point here is that, within each EaP country/economy, the socio-economic gap in student performance is larger than the gender gap, the geographic gap and the language gap.

[3] In Baku, this analysis is not possible because sample of rural students is too small.

[4] In EaP countries/economies, the value of the ESCS index among socio-economically advantaged students is 0.7 or higher. On average across OECD countries, the value of the ESCS index for all students is 0.0.

[5] The regression model used in this section (see Figure 3.10) is the following: the outcome variable is student performance in mathematics and the predictor of interest is the geographic location of the students' school (i.e. the school is in a rural area, town or urban area). To account for the potential confounding effect of socio-economic factors, two variables were included as control variables: one that measures the student socio-economic status (student value in ESCS index) and one variable for the school socio-economic profile (the average ESCS index across all students in the student's school). After accounting for socio-economic factors, the performance difference between students in urban and rural schools in Ukrainian regions changes in favour of rural students by 12 points but the difference is not statistically significant. This change in the sign of performance difference is due to the socio-economic advantage of urban students and urban schools relative to rural students and rural schools; when rural and urban students and schools of similar socio-economic profile are compared, the performance difference disappears. In Ukrainian regions in PISA 2022, the average socio-economic status of students enrolled in rural schools is -0.78 points in the ESCS index, whereas the average socio-economic status of students in urban schools is -0.11 points. Furthermore, rural schools' average socio-economic profile of is -0.78 points in the ESCS index and urban schools' average socio-economic profile is -0.09 points.

[6] Some countries and economies, including the Netherlands, struggled to meet PISA technical standards for student sampling in PISA 2022. These specific countries and economies are marked with an asterisk throughout this report. See Box 1.1 in chapter 1 for details.

4 The learning environment in and outside of school

This chapter explores students' learning environments, both within and outside school. The learning environment at school includes the role of teacher support, classroom disciplinary climate, student engagement and parental involvement at school. In Eastern Partnership (EaP) economies, students who receive greater teacher and family support tend to achieve higher scores in the OECD Programme for International Student Assessment (PISA). The chapter also looks at the use of digital devices for learning and leisure at school, assessing whether they act as a distraction during lessons. Additionally, it describes how EaP countries managed school closures during the COVID-19 pandemic and highlights the main issues students face in adapting to remote learning.

The learning environment encompasses what happens in classrooms and schools, from the disciplinary climate to teaching practices. What happens outside of school, during students' free time and with family at home is also an important component. This chapter investigates the learning environment from both perspectives, both within and outside of schools. Finally, it draws lessons from the way learning continued during the COVID-19 pandemic (Figure 4.1). Different aspirational benchmarks, such as Finland and Japan, are used depending on the topic discussed as in this report's other chapters. The chapter also shows countries that illustrate the range of possible values (e.g. highest and lowest) to put results for Eastern Partnership (EaP) countries/economies into context.[1]

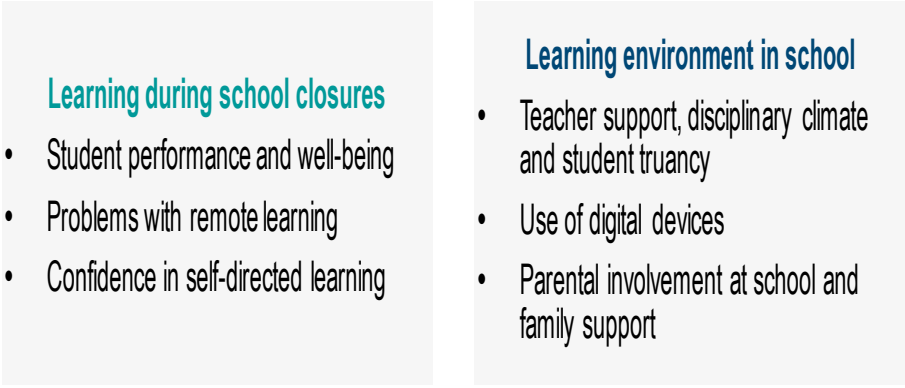
The first section of this chapter provides insights from the OECD Programme for International Student Assessment (PISA) 2022 on the learning environment in EaP countries/economies. According to students, in EaP countries/economies, teacher support and disciplinary climate in mathematics lessons are, on average, better or similar to the OECD average. An exception is the disciplinary climate in Baku (Azerbaijan)[2], which is worse. However, more students skip classes or whole days of school and arrive late – which is strongly associated with lower student performance – in EaP systems than on OECD average. While student truancy and lateness have improved since 2018, further improvements are possible. The use of digital devices at school does not appear to be as conducive to learning as it could be in EaP countries/economies. Limiting distractions is important for student performance and well-being.

The chapter highlights parental involvement as a strength in EaP countries/economies. According to school principals, it shows that parental involvement in students' learning at school is higher in EaP countries/economies than in OECD countries, except in Moldova. Students in EaP countries/economies, most noticeably in Baku and Georgia, perceived their families as more supportive than did students in most OECD countries. However, parental involvement at school decreased substantially between 2018 and 2022 in all EaP countries/economies except Georgia. EaP countries/economies should aim to strengthen school-family partnerships and keep parents involved in students' learning.

The second section of this chapter analyses how learning continued during the COVID-19 pandemic. This is an important context for understanding student learning and well-being, as analysed in this report. According to student reports, the analysis shows that in EaP countries/economies, fewer students experienced short school closures during the COVID-19 pandemic than on average across OECD countries. This is positive because it likely contained the extent of learning losses in EaP countries/economies. As highlighted in Chapter 2, performance generally declined in EaP systems between PISA 2018 and PISA 2022. In addition, EaP countries/economies had stable or improving trends in terms of their sense of belonging at school, whereas, in countries with longer school closures, the sense of belonging dropped between PISA 2018 and PISA 2022.

Looking at students' experiences during the pandemic also allows drawing lessons on strengths and weaknesses that are still relevant today for building more resilient and inclusive education systems in EaP countries/economies in the future. Students in EaP countries/economies faced different kinds of problems with remote learning when their school building was closed due to the COVID-19 crisis Although EaP students tend to feel confident in self-directed learning, many still struggle to motivate themselves to do schoolwork and understand school assignments. A comparatively smaller but still substantial share of students had problems with logistical aspects such as having Internet access or finding a quiet place to study. This shows the importance of further preparing students for autonomous learning, which includes students' self-directed learning skills. As shown in this chapter, supportive teaching practices can nurture students' confidence in their capacity for self-directed learning. Developing more supportive teaching practices in EaP countries/economies could entail strengthening personalisation in teaching and learning and improving relationships between teachers and students.

Figure 4.1. How the learning environment is covered in this report



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Learning environment in school

Teacher support, disciplinary climate and student truancy

Teacher support during classroom lessons

In 2022, PISA surveyed students about teacher support in their mathematics lessons. Students were asked how often their teachers show interest in each student's learning, give extra help, assist with learning and continue teaching until understanding is achieved. Responses ranged from "never or hardly ever" to "every lesson". These responses were combined to create a teacher support index. The average of this index is 0, with a standard deviation of 1, across OECD countries. A higher index value indicates that students perceive their mathematics teacher as more supportive.

Students in EaP countries/economies generally felt similarly or more supported by teachers in their mathematics lessons than students in OECD countries. For example, 75% of students in Baku and Georgia responded that teachers show an interest in every student's learning, compared to 63% across OECD countries (Figure 4.2). Costa Rica and Poland (included in the figure) were the OECD countries with the highest and lowest values respectively, in the teacher support index in PISA 2022.

Students who feel more supported by their teachers in mathematics lessons score higher in mathematics and experience less anxiety towards mathematics. A one-unit increase in the teacher support index corresponds to an average improvement in mathematics performance of five score points across OECD countries. **Teacher support has a similar positive association with mathematics performance in Baku, Georgia and Moldova**, although the results were not statistically significant in Ukrainian regions (18 of 27)[3]. **Additionally, more teacher support is linked to reduced mathematics anxiety in all EaP countries/economies except Moldova**.

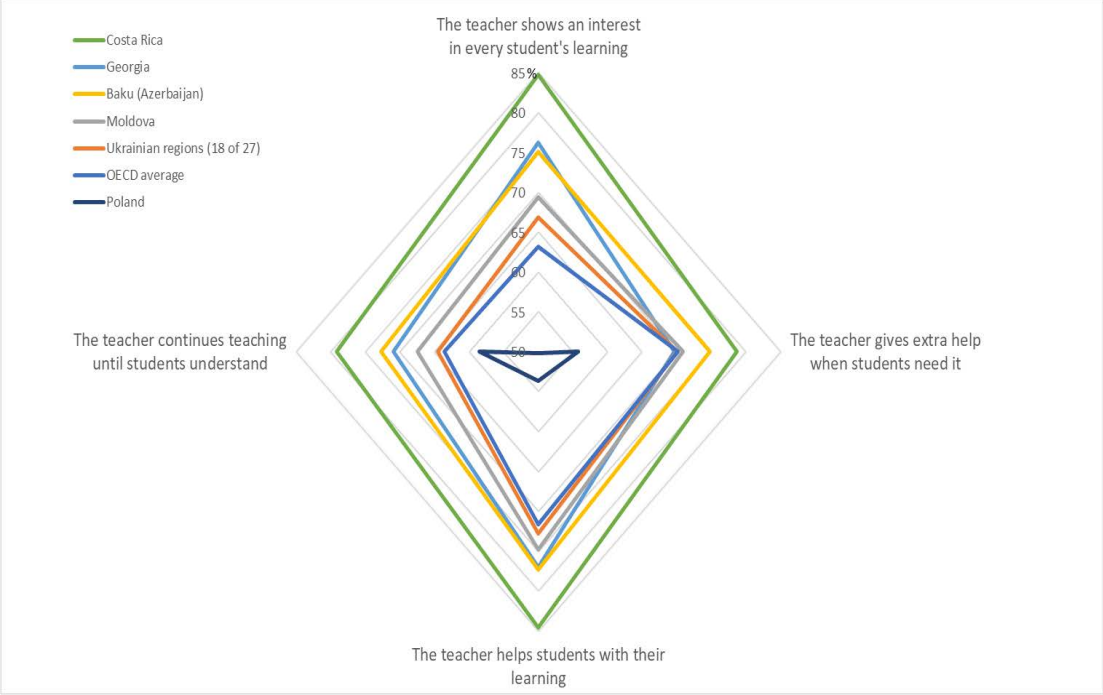
Disciplinary climate during classroom lessons

In all EaP countries and economies, students in classes with a better disciplinary climate generally outperformed those in classes with frequent disciplinary issues. This is the picture observed in most countries and economies that took part in PISA 2022. Moreover, countries and economies with better average disciplinary climates showed better overall mathematics performance. This was the case even

after accounting for countries'/economies' level of economic wealth in gross domestic product (GDP) per capita (OECD, 2023[1]).

Figure 4.2. Students in EaP countries/economies generally reported teacher support in mathematics lessons that was above or similar to the OECD average

Percentage of students who reported that the following happens in their mathematics lessons for most or every lesson

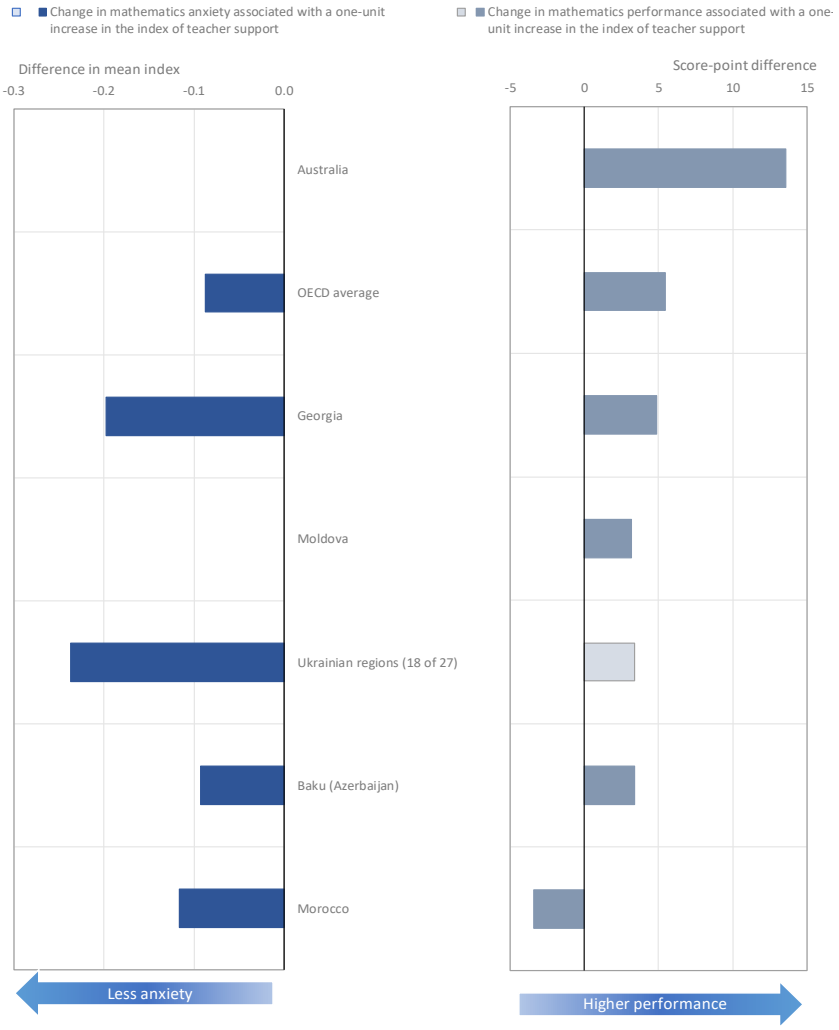


Note: *Countries and economies are ranked by ascending order of the percentage of students who reported that their teacher shows an interest in every student's learning for most or every mathematics lesson.*
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/eo3ngz

Figure 4.3. Students who report more support from teachers in mathematics lessons score higher in mathematics and report less anxiety towards mathematics

Change in mathematics anxiety and mathematics performance associated with a one-unit increase in the index of teacher support



Notes: Statistically significant values are shown in darker tones.
The results are based on linear regression analysis that accounts for students' and schools' socio-economic profile. The PISA index of economic, social and cultural status (ESCS) measures the socio-economic profile.
Countries and economies are ranked in descending order of the change in mathematics performance associated with a one-unit increase in the index of teacher support.
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/gfbc28

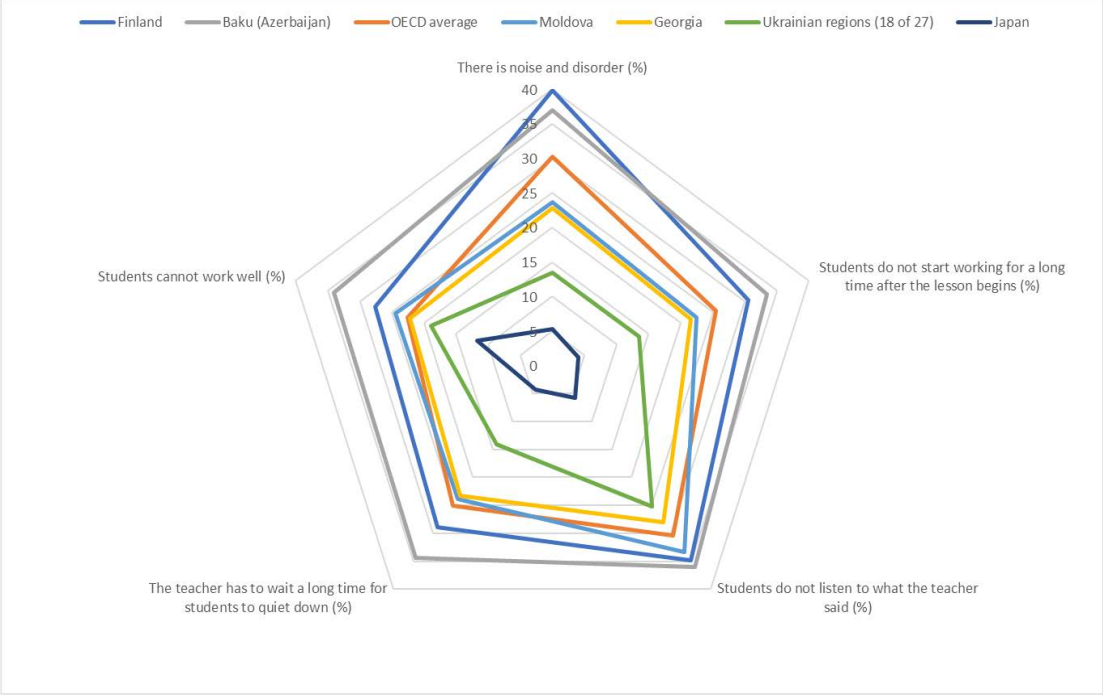
According to the PISA index of disciplinary climate,[4] students in Georgia and Ukrainian regions benefit from a better disciplinary climate in mathematics lessons than the average OECD student. However, their climate was not as good as that of 12 other countries and economies, including Japan. By

contrast, students **in Baku suffer from a worse disciplinary climate**, even though it is still better than 29 other countries and economies, including Finland.

As shown in Figure 4.4, comparatively few students in Georgia and Ukrainian regions suffer from noise and disorder in their classrooms or feel that students do not start working for a long time after the lesson begins. In Baku, by contrast, about a third of students have to wait a long time for teachers to start class while students quiet down and feel that students cannot work well.

Figure 4.4. In Georgia and Ukrainian regions, there is better disciplinary climate during classroom lessons than on average across OECD countries

Percentage of students who reported that the following happens in their mathematics lessons during most or every lesson



Note: *Countries and economies are ranked in order of the percentage of students who reported that there is noise and disorder in most or every lesson in their mathematics classes.*
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/8327d0

Student truancy and lateness

Between 2018 and 2022, EaP countries/economies saw a notable decrease in student truancy, particularly in Georgia and Ukrainian regions. A significant decrease in lateness is also observed in all EaP countries/economies, except Georgia. Decreases in truancy and lateness during this period are also observed on average across OECD countries.

Nevertheless, students in EaP systems tend to miss school or come late to class more than the average student in OECD countries (Table 4.1). Among countries and economies participating in PISA 2022, Japan had the lowest levels of lateness and truancy, while Montenegro had the highest level of lateness.

Table 4.1. Student truancy and lateness decreased between 2018 and 2022 in EaP countries/economies and economies

Percentage of students who reported that the following happened at least once in the two weeks prior to the PISA test

	Lateness		Truancy			
	Arrived late for school		Skipped some classes		Skipped a whole day of school	
	PISA 2022	Change between PISA 2018 and PISA 2022	PISA 2022	Change between PISA 2018 and PISA 2022	PISA 2022	Change between PISA 2018 and PISA 2022
	%	% dif.	%	% dif.	%	% dif.
Japan	12	=	3	↓ (-1)	2	=
OECD average	45	↓ (-2)	22	↓ (-5)	20	↓ (-2)
Moldova	54	↓ (-4)	32	↓ (-4)	32	↓ (-8)
Baku (Azerbaijan)	56	↓ (-4)	48	↓ (-9)	43	↓ (-4)
Ukrainian regions (18 of 27)	57	↓ (-5)	32	↓ (-10)	25	↓ (-14)
Georgia	58	=	35	↓ (-27)	39	↓ (-23)
Montenegro	64	↓ (-3)	46	↓ (-8)	23	↓ (-35)

Note: *Countries/economies are sorted in descending order of students arriving late for school in PISA 2022.*
↓ Decrease in PISA 2022 compared to PISA 2018.
= Difference is not significant.
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/ov3lth

In EaP countries/economies – except for Baku – student truancy and lateness were strongly associated with lower mathematics performance, as in most countries and economies that took part in PISA 2022 (Figure 4.5). This highlights that students who miss school and arrive late lose critical learning opportunities and support. **In Moldova, Ukrainian regions and on average across OECD countries, students who skipped a whole day of school at least once in the 2 weeks prior to the PISA test scored about 30 score points less than their peers** after accounting for their socio-economic profile. When it comes to lateness, **students who reported that they had arrived late for school at least once in the 2 weeks prior to the PISA test underperformed their peers by between 9 (Georgia) and 20 (OECD average) points**.

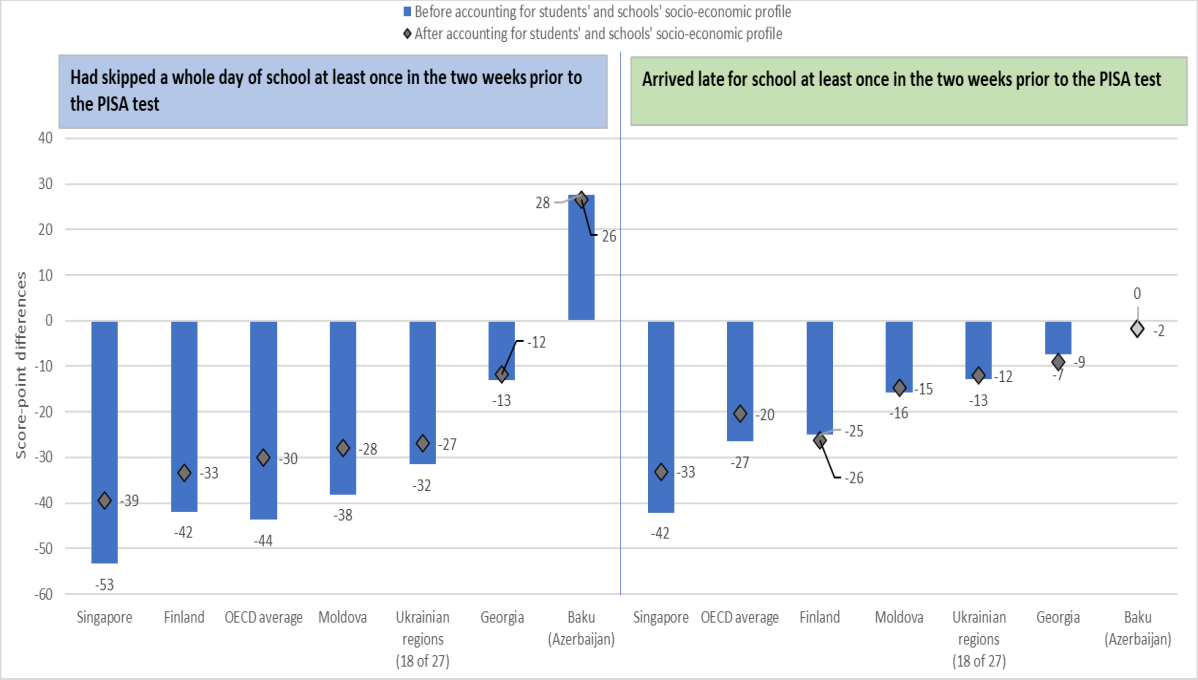
In high-performing countries such as Finland, Japan and Singapore, the difference in mathematics performance among students who skip school or arrive late to school is even more significant than the OECD average. Top-performing countries likely use time more effectively in the classroom; this could partly explain why learning losses are greater for students who skip school or arrive late. It is also possible that the pressure on students to excel academically can exacerbate the consequences for those who disengage by skipping or arriving late.

Baku, together with Türkiye, is one of two education systems in PISA 2022 where, contrary to expectations, students who skip school perform better than their peers in mathematics, even after accounting for students' and schools' socio-economic profiles. While PISA data do not allow for a conclusive explanation, one possible reason is that rules about truancy are not clear for students or are not effectively enacted by schools in Baku. This hypothesis is supported by the very large share of students (one in four) who skip school and by the fact that **truancy in Baku is pervasive across socio-economic groups** (i.e. no significant differences between advantaged and disadvantaged students). Furthermore, Baku is one of the few education systems where **students in higher grade levels (i.e. upper secondary**

education) are significantly more likely to be truant than students in lower levels (i.e. lower secondary education). This suggests that truancy worsens as students' progress in their education.

Figure 4.5. Student truancy and lateness are associated with lower mathematics performance in all EaP countries/economies, except in Baku

Change in mathematics performance when students reported that they skipped a whole day of school and arrived late for school at least once in the two weeks prior to the PISA test



Notes: All changes in mathematics performance are statistically significant before and after accounting for students' and schools' socio-economic profiles, except for Baku where lateness was unrelated to mathematics performance.
Countries and economies are ranked in ascending order of the change in mathematics performance before accounting for students' and schools' socio-economic profiles.
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/qgl5nr

Use of digital devices

Use of digital devices for learning and leisure at school

How education systems adapt to technological change and whether policy makers can balance risks and opportunities is crucial in defining the effectiveness of education systems (OECD, 2015[3]). The use of digital devices in schools varies widely across education systems. **In EaP countries/economies, overall usage was highest in Ukrainian regions and lowest in Georgia. Students in Georgia used digital devices for 2.6 hours per day, whereas those in Ukrainian regions used them for 4.6 hours per day** (Figure 4.6). For comparison, the usage of 7 education systems, including Finland, exceeded 4 hours per day. Meanwhile, in 14 education systems, including Japan, students spent less than 2.5 hours per day on digital devices. In Ukrainian regions, the high number of hours on digital devices can be attributed to the school closures to ensure student safety in the context of war. While schools started to reopen in early

2022 after the school closures to respond to the COVID-19 pandemic, the country's school system operated again on line from February 2022 to October 2022.

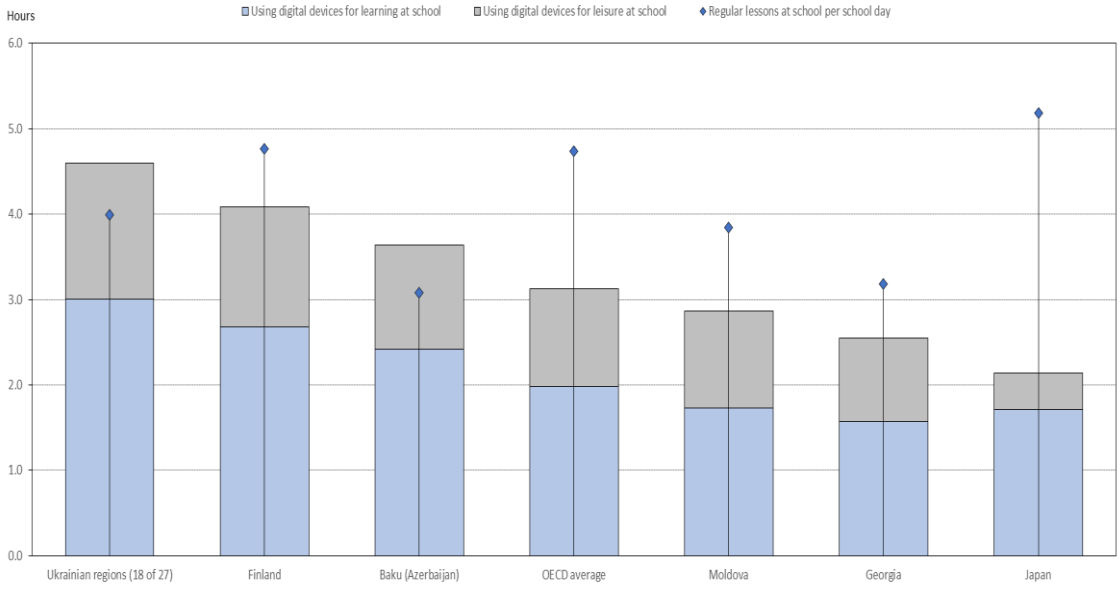
In Baku and Ukrainian regions, the two countries with the highest total time students spend on digital devices, students spend more time on digital devices at school than on regular school lessons. This might again be related to the need for students to use digital devices to participate in remote lessons in Ukrainian regions. The same picture is observed in ten countries/economies participating in PISA 2022. It is likely that students who spend more time on their digital devices than on regular classroom lessons are using their devices during most of their classroom time, which in turn can lead to distraction from instruction. This might partly explain that in all ten countries/economies where this was the case, student performance in mathematics is significantly below the OECD average.

What students do on their devices in this time at school also differs (Figure 4.6). They may use them for learning or leisure. **In Baku and Ukrainian regions, the two EaP economies with the highest amount of time spent on digital devices, students spend a slightly higher share of their total time on digital devices for learning**. By contrast, **students in Georgia and Moldova, the two EaP countries/economies with less total time on digital devices, spend a slightly lower share of their time using digital devices for learning activities**. Across OECD countries, students spend more than twice as much time on digital devices for learning than for leisure, at an average of 2 hours per day compared to 1.1 hours.

Looking at **the use of digital devices for leisure at school, all EaP countries/economies spend between one and one and a half hours per day on digital devices, which is about the same as the OECD average**.

Figure 4.6. Time spent using digital devices for learning and leisure at school varies across EaP countries/economies

Time spent per day by students (in hours)



Notes: Time spent in regular lessons at school per school day refers to the time spent in regular lessons per school week divided by five (assuming there are five days per school week).
Countries and economies are ranked in descending order of the time spent using digital devices at school for learning and leisure.
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/x9rny2

How does using digital devices for learning or leisure relate to learning outcomes? **Moderate use of digital devices in school for learning is related to higher performance across OECD countries**. Students who spend up to 1 hour per day on digital devices for learning activities in school scored 25 points higher in mathematics than students who spend no time on such devices. This **positive relationship between one hour of learning using digital devices and performance is also observed in Moldova**, as well as in over half of the education systems with available data. **However, it is not associated with higher performance in other EaP countries/economies**. In Baku, Georgia and Ukrainian regions, there is no difference in performance between students who do not use digital devices for learning and students who spend up to one hour per day on digital devices for learning.

The relationship between digital devices and academic performance becomes negative, however, when students spend more than 1 hour per day on digital devices for learning in school; for example, on average across OECD countries, students who spent between 5 and 7 hours per day on digital devices for learning activities in school scored 12 points lower than students who spent between 3 and 5 hours per day. Students who spent over 7 hours per day on digital devices for learning activities in school scored even lower. A similar pattern is observed in all EaP countries/economies.

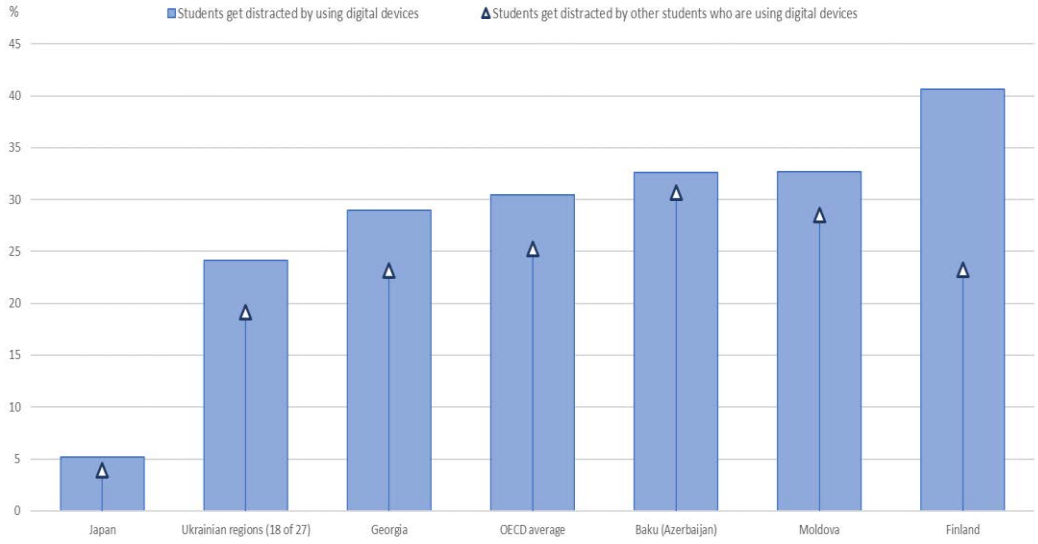
More time using digital devices for leisure rather than instruction is also associated with poorer results. On average, across OECD countries, students who spent a small amount of time (i.e. up to 1 hour per day) on digital devices for leisure activities scored more than 20 points higher in mathematics than students who spent more than 2 hours and up to 3 hours, and 40 points higher than students who spent more than 3 hours and up to 5 hours using digital devices for leisure at school. **A similar pattern is again observed in all EaP countries/economies**.

Distraction from digital devices during classroom instruction

One of the reasons why only moderate use of technology contributes to learning is that using digital devices at school can lead to distraction in the classroom. **Three out of ten students reported that students in their classes get distracted using digital devices in most or every mathematics lesson in Baku, Georgia, Moldova and, on average, across OECD countries**. Furthermore, a somewhat smaller but still significant proportion of students reported digital distraction in most or every mathematics lesson by other students who are using digital devices (Figure 4.7). Distraction due to using digital devices is very rare in Japan and more frequent in Finland.

Figure 4.7. Some three out of ten students in EaP countries/economies reported that students in their classes get distracted using digital devices during mathematics lessons

Percentage of students who reported that the following happens in every or in most of their mathematics lessons



Note: *Countries and economies are ranked in ascending order of the percentage of students who reported that students get distracted by using digital devices in every or most of their mathematics lessons.*
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/sdfxbo

Parental involvement at school and family support at home

Parental involvement at school

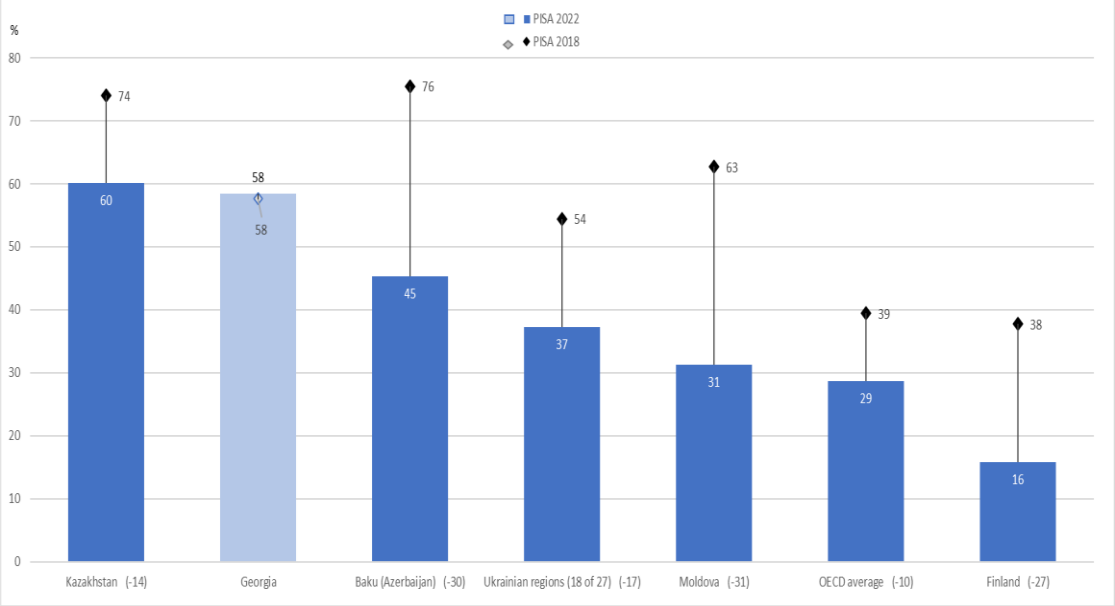
Parental involvement in students' learning at school is generally higher in EaP countries and economies than in OECD countries, except for Moldova, according to school principals. In Baku, Georgia and Ukrainian regions, more than 35% and almost 60% of students were in schools where most parents initiated discussions about their child's progress with a teacher (Figure 4.8).

By this measure, **Georgia is among the countries and economies with the greatest parental involvement at school**. Parental involvement is still only higher in Kazakhstan, the Philippines and Viet Nam. By contrast, Finland and Japan, which are used as benchmarks for a number of indicators in this report, have rather low levels of parental involvement at school.

Between 2018 and 2022, however, parental involvement in students' learning at school decreased substantially in all EaP countries/economies except Georgia. The share of students in schools where most parents initiated discussions about their child's progress with a teacher dropped by about 30 percentage points in Baku and Moldova and 17 percentage points in Ukrainian regions, versus 10 percentage points on average across OECD countries (Figure 4.8).

Figure 4.8. Parental involvement in students' learning is higher in EaP countries/economies than on average across OECD countries but has declined since 2018, except in Georgia

Percentage of students in schools whose principal reported that at least 50% of students' parents are involved in discussing their child's progress with a teacher on their own initiative



Notes: Changes between PISA 2018 and PISA 2022 that are statistically significant are shown in a darker tone. In addition, they are shown in brackets under the country/economy name. In Georgia, the change is not significant.
Countries and economies are ranked in descending order of the percentage of students in schools whose principal reported that at least 50% of students' parents are involved in discussing their child's progress with a teacher on their own initiative in PISA 2022.
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/ewky53

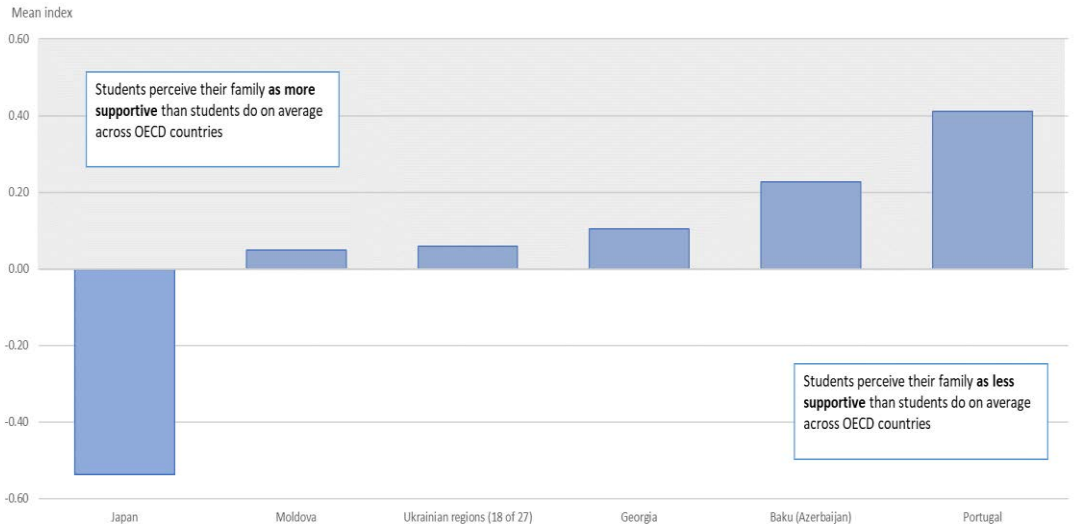
Education systems with positive trends in parental engagement in student learning between 2018 and 2022 showed greater stability or improvement in mathematics performance. This was particularly true for disadvantaged students. These figures show that the level of active support that parents offer their children might have a decisive effect.

Family support at home

Students in EaP countries, most noticeably in Baku and Georgia, perceived their families as more supportive than students in most OECD countries.[5] Only students in Portugal and five other countries felt their families were even more supportive than in Baku. By contrast, the country with the lowest level of perceived family support was Japan (Figure 4.9).

Figure 4.9. Family support at home is higher in EaP countries/economies than on average across OECD countries

Index of family support (based on students' reports)



Note: *Countries and economies are ranked in ascending order of their mean value in the PISA index of family support.*
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

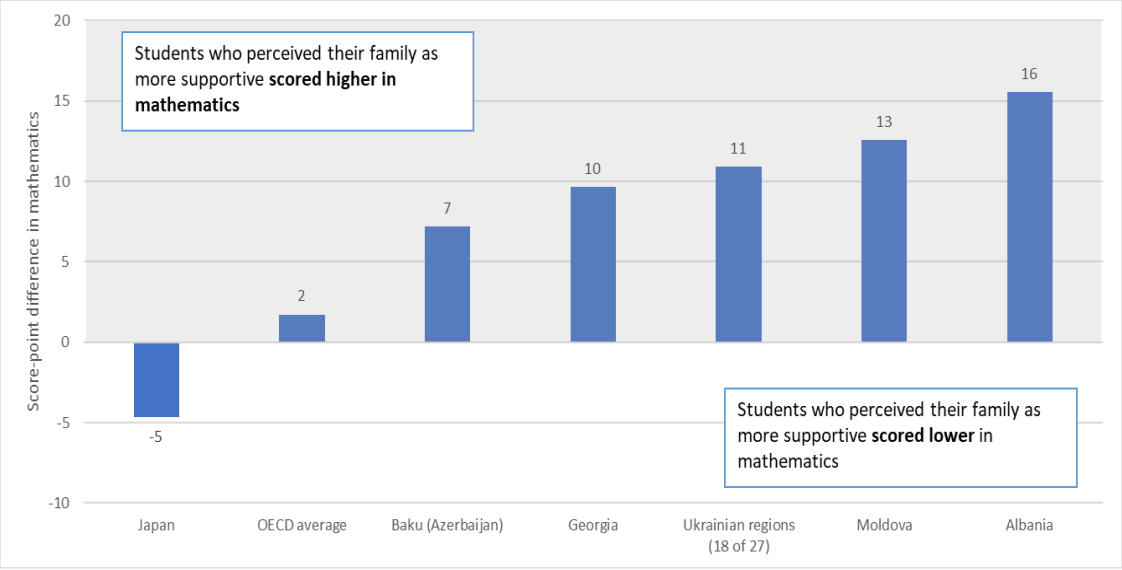
StatLink https://stat.link/b0kf6h

Students with more family support at home perform better in mathematics in all EaP countries and economies, similar to what is true on average across OECD countries. A one-unit increase in the index of family support is associated with an increase of between 7 and 13 score points in EaP countries and economies (Figure 4.10). Only in Albania and five other countries/economies is the increase in performance steeper than in Moldova, the EaP country with the strongest positive association.

However, family support at home is not always associated with higher performance. In Japan (also in Germany and Sweden), students with more family support at home actually perform worse in mathematics than their peers. This might seem counterintuitive. While PISA data do not provide evidence of a causal relationship nor the potential direction of the relationship, in some contexts, such as possibly in Japan, parents might provide more support at home when their children perform poorly in school.

Figure 4.10. Family support at home is strongly associated with student performance in EaP countries

Change in mathematics performance associated with a one-unit increase in the index of family support



Notes: All changes in mathematics performance associated with a one-unit increase in the index of family support are statistically significant.
Countries and economies are ranked in ascending order of the change in mathematics performance.
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/aryw6n

Learning during school closures

PISA 2022 took place as countries were still grappling with the impacts of the COVID-19 pandemic. The pandemic presented a major challenge for education, testing the extent to which systems, schools and students around the globe were able to adapt to sudden and profound changes in how students are taught and how they learn. It is thus important to understand how it affected teaching and learning practices as a contextual factor. At the same time, it provides insights into potential strengths and weaknesses that might need to be addressed to build resilient and inclusive school systems in the future.

School closures, defined as the period in which school buildings were closed to students, were one of the most common responses to the pandemic to contain the spread of the virus. PISA 2022 collected information on learning during school closures from both students and principals. However, data on school closures collected through the PISA student questionnaire suffer from specific limitations, namely low response rates and different biases. Readers should consider these limitations when drawing conclusions from the results presented in this part of the chapter on learning during school closures. Annex 4.A explains these limitations in detail, and given these, readers need to take care in drawing definitive conclusions from this analysis.

School closure policies differed between countries/economies (OECD, 2021[4]).[6] As a result, the duration of school closures, defined as the closure of the building itself, as analysed here, does not capture all the time that individual students were not permitted to enter the school building. As mentioned above, the situation in Ukrainian regions is particular, as COVID-19-related school closures were compounded by school closures related to the war in the country. As a result, students in Ukrainian regions studied remotely

for a longer period than in other countries. The support schools provided to students also varied, depending on when and for how long schools were closed. Schools in education systems where closures were relatively rare and brief may have provided fewer supportive actions since schools may have resumed in-person classes before support was considered necessary. In these cases, the values on the indicators for school support may be low.

Table 4.2 shows how EaP countries/economies supported students and schools during the pandemic. In some countries, notably Ukraine, the response was defined at the local level, in others, such as Moldova, at the central level. In Baku and Georgia, some measures were dropped as the pandemic progressed, while in Moldova, measures were largely maintained and new ones were put into place.

Table 4.2. How education systems supported students and schools during the pandemic

Information for school years 2020/21 and 2021/22

	Baku (Azerbaijan)	Georgia	Moldova	Ukraine
Early warning systems to identify students at risk of dropping out	x	Yes	2020/21: No 2021/22: Yes	x
Adjustments to the curriculum in any subject or grade	No	2020/21: Local 2021/22: No	No	Local
Increased instruction time (e.g. through summer schools, extended school day, school week or academic year)	2020/21: Yes 2021/22: x	No	No	Local
Individualised self-learning programmes (computer-assisted or pencil-and-paper based)	2020/21: Yes 2021/22: No	No	Yes	Local
Accelerated education programmes (covering instructional content in a shorter timeframe) or catch-up programmes for students who dropped out of school	x	Yes	No	Local
Psychosocial and mental health support to students (e.g. counselling)	2020/21: Yes 2021/22: No	Local	Yes	Local
Strengthened/provided additional school nutrition services (e.g. school feeding programmes, free or discount on school meals)	x	No	Yes	Local
Structured pedagogy (e.g. programmes to improve instruction with teachers' guides, lesson plans, student materials and teacher training)	No	2020/21: Yes 2021/22: ..	Yes	Local
Teacher training in how to support students' mental health and well-being	x	..	Yes	Local
Recruitment of specific personnel to support students' mental health and well-being (e.g. psychologists, counsellors)	No	..	Yes	Local

x: Not applicable; .. : Missing value or not available.
Source: OECD (2023[5]), Annex B3, PISA 2022 system-level indicators. *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*, PISA, OECD Publishing, Paris, https://doi.org/10.1787/53f23881-en.

StatLink https://stat.link/ypzlhg

The relation between school closures and student performance and well-being

According to students, in EaP countries/economies, fewer students experienced short school closures than on average across OECD countries. To measure the length of school closures, PISA 2022 asked students whether their school building was closed to them for more than a week in the previous three years due to COVID-19(some schools closed and reopened multiple times during the period). Schools in most countries/economies were closed for several months because of the pandemic.

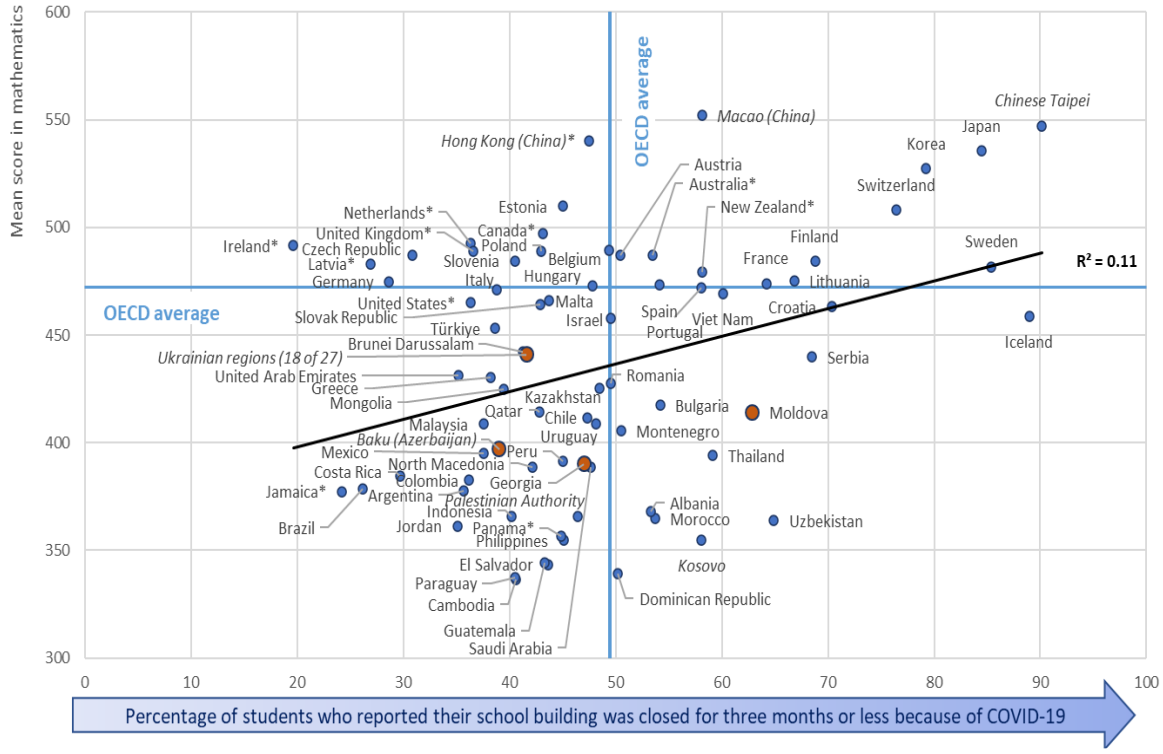
PISA 2022 then makes a distinction between "short" and "long" school closures and assesses the share of students reporting "short" closures. Short closures are defined as those for less than three months and

long closures for more than three months. On average, around half of the students across OECD countries experienced short closures.

In Baku, Georgia and Ukrainian regions, less than half of students experience short closures (Figure 4.11). Conversely, more students in Moldova experienced short school closures than their peers across OECD countries and more than 60% of students experienced closures for 3 months or less. When interpreting these results, keep in mind that it is not possible to establish with confidence whether these are accurate estimations of the length of school closures in EaP countries/economies: only 33% of students in Baku and less than 70% of students in Georgia and Ukrainian regions (60% and 67% respectively) responded to the question on the length of school closure during the COVID-19 pandemic (see Annex 4.A).

Figure 4.11. Mathematics performance is higher in systems where more students were spared from longer school closures

Length of COVID-19 school closures as reported by students



Note:
* Caution is required when interpreting estimates because one or more PISA sampling standards were not met (see Box 1.1 in Chapter 1).
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/pdbjns

While no causal relationships can be established with PISA data, the results suggest that the duration of school closures is related to differences in student performance. **Education systems that spared more students from long closures (longer than three months) showed higher average mathematics performance** than those with more schools closed for longer periods (Figure 4.12).

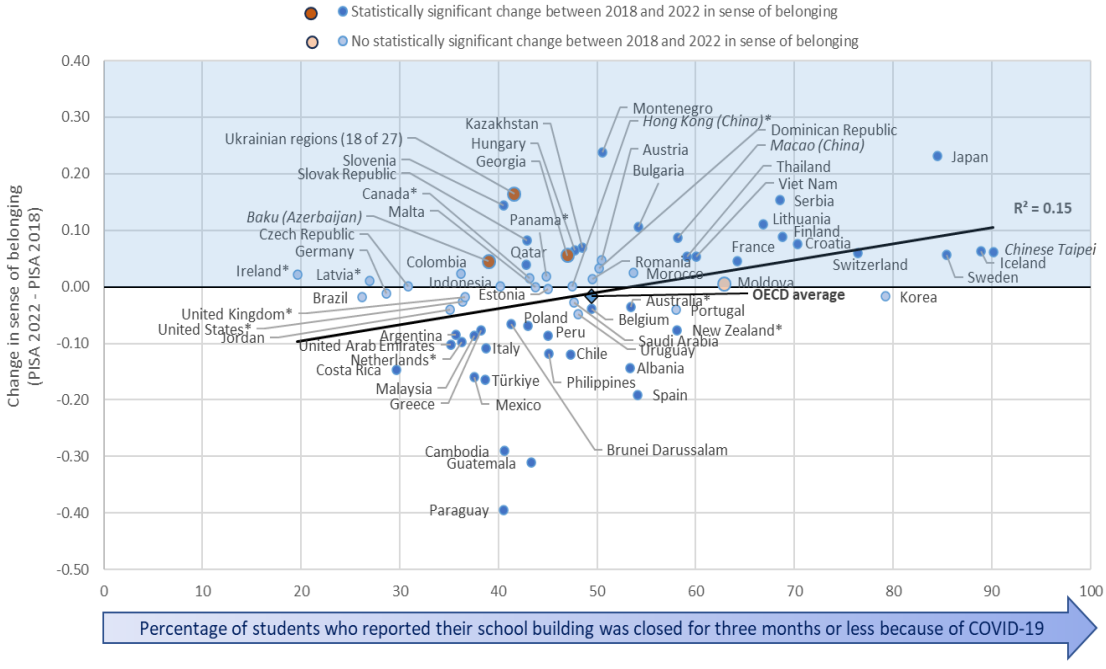
Furthermore, shorter school closures are positively related to students' well-being, as measured, for example, by their sense of belonging at school. **Countries/economies that avoided long school closures for more of their students, according to students, had more stable or improving trends in their sense of belonging at school** (Figure 4.13). A clear example is Japan, which closed its schools for only 3 months or less to 84% of its students, as reported by students, had one of the greatest improvements in students' sense of belonging at school, reaching a level above the OECD average in 2022.

EaP countries/economies deviate somewhat from the general pattern. **The sense of belonging at school did not change between PISA 2018 and PISA 2022 in Moldova**, the EaP country where a smaller proportion of students suffered from long school closures. **In Baku and Georgia**, where a larger proportion of students suffered from longer school closures, **sense of belonging at school improved** by a small yet significant margin during this period.

An even larger difference from the general pattern can be observed **in Ukrainian regions, where a sense of belonging at school improved greatly between 2018 and 2022**; only Japan and Montenegro saw a greater sense of belonging than in Ukrainian regions. It is plausible that schools and school communities became a source of social-emotional protection for students in the context of war, which could explain the increase in student sense of belonging in Ukrainian regions; in addition, it is possible that this increase is due to changes in the composition of the PISA sample between 2018 and 2022. The high non-response rate to the question on school closures can also partly explain this finding.

Figure 4.12. Students' sense of belonging at school strengthened between 2018 and 2022 in EaP countries/economies, except Moldova

COVID-19 school closures and change between 2018 and 2022 in the sense of belonging



Note:
* Caution is required when interpreting estimates because one or more PISA sampling standards were not met (see Box 1.1 in chapter 1).
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/opz3j2

Students' learning experience during school closures

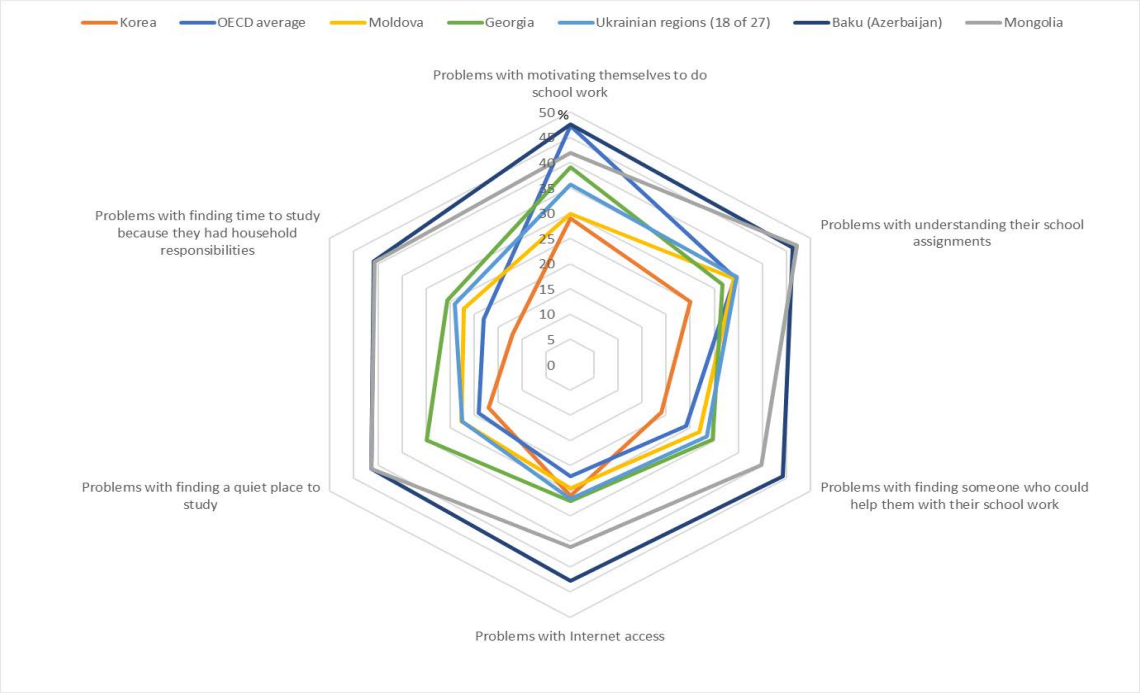
To avoid severe learning losses during school closures due to COVID-19, systems and schools ensured that education continued effectively in remote mode. Remote education forces students to learn more independently – and to draw on self-directed learning skills (Bond et al., 2021[5]). The following sections describe the problems with remote learning and the levels of self-directed learning skills in EaP countries and economies, as reported by students in PISA, and what EaP countries/economies might learn from this in the future. As the analyses suggest, this includes further supporting students' motivation and engagement in their learning but also helping families address logistical aspects that might hinder student learning, such as adequate Internet access at home or the lack of a quiet place to study. Nevertheless, students in EaP countries/economies report feeling relatively confident in their ability for self-directed learning and are similarly supported by teachers as in OECD countries. The pandemic highlighted teacher support's role for students, which positively correlates with self-directed learning and mathematics performance.

Problems with remote learning

Students faced **different kinds of problems with remote learning** when their school building was closed because of COVID-19. Students' ratings of how often they had various problems completing their school work (e.g. "problems with Internet access", "problems with understanding my school assignments") while their school building was closed due to COVID-19 were combined to create the PISA index of problems with remote learning. Higher values in this index indicate that students faced more problems with remote learning during the time schools were closed during COVID-19. **Students in all EaP countries and economies had more issues with remote learning than their peers across OECD countries**, as indicated by higher values in this index. Problems with remote learning were particularly acute in Baku, which had the second-highest value in this index out of all PISA 2022 participating countries and economies, only after Mongolia. Japan had the least problems among all countries/economies (OECD, 2023[1]).

Figure 4.13. Students in EaP countries/economies faced different kinds of problems with remote learning during COVID-19

Percentage of students who reported that, when their school building was closed because of COVID-19, they had the following problems when completing their schoolwork at least once a week



Note: *Countries and economies are ranked in ascending order of their value in the PISA index of problems with remote learning.*
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/fsnhbx

Figure 4.13 shows the incidence of specific problems with remote learning. Most noticeably, many students struggled to motivate themselves to do schoolwork and understand school assignments. **In Baku, almost half of students had problems at least once a week motivating themselves to do schoolwork**. A similar share of students had self-motivation problems on average across OECD countries, while only about three in ten students had self-motivation problems in Korea and Moldova. Furthermore, four out of ten students in Baku reported having problems at least once a week with understanding school assignments and finding someone to help them with their schoolwork. **In the other EaP countries and economies, and on average across OECD countries, about a third of students had problems at least once a week with understanding school assignments during school closures**.

A comparatively smaller but still substantial share of students in EaP countries/economies had **problems with logistical aspects such as having Internet access, finding a quiet place to study or finding time to study because of household responsibilities**.

Student confidence in self-directed learning

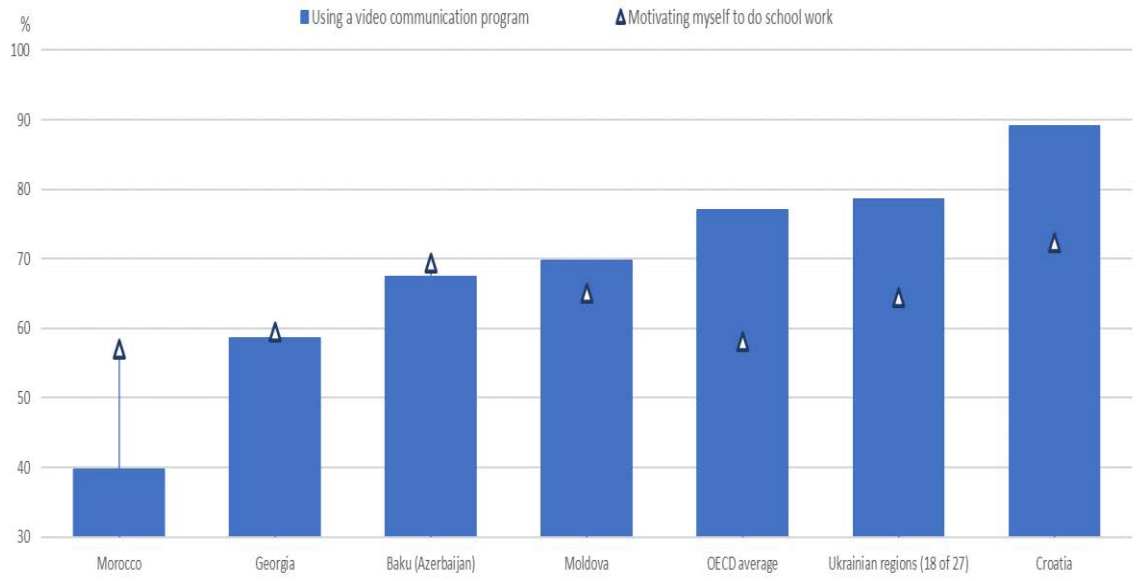
To measure the extent to which education systems prepared students for self-directed learning, PISA 2022 asked students to report on their confidence in their capacity for self-directed learning in case their school building would have to close again in the future. Self-directed learning encompasses two components: using digital technology for learning remotely and taking responsibility for their own learning.

In EaP countries/economies, most students feel confident in their capacity for self-directed learning. Unlike in OECD countries, **students feel similar levels of confidence in both their capacity to use digital technology for remote learning and to motivate themselves to do schoolwork**. In Baku and Moldova, seven out of ten students felt confident in using digital technology to learn remotely and taking responsibility for their own learning. In Georgia, this was six out of ten students.

On the other hand, students in OECD countries felt significantly more confident about using digital technology for learning remotely than they felt about taking responsibility for their own learning. This is also the case for students **in Ukrainian regions, where students feel more confident about using digital technology than motivating themselves**. The additional months of school closures in relation to the war could explain why Ukrainian students are more confident with technology but also have lower motivation than others.

Figure 4.14. Most students in EaP countries/economies feel confident in their capacity for self-directed learning

Percentage of students who reported feeling confident/very confident in taking the following actions if their school building closes again in the future



Note: *Countries and economies are ranked in descending order of the percentage of students who reported feeling confident or very confident in using a video communication programme.*
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/lw35fe

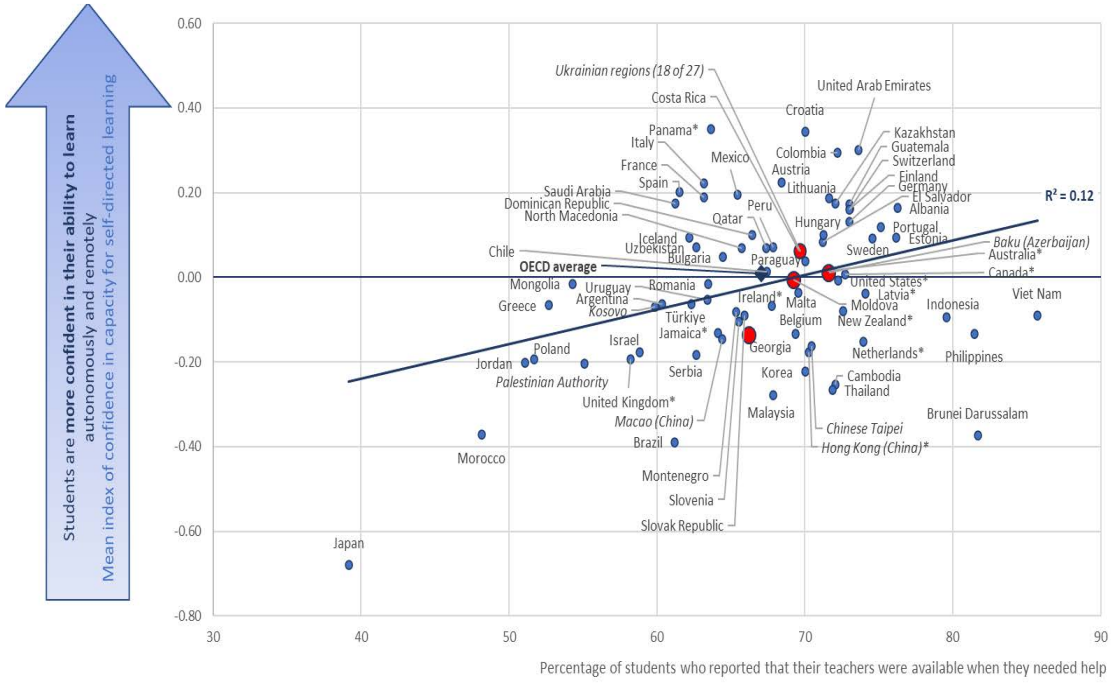
Supportive teaching practices can nurture students' confidence in their capacity for self-directed learning. **In EaP countries/economies, and on average across OECD countries, students who responded that their teachers were available for help when they needed them when schools were closed during COVID-19 are more confident in their capacity for self-directed learning**, even after accounting for mathematics performance and students' and schools' socio-economic profiles (OECD, 2023[1]).

Furthermore, as shown in Figure 4.15, greater average levels of student confidence in capacity for self-directed learning are found in education systems where a greater share of students reported that their

teachers were available when they needed help during COVID-19 school closures. **In EaP countries and economies** and on average across OECD countries, **seven out of ten students reported that their teachers were available when they needed help**.

Figure 4.15. Supportive teaching practices can nurture students' confidence in their capacity for self-directed learning

Based on students' reports of their experience during COVID-19 school closures



Note: Positive values on the vertical axis mean students are more confident in their capacity for self-directed learning.
* Caution is required when interpreting estimates because one or more PISA sampling standards were not met (see Box 1.1 in Chapter 1).
Source: OECD (2022[2]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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The strongest link to mathematics performance during COVID-19 school closures was teacher availability to help students when they needed help. After accounting for students' and schools' socio-economic profiles, students with access to teacher help when needed scored 15 points higher in mathematics on average. This is compared to students with less supportive teachers across OECD countries (OECD, 2023[1]).

Annex 4.A. Interpreting the data from students on school closures

PISA 2022 data on COVID-19 school closures have two main limitations: i) high non-response rates; and ii) response biases. Readers should keep these limitations in mind when drawing conclusions from the results presented in the first part of this chapter on learning during school closures (OECD, 2023[1]).

Non-response to questions about COVID-19 school closures

When responding to a survey, some participants might not respond to a question as they might not have time or prefer not to answer, for example. In the PISA 2022 student questionnaire, many students did not respond to questions about COVID-19 school closures because the questions on this topic were placed at the end of the student questionnaire. This limits the representative nature of these data.

In EaP countries/economies, rates of non-response to the question on the length of school closure were higher than on average across OECD countries, except in Moldova. On average, almost 25% of students across OECD countries did not answer the question about the duration of COVID-19 school closures. In Baku, 67% of students did not answer the question, the largest share among all PISA participating countries. The share of missing data for this question was also very large in Georgia (40%) and Ukrainian regions (33%). Only in Moldova was the share of students who did not answer this question (19%) lower than on average across OECD countries.

A comparison of the characteristics of students who responded to the question on the duration of COVID-19 school closures with those who did not respond shows that both differ in important ways in EaP countries and economies and, on average, across OECD countries. **Non-responding students scored lower in mathematics, reading and science, were of lower socio-economic status and were more often boys than girls.**

In addition, the high non-response rate affects the precision of the data since standard errors are higher than for other parts of the questionnaire.

Potential biases from student responses on school closures

Students' responses to the questions on school closures are subject to various biases, such as any information from questionnaires. Common biases include social desirability – where students might downplay negative feelings to appear more positive, for example – and cultural bias – where different cultures have varying views on education and school closures. These biases may be more pronounced given the debates about the appropriateness of school closures and other measures to address the COVID-19 pandemic.

In addition, **students retrospectively answered these questions on school closures** in 2022, possibly recalling events from early 2021. Some students might struggle to remember details about their school's closure, especially if it happened early in the pandemic. Systemic bias should also be considered since school closures varied in timing and duration across countries. For example, students from countries with long closures might have a different perspective than those with shorter closures.

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OECD (2015), *Students, Computers and Learning: Making the Connection*, PISA, OECD Publishing, Paris, https://doi.org/10.1787/9789264239555-en. [3]

Notes

[1] The EaP countries/economies forming part of this report are Baku in Azerbaijan, Georgia, Moldova and 18 of the 27 regions in Ukraine. Any reference to EaP countries/economies, as well as the EaP average, specifically pertains to Baku, Georgia, Moldova and Ukrainian regions. Armenia is also part of the EaP but has not yet participated in PISA, although participation is underway for PISA 2025.

[2] Azerbaijan as a whole country participated in PISA 2006 and PISA 2009, 2006 but has only participated with its capital city, Baku, since PISA 2018.

[3] Ukraine joined PISA for the first time in 2018. However, in the context of war, only 18 of the country's 27 regions were able to participate in the 2022 assessment. Box 1.2, included in Chapter 1, provides detailed information on Ukraine's participation.

[4] In PISA 2022, students were asked how often ("never or hardly ever", "some lessons", "most lessons", "every lesson") certain things happen in their mathematics classes (e.g. "students do not listen to what the teacher says" and "there is noise and disorder"). These statements were combined to create the index of disciplinary climate (DISCLIM) with an average of zero and a standard deviation of one across OECD countries. Positive values on the index mean that the student reported a better disciplinary climate in mathematics lessons than did students on average across OECD countries. Mean values in this index for all countries and economies in PISA 2022 are included in *PISA 2022 Results (Volume II): Learning During – and From – Disruption* (OECD, 2023[1]), Table II.B1.3.9. For EaP countries/economies, mean values in the DISCLIM index are the following: -0.06 in Baku, -0.01 in Moldova, 0.13 in Georgia, and 0.31 in Ukrainian regions (18 of 27).

[5] In PISA 2022, family support (FAMSUP) was measured by asking students how often ("never or almost never", "about once or twice a year", "about once or twice a month", "about once or twice a week", "every day or almost every day") their parents or someone in their family do different things with them indicative of family support (e.g. "discuss how well you are doing at school"; "eat the main meal with you"; or "spend time just talking with you"). An index of family support with an average of zero and a standard deviation of one across OECD countries is formed by combining students' responses to ten scenarios. Students with positive values on this index perceived their family as more supportive than did students on average across OECD countries.

[6] In many countries, schools opened for certain grades, levels of education or age groups, often giving preference to students in earlier years (OECD, 2021[6]). School closures were often only imposed in affected regions, schools or classes, not nationwide (e.g. teaching shifted to remote mode for classes where COVID-19 cases were detected or for contact cases within these classes). In some education systems, half of the student body alternated with the other half in attending classes in person.

5 Seven building blocks to improve student learning, equity and well-being

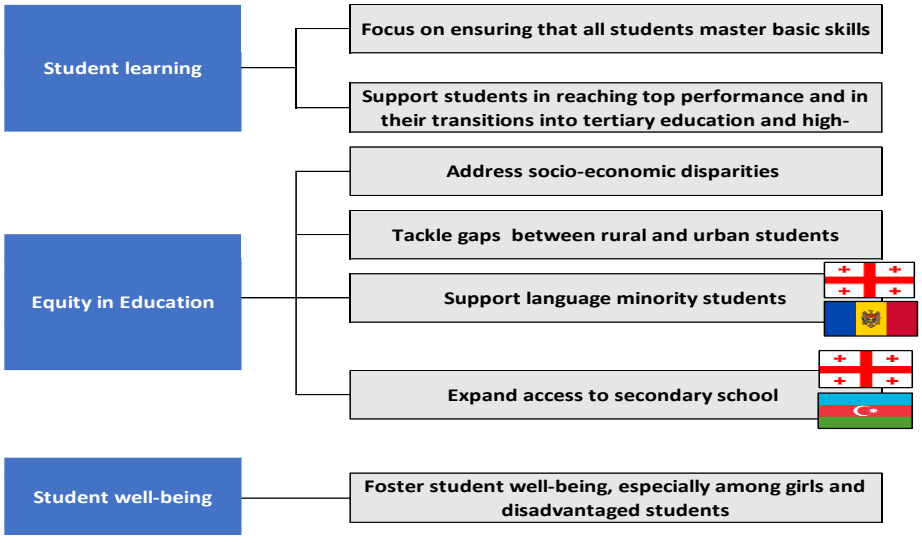
This chapter brings together the findings of previous chapters of the report to identify policy priorities and strategies for improving student learning, equity and well-being in Eastern Partnership (EaP) countries. It outlines seven building blocks for an ambitious policy agenda aimed at ensuring all students master basic skills while also supporting high performers, addressing disparities in education opportunities, expanding access to secondary education and promoting student well-being, especially among girls and disadvantaged students. While most recommendations are relevant to all systems in the region, some are specifically targeted to individual economies.

This chapter brings together the findings from the report and identifies policy priorities and potential strategies to address them. The chapter puts forward seven building blocks that could form part of an ambitious policy agenda to improve student learning, equity and well-being in countries of the Eastern Partnership (EaP) (see Figure 5.1 and Table 5.2).[1] They draw on both strengths that EaP countries and economies can build on and challenges they need to address. With their emphasis on foundational skills, high-skill job transitions and focus on marginalised and disadvantaged students, the building blocks suggest a holistic approach to fostering equity and excellence in education. While some of the building blocks will benefit all students, additional measures can be targeted at specific groups of students who are identified in the report as likely to benefit from specialised support.

Most of the recommendations are relevant to all EaP systems. However, some are especially pertinent to some contexts, given the relative importance of different factors associated with the quality and equity of learning opportunities. For example, improving opportunities for rural students is especially important in Moldova, which has a large rural population and persistent disparities in educational achievement to the detriment of rural students. Other recommendations are only relevant to some EaP countries/economies. For example, expanding access to secondary school is a priority for Baku (Azerbaijan)[2] and Georgia, where coverage remains relatively low, but not in Moldova and Ukrainian regions. Recommendations that apply only to some countries/economies are shown together with the flags of the countries they apply to in Figure 5.1. The specific challenges facing Ukraine following the war also need to be recognised. Box 5.1 summarises key insights for the country, which is the context for the general recommendations.

As highlighted in Chapter 1, the policy implications distilled from the OECD Programme for International Student Assessment (PISA) are particularly relevant for secondary schooling. However, since learning is a continuous journey for students, the proposed way forward for EaP countries/economies also includes recommendations for earlier stages of the education system. The chapter also draws on further analyses of EaP countries/economies carried out by the OECD, in partnership with the European Commission and the United Nations Children's Fund (UNICEF), in recent years, as well as additional secondary research and data, such as from the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank and non-governmental organisations, to contextualise these findings.

Figure 5.1. Building blocks for improving student learning and well-being in EaP school systems



Note: Building blocks are coloured in light grey and apply to all EaP countries/economies, except for those that display country icons. “Expand access to secondary school” applies to Baku and Georgia. “Support language minority students” applies to Georgia and Moldova.

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PISA and other OECD reports show no single best way to organise a national or state education system to achieve excellence, equity and well-being. Policy initiatives that work well in the context of one school system are not necessarily transferable to others. At the same time, available evidence likewise shows that deliberate policy choices, adequately funded and carefully implemented with stakeholder involvement over time, can lead to substantial improvements in student performance, equity and well-being, regardless of a country's cultural or economic context (OECD, 2013[1]; 2011[2]; 2016[3]; 2018[4]; 2018[5]; 2011[6]). The chapter draws on these experiences and selected country examples that could inspire EaP countries and economies. It is hoped that the direction suggested in this chapter makes a meaningful contribution to policy discussions in EaP countries/economies on how to take school systems forward.

Box 5.1. Key insights for Ukraine

The context of Ukraine's participation in PISA 2022 is a very specific one, as a result of the war. Despite the challenges the war brings, the country is currently engaged in ambitious reforms. This includes modernising its school curriculum in upper secondary education to give students greater choice. Pilot schools have been created nationally and are supported by the OECD.

The analysis in this report suggests several factors that could be taken into account in the further development of the country's ongoing reforms and efforts to rebuild the school system as the country emerges from the war:

- Students' educational expectations have been decreasing significantly between 2018 and 2022, although they remain relatively high. Giving students a sense of the future and a perspective within the country seems important.
- Students express a strong sense of belonging at school, potentially fuelled by the context of war. This is a strength that the country could build on.
- While PISA's coverage index for Ukrainian regions is not so robust in the current context, it seems important to understand the drop in coverage observed for Ukrainian regions. The war in Ukraine has interrupted the regular learning progression of many students who might need to be re-engaged in the school system at present or in the future.
- The education system seems to rely, to a great extent, on digital resources to maintain continuity in teaching and learning. This provides an opportunity for teachers and students to draw lessons about effectively using these resources while underscoring the need to invest in competencies to use digital resources well. At the same time, despite the extensive usage of digital devices, digital distraction is slightly lower than in OECD countries, indicating students' capacity to manage their attention.
- The extent of teacher support in mathematics lessons, as reported by Ukrainian students, is similar to the OECD average. However, Ukrainian regions are the only EaP country/economy where greater teacher support is not associated with better mathematics performance. The reasons for this could be worth exploring (e.g. is this explained by teachers targeting support at lower-performance students? Could it be related to the challenges for teachers to support students remotely while schools operated on line to maintain continuity in education with the beginning of the war?).
- Unlike in other EaP countries/economies, Ukrainian students felt less confident in their capacity to motivate themselves during the COVID-19 pandemic. This might also hold lessons for the current situation, indicating an area of self-directed learning in which to support students.

- Ukrainian principals express worrying levels of concern about their school infrastructure and educational materials, which indicates an area to address in order to support learning in the current context. Rebuilding the country's educational infrastructure will be an important aspect of providing the basis for quality learning.
- Parents and families seem to be an important resource to draw on to support student learning. While parental involvement as measured by PISA has dropped over time, it remains relatively high in Ukrainian regions. Ukrainian students also perceive their family as more supportive than the average OECD student and greater family support positively correlates with student performance.

As explained in Chapter 1, these insights are drawn from 18 of the country's 27 regions that participated in PISA 2022. While PISA 2022 was meant to include Ukraine's entire educational system, this was not possible in the context of the war. The results can be deemed reliable for reporting, although comparisons with previous data require caution. For more information on data collection limitations in Ukraine, see Box 1.3 in Chapter 1 of this report.

Source: OECD (forthcoming[7]), Report on Ukraine, OECD Publishing, Paris.

Building Block 1: Focus on ensuring that all students master basic skills

As shown in Chapter 2, the performance of 15-year-olds in EaP countries/economies places them below the average PISA performance in mathematics, reading and science. A main reason for this is the **high proportion of students who do not demonstrate basic proficiency in these subjects**. The share of students in EaP countries/economies not reaching basic competencies in reading is of particular concern, and even more so for boys, especially in Baku and Georgia. **While some EaP countries/economies have seen progress in their performance since joining PISA, this has also been uneven**, even before the declines during the COVID-19 pandemic. Between 2018 and 2022, performance declined in three out of four EaP countries/economies. Baku, Moldova and Ukrainian regions.

These findings show a clear need to improve student performance across the board and, most urgently, to reduce the large number of students not reaching baseline proficiency levels. Indeed, reaching the European Education Area European Union-level targets to lower the proportion of students with low achievement to less than 15% by 2030 will require a significant effort in EaP systems, from halving the present rate in Ukrainian regions to reducing it fivefold in Baku.

The potential rewards are, however, significant. High-quality education is associated with a wide range of economic and social benefits for both individuals and societies in terms of productivity, earnings, public health and citizenship (OECD, 2022[8]). Reducing low performance helps improve young people's later success in their further studies or in the labour market and brings important economic gains to countries and economies. While estimates rely on important assumptions, OECD analyses suggest that the potential economic gains from achieving universal basic skills for middle-income countries average more than eight times their current gross domestic product (GDP). For Georgia – the EaP country with available data – the analysis suggests that helping every student acquire basic skills could increase more than fivefold its GDP (OECD, 2015[9]).

PISA has shown that reducing the share of low-performing students is possible and can be accomplished relatively quickly. Countries as diverse as Germany, Mexico and Türkiye have effectively reduced their share of low performers in mathematics over the course of their participation in PISA. As their experience shows, improving the performance of all students requires universal policies that are applied across the system (OECD, 2016[3]; 2018[10]; 2023[11]). For EaP countries/economies, three key priorities stand out

from this report's analysis that could help lift performance overall: increasing the level of public investments, developing and raising the status of the teaching profession and creating good learning environments.

Increasing public investment in school education

Policy makers in EaP systems need to prioritise tackling low educational performance in their public policy agendas and support this priority with additional educational resources. As highlighted in Chapter 1, educational spending per student in all EaP countries remains relatively low. EaP countries/economies are among those countries where additional levels of spending could make a difference in learning outcomes. The share of public spending dedicated to education in EaP countries and economies has been improving in some but not all of them, ranging between 10.8% in Azerbaijan and 12.5% in Georgia to 14.3% in Ukraine and 16.3% in Moldova. Only Moldova meets the national benchmark set for the United Nations Sustainable Development Goals (SDGs) of spending a minimum of 15% of government expenditure on education by 2025 (UNESCO UIS, 2024[12]; 2024[13]). In Azerbaijan, the share of public expenditure dedicated to education actually fell by 11 percentage points between 2000 and 2020, a time when general government revenue increased by 12 percentage points (UNESCO, 2023[14]).

Since it will take time to mobilise additional public resources, the **resources that are available need to be spent effectively (that is, achieving intended goals) and efficiently (minimising waste)**. PISA data suggest some effectiveness in spending in EaP countries/economies. Their performance is roughly what would be expected based on their per student spending, and in some cases, it is higher, namely in Baku and Georgia. However, countries could identify and address areas of inefficiency to liberate resources for strategies to raise overall performance. For example, the school networks in Georgia and Moldova contain many small schools that create high fixed costs but do not necessarily support quality teaching and learning (Li et al., 2019[15]; OECD, 2023[16]). As the analysis in Chapter 3 indicates, small schools in both Georgia and Moldova are generally smaller than the OECD average. Students in these small schools tend to perform worse than those in large schools in both countries and also worse than those in medium-sized schools in Moldova. However, performance differences disappear once socio-economic factors are considered, except when comparing small and large schools in Moldova. Further discussion on school network reform is provided in Building Block 4, focusing on improving learning opportunities for rural students.

Additional public investment in school education should include a significant investment in the teaching profession, given its importance in determining student outcomes, as suggested in the next recommendation. **Moreover, there is also a clear need for increased investment in material and physical resources**. Chapter 3 identifies shortages and quality concerns in these areas as significant issues across all EaP countries/economies. Given that misuse of spending on these resources poses a substantial risk, authorities should monitor the integrity of resource use. For example, integrity has been identified as an area of concern for Ukraine in the past. The related report provides suggestions on identifying and changing any policies that create incentives for the misuse of funds that are likely applicable to other EaP countries/economies (OECD, 2017[17]).

Developing and raising the status of the teaching profession

Low-performing students benefit most from having qualified, highly skilled teachers (OECD, 2016[3]) **and EaP countries/economies could still do more to develop the profession**. The status of teaching tends to be low and the profession fails to attract highly qualified candidates (OECD, 2023[16]). This is a particular issue in the context of teacher shortages, as this report indicates for Baku, or in contexts where the profession is ageing, as other data suggest for Georgia (OECD, 2019[18]). Reportedly, both issues are also of concern in Ukraine.

Policies to raise the profession's status and improve teaching quality are complex and varied and will need to consider the contexts of EaP systems. They can include the establishment of new qualifications, training requirements and incentives to recruit and retain the most talented graduates (OECD, 2018[4]; 2019[19]), as planned in Moldova. As part of its Education Development Strategy 2030, the Ministry of Education, Culture and Research of Moldova is planning a comprehensive review of teachers' careers and remuneration (OECD, 2023[16]). In designing their policies, EaP countries/economies could look to the experience of countries such as Estonia that have similarly sought to improve teachers' status and satisfaction by increasing salaries and creating new development opportunities (OECD, 2020[20]).

Beyond attracting new entrants, **EaP countries/economies could better support the current workforce in developing their skills**. Data analysed for this report show that while students feel supported by their teachers at a level similar to OECD countries, the quality of this support could be improved. This involves supporting teachers in adopting **student-centred pedagogies** over traditional methods focused on rote learning. Particularly in countries like Georgia, Moldova and Ukraine, the transition to competency-based curricula demands that teachers can individualise learning and use diagnostic assessments (OECD, 2023[16]; OECD/UNICEF, 2021[21]). In Georgia, the National Assessment and Examinations Centre has recently started developing national assessments in grades 6 and 10 to support this change in the coming years.

Additionally, teachers could be better equipped to **integrate new technologies in teaching and learning**. Despite the widespread use of digital devices in EaP systems, the report shows no association between digital resources and student performance after accounting for socio-economic factors. As a first step, this requires defining together with teachers and teacher educators what it means to be digitally competent and how to develop, evaluate and certify these teacher skills (OECD, 2015[22]). Estonia offers a good example with its digital competency framework for teachers, inspired by the European Framework for the Digital Competence of Educators (see JRC (2017[23])). This framework includes an online self-assessment tool for teachers to pinpoint areas needing improvement. It is aligned with a student digital competency framework to provide a common language for digital teaching and learning. Moreover, Estonian teachers have access to various training opportunities to advance their digital skills, including peer learning programmes such as the Digital ABC initiative (OECD, 2023[24]).

Creating good learning environments

The analysis in this report underscores **the need for EaP countries to adopt policies that support schools in creating environments conducive to learning**. This includes truancy, lateness, "traditional" and digital forms of classroom distraction and, in Baku and Moldova, school safety.

School leadership is pivotal in establishing school climates that support learning and is an area that EaP countries/economies could still invest in further. There are rich examples from OECD practice and research on how to strengthen school leadership, such as with professional standards, training programmes and professional networks. Azerbaijan has already introduced principal standards and expanded the range of providers for school leader training to make training more relevant (Kazimzade, 2017[25]). EaP countries/economies could offer guidance on effective practices based on research to aid school leaders in developing positive learning environments. For example, to reduce digital distractions, guidance could be provided on designing and implementing cell phone bans for specific age groups together with teachers and students (OECD, 2023[26]).

Parents can play an important role in keeping students engaged in their learning and creating a positive school climate. Parental involvement in their children's education has been a strong point in EaP countries/economies, though it has declined since the COVID-19 pandemic. As a first step, **EaP countries/economies could explore the reasons behind this decline together with national parent organisations**. National promotional campaigns could be developed to re-engage parents. Schools could guide parents in supporting their children and actively participating in the school community.

Regarding school safety, **Baku and Moldova could similarly initially investigate the specific concerns of students**. Targeted interventions could be developed, such as initiatives to foster a positive and friendly school environment, complemented by teacher training on implementing these initiatives. For issues related to road safety, specific measures could be considered, such as reducing or prohibiting traffic near schools during key times of the day to enhance safety (Burns and Gottschalk, 2020[27]).

Building Block 2: Support students in reaching top performance and in their transitions into tertiary education and high-skilled jobs

By the time they reach 15 years of age, **very few students in EaP countries/economies achieve academic excellence**. The share of "top-performing" students in PISA 2022 (i.e. those who achieve Proficiency Levels 5 or 6 in mathematics, reading or science) was higher than 1% only in Ukrainian regions, where it was about 3%. For comparison, the share of top-performing students in mathematics is 9% on average across OECD countries, 13% in Japan and 41% in Singapore.

This virtual lack of top-performing students is worrisome because megatrends such as digitalisation and the transition to a low-carbon economy make advanced skills increasingly important in the global economy. This has real implications for the development strategies of EaP countries. For example, achieving economic diversification in Azerbaijan (Vusa, 2022[28]; World Bank, 2018[29]) or increasing productivity and competitiveness in Moldova (World Bank, 2023[30]) will require highly skilled professionals able to lead future research, development and innovation in the context of high rates of emigration of high-skilled labour.

From the analysis in this report, for EaP countries/economies, **three key policy options stand out that could foster academic excellence and help students transition into high-skilled jobs**: supporting students with high academic potential during compulsory education, improving the transition of secondary school graduates into tertiary education and ensuring that tertiary graduates have attractive job opportunities in the labour market.

Supporting students with high academic potential during compulsory education

Although all students have the potential to excel in education and should have opportunities to do so, **strong and moderate performers in PISA 2022 are the students with the highest potential to benefit from policies that foster academic excellence in EaP countries**. Few students in EaP countries and economies score at the highest proficiency levels in PISA. Still, the number of students showing "strong" performance in mathematics, reading and science, scoring at Proficiency Level 4, is not negligible (Table 5.1). Strong performers are students who demonstrate a high potential to become top performers. Furthermore, the share of students who display a "moderate" level of performance, i.e. who score at Proficiency Level 3, is substantial in EaP countries/economies. Moderate performers are students who have not only reached basic proficiency but demonstrate a range of more advanced additional skills which are associated with Proficiency Level 3. They are, therefore, well-positioned to take their academic achievement to a higher level.

One way to support students with high academic potential is with acceleration and/or enrichment strategies. These allow students to learn at a faster pace and have access to richer curricular content and learning activities outside the classroom. They include, for example, differentiated pedagogies that meet the heterogeneous needs and interests of students using varied course content, activities and assessments (Moallemi, 2023[31]; Pozas and Schneider, 2019[32]; Dupriez, Dumay and Vause, 2008[33]). School-level strategies such as mentoring, counselling and student collaboration have also proven to be effective in creating meaningful learning experiences for students with high potential (Rutigliano and Quarshie, 2021[34]).

Table 5.1. Strong and moderate performers exist in EaP countries/economies that have the highest potential to achieve top performance

Percentage of students at Proficiency Level 3 ("moderate" performance) and Level 4 ("strong" performance) in mathematics, reading and science

	Mathematics		Reading		Science	
	Level 3	Level 4	Level 3	Level 4	Level 3	Level 4
Ukrainian regions (18 of 27)	19	9	21	7	10	10
Moldova	13	5	17	5	5	5
Baku (Azerbaijan)	12	4	8	1	1	1
Georgia	9	3	9	2	2	2

Countries/economies are shown in descending order of the total percentage of students at Proficiency Level 3 and Level 4 in mathematics.
Source: OECD (2022[35]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

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The success of these acceleration and enrichment strategies depends greatly on teachers' and schools' capacity to support talented and motivated students. Teacher capacity in this area can be built through initial teacher education and continuous professional development. In addition, policy makers can support teacher practice by making guidelines and orientation documents available to teachers.

Evidence from PISA also suggests that students who perform at the highest levels are dedicated, engaged and confident learners (OECD, 2009[36]). **EaP countries/economies could explore ways to enhance students' attitudes towards learning**. High-performing students tend to devote more time to studying than other students, especially at school. When not at school, they engage in learning-related activities relatively often. For example, many top performers in science regularly watch science programmes on television or read science magazines or science articles in newspapers. Also, top-performing students report that they enjoy learning, want to learn more and are motivated to do well.

Improving the transition of secondary school graduates into tertiary education

A large majority of students in EaP countries/economies expect to complete tertiary education. This partly reflects the significant increase in the proportion of students with these expectations since 2018 (except in Ukrainian regions, where this share declined but remains relatively high). On the one hand, high student expectations are a good thing since they indicate students' motivation for continuing their studies after completing compulsory education. Students' educational expectations can play a large role in shaping their future achievements (Nurmi, 2004[37]; Guyon and Huillery, 2020[38]). PISA has shown that students with higher educational expectations at age 15 are more likely to continue their studies and attain high-skilled jobs than those with lower expectations, even after accounting for academic performance at age 15 (OECD, 2018[10]). Thus, **high student expectations might facilitate the success of policies that foster academic excellence and ease the transition into tertiary education**.

On the other hand, **they raise important questions about the match between these aspirations and the actual opportunities for accessing and succeeding in tertiary education in EaP countries**. In Georgia, for example, about 70% of the entire population of 15-year-olds expects to complete tertiary education,[3] according to PISA data; however, only 42% graduated with a tertiary degree in 2022 (UNESCO UIS, 2024[39]). Thus, a substantial increase in the number of places available in tertiary institutions would be required to accommodate the growing demand. Furthermore, the contrast between students' high educational aspirations and their actual academic performance is striking. Despite generally low scores on academic assessments, many students still aim for tertiary education. This gap between their aspirations

and readiness could make it difficult for students to achieve their goals and succeed in tertiary education, resulting in dropout and high costs for individuals and society.

Quality counselling programmes can provide students with accurate information about academic requirements, financial costs and student aid for different pathways to improve the transition of secondary graduates into tertiary education. Advising students can help them to have a clearer idea of the paths available to them and empower them to make better choices for their future. EaP countries and economies could review how their existing counselling programmes fulfil these needs effectively. Moreover, the transition to tertiary education depends greatly on diverse offers at both secondary and tertiary levels – namely the development of professionally oriented tertiary education – and on the co-ordination of the academic offer across the two levels of education. Another key factor is the relevance of the offer at the tertiary level for the labour market (OECD, 2020[40]).

Helping tertiary graduates transition into high-skilled jobs

Available evidence suggests that **the labour market in EaP countries is not yet prepared to offer skilled jobs to a growing number of highly educated young people**. For example, an analysis of skills mismatch shows that at least one in four tertiary graduates held jobs requiring lower formal qualifications (i.e. semi-skilled occupations) in Georgia, Moldova and Ukraine (ETF, 2020[41]). Over-skilling is higher among young tertiary graduates in all of these countries. Labour market policies to support the transition from education to work could prevent an increase in the mismatch between education, skills and job requirements. In the context of Ukraine, aligning tertiary education with the labour market and economy will be important to support the country's recovery and reconstruction needs.

Chapter 2 analysed students' interest in two specific occupational fields: information and communication technology (ICT) and healthcare. These insights could guide strategies to create opportunities in high-demand fields and increase the supply of skilled labour in areas of low demand. The analysis suggests that interest in pursuing professional careers in ICT among 15-year-olds in EaP countries is generally high and increasing, whereas interest in healthcare professions is declining. **Developing opportunities for young people to acquire ICT skills and enter this field could be a promising strategy**. Conversely, it is important to **understand why interest in healthcare professions is waning** and to **develop strategies to rekindle students' interest in this sector**, especially in the context of ageing societies.

Baku is an exception, with a high interest in health-related professions and a low and declining interest in ICT-related careers. This might be related to the structure of the economy and labour market opportunities. Given the limited interest in ICT, **Azerbaijan might consider implementing science, technology, engineering, arts and mathematics (STEAM) initiatives in schools** to broaden the appeal of these fields.

Building Block 3: Address socio-economic disparities in education opportunities

There is a clear need to target support for disadvantaged students. **Disparities in student performance by socio-economic status are pervasive in EaP countries/economies**, even if somewhat smaller than on average across OECD countries (see Chapter 3). In mathematics, for example, advantaged students outperformed their disadvantaged peers by more than 50 score points – the equivalent of almost 2 years of schooling – in all EaP countries/economies. **Policies in EaP countries/economies should aim to dismantle the barriers to learning faced by disadvantaged students**. The high share of disadvantaged students who already perform among the highest performing students in their education system in EaP countries/economies suggests that such policies have a real chance to succeed, between 10% and 14% of 15-year-old students in EaP countries/economies compared to 10% on OECD average, as shown in Chapter 3.

While countries need to take into account the multiple risk factors faced by disadvantaged students that are specific to their context, EaP countries/economies could tap into three policy options: promoting equity through school funding, investing in high-quality early childhood education and care, and promoting positive attitudes towards learning among disadvantaged students.

Promoting equity through school funding

School funding systems have an important role to play in equalising chances for learning for students from disadvantaged backgrounds (OECD, 2022[8]; 2017[42]). **EaP countries/economies could review how their funding systems promote equity**. There is some evidence that school funding is not always designed to best promotes equity in EaP countries/economies. In Georgia, for example, an ongoing research project supported by the World Bank aims to replace the current financing model to ensure adequate funding, particularly for disadvantaged students, to support teacher development and provide up-to-date educational resources for the implementation of the new competency-based curriculum. The reform seeks to address known issues in the existing system that does not adequately consider the additional needs of disadvantaged schools (Li et al., 2019[15]), which might help explain why disadvantaged and rural students in Georgia report access to fewer and poorer quality educational and digital resources. Disparities in educational resources are also apparent in Ukrainian regions, although the extent to which these are linked to the school funding mechanism is unclear, also bearing in mind the specific context of the war. Finally, the report suggests inequities in the availability of assisting staff in Baku and Georgia.

Targeted programmes are one way to compensate for disadvantages, especially if they are combined with a stable funding allocation that is based on a well-designed funding formula. While a funding formula that includes weightings for the characteristics of the student body of the school can promote both equity and transparency, targeted programmes can provide multidimensional support to address the multifaceted needs of disadvantaged students (OECD, 2017[42]; 2021[43]). In Ireland, for example, the Delivering Equality of Opportunity in Schools programme provides participating schools with priority access to a range of support programmes such as teacher professional development, the School Meals Programme and the Home School Community Liaison Services Scheme that aim to build a positive relationship between families and schools (OECD, 2024[44]).

Investing in high-quality early childhood education and care

Some EaP systems still need to further expand the provision of high-quality early childhood education and care (ECEC) for all children, especially those from disadvantaged families. ECEC is critical for more equitable educational opportunities because disparities in performance related to socio-economic status develop early and widen throughout students' lives (OECD, 2018[10]). Coupling ECEC interventions with health, nutrition and parent-involvement services can deliver substantial lifelong benefits for students, including higher educational attainment and career achievement, reduced criminal activity, better health and stronger family and personal relationships (Conti, Heckman and Pinto, 2016[45]; García, Heckman and Ronda, 2023[46]).

EaP countries have taken steps to improve participation in early learning. For example, the 2009 Education Law was the first to include pre-school education in Azerbaijan. Since then, pre-school education has been a priority for the Ministry of Science and Education of Azerbaijan, with the creation of many new pre-school places (World Bank, 2020[47]). However, except for Moldova, where all children from age 3 are expected to be in pre-primary education, **participation in ECEC in EaP countries remains behind targets set by the European Union for the European Education Area**. These targets aim for at least 96% of children aged 3 to start compulsory primary education to participate in ECEC by 2030.

A comprehensive policy to expand the provision of ECEC in EaP countries/economies might start by funding the development of more ECEC places to meet demand while allocating sufficient

resources to support quality, including through the development and training of early childhood educators. This can be supported by progressive funding systems that give greater priority to the public funding of the early years.

Promoting positive attitudes towards learning among disadvantaged students

EaP countries/economies might also consider **policies that promote positive attitudes towards learning among disadvantaged students**. Resilient students are more motivated to learn academic subjects, are more engaged with them and have greater self-confidence in their ability to learn (OECD, 2011[48]). As findings from the OECD Survey on Social and Emotional Skills show, positive attitudes are associated with better performance in reading and mathematics in Ukrainian regions. While these socio-emotional skills are important in themselves, they also matter in improving performance (OECD, 2024[49]).

Policy tools that can be used to promote these kinds of positive attitudes include **programmes designed to increase disadvantaged students' confidence in their academic abilities**. For example, these programmes can challenge false perceptions of inability among disadvantaged students and teach instead that intellectual abilities can be developed (i.e. a growth mindset) (Yeager et al., 2019[50]). Career guidance can also be an important area in which to raise awareness of the importance of education and its benefits. **Programmes that facilitate interactions between disadvantaged students and individuals who work in scientific industries** may help disadvantaged students believe they can do well in school and use what they have learnt in their real life outside of school. For example, high-quality mentoring programmes have been shown to be beneficial, particularly for disadvantaged students (DuBois et al., 2002[51]). In all EaP countries/economies, disadvantaged students are less likely to expect to complete a tertiary degree than their advantaged peers, indicating low aspirations. These types of specific interventions could be integrated into existing initiatives. In Georgia, for example, all schools are now required to develop support programmes to assist students with low achievement who are often from disadvantaged backgrounds.

Finally, **scholarships for disadvantaged students that reward academic achievement can be a way to shape students' attitudes to learning and raise their aspirations**. In Colombia, for example, a scholarship programme supported the best students from the most disadvantaged households to access tertiary education. The programme contributed to reducing the socio-economic gap in access to tertiary education and improving the performance of disadvantaged students in the final school leaving examination, influencing students' efforts and attitudes to learning (Radinger et al., 2018[52]).

Building Block 4: Tackle gaps in education opportunities between rural and urban students

In all EaP countries/economies except Baku, a large share of students sampled in PISA attend schools in rural areas and these students perform worse than their urban peers. Rural-urban gaps in performance are particularly pronounced in Moldova, the country with the second-highest share of rural students in PISA 2022. Extrapolating from long-term trends in the share of the rural population, the share of rural students is likely to remain high in the country (World Bank, 2024[53]).

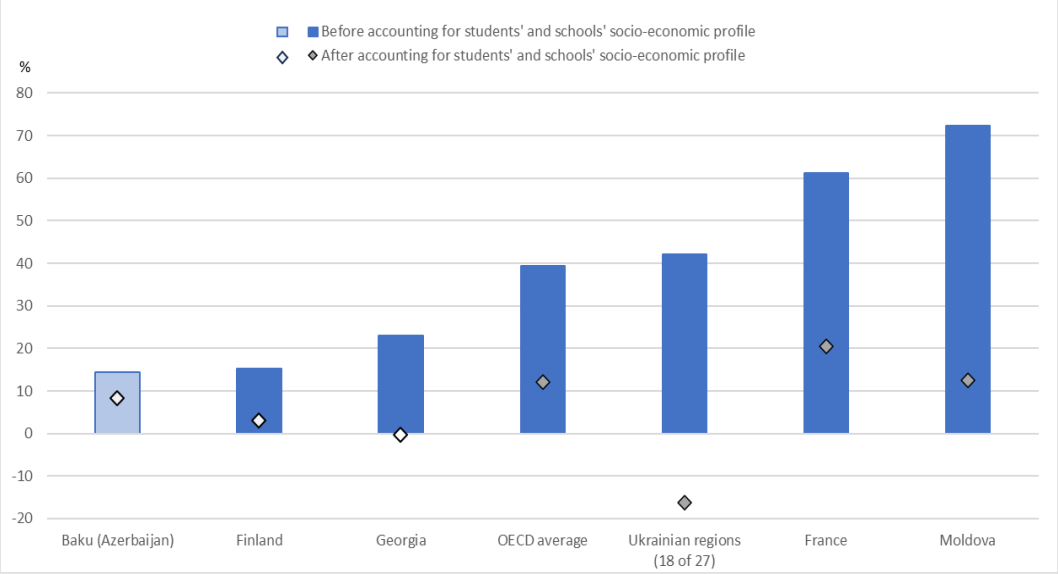
In Baku, the number of rural students in the PISA sample is very small by design. However, when Azerbaijan participated in PISA 2009 as a country, a sizeable share of the students attended a rural school. More recent data show that while the share of the rural population has been declining, still 42% of the population lives in rural areas (World Bank, 2024[53]). Other analysis likewise points to disparities in poverty and educational outcomes between rural and urban areas in Azerbaijan (World Bank, 2020[47]). Therefore, the lessons shared in this recommendation are relevant to all EaP countries, including Azerbaijan.

To improve learning opportunities for rural students, **EaP countries could consider designing a targeted policy for rural education in consultation with rural communities**. Each rural context is unique and, even within rural areas, there are different needs, from remote schools to rural schools at the urban fringe. Still, there are insights from international experience that EaP countries/economies could learn from. A rural education policy in EaP countries/economies could incorporate three aspects:

- **Connecting rural education policies with other mutually reinforcing regional and economic development policies**. In many countries, including EaP countries/economies, disadvantages in learning opportunities for rural students overlap with their socio-economic disadvantage. Improving the chances of rural students benefits from integrating interventions for rural education with other policies, such as regional development and innovation policies. For example, vocational education can support the development of specific economic sectors in rural areas by supplying the skills businesses need to operate. Integrating entrepreneurship education in rural schools can support the creation of local businesses (Echazarra and Radinger, 2019[54]).
- **Exploiting the potential of digital technologies**. The benefits of digital technologies for student learning depend on teachers' capacity to engage with these tools, as highlighted above. For rural schools, however, digital tools can make up for shortcomings that are otherwise difficult to address, such as offering student enrichment courses or opportunities for professional exchange for teachers. These might otherwise not be available due to the small size of schools (Echazarra and Radinger, 2019[54]). However, as the analysis of the PISA data for this report shows, the potential of digital technologies currently seems to be underutilised in some EaP countries/economies, such as Georgia and Moldova. In both countries, PISA data suggest disparities in digital resources between rural and urban schools. A first step would be to equalise access to digital resources.
- **Reviewing the organisation of the school network**. Rural education policies also need to consider strategies for organising rural school networks. As highlighted above, small schools, which make up a large share of rural schools in both countries, tend to perform worse than large schools, although performance differences can be accounted for to a large extent by generally students' and schools' socio-economic profiles (Figure 5.2). School network reorganisation strategies must ultimately demonstrate that they benefit rural students. When engaging in reorganisation, countries need to draw on a broad spectrum of strategies, from resource sharing and co-operation to clustering and consolidation, involve local communities and consider student transportation (OECD, 2018[5]). Moldova has already committed to reorganising its school network as part of its Education Development Strategy 2030 (OECD, 2023[16]).

Figure 5.2. Students in large schools outperform students in small schools due in part to their higher socio-economic profile

Differences in mathematics performance between students in large and small schools, before and after accounting for socio-economic profile of students and schools



Notes: Statistically significant score changes are shown in a darker tone.
Countries and economies are ranked in ascending order of score difference in mathematics performance between students in large and small schools before accounting for students' and schools' socio-economic profiles.
Source: OECD (2022[35]), *PISA 2022 Database*, https://www.oecd.org/en/data/datasets/pisa-2022-database.html.

StatLink https://stat.link/chv0ty

Building Block 5: Support language minority students (Georgia and Moldova)

In EaP education systems, linguistic diversity is more prevalent than diversity by immigrant background. PISA data indicate that **students from minority language backgrounds in Georgia and Moldova struggle academically, partly due to lower socio-economic conditions**. In Baku and Ukrainian regions, PISA 2022 does not show significant differences in mathematics performance by students' language background.

To support these students, both Georgia and Moldova have implemented various programmes. For over two decades, Georgia has prioritised education for minority integration, introducing bilingual teaching and improved second language textbooks (Burduli, 2021[55]). Moldova has also provided intercultural training for teachers and educational materials in minority languages (Council of Europe, 2023[56]). Despite these efforts, learning disparities persist, suggesting the need for additional measures, such as:

- **Enhancing initial teacher education** to include cultural anthropology, social psychology, child cognitive development and second language acquisition for teachers. Existing teachers could benefit from professional development in equity, inclusion and diversity to better engage with students and parents from minority backgrounds (OECD, 2023[57]). Some countries, recognising the importance of preparing teachers for diverse student backgrounds, have reformed their teacher education programmes. For example, Denmark now requires all teachers to be trained in special needs and second language instruction (OECD, 2019[19]). This can also improve the communication between teachers and parents who speak a different language (Lawal, 2021[58]).

- **Employing dedicated support staff**, such as bilingual assistants, to address the language needs of students whose first language is not the school's language of instruction. These staff can collaborate with teachers in a co-teaching model to tailor instruction to all learners, including those from minority language backgrounds (OECD, 2023[57]; Masdeu Navarro, 2015[59]).

Building Block 6: Expand access to secondary schools (Baku and Georgia)

To ensure all students, especially those from disadvantaged backgrounds, reach a minimum skill level, they must first access and successfully complete their secondary education. In EaP countries/economies, education coverage (i.e. the proportion of 15-year-olds who are enrolled in school at Grade 7 or above) is nearly universal in Moldova, but in Baku and Georgia, over 10% of 15-year-olds are not enrolled in school, though Georgia has shown improvement over time. **Both countries/economies need to reinforce efforts to ensure all 15-year-olds have access to secondary education**.

Improving secondary school enrolment may involve various policy measures, such as improving the quality of earlier education stages. Students who struggle early are at a higher risk of dropping out before reaching secondary education. In Baku, it is particularly important to ensure timely school entry, as a high percentage of students report starting school at age 7, indicating early entry challenges. Additionally, the design of the school system and economic support for students and their families play important roles in student progression and completion rates. Several options exist for Baku and Georgia to consider:

- **Extending compulsory schooling**: Baku could increase the compulsory schooling age, which currently ends at 15 years, the earliest among EaP systems and earlier than most OECD systems. While extending compulsory education, as seen in Georgia, which goes until age 18, signals the importance of schooling, it alone may not sufficiently boost secondary school enrolment.
- **Strengthening vocational education and training (VET)**: Both Baku and Georgia could improve the quality and relevance of their VET programmes in secondary education. Offering diverse educational pathways is essential to cater to different learner types, including those who struggle academically (Stronati, 2023[60]). Developing skills needed to transition to green and digital economies is also important. However, vocational options in both Baku and Georgia appear to be underdeveloped. The low share of vocational students in the PISA sample also evidences this. Both countries/economies have recognised VET as a priority, implementing policies to better involve employers, elevate VET status and upgrade the skills of VET trainers (Majidova and Petrivska, 2023[61]; MoESCS, 2020[62]). While difficult to replicate, well-developed VET systems such as Germany and Switzerland could provide inspiration for strengthening VET and creating strong work-based learning opportunities.
- **Implementing conditional cash transfers (CCTs)**: Baku and Georgia could introduce CCTs to encourage participation in secondary education. Given that poverty is a major barrier to educational engagement – disadvantaged students face higher levels of socio-economic challenges in both Baku and Georgia compared to the OECD average – CCTs could mitigate some of the financial obstacles preventing youth from continuing their education. Evidence from other middle-income countries shows that CCTs significantly increase enrolment and attendance while reducing dropout rates, particularly in secondary education (García and Saavedra, 2017[63]).

Building Block 7: Foster student well-being at school, especially among girls and disadvantaged students

Even though more than half of students in EaP countries/economies report positive well-being as measured by their sense of belonging at school, **students' sense of belonging at school is weaker in**

EaP countries/economies than on average across OECD countries. This is particularly acute when it comes to student loneliness (e.g. a higher share of students reporting "I feel lonely at school") and social ties (a lower share of students reporting "other students seem to like me"). In addition, **disparities in the sense of belonging by student background exist in all EaP countries/economies**. Socio-economically disadvantaged students are less likely to feel they belong at school than advantaged students and girls' sense of belonging at school is lower than boys' (except in Ukrainian regions).

Monitoring student well-being in EaP systems going forward will be important because education systems can make a difference in students' overall development and quality of life. Children in school spend a considerable amount of time in their classrooms, socialising with classmates and interacting with teachers and other school staff. Therefore, how connected they feel to others at school is key to understanding student well-being in its social dimension. Students who feel that they are part of and are accepted by a school community report that their life has more meaning (Juvonen, 2006[64]) and are also less likely to engage in risky behaviours such as substance abuse and truancy (Currie et al., 2012[65]; Resnick, 1997[66]; Schulenberg et al., 1994[67]). **As EaP countries continue to participate in PISA, they could monitor trends in student well-being over time using the wide range of measures that the survey provides**.

In addition to system-level monitoring, **policy makers in EaP countries/economies could promote and support school- and classroom-level practices that bolster student well-being**. Evidence-based interventions to promote student well-being include the following:

- **Interventions to develop quality teacher-student relationships** can effectively foster students' social, psychological and cognitive well-being outcomes (Borman et al., 2021[68]; Cook et al., 2018[69]; Gehlbach et al., 2016[70]). Effective practices include praise, reflective and supportive listening and coaching and validating emotions, among many others (Kincade, Cook and Goerdt, 2020[71]). Training teachers in this area can greatly support teacher-student relationships (Schonert-Reichl, 2017[72]).
- **Interventions and initiatives that nurture friendships among students at school** can also lead to greater well-being in students, including happiness and life satisfaction, belonging, socio-emotional skills, and mental and physical health (Roffey, 2011[73]; Demir et al., 2010[74]; Holder and Coleman, 2007[75]; Thomas, da Cunha and Santo, 2022[76]; Thomas, da Cunha and Santo, 2022[76]; Barker and Galambos, 2003[77]).
- **Programmes to develop students' social-emotional skills** can boost well-being of students of all ages (Bonell et al., 2018[78]; Sklad et al., 2012[79]; Taylor et al., 2017[80]; Wigelsworth et al., 2016[81]). Features that make such programmes more effective are a significant teacher training component, multiple sessions and reinforcement of social-emotional skills both in the curriculum and teacher-student interactions.

Table 5.2. Seven building blocks to improve student learning, equity and well-being: Summary

Findings	EaP country/economy	Policy recommendation
Student learning		
Building Block 1: Focus on ensuring that all students master basic skills		
Low average performance in mathematics, reading and science	All EaP countries/economies	1.1. Increase the level of public investment in school education. Spend these resources effectively and efficiently and monitor the integrity of resource use. Additional investment can be used to advance the teaching profession (see recommendation below), to address shortages of material and physical resources in schools and to target support for disadvantaged students (see recommendation below). 1.2. Develop and raise the status of the teaching profession. This involves: recruiting and retaining talented graduates (e.g. establishing new qualification and training requirements and incentives). Developing the skills of the current teaching workforce (e.g. in student-centred pedagogies and use of new technologies in teaching and learning). 1.3. Create school and classroom environments conducive to learning. This involves: Investing in school leadership. Strengthening parental involvement. Specific to Moldova and Baku: addressing concerns about school safety.
Negative trends in student performance since 2015 or 2018	Performance decline since 2015 in Georgia	
	Performance decline since 2018 in Baku, Moldova and Ukrainian regions	
High proportion of students who do not demonstrate basic proficiency in mathematics, reading and science	All EaP countries/economies	
Building Block 2: Support students in reaching top performance and in their transitions into tertiary education and high-skilled jobs		
Extremely low proportion of students who demonstrate top levels of proficiency in mathematics, reading and science	All EaP countries/economies	2.1. Support students with high academic potential during compulsory education. - Use acceleration and/or enrichment strategies. - Develop teacher capacity to support talented and motivated students (e.g. initial teacher education, professional development, making guidelines and orientation documents available to teachers). - Explore ways to enhance students' attitudes towards learning.
High share of students who expect to complete tertiary education	All EaP countries/economies	2.2. Improve the transition of secondary school graduates into tertiary education. - Provide students with accurate information about academic requirements, financial costs and student aid for different career pathways (e.g. counselling programmes). - Offer professionally oriented programmes at both secondary and tertiary levels. Guarantee co-ordination of the offers across the two levels of education and the relevance of the offers at the tertiary level for the labour market.
Growing interest in ICT professions and declining interest in healthcare professions	Georgia, Moldova, Ukrainian regions (NOT Baku)	2.3. Help tertiary graduates transition into high-skilled jobs. - Develop opportunities for young people to acquire ICT skills and enter this field (e.g. STEAM initiatives in schools). - Develop strategies to rekindle students' interest in healthcare professions.
Equity in education		
Building Block 3: Address socio-economic disparities in education opportunities		
Large differences in student performance between socio-economically advantaged and disadvantaged students	All EaP countries/economies	3.1. Review school funding system to promote equity. - Targeted support for disadvantaged students and schools (e.g. multidimensional support), combined with an allocation that is based on a well-designed formula to promote equity and transparency). 3.2. Promote positive attitudes towards learning among disadvantaged students (e.g. career guidance, programmes designed to increase students' self-confidence and interactions with real-life work).

Findings	EaP country/economy	Policy recommendation
Socio-economic gap in ECEC attendance	All EaP countries/economies, particularly pronounced in Georgia	3.3. Invest in high-quality ECEC to meet demand, improve quality (e.g. training of ECEC educators; provision of health, nutrition and parent-involvement services in ECEC centres).
Building Block 4: Tackle gaps in education opportunities between rural and urban students		
Students in rural areas performing worse than urban students	All EaP countries/economies In Moldova: - Share of rural students is higher than most PISA participating countries/economies - Urban-rural gap in performance is more pronounced and not fully explained by socio-economic differences	4.1. Design a targeted policy for rural education in consultation with rural communities. - Connect rural education policies with other mutually reinforcing policies of regional and economic development (e.g. vocational education for rural economic sectors). - Exploit the potential of digital technologies for students and teachers. - Review the organisation of the school network involving local communities.
Building Block 5: Support language minority students (Georgia and Moldova)		
Students who speak a different language at home than at school performing worse	Georgia and Moldova	5.1. Enhance support for language minority students. - Enhance initial teacher education for language minorities. - Employ dedicated support staff, such as bilingual assistants.
Building Block 6: Expand access to secondary school (Baku and Georgia)		
Over 10% of 15-year-olds are out of school	Baku and Georgia	6.1. Ensure all 15-year-olds have access to secondary education: - Baku: increase compulsory schooling age (currently it ends at 15 years). - Baku and Georgia: strengthen VET. - Baku and Georgia: implement conditional cash transfers.
Student well-being		
Building Block 7: Foster student well-being at school		
Sense of belonging at school is lower than on average across OECD countries, particularly low when it comes to social interactions among students (loneliness, being liked by other students)	All EaP countries/economies	7.1. Monitor trends over time in student well-being using PISA measures. 7.2. Promote and support school and classroom-level practices that bolster student well-being (e.g. interventions to develop and nurture quality teacher-student relationships, friendships among students and students' social-emotional skills).
Disparities in the sense of belonging by student background: disadvantaged students and girls are less likely to feel they belong at school than advantaged students and boys)	All EaP countries/economies (no gender gap in Ukrainian regions)	

StatLink https://stat.link/ycvnjz

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Notes

[1] The EaP countries/economies forming part of this report are Baku in Azerbaijan, Georgia, Moldova and 18 of the 27 regions in Ukraine. Any reference to EaP countries/economies, as well as the EaP average, specifically pertains to Baku, Georgia, Moldova and Ukrainian regions. Armenia is also part of the European Union EaP but has not yet participated in PISA, although participation is underway for PISA 2025.

[2] Azerbaijan as a whole country participated in PISA 2006 and PISA 2009, 2006 but has only participated with its capital city, Baku, since PISA 2018.

[3] Eighty-six percent of students in Georgia reported that they expect to complete higher education in PISA 2022. However, the coverage of the PISA sample in Georgia is 82%. If we consider 15-year-olds who are not in PISA, then about 71% of 15-year-olds in Georgia expect to complete higher education (0.86*0.82=0.7052).

PISA

Education in the Eastern Partnership: Findings from PISA

The countries of the Eastern Partnership (EaP) – an initiative between the Member States of the European Union and Eastern European and South Caucasus countries – are navigating significant challenges while striving for sustainable economic growth and social cohesion. Education plays a crucial role in unlocking the potential of digitalisation and the green transition, offering pathways for economic diversification and innovation. This report, developed in co-operation with the European Commission and UNICEF, analyses PISA data for the EaP countries and economies that participated in PISA 2022: Baku (Azerbaijan), Georgia, Moldova, and Ukrainian regions. It identifies the strengths and challenges within these education systems and provides recommendations on how to build more resilient, equitable, and high-performing systems to support economic and social goals. This report will be of particular interest to policymakers and stakeholders dedicated to advancing education across the Eastern Partnership region.

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