Value for Money in School Education

SMART INVESTMENTS, QUALITY OUTCOMES, EQUAL OPPORTUNITIES

OECD

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Foreword

Policy making has always been a matter of making choices, managing trade-offs and balancing multiple goals and priorities to make complex decisions with budgetary implications. But against this background, the past few years have seen an unprecedented surge in the number of new priorities facing policy makers. While ageing populations and the impact of changing demographics on social and health public expenditure is a well-established trend, the past two decades have also seen the emergence of digitalisation and climate change as key areas of interest and intervention for public policy and investment.

But beyond these deep structural megatrends, a number of unanticipated external shocks in recent years (or months) have heightened the pressure on and competition for public budgets. The COVID-19 pandemic has strained healthcare budgets and put stress on economies world wide. As countries emerge from the pandemic, the recovery in the economy, but also in the health or education sectors will require significant budgetary resources. Meanwhile, the urgency of the green transition is growing, and soaring energy prices in the context of Russia's war of aggression against Ukraine call for a fast-track energy transition in OECD countries, especially those based in Europe. But this volatile and uncertain geopolitical situation is also having an impact on the global economy at large, calling for governments to mitigate negative impacts, as well as on defence expenditure in several OECD countries.

In this context, governments face mounting pressure to enhance the efficiency of their public spending to be able to address these different priorities, and they will be required to make complex budgetary decisions. Education will be no exception.

There is a strong case for public investment in education as high-quality education leads to a range of economic outcomes, including higher productivity, innovation and long-term economic growth, as well as broader social outcomes for both individuals and society, such as improved quality of life and citizenship, and enhanced resilience of individuals and societies in front of emergencies. Resilient and equitable education systems are a cornerstone for more inclusive and equitable societies that can adapt to change, respond proactively to emerging challenges and ensure that no one is left behind. But while sustained high-quality education is a long-term investment in the knowledge, skills and competencies that will continue to enable individuals and societies to thrive and recover from disruptions, education ministries will nevertheless need to rethink the way they invest in education to make their investments smarter and ensure that education systems deliver greater value for money.

This publication describes and emphasises the wealth of economic returns and broader social outcomes derived from high-quality education. Indeed, beyond economic benefits, high-quality education pays off for individuals, communities and societies in significant and diverse ways. But investing in quality education that translates into better and more relevant skills requires a smart use of a range of policy levers that can help bring about greater value from the money invested in education. This publication highlights in particular the importance of governing and distributing school funding efficiently for seizing the benefits of education investments; using school funding to achieve equity alongside greater efficiency; and planning, monitoring and evaluating the use of school funding and its efficiency.

In order to make smarter investment decisions, enhanced collaboration between ministries of finance and ministries of education is ever more critical, particularly in times of fiscal tightening and scrutiny. This report builds on the background notes for, and discussions at, the *High-Level Seminar on Value for Money in Post-COVID Education* organised on 16 February 2022 by the OECD Directorate for Education and Skills and the OECD Economics Department, in co-operation with the French Ministry in charge of Education and the French Ministry in charge of Finance. The seminar brought together senior representatives of ministries of finance and education across the OECD in a dialogue around key themes in the area of educational efficiency and funding for more equitable and inclusive education. The seminar and this report have built upon OECD expertise on structural growth determinants at the OECD Economics Department, and various work streams from the Directorate for Education and Skills, more specifically on the resourcing of school education (developed as part of the OECD School Resources Reviews), effective public budgeting, and education outcomes' measurement. In particular, the report draws on data from the Programme for International Student Assessment (PISA) and the Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC), as well as on internationally comparable education indicators published in *Education at a Glance*.

This report would not have been possible without the leadership and generous support from the French Ministry in charge of Education, which supported the High-Level Seminar underpinning its content. The background notes prepared for the seminar that underpin this report have also benefitted from valuable suggestions from government officials at the French Ministry in charge of Education and Ministry in charge of Finance. The OECD expresses its gratitude for this leadership and support by the French authorities, including the Minister of Education who spoke at the Seminar.

The authors wish to thank the OECD Secretary General Mathias Cormann, Deputy Secretary General Ulrik Vestergaard Knudsen, Chief-Economist Laurence Boone, as well as Luiz de Mello and Andreas Schleicher (respectively Directors of the Economics Department Policy Studies Branch and the Directorate for Education and Skills) for the strategic oversight of the *High-Level Seminar* and for their contributions to its discussions and foreword. The development of this report was guided by Paulo Santiago (Head of the Policy Advice and Implementation Division on the Directorate for Education and Skills' side) and David Turner (Head of the Macro-economic Analysis Division on the Economics Department's side), and led by Karine Tremblay (Senior Analyst in the Directorate for Education and Skills).

Karine Tremblay prepared the Overview of this report and provided guidance and extensive comments for all chapters. Chapter 1 was co-authored by Balázs Egert and Christine de la Maisonneuve (respectively Senior Economist and Economist in the Economics Department). Andreea Minea-Pic (Analyst in the Directorate for Education and Skills) authored Chapter 2. Thomas Radinger (Analyst in the Directorate for Education and Skills) is the lead author of Chapters 3 and 4, with input from Luka Boeskens (Analyst in the Directorate for Education and Skills), who was also the lead author of Chapter 5. The authors also want to acknowledge colleagues from the Directorate for Education and Skills for their valuable input for various report analyses, namely Lucie Cerna, Diana Toledo Figueroa, Stéphanie Jamet and Miyako Ikeda. The chapters also benefitted from comments, contributions and feedback provided by Paulo Santiago, David Turner, Balázs Egert and Christine de la Maisonneuve. Daiana Torres Lima co-ordinated the report production and administrative aspects, with support from Rachel Linden and Clara Young for report production, editing and communications, alongside Katharina Meyer in the editorial process.

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Abbreviations and acronyms

AAS	Associate in Applied Science
AEP	Asignación de Excelencia Pedagógica
AHS-O	Allgemein bildende höhere Schule – Oberstufe [upper secondary academic secondary school]
AHS-U	Allgemein bildende höhere Schule – Unterstufe [lower level of academic secondary school]
BER	Building the Education Revolution
CRA	Colegios Rurales Agrupados [rural schools]
DEIS	Delivering Equality of Opportunity in Schools
DEPP	Direction de l'Evaluation, de la Prospective et de la Performance [Department of Evaluation, Foresight and Performance]
E2C	Écoles de la 2e Chance [second chance schools]
ECDF	Evaluación de Carácter Diagnóstico Formativo [Diagnostic and Formative Evaluation]
ECEC	Early childhood education and care
EFW	Education Finance Watch
EMIS	Education Management Information System
FFIE	Fondo de Financiamiento de la Infraestructura Educativa [Educational Infrastructure Fund]
FGU	Preparatory Basic Education and Training
FUNDEB	Fundo de Manutenção e Desenvolvimento da Educação Básica [Maintenance and Development Fund for Basic Education]
FUNDEF	Fundo para Manutenção e Desenvolvimento do Ensino Fundamental e Valorização do Magistério [Maintenance and Development of Basic Schools and the Valorisation of the Teaching Profession]
GDP	Gross Domestic Product
LOI	Learning Opportunities Index
MYS	Mean Years of Schooling
MTEFs	Medium-Term Expenditure Frameworks
NMS	Neue Mittelschule [New Secondary School]
PER	Programa de Educación Rural [Rural Education Programme]
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
RTLB	Resource Teachers: Learning and Behaviour
SCHEP	Schulentwicklungsprogramm [long-term school development programmes]
SES	Socio-Economic Status
SGP	Sistema General de Participaciones [General System of Transfers]
TALIS	Teaching and Learning International Survey
TFP	Total Factor Productivity
V4M	Value for Money
VET	Vocational education and training
ZEP	Zones d'Éducation Prioritaire [Priority Education Zones]
ZER	Zona Escolar Rural [Rural Education Zones]

Executive summary

The fiscal response of OECD governments to the COVID-19 crisis has been swift, strong and decisive. Across the OECD, governments have committed billions of dollars to support public health systems, and protect their economies and populations from the economic impact of the crisis. While the impacts of the pandemic are still lingering, Russia's war of aggression against Ukraine has been dragging down global growth and putting additional pressure on inflation. Global Gross Domestic Product (GDP) stagnated in the second quarter of 2022 and output declined in the G20 economies while high inflation is persisting longer than expected.

Against the backdrop of this dim economic outlook, finance ministries face complex choices and a growing number of competing budgetary priorities. While investment in education is a crucial element in the economic and social recovery from the pandemic and the consequences of the current geopolitical and economic turmoil, ensuring value for money in education investment will likely become more important in the future. Education ministries will need to make a good case for educational expenditure, demonstrate their efficient use of resources and search for ways to deliver greater value for money.

International evidence, including that of the OECD's Programme for International Student Assessment (PISA), suggests that there is a lot that countries can learn from one another to make better spending choices in education. Indeed, some school systems are achieving excellent education results with modest levels of resources while others have increased spending without measurable improvements in student learning outcomes. Beyond a certain level of investment, enabling all students to succeed hinges on the ability to direct resources effectively to where they matter the most. Determining the optimal allocation of resources involves complex trade-offs, an ongoing reflection on education priorities and policies that are aligned with governance arrangements at different levels of the school system.

The successful implementation of such policies requires careful policy design, effective communication and inclusive stakeholder involvement. Education ministries are uniquely positioned to address these challenges, connect resourcing strategies to education priorities, and build strong partnerships to work towards them. Finance ministries, on the other hand, can play a key role in supporting education ministries with relevant expertise during the budgeting process, in identifying efficiency gains and working towards aggregate fiscal integrity. At times of increased fiscal scrutiny, strengthening the collaboration between ministries of finance and ministries of education is therefore crucial.

It is with this goal in mind that the OECD and the French authorities organised a *High-Level Seminar on Value for Money in Post-COVID Education* on 15 February 2022, bringing together representatives of Ministries of Finance and Education from across the OECD for an inter-sectoral dialogue to exchange perspectives and address common challenges. The event was organised by the OECD Directorate for Education and Skills and the OECD Economics Department in co-operation with the French Ministries in charge of Education and Finance. This report builds on the background materials prepared for the international seminar and the discussions it inspired on key issues in educational efficiency – what we know, what we do not know, and how we can use the tools at our disposal to move beyond the status quo.

Following an Overview laying out the context for this report, the following chapters take stock of the economic returns to education and its broader social outcomes for individuals and society, thereby making the case for continued public investment in education. The report then focuses on key policy levers that can help to bring about greater value for money invested in education, namely: governing and distributing school funding to make the most of education investments; achieving equity in education alongside greater efficiency; and planning, monitoring and evaluating the efficient use of school funding.

Chapter 1 takes a closer look at the *Importance of Human Capital for Economic Outcomes*. Boosting human capital through education features prominently among many countries' structural policy priorities identified by the OECD. Sustained high-quality education constitutes a long-term investment in the knowledge, skills and competencies of people, leading to higher productivity, earnings and quality of life for individuals. At the macro level, a well-educated workforce is a key contributor to greater aggregate productivity, innovation and long-term economic growth. The chapter reviews the empirical evidence on the link between human capital and economic outcomes and presents an improved measure of human capital, which incorporates both quality and quantity dimensions drawing on data from PISA and the OECD Survey of Adult Skills (PIAAC). The analysis suggests that increasing human capital (and particularly its quality dimension) could yield substantial long-term productivity gains, although they may take longer to materialise than for other policies.

Chapter 2 goes beyond the economic benefits of education to consider the *Broader Social Outcomes of Education for Individuals and Society*. High-quality education pays off for individuals, communities and societies beyond economic outcomes. Better-educated individuals live longer and healthier lives. They become more engaged citizens and are more likely to take action for collective well-being. Sustained high-quality education also supports communities. It can make them more resilient to emergencies, such as the COVID-19 pandemic, and better at proactively addressing emerging challenges, such as climate change. Education can also help societies to adapt creatively to change and to make the most of new opportunities, such as the digital transformation. The broader social outcomes of education thus include both private benefits (e.g. better health, better opportunities for one's children) and societal ones, as private benefits translate into positive externalities and collective benefits.

Chapter 3, *Governing and Distributing School Funding*, then turns to the examination of smart ways of investing in education. The chapter considers how governance arrangements and allocation mechanisms can help to ensure the efficient and equitable resourcing of schools. Once school systems have a sufficient overall level of funding available, it is critical to direct those resources to where they are needed the most. The chapter examines whole-system approaches to managing the complexity of school funding governance in the context of fiscal decentralisation and growing school autonomy. It also presents a series of questions that education systems need to address when designing school funding allocation mechanisms, highlighting the potential of needs-based funding formulas. Finally, the chapter underlines the importance of adequate regulatory frameworks for the public funding of private providers to mitigate unintended consequences and harmful effects on equity.

Chapter 4 addresses the challenge of *Using School Funding to Achieve Both Efficiency and Equity in Education*. Most countries strive to improve access, quality, equity and efficiency for their education systems. However, pursuing these objectives simultaneously is a challenge for policy makers. The pursuit of equity and efficiency in education has often been presented as a trade-off when it comes to the allocation of resources. Nevertheless, efficiency and equity in education can go hand in hand, and the chapter examines how to bring the two together through insights and promising policies from OECD countries in four areas: investing in high-quality early childhood education and care; investing in teacher quality; reducing educational failure; and adapting school networks to changing demand.

Chapter 5 focuses on *Planning and Monitoring the Use of School Funding to Improve Equity and Performance*. Planning, monitoring and evaluating education spending is essential to enhance value for money and develop financially sustainable budgets that support the provision of high-quality education and

address policy priorities. The chapter discusses how education and finance authorities can work together to ensure the alignment of budget planning procedures with education strategic priorities. It also highlights case studies of OECD countries that have effectively used evaluations, spending reviews and monitoring processes to inform a more effective use of school funding.

Overview

On 16 February 2022, the OECD Secretary General, Mathias Cormann, opened a virtual *High-Level Seminar on Value for Money in Post-COVID School Education* that brought together high-level decision makers from Ministries of Education and their counterparts from Ministries of Finance, including several Vice-Ministers and Directors-General. The event was convened at the initiative of the French authorities, under the auspices of the OECD Directorate for Education and Skills and the OECD Economics Department on the one hand, and the government of France on the other.

OECD countries emerged from the COVID-19 pandemic severely indebted, and owe it to future generations to invest in their future…

This High-Level Seminar emerged from the acknowledgement that as OECD countries emerged from the COVID-19 pandemic severely indebted, having spent billions of USD to support healthcare systems and the economy, they owed it to future generations to invest in their future to compensate for the debt incurred.

Indeed, the fiscal response of OECD governments to the COVID-19 crisis has been swift and strong. Across the OECD, governments have committed billions to support public health systems, prevent business failures and shield households from the impact of the crisis. Substantial resources will continue to be needed for the health sector and the economic recovery over the coming years, hence finance ministries will be faced with complex choices in seeking to balance short-term and long-term economic and social goals. As other areas of public policy, education is likely to face growing pressure for cost containment and trade-offs in future budgetary discussions.

On the positive side, from an economic perspective, sustained high-quality education constitutes a long-term investment in the knowledge, skills and competencies of people, which leads to higher productivity, earnings and quality of life for individuals. At the macro level, a well-educated workforce is a key factor in achieving greater aggregate productivity, innovation and long-term economic growth. Beyond these direct economic benefits, there are also a wide range of broader social returns to education, many of which are crucial to make individuals and societies more resilient to respond to future emergency situations such as the COVID-19 crisis. These include better public health and citizenship outcomes as well as the ability to adapt to change and respond creatively to disruptions. Taken together, these direct and indirect benefits of education make a strong case for public support to education.

But education has suffered during the pandemic, questioning how to use this crisis as a stepping stone to rethink education systems and adapt them for the future…

Yet, education has suffered during the pandemic and comes out of it facing a number of traditional and more recent challenges (OECD, 2021[1]) (De La Maisonneuve, Egert and Turner, 2022[2]).

In many systems, mass school closures during the first stages of the pandemic affected the most vulnerable students, thus exposing and amplifying enduring challenges of equity. The pandemic has also

underlined some important shortcomings of past education, with so many youths and adults lacking basic critical thinking and information literacy skills, and being lured by disinformation and manipulative complot theories. Last but not least, the pandemic has also emphasised the importance of the socialisation function of education, and the need to support not only the cognitive development of students, but also the development of a range of social and emotional skills, values and attitudes to prepare them to thrive in adverse circumstances.

Students have not been the only education stakeholders to suffer. During the pandemic, teachers have put in massive effort to maintain some education continuity for their students, investing time to train in using digital technologies, responding to new demands such as providing socio-emotional support to their students and devising catch up strategies for those who had fallen behind. But the well-being of educators themselves has become an issue, as many came out of the pandemic drained by two years of education disruptions, high workloads and exposure to the virus, leading some to leave the profession and fuelling teacher shortages in many countries.

As education systems returned to some form of normality in early 2022, education policy makers worldwide were therefore pondering how to use this crisis as a stepping stone to rethink their education systems in order to adapt them to the world of tomorrow and enhance their efficiency.

This reflection takes place in a context of mounting pressure to enhance efficiency in public spending…

Ensuring value for money and efficiency in public spending is a growing imperative, as there will be many competing demands on public budgets in the coming years. Indeed, the *High-Level Seminar on Value for Money in Post-COVID School Education* was held on 16 February 2022, at a time when OECD countries were emerging from the pandemic, and support to the economic recovery, healthcare, ageing and green transition expenditure were the top priorities of policy makers. But this tight budgetary context was exacerbated less than a week later with Russia's war of aggression against Ukraine on 24 February 2022, and its economic, social and geopolitical implications. Seven months down the road, it is now clear that this external shock will have a long-lasting impact on the global economy and OECD countries.

The September 2022 OECD Economic Outlook reviewed some of the short- and medium-term impacts of the war in Ukraine (OECD, 2022[3]). For a start, the conflict and its many ramifications have stalled the momentum of the global economy, which was bouncing back from the COVID-19 outbreak. GDP growth is projected to slow in both 2022 and 2023 in most G20 economies. The war has also accelerated inflation, first and foremost on energy prices, but also for metal and food products, which Ukraine was a large exporter of. Disruptions to supply chains, which were already prevalent in the aftermath of the pandemic, have worsened initially, although there are now signs that bottlenecks are easing. Coupled with the tripling of energy prices over the past year and the possibility of an energy crunch in Europe during the Winter 2022-23, this could hinder industrial activity and continue fuelling inflation, especially for energy-intensive sectors. Meanwhile, nominal wage growth failing to keep pace with inflation, combined with rising interest rates to lower inflation, are putting pressure on household real disposable income in many OECD economies, curbing private consumption growth.

These recent developments could have long-term effects, not only for OECD economies, but also for public budgets as described in various recent reports and analytical pieces (Rogoff, 2022[4]; OECD, 2022[3]):

- First, stalled economic growth in many OECD economies can be expected to dampen fiscal revenues, depending on the extent to which higher-than-expected inflation-related revenue gains compensate the slowdown of economic activity (OECD, 2022[3]). Should the decrease in fiscal revenues materialise, this could fuel public deficits and the public debt burden.

- Indeed, in a context of high inflation, raises in interest rates to curb it down translate into higher public debt service costs for governments.
- High inflation on energy and some commodities' markets will also require public support to cushion the immediate impact of higher food and energy costs for consumers and businesses. As of September 2022, the OECD reported that several large European countries have already announced successive support packages that cumulatively amount to 2% of GDP, or more, and are likely to continue well into 2023 at least. Additional support measures for next year have already been announced in Germany, France, and the United Kingdom (OECD, 2022[3]).
- In relation to energy, the Ukraine war and its ramifications has exposed the dependence of European economies on Russian energy. Climate change (IPCC, 2022[5]), combined with the sudden drying of Russian energy flows, is now forcing OECD governments, especially in Europe, to accelerate and fast-track their energy transition. This will require investments in greener energies and energy efficiency, including clean energies, greener transports and buildings energy efficiency. Public spending will be needed to advance, support and incentivise the energy transition, e.g. for the renovation of public buildings, low-carbon energy and transport infrastructures, and steering private investments through tax incentives or financial support (International Energy Agency, 2022[6]).
- In the industry sector, major supply chains disruptions during the pandemic and since the invasion of Ukraine have raised discussions on relocating some strategic industries (e.g. pharmaceutical products or semiconductors) in advanced economies. Proponents of such strategies emphasise the need to make supply chains more resilient to external shocks, while others underline that such a move would take time, be costly and deglobalisation forces also entails risks on geopolitical stability (Rogoff, 2022[4]). At any rate, this would likely incur costs to public finances.
- Another emerging priority for public finances relates to military and defence expenditure, following several decades of decrease since the end of the Cold War in 1990. There is now emerging evidence of growing military expenditure in the new geopolitical context (Clements and Gupta, 2022[7]) (NATO, 2022[8]).
- Last but not least, social expenditures are likely to remain high priorities for public budgets in managing the consequences of the economic downturn for workers, as well as the refugee crisis.

Taken together, these forces might jointly translate into greater competition for public funds and a tighter budgetary environment. Clement and Gupta emphasise the challenging environment facing policy makers, given the post-COVID-19 fiscal consolidation context. They argue that "*the scope for raising taxes in (advanced) economies is non-existent (…) one potential option would be to restrain the growth in age-related spending on health and pensions, but this would require politically difficult reforms that are unpopular with a key electoral group. The other step would be to save resources by curtailing relatively inefficient programmes. This too will be difficult*" (Clements and Gupta, 2022[7]). Rogoff reaches a similar diagnosis: "*with an apparent end to the peace dividend that has long helped finance higher social expenditures, rebalancing fiscal priorities could prove quite challenging even in advanced economies*" (Rogoff, 2022[4]).

This context makes the search for efficiency gains in public spending both timely and relevant.

The efficiency imperative will impact education as well

Given the many benefits of education for the economy and society at large, investment in education should remain a crucial element in the economic and social recovery from the COVID-19 crisis. This is evidenced by the European Parliament call on EU member states to spend at least 10% of the *NextGenerationEU* recovery plan and stimulus package funds on education (European Parliament, 2021[9]).

But in a context of competing budgetary priorities and fiscal consolidation, ensuring value for money in its use is also increasingly imperative. The pressure on policy makers to enhance the efficiency of public spending is likely to affect all sectors in the coming years, including education. Education ministries will need to be able to make a good case for educational expenditure, demonstrate their efficient use of resources and search for ways to deliver greater value for money. Preparing for the aftermath of the COVID-19 crisis and Russia's war of aggression against Ukraine will require building on successful innovations emerging from the pandemic and refocussing educational priorities to where investment adds most value.

This report on *Value for Money in Education: smart investments, quality outcomes, equal opportunities* aims to inform some of the choices that policy makers will face in the years to come. There is a need to better understand the diverse benefits of investments in quality education, for the economy, but also for society, and therefore how to foster excellence as well as equity in educational opportunities irrespective of personal contexts. This requires rethinking how investments in education are channelled to where they have most impact and engaging more systematically into policy evaluation in the education area. Indeed, international comparisons suggest that large education budgets alone do not guarantee better performance, and beyond a certain level of investment, enabling all students to succeed hinges more on the ability to direct resources effectively to where they matter the most.

Determining the optimal allocation of resources involves an ongoing reflection on educational priorities and policies that are attuned to governance arrangements at different levels of the school system. The successful implementation of such policies requires careful policy design, effective communication and inclusive stakeholder involvement. Education ministries are uniquely positioned to address these challenges, connect resourcing strategies to educational priorities, and build strong partnerships to work towards them. Finance ministries, on the other hand, can play a key role in supporting education ministries with relevant expertise during the budgeting process, including to identify potential efficiency gains and work towards aggregate fiscal integrity. At times of increased fiscal scrutiny, strengthening the collaboration between ministries of finance and ministries of education is therefore more important than ever.

But in addition to inter-sectoral collaboration, there is also a lot that countries can learn from each other and international collaboration in terms of making effective spending choices in education. This report provides some promising directions and showcases policy examples that can be a source of inspiration for policy makers in their efforts to enhance both equity and efficiency in their education systems and meeting the key challenges facing them.

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1 The importance of human capital for economic outcomes

Human capital is widely regarded as a fundamental input in growth theory. Furthermore, recommendations to boost human capital feature prominently among structural policy priorities identified by the OECD for a number of countries. However, the empirical evidence linking human capital with macroeconomic outcomes has been problematic. This chapter first provides an overview of the role of human capital in determining economic outcomes and reviews existing evidence on this topic. It then presents a new measure of human capital based on OECD education data surveys, which better incorporates both quality and quantity dimensions. Drawing on the proposed measure of human capital, this chapter suggests a substantial scope for long-run productivity gains from human capital, with a larger effect from quality as compared to quantity improvements, although the lags are typically much longer than for other policies that boost productivity.

Introduction

The fiscal response of OECD governments to the COVID-19 crisis has been swift. Across the OECD, governments have committed billions of dollars to support public health systems, prevent massive business failures and protect households from the impact of the crisis. The additional spending (or forgone revenue) amounts to around 10% of Gross Domestic Product (GDP) on average in OECD countries over 2020-2021, with wide disparities across countries (IMF, 2022[1]). The aid to the health sector represents on average 1.5% of GDP. Public debt ratios in 2023 are projected to exceed 2019 levels considerably (by 15 percentage points in the median OECD economy) (OECD, 2022[2]). They will need to be adjusted over the medium term given future demands on public finances from long-term trends such as ageing populations (Guillemette and Turner, 2021[3]) and climate change. Boosting growth will help reduce the debt-to-GDP ratios. However, more recent developments related to the consequences of Russia's war of aggression against Ukraine are likely to further strain public finances. While stagnating economic growth will lower fiscal revenues, increased expenditures are expected in many OECD countries: rocketing energy costs call for efforts to support households and small businesses, rising interest rates put pressure on public debt, and spending on defence gains new priority in the new geopolitical context (OECD, 2022[4]; NATO, 2022[5]).

Substantial public resources will continue to be needed to support the health sector further, to address the economic consequences of the new geopolitical situation and to accelerate the green and energy transitions in an effort to limit climate change and enhance energy sovereignty. Finance ministries will therefore be faced with complex choices and competing budgetary priorities in seeking to balance short-term and long-term economic, geopolitical, environmental and social goals. In this context, it is useful to undertake a critical assessment of the importance of various pillars of economic growth, and more specifically the importance of education, for economic outcomes.

From an economic perspective, sustained high-quality education constitutes a long-term investment in the knowledge, skills and competencies of people, leading to higher productivity, earnings and quality of life for individuals. At the macro level, a well-educated workforce is a key factor in achieving greater aggregate productivity, innovation and long-term economic growth. Yet, these economic benefits are not always straightforward to measure, in part due to data constraints.

Human capital is widely regarded as a fundamental input in the theoretical growth literature.[1] Furthermore, recommendations to boost human capital feature prominently among structural policy priorities identified by the OECD for a number of countries (OECD, 2021[6]). However, despite this emphasis in both economic theory and policy practice, the empirical evidence linking human capital with economic outcomes has been problematic, especially at the macroeconomic level.

This chapter provides a short overview of the role of human capital in determining economic outcomes, including both microeconomic and macroeconomic evidence, and concludes by summarising a proposal for a new measure of human capital, which better incorporates both quality and quantity dimensions by using OECD data from the Programme for International Student Assessment (PISA) and the Survey of Adult Skills (PIAAC). Incorporating this new measure of human capital within the OECD's standard framework for assessing structural reforms suggests substantial scope for long-run productivity gains from human capital, with greater potential from improvements in the quality than the quantity component of human capital, although the lags are typically much longer compared to other policies that boost productivity.

This chapter is organised around five sections:

- First, the chapter provides a brief account of the literature on the role of human capital for economic outcomes, and its importance as a key structural policy priority in OECD countries.

- Second, the chapter elaborates on the definition of human capital and the conceptual framework underpinning the concept.
- Third, the chapter reviews the empirical microeconomic evidence on rates of return to education for individuals, in terms of employability premia and equilibrium effects.
- Fourth, the chapter outlines the empirical macroeconomic evidence deriving from growth accounting and cross-country regression analyses.
- Finally, the chapter offers a proposal for a new measure of human capital based on OECD PISA and PIAAC and mean years of schooling data and examines the effects of this new measure of human capital on multi-factor productivity.

Human capital is among the main OECD structural policy priorities

The OECD has consistently singled out education and skills development as a key structural policy priority in its economic reviews of OECD and non-OECD countries…

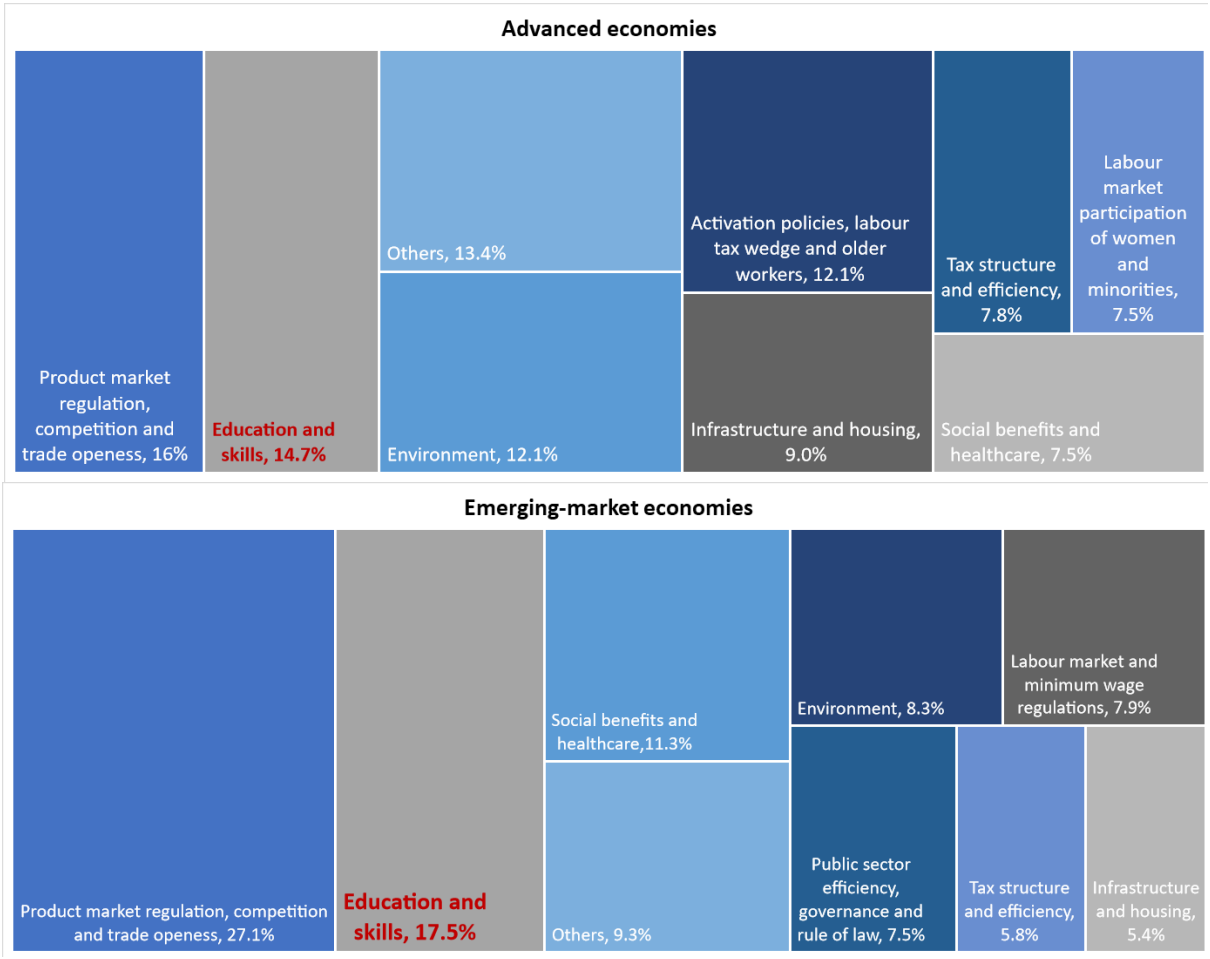
Boosting human capital is one of the main structural policy priorities recommended by the OECD for a large number of OECD and non-OECD countries (OECD (2021[6]) and Figure 1.1.). In both cases, recommendations related to education and skills development account for the second largest share of total policy priorities behind product market reform. Further, the recommendations concern all levels of formal education and training in the workplace (Figure 1.2.):

- **Expanding the quality of pre-school childcare.** Evidence shows that early childhood education and care provide the basis for a child's future skills development and learning. This is particularly true for disadvantaged children (OECD, 2018[7]). Expansion of pre-primary education improves educational attainment, labour market attachment and welfare dependency (Braga et al., 2013[8]; Havnes and Mogstad, 2011[9]).
- **Improving teacher quality**. Within schools, teaching quality is the single most important factor that affects students learning (OECD, 2005[10]). The quality of teachers is an elusive concept that cannot be directly measured reliably, but it has been proxied, for instance, by the share of certified teachers, the PIAAC score of teachers, or teachers' wages, which have all been found to show a positive association with student test scores (Hanushek, Piopiunik and Wiederhold, 2019[11]; Dolton and Marcenaro-Gutierrez, 2011[12]). These findings suggest that teacher quality does indeed matter, although the exact mechanisms at play remain to be investigated.
- **Improving tertiary education**. Tertiary education has an impact on wage earnings of its graduates. Higher education institutions that have the autonomy to manage their financial resources, staff policies and the selection of students have been often shown to achieve better education outcomes (Oliveira Martins et al., 2007[13]).
- **Developing lifelong learning**. While technology is evolving rapidly, workers need to adapt quickly to the new requirements of the labour market. Skills acquired in formal education or in previous jobs become obsolete more quickly. Lifelong learning is key to help workers upgrade and expand their skills and adapt to technological change (OECD, 2021[14]). On average across OECD countries, 57% of medium- and high-income adults participate in adult learning, while only 35% of low-income adults do so (OECD, 2019[15]). Policies should aim at raising the participation of people with low levels of education in lifelong learning. Denmark, Sweden and Norway managed to attain the same participation of workers regardless of income level (OECD, 2019[16]).

This emphasis on education and skills development is consistent with the prominence of human capital as a key driver of productivity and growth in economic theory

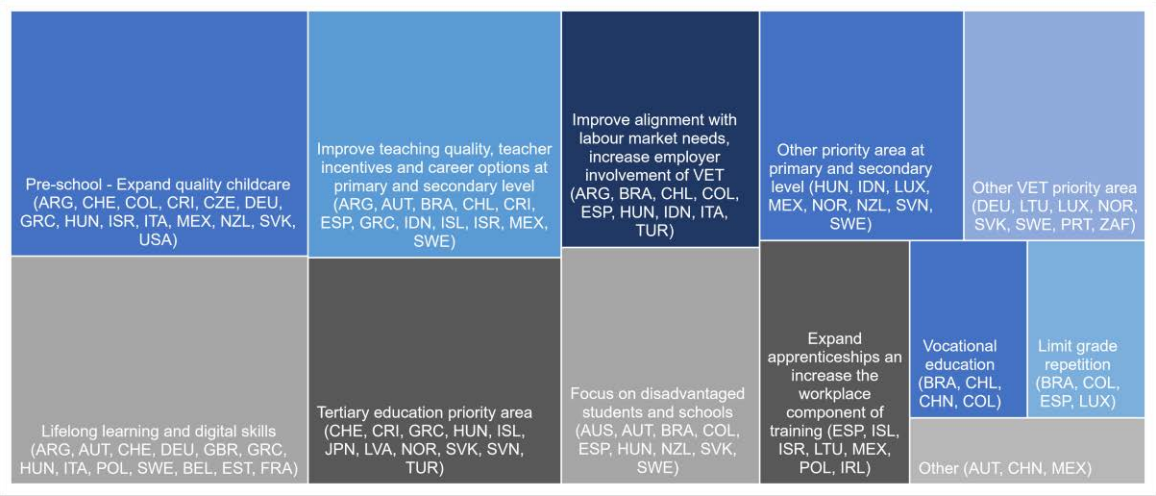
The prominence of education policy recommendations in structural reform priorities is not surprising considering the strong theoretical underpinnings of the importance in human capital in productivity and income developments. However, efforts at providing empirical evidence have been more mixed, not least because of the difficulty of developing a measure of human capital that can adequately capture intangible characteristics such as knowledge and skills. This is briefly reviewed in the next sections.

Figure 1.1. Human capital among the main structural policy priorities



Source: Adapted from OECD, (2021[6]) Economic Policy Reforms 2021: Going for Growth: Shaping a Vibrant Recovery, https://doi.org/10.1787/18132723, Figure 2.

Figure 1.2. Policy recommendations regarding human capital



Source: OECD (2021[6]), Economic Policy Reforms 2021: Going for Growth: Shaping a Vibrant Recovery, https://doi.org/10.1787/18132723, Figure 1.A.8.

Human capital as a driver of economic outcomes: definition and conceptual framework

Economic theory has long envisaged human capital as a limited stock of knowledge and skills conceived as a production factor with a finite impact on GDP per capita

Human capital can be broadly defined as the stock of knowledge, skills and other personal characteristics embodied in people that help them to be more productive. Investment in human capital includes investment in formal education (early childhood, formal school and higher education system, adult training programmes), but also informal and on-the-job learning and work experience. A wider definition includes health as well.

Understanding the determinants of economic growth has occupied economists for decades. Starting with a standard aggregate production function where the output of the economy is a function of labour, capital and technological change (Solow, 1956[17]), the augmented neoclassical growth models incorporated human capital as a production factor (Mankiw, Romer and Weil, 1992[18]). In these models, the change in gross domestic product per worker is linked to the change in human capital, the latter having only a limited impact as the capacity for a country to invest in human capital faces natural constraints (Hanushek and Woessmann, 2021[19]).

But endogenous growth models have reinforced interest in human capital, arguing that it also contributes to long-term growth indirectly, through innovation diffusion and TFP[2]

By contrast, the endogenous growth literature argues that growth is eventually driven by innovation and that human capital is key to raise the innovative capacity of a country (Schumpeter (2006[20]), Lucas (1988[21]); Romer (1990[22]); Aghion and Howitt (1997[23])). In these models, the changes in GDP per worker are linked to the level of human capital, the latter influencing long-run growth rates. A last strand of literature argues that human capital facilitates the diffusion of technologies (Nelson and Phelps (1966[24]); Welch

(1970[25]); Benhabib and Spiegel (2005[26])). In these models, human capital influences growth directly and indirectly through its impact on total factor productivity.

A key question is whether the relationship between human capital and growth is causal i.e. if higher human capital generates more growth or if higher growth leads to higher human capital. This question is essential as policy makers expect the policies directed to improve human capital to have a positive effect on long-term growth. The first studies analysing the link between the years of schooling and growth may have encountered reverse causality issues (Bils and Klenow, 2000[27]; Hanushek and Woessmann, 2021[19]). By contrast, using student performance as a measure of human capital should be less prone to misinterpretation, as it is unlikely that higher growth leads to higher student performance. Indeed, academic literature has found little impact of an increase in education spending on student performance, so there is little chance that higher growth-induced expenditure alters student performance (Hanushek and Woessmann, 2011[28]).

Empirical microeconomic evidence of the outcomes of education for individuals

In human capital theory (Becker, 1967[29]), schooling is seen as an optimising investment decision based on future benefits and the costs of education. While there are costs associated with the pursuit of studies, the individual returns to education can be large (Schultz, 1961[30]; Mincer, 1974[31]). More education is supposed to increase the productivity of individuals which will translate into higher salaries and higher employability probability.

Empirical estimates of rates of return to education show positive returns to more time spent in education

A general view is that the demand for education depends on the economic incentives associated with studying (Becker, 1967[29]; Freeman, 1986[32]). The common use of mean years of schooling (MYS) in many panel regressions as a proxy measure of human capital relies on two assumptions: i.) returns to education do not differ across countries and over time; ii.) returns increase linearly with the quantity (years) of education. The second assumption is based on microeconomic evidence from Mincerian wage equations according to which log wage earnings is a linear function of the time spent in the education system (and a positive, but decreasing, function of work experience). The specification is named after Jacob Mincer (1958[33]; 1974[31]) and has been described as "*one of the most widely used models in empirical economics*".

Against this background, empirical studies from the late 1990s started to question the assumption of linear returns to years of schooling and instead assumed decreasing marginal returns, so that primary education had the biggest marginal returns, followed by secondary education, with tertiary education having the lowest returns. A first wave of studies relied on piece-wise linearity assuming returns of 13.4%, 10.1% and 6.8% for primary, secondary and tertiary education, respectively (Hall and Jones, 1999[34]; Caselli, 2004[35]; Feenstra, Inklaar and Timmer, 2015[36]). A second wave relied on a polynomial specification, advocated by Morrisson and Murtin (2013[37]), which smoothed out the step decreases in the piece-wise linear form of decreasing returns.

The most recent and reliable data suggest that average returns to primary, secondary and tertiary education are U-shaped relative to the time spent in education (Psacharopoulos and Patrinos (2004[38]); Montenegro and Patrinos (2014[39])). The pattern of returns has important implications for measures of human capital. In particular, assuming U-shaped, increasing or decreasing returns yields considerable differences not only in the level, but also in the slope, of the human capital variable.

Education also translates into employability premia

Acquiring more education entails a lower risk of unemployment and a higher likelihood of labour market participation. The gap in unemployment risk across the different levels of education is particularly large for the young, and tends to narrow with age (Blöndal, Field and Girouard, 2002[40]). Using the Heckman two-step method to assess and correct for the selection bias (Heckman, 1979[41]; Heckman, Lochner and Todd, 2005[42])), evidence shows that the estimated conditional probability of employment for a tertiary education holder is around two percentage points higher than for an upper-secondary degree holder (Boarini and Strauss, 2007[43]).

But microeconomic studies cannot easily integrate general equilibrium effects to estimate the overall macroeconomic impact of a policy change

A weakness of microeconomic studies is that they cannot easily integrate general equilibrium effects, as the returns to education are estimated on data corresponding to a given state of the economy, with given prices and policies. Thus, the estimated marginal impact on any individual's income may not be representative of the overall macroeconomic impact on the economy if a new policy is applied widely.

Empirical macroeconomic evidence of the aggregate impact of education

While theoretically human capital is a key determinant of growth, finding an empirically robust relation between human capital and growth at the macroeconomic level is not an easy task because, among other things, there is no widely accepted definition of human capital.

In growth accounting studies, the contribution of human capital to cross-country differences in income depends on the measure of human capital used

The growth accounting methodology consists in decomposing income differences across countries into the variation of their components: physical capital, human capital and a residual, the total factor productivity, which represents technical progress. The exercise requires income and its components to be measured correctly and is dependent on the assumed functional form of the production function (Flabbi and Gatti, 2018[44]).

The contribution of human capital to cross-country differences in income depends on the measure of human capital used. Using secondary school enrolment, Mankiw et al. (1992[18]) find that the difference in human capital explains 50% of income differences. Using years of schooling attainment, Klenow and Rodriguez-Clare (1997[45]) find that human capital accounts for only 10 to 30% of income differences. Adjusting human capital for quality leads to broadly the same finding that human capital explains a smaller share of income differences (Caselli, 2004[35]). Under the assumption of perfect substitutability of skilled and unskilled workers, those studies aggregate the different types of human capital into a single measure.

Removing the perfect substitutability assumption leads to different results (Flabbi and Gatti, 2018[44]). Jones (2016[46]) suggests computing aggregates by taking into account the different returns of the different categories of human capital (skilled and unskilled workers) as a function of their relative scarcity and the possible complementarities between them. Based on the same data used by Caselli (2004[35]), he concludes that physical and human capital variations can fully explain output differences between countries. Removing not only the perfect substitutability assumption but also using a broader definition of skills, Malmberg (2016[47]) argues that human capital accounts for the bulk of income differences across countries.

Likewise, cross-country growth regressions provide mixed evidence on the relationship between quantity-based measures of human capital and economic outcomes

Macroeconomic cross-country growth regressions provide mixed evidence on the relationship between economic outcomes and quantity-based measures of human capital, including literacy, enrolment rates and mean years of schooling (Benos and Zotou, 2014[48]). Past OECD studies looking at OECD countries confirm the difficulty of finding a robust positive effect of human capital on income per capita or productivity levels. First, including many control variables in the regression analysis tends to reduce the size or significance of the effect identified. Human capital may be correlated with other variables, in particular those representing good governance, and may have indirect effects through such variables. Including these variables in the regression, is thus likely to weaken the estimated effect of human capital (Fournier and Johansson, 2016[49]). Second, using common time fixed effects appears to weaken the estimated effect of human capital as it has a similar time trend across OECD countries (Égert, 2017[50]). Thirdly, the estimated effect is sensitive to the measure of human capital and to the estimation method (Guillemette et al., 2017[51]).

One major criticism of many of these macroeconomic studies is that they use quantity-based measures of human capital that do not capture quality aspects. The same length of schooling does not entail the same amount of knowledge and skills if the quality of education differs across countries and evolves over time. In a first new strand of the literature, MYS was adjusted by the returns to education. However, the available estimates of returns to education may not capture this sufficiently, especially if they are averaged over countries or time, particularly because returns may differ due to other factors such as labour market conditions. Moreover, MYS, even if adjusted for work experience, neither account for training received after leaving the formal education system nor for a possible depreciation of skills.

Another strand of academic literature has attempted to model both quantity and quality dimensions of human capital to explain macroeconomic variables (such as productivity or GDP per capita) following two main approaches:

- Including a measure of quality (e.g. student test scores) and quantity (MYS) as separate explanatory variables in panel or cross-country regressions (for example: Altinok (2007[52]); Hanushek and Kimko (2000[53]); Hanushek and Woessmann (2012[54]); Fournier and Johansson (2016[49]); Barro and Lee (2015[55])). However, such an approach usually results in either the quantity or (more often) the quality variable being dominant and the other being statistically insignificant and quantitatively unimportant. Moreover, such effects can become fragile if additional control variables are added (Fournier and Johansson, 2016[49]).
- Another approach takes a combination (usually a product or geometric mean) of MYS and a variable representing the quality dimension, usually based on student test scores and often relative to a benchmark country (for example: Altinok (2007[52]), Fournier and Johansson (2016[49]), Rabiul, Ang and Madsen (2014[56])). The resulting composite variable is sometimes being referred to as *learning-adjusted years of schooling* (LAYS). A weakness of these approaches is that the relative weighting of quality and quantity components is arbitrarily imposed during the construction of the composite variable (so that typically an equal percentage increase in the quality or quantity dimensions has the same effect on the composite measure).

A new measure of human capital to improve estimates of the macroeconomic outcomes of education

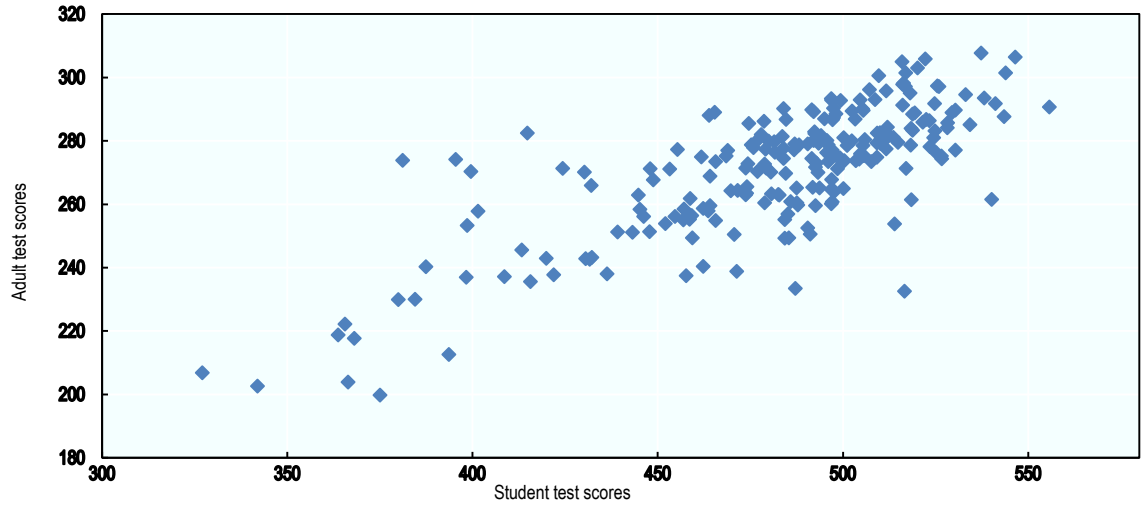
To address the shortcomings of previous empirical studies, a new measure of human capital is developed using PIAAC, PISA and MYS data to account for quality and quantity of education

A new stock measure of human capital has been developed recently by exploiting data from the OECD Programme for International Student Assessment (PISA) and the Programme for the International Assessment of Adult Competencies (PIAAC) (Égert, de la Maisonneuve and Turner, 2022[57]). It attempts to overcome inherent problems with using either in isolation: PIAAC provides a measure of skills for the entire adult working population, but has no time series and limited country coverage; PISA, especially when combined with similar international test scores, has a much longer time series and country coverage, but only applies to those aged 15. Moreover, conceptually, PISA measures the quality of education in primary or secondary schooling resulting in quality effects transmitted to the stock of working-age population with long lags.

The analysis shows that skills at the age of 15 (measured by student test scores) have a strong empirical relationship with skills (measured by PIAAC) observed later in adulthood of the same cohorts (Figure 1.3). Regression analysis estimates that, depending on the specification, the elasticity of cohort-specific adult skills with respect to student test scores is three to four times higher than the elasticity with respect to mean years of schooling. Exploiting this link, a new stock measure of human capital, covering the working-age population and reflecting both the quality and quantity of education, is calculated as the cohort-weighted average of past student test scores and mean years of schooling of current cohorts.

Figure 1.3. Student and adult test scores are correlated

Adult test scores of specific cohorts matched with earlier student test scores of the same cohorts 35 OECD and partner countries



Note: Adult test scores of specific cohorts, obtained from surveys of adult skills, are matched with earlier student test scores of the same cohorts for the 35 countries for which both PIAAC and PISA scores are available. Student test scores denote the average scores for reading, maths and science. Adult test scores stand for the average of scores on literacy, numeracy and problem solving.
Source: Adapted from Égert, de la Maisonneuve and Turner (2022[57]), "A new macroeconomic measure of human capital exploiting PISA and PIAAC", OECD Economics Department Working Papers, No. 1709, https://doi.org/10.1787/a1046e2e-en, Figure 1.

StatLink https://stat.link/rzb32u

This new human capital measure shows a strongly significant correlation with multi-factor productivity…

The effect of the new measure of human capital is evaluated within the OECD Economics Department's *Quantitative Assessment of Structural Reforms* framework (Égert and Gal, 2017[58]). The framework quantifies the impact of structural reforms on per capita income and includes a multi-factor productivity (MFP) regression. In addition to human capital, the policy determinants of MFP include an indicator of product market regulation; a measure of innovation intensity; trade openness (an intermediate policy outcome, which proxies trade policies) and the output gap as a cyclical control variable.

When added to the cross-country time-series regression, the new measure of human capital has a strongly significant correlation with MFP. To assess the potential productivity gains from improvements in human capital, the effect of closing the gap between the median OECD country and the top three performers, in both quantity and quality components of the new human capital variable are considered separately:

- A sustained improvement in PISA student test scores by 5.1%, equivalent to an improvement by 25.5 points from the median OECD country (496.2, the average of the Czech Republic and Norway in 2018) to the average of the leading three countries (Estonia, Japan and Korea in 2018), is estimated to increase MFP by between 3.4% and 4.1 % in the long run (for details see Égert, de la Maisonneuve and Turner (2022[57])).
- A sustained increase in mean years of schooling by 9.3% equivalent to an improvement by 1.2 years from the median OECD country (12.7 years, the average of the cohort of 20 to 24 years in Lithuania and Poland in 2020) to the leading three countries (Ireland, Australia and Japan),

is estimated to increase MFP by between 1.8% and 2.2 % in the long run (Égert, de la Maisonneuve and Turner, 2022[57]).

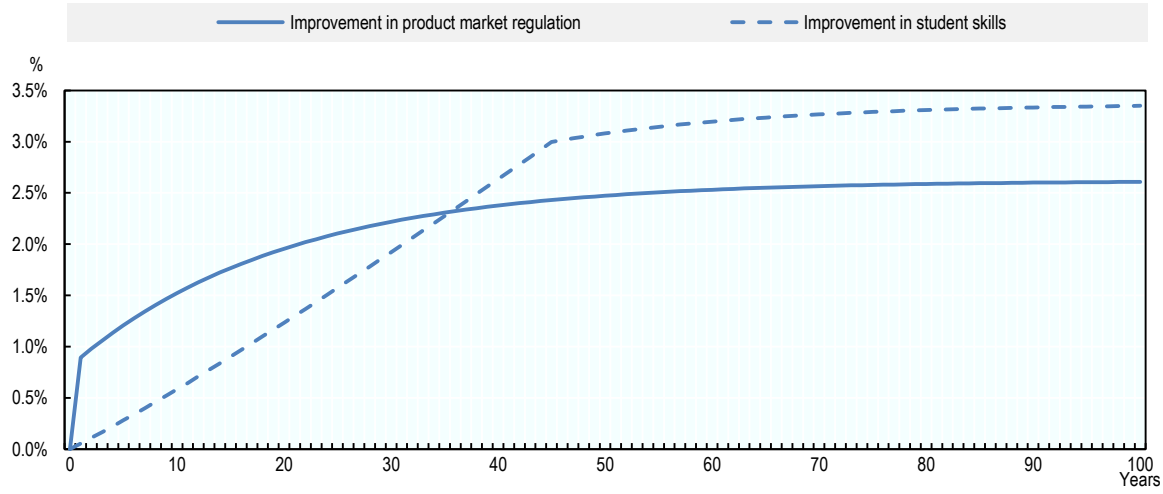
… and much larger potential productivity gains from improvements in the quality of human capital than its quantity

These stylised calculations suggest that the potential for productivity gains is much greater from improvements in the quality than quantity component of human capital. Moreover, the magnitude of these potential gains in MFP is comparable to a similarly standardised improvement in product market regulation, which is the other key reform category advocated by the OECD next to investments in human capital (Figure 1.1.). A similarly scaled improvement in the OECD's product market regulation indicator (equal to the difference from the median to the top three performing countries) generates a long-run increase in MFP of 2.6% (for details see Égert, de la Maisonneuve and Turner (2022[57])).

However, while an improvement in student skills has a broadly similar long-run impact on multi-factor productivity as improving product market regulation, it may take four decades to fully show

There are, however, unusually long lags between policies that affect the skills of students in compulsory schooling and their long-run macroeconomic effect. The calculations described above all assume that improvements are sustained in successive cohorts of students, but it still takes nearly 50 years before these student cohorts are fully reflected in all cohorts of the working-age population. There is then a further lag before this upskilling is fully reflected in MFP. To underline these longer lags the effect of a policy that brings about a sustained improvement in student skills can be compared with a policy that leads to a stepwise improvement in product market regulation (in both cases the shocks are again calibrated to close the gap between the median and top three performing countries). Thus, while an improvement in student skills has a broadly similar long-run impact on MFP as improving product market regulation, it may take four decades to take effect (Figure 1.4.). These long lag times thus highlight the attractiveness of lifelong learning strategies aimed at improving the human capital of the existing workforce.

Figure 1.4. Comparing policy responses to improve skills and product market competition



Note: The chart displays the dynamic response of mfp to a standardised shock to student skills and product market regulation. The shocks are standardised by calibrating the magnitude of the shock as the difference between the OECD median country and the top three performing countries in terms of the shocked indicator (see text for further details). The shock for human capital assumes that skills are upgraded gradually as students gradually enter the workforce.

Source: Adapted from Égert, de la Maisonneuve and Turner (2022[57]),"A new macroeconomic measure of human capital exploiting PISA and PIAAC", OECD Economics Department Working Papers, No. 1709, https://doi.org/10.1787/a1046e2e-en, Figure 6.

StatLink https://stat.link/z3xu0a

Key Messages

Overall, this new measure of human capital based on Survey of Adult Skills (PIAAC) and PISA data to account for the quality of human capital in a more fine-grained manner confirms the importance of human capital improvements for multi-factor productivity, and ultimately economic growth. In doing so, this analysis sends a strong message to finance policy makers for continued public investments in education given the magnitude of this impact which is equivalent to improvements in product market regulation in the long run.

This new analysis also provides important messages for education policy makers, insofar as it shows stronger economic effects on multi-factor productivity deriving from quality improvements in human capital relative to gains in educational attainment and mean years of schooling (representing the quantity of human capital). For education authorities, these findings send a strong signal calling for sustained efforts to boost the learning outcomes of all students and to enhance the effectiveness and efficiency of their education systems, in order to realise these potential productivity gains and economic returns.

Lastly, a third important message for both finance and education policy makers relates to the time lags of human capital improvements, which take around 50 years to fully materialise. On the one hand, this underlines the urgency of tackling quality and equity challenges in education to maximise economic returns. On the other hand, it highlights the critical importance of a long-term commitment and non-partisan process of continued improvement in the education sphere, as its benefits will take far longer than the time horizon of electoral cycles to materialise.

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Notes

[1] For a recent survey of the economic growth literature, including the role played by human capital, see Jones (2016[46]).

[2] Total Factor Productivity.

2 The broader social outcomes of education: Educating for thriving individuals and societies

High-quality education that translates into better and more relevant skills pays off for individuals, communities and societies in significant and diverse ways. It leads to higher earnings, increased productivity, innovation and sustained economic growth. Beyond these economic outcomes, high-quality education also generates a wide range of social returns. Better-educated individuals live longer and healthier lives. They become more engaged citizens and are more likely to take action for collective well-being. Sustained high-quality education supports communities in proactively addressing emerging challenges, such as climate change but also making the most of new opportunities, such as the digital transformation. This chapter provides an overview of the broader social outcomes of education. Such returns span a continuum, from private benefits (e.g. better health, better opportunities for one's children) to societal ones, as private benefits translate into positive externalities and collective benefits. The social outcomes of education can thus be considered as an outcome in themselves or as a crucial channel towards better economic outcomes.

Introduction

High-quality education pays off for individuals, communities and societies in significant and diverse ways

High-quality education leads to higher earnings, increased productivity, innovation and sustained economic growth. Beyond these economic outcomes, it also generates a wide range of social returns. Indeed, there is much evidence that high-quality education translates into enhanced public health and political participation, and helps individuals and societies adapt to change and respond creatively to disruptions. Better-educated individuals live longer and healthier lives. They become more engaged citizens and are more likely to take action for collective well-being. Sustained high-quality education supports communities in proactively addressing emerging challenges, such as climate change but also making the most of new opportunities, such as the digital transformation. When emergencies like the COVID-19 pandemic arise, high-quality education is also key for building individual and societal resilience, and fostering a sustainable recovery.

High-quality education develops the skills, attitudes and knowledge that are crucial for individuals to thrive in an interconnected world, and contribute to societies' transformations and collective well-being. In rapidly evolving economies and societies, a well-rounded set of skills, including cognitive, socio-emotional and digital skills, makes the difference between being ahead of the wave and falling behind. A good level of literacy, numeracy and problem-solving skills in technology-rich environments is the key that enables individuals to unlock all the benefits of Internet use and use the Internet in diversified and complex ways rather than just for information and communication (OECD, 2019[1]). Beyond foundation skills, strong lifelong learning attitudes – namely a willingness to learn and a habit of learning – are vital for individuals to continue acquiring skills and knowledge at all stages of life, and hence, adapt more easily to changing life circumstances (OECD, 2021[2]). A good level of cognitive and socio-emotional skills, knowledge and attitudes also support individuals' physical and mental health throughout life (Almlund et al., 2011[3]; Shuey and Kankaraš, 2018[4]). In addition, the framework of the OECD Learning Compass 2030 puts forward a range of transformative competencies that have the potential to help students shape a better future (OECD, 2020[5]). Such transformative competencies include how to create new value, reconcile tensions and dilemmas, and take responsibility, thereby blending critical thinking and creativity, empathy and respect. Evidence from the OECD Programme for International Student Assessment (PISA) 2018 shows that students who are better aware of global issues, more interested in learning about other cultures and better able to adapt their thinking and behaviour to novel situations are more likely to report that they take actions for collective well-being and sustainable development (OECD, 2021[6]).

Accordingly, many education systems are now integrating cross-cutting themes in their curricula, such as environmental education and sustainability issues (for 21 jurisdictions out of 37 examined), local and global citizenship and peace (19/37), core literacy and lifelong learning (19/37), and health education and well-being (19/37) (OECD, 2020[7])[1]. Education outcomes thus go beyond academic learning. Already in schools, education provides a setting to support and enhance students' well-being, to enable students to socialise and benefit from productive interactions with their peers, become responsible and engage in collective actions. The pandemic has further emphasised the role of education systems beyond imparting knowledge and skills. Schools, teachers and education systems have been crucial in ensuring students remain in good health, access social services and participate in fruitful interactions during the pandemic. Beyond the protective role of school environments, at the individual level, skills and stronger attitudes towards learning such as self-efficacy or intrinsic motivation are likely to have shielded students from becoming disengaged or dropping out during school closures (OECD, 2021[2]). For adults, the level of education has made the difference between those who have remained engaged, at work, with public services or health providers and those who have been or felt left out or left behind. Lower-educated- people

have felt more lonely and less included in societies than better-educated ones during the COVID-19 crisis (OECD, 2021[8]).

Educating with a whole-child and whole-of-society approach requires investments in education that acknowledge all the individual and societal benefits education provides (Box 2.1). Such benefits span a continuum, from private benefits (e.g. better health, better opportunities for one's children) to societal ones, as private benefits translate into positive externalities and collective benefits. Better-educated individuals with healthier behaviours are more likely to be in good health and thereby help reduce the cost of healthcare and the spread of diseases. In turn, reductions in illness can translate into reduced social or health-related expenditure. Better-informed citizens, who participate more in the political life and are able to distinguish fact from opinion can support better-functioning public institutions and democracies. High-quality education can help individuals move up the social ladder, translating into higher social cohesion, reduced inequality and enhanced social mobility. Such social returns to education can thus be considered as an outcome in themselves or as a crucial channel towards better economic outcomes.

Box 2.1. Taking a whole-child approach in measuring the performance of education systems

Countries increasingly take a whole-child approach in measuring the performance of their education systems, focusing on a range of social outcomes.

Apart from its participation in international assessments (e.g. PISA, the OECD Survey of Adult Skills – PIAAC), **Chile** relies on the Education Quality Measurement System (*Sistema de Medición de la Calidad de la Educación- Simce*) to measure the performance of its education system. In the context of the Quality Assurance System, *Simce* assesses students' learning outcomes in a range of curricular areas and in relationship with the school and social environment in which students evolve (MINEDUC, n.d.[9]; Agencia de la Calidad de la Educacion, n.d.[10]).

The standardised tests administered through *Simce* (ex. reading comprehension and writing, mathematics, natural sciences) are taken by students in Grade 2, 4, 6 and 8 of basic education, and Grades 10 and 11 of upper secondary education. Along with the assessments, *Simce* collects data on teachers, students and parents through questionnaires to analyse students' outcomes in their wider learning context (Agencia de la Calidad de la Educacion, n.d.[10]). *Simce* measures key dimensions for a comprehensive child development through indicators for personal and social development that include: academic self-perception and self-assessment, school motivation, school climate, citizenship participation and training, and healthy life habits (Agencia de Calidad de la Educacion, 2019[11]).

Evidence from *Simce* test results combined with these personal and social development indicators have served as inputs for resource allocation to struggling education communities. Schools have thus been categorised in four performance levels (from high performance to insufficient), based on their students' *Simce* test results and progress relative to previous measurements, personal and social development indicators, and a range of student characteristics (e.g. vulnerability) (MINEDUC, n.d.[12]). The resulting school categories have been used, first, to identify struggling schools and thus determine which schools will receive the evaluation and orientation visits carried out by the Quality Measurement System. Second, the categories have been used to provide support and allocate resources to schools in need.

In **France**, the Ministry of National Education and Youth has devoted particular efforts to developing analyses and applied research examining how education policies can shape social returns to education. Some of these projects have been carried out in co-operation with other public or government bodies (e.g. *France Stratégie* - an autonomous institution reporting to the prime minister and in charge of strategic reflection, the Ministry of Economy and Finance). The Ministry of National Education and Youth has put a strong focus on inclusion, understood in a broad sense beyond social inclusion. It has thus investigated the design of more inclusive schools for students with special education needs (e.g.

through additional investments in human resources, teacher professional development) or how education policies can help bridge gender gaps.

Thus, in 2019, the Ministry of National Education and Youth and the Secretary of State for Equality between Women and Men and the Fight against Discrimination, together with other ministries with responsibilities in the area of education policy, signed a new agreement for gender equality in the education system covering the 2019-2024 period (Convention interministérielle pour l'égalité entre les filles et les garçons, 2019[13]). The agreement puts forward five intervention areas, including: i) steering the gender equality policy as closely as possible to the students, ii) training all education staff for gender equally, iii) transmitting a culture of equality and mutual respect to young people, iv) fighting sexist and sexual violence, and v) moving towards greater gender diversity in training provision through greater freedom for boys and girls in their orientation choices (Convention interministérielle pour l'égalité entre les filles et les garçons, 2019[13]). The ministry has thus devoted special attention to girls' self-censorship throughout their education pathways as this also affects their subsequent inclusion in the economy and society. The ministry's work programme has included work on guidance provision at key moments of students' education pathways seeking to avoid self-censorship and/or discrimination in orienting girls (and boys) towards specific professions. In 2021, mandatory modules on gender equality to train the education community to deconstruct prejudice were also introduced as part of initial teacher education and teacher professional development (Ministère de l'Education Nationale et de la Jeunesse, 2022[14]).

This chapter therefore examines how education translates into a range of benefits for individuals, communities and societies:

- First, the chapter analyses the role of sustained high-quality education for health and well-being, and in particular the mechanisms through which education impacts 1) health outcomes, health-related behaviours and life expectancy (as well as externalities on peers and children), and 2) mental health and psychological well-being.
- Second, the chapter examines the role of education and skills for building more civic, cohesive and inclusive societies, putting the emphasis on how high-quality education 1) supports civic engagement and reduces antisocial behaviour to the benefit of communities, 2) helps build social capital, and particularly trust, 3) supports equity in subsequent lifetime outcomes and 4) forms more tolerant and open-minded individuals who can underpin more cohesive societies.
- Third, the chapter delves into the critical role played by education systems in helping individuals, communities and societies 1) make the most of new opportunities, such as the digital transformation and 2) proactively addressing emerging challenges, such as climate change.

Educating for healthier and happier lives

Better-educated individuals enjoy healthier and longer lives

Better-educated individuals tend to live healthier and longer lives (Galama, Lleras-Muney and Kippersluis, 2018[15]; Bradley and Green, 2020[16]). They are less likely to suffer from a range of health conditions (e.g. overweight, high blood pressure, heart disease), report better health-related behaviours (e.g., they eat healthier, smoke less, exercise more) and enjoy higher life expectancy.

Education translates into better health through better income and social protection, as well as healthier behaviours…

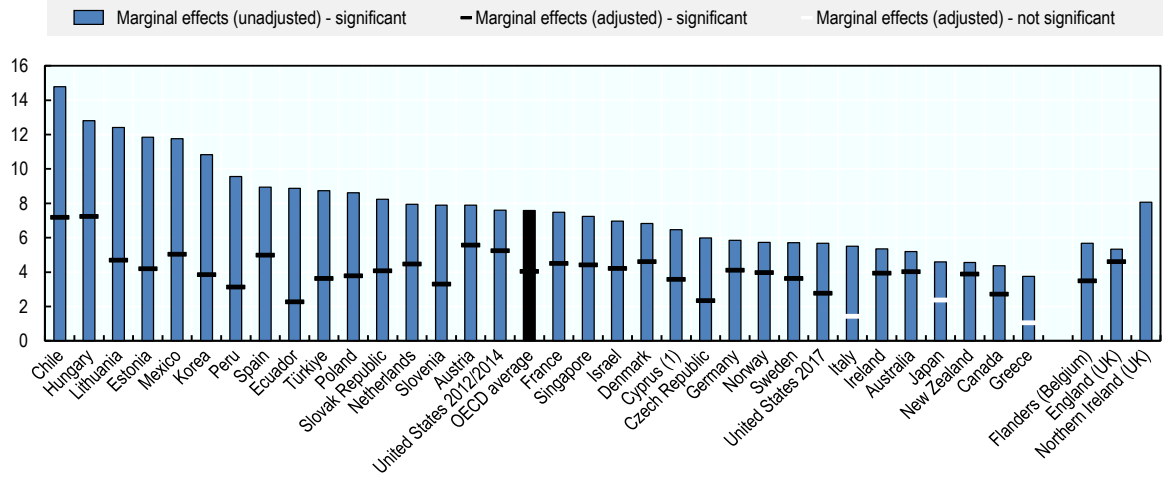
Education can translate into better health through a range of channels. Education helps individuals be better aware of risky health behaviours (e.g. excessive drinking) and better informed regarding available

healthcare or medical services, thus taking better health-related decisions (Grossman, 1972[17]; Bradley and Green, 2020[16]). At the same time, education enhances other channels, such as income, that can in turn support a healthier life. Better-educated individuals are likely to have higher earnings, live in safer neighbourhoods and benefit from better health insurance through their jobs. Education can also improve health by reducing financial constraints to adopt a healthy and diverse diet, and stress due to low socio-economic conditions or difficulty in meeting basic financial ends (Marmot, 2017[18]; Lance, 2011[19]; Bradley and Green, 2020[16]).

The positive relationship between education and health has been documented in a variety of countries. Adults with better numeracy skills display better self-reported health in countries with available data in the OECD Survey of Adult Skills (PIAAC) (Figure 2.1.). In a similar vein, individuals having attained a higher qualification via formal adult education, even at a later stage in life, are more likely to report good health outcomes relative to those who did not attain a higher qualification (Desjardins, 2020[20]). Higher education levels are also associated with higher life expectancy. Recent evidence on the relation between education attainment and longevity in OECD countries shows that average absolute gaps in life expectancy between high and low-educated individuals at age 25 were of 5.2 years for women and 8.2 years for men (Murtin and Lübker, 2022[21]).

Figure 2.1. Effect of numeracy proficiency on high levels of self-reported health

Marginal effects (as percentage-point change) of one standard deviation increase in numeracy proficiency score on the probability to report good to excellent health



Statistically significant differences are marked in a darker tone. Adjusted differences are based on a regression model and take account of differences associated with the following variables: age, gender, education, immigrant and language background and parents' educational attainment. One standard deviation in proficiency in numeracy for the total population is 52 score points.

[1] Note by the Republic of Türkiye: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Adapted from OECD (2019[22]), *Skills Matter: Additional Results from the Survey of Adult Skills*, https://dx.doi.org/10.1787/1f029d8f-en, Figure 5.7.

Yet the strength of the association varies across countries, populations and types of health outcomes…

However, the strength of the association between education and health varies across countries and type of health outcomes. While education-related inequalities in smoking are significant across most European countries, Canada and the United States, they tend to be even larger in some Northern, Central and Eastern European countries (OECD, 2019[23]). In a similar vein, gaps in life expectancy by education level display large cross-country differences. In 2016, tertiary-educated adults at age 25 in Estonia on average had a 8 years longer life expectancy than their lower-educated peers (Eurostat, 2021[24]). In contrast, the education-related gap in life expectancy was of only 1.3 years in Italy, where adults also displayed higher average life expectancy in general. This being said, inequalities in life expectancy across countries tend to be smaller for individuals with higher education attainment compared to individuals with lower education or less (Marmot, 2017[18]).

Understanding the extent to which better education translates into healthier lives is crucial for addressing health inequalities (within and between countries), achieving better health outcomes at the societal level (e.g. reducing the spread of diseases) and more effectively using public resources. Research evidence on the causal impact of education on health remains, nevertheless, mixed (Galama, Lleras-Muney and Kippersluis, 2018[15]; Grossman, 2015[25]; Bradley and Green, 2020[16]). It highlights substantial heterogeneity in the estimated effects of education on health across time, space, populations and health outcomes studied. For instance, education has a stronger effect on men's mortality than women's mortality. By contrast, education-related inequalities in overweight are higher for women than for men (OECD, 2019[23]).

There are many factors that can drive the variation in education effects on health…

Education policies are thus likely to generate different effects on health in different contexts and environments (Lance, 2011[19]). Beyond methodological aspects, a range of factors can drive the observed heterogeneity in education effects on health (Galama, Lleras-Muney and Kippersluis, 2018[15]).

- To start with, education translates into higher lifetime earnings that can be used for better health-related goods and services. At the same time, labour market returns to education vary for different groups of individuals, cohorts, in time and by academic streams or professional field (Bradley and Green, 2020[16]; Carneiro, Heckman and Vytlacil, 2011[26]).
- Variations in the availability of general safety nets and universal health care access is also a likely factor behind the variation in the health outcomes of education, as illustrated by Figure 2.1.. Countries with universal health care access tend to display lower net effects of education relative to those where health insurance is tied to individual earnings – hence to educational attainment to some extent (Lleras-Muney, 2018[27]).
- The availability of health-related information also matters as there is evidence suggesting that better-educated individuals are more responsive to it and thus more likely to adopt healthier attitudes and lifestyles where information is available (Galama, Lleras-Muney and Kippersluis, 2018[15]; OECD, 2019[23]). Illustrating this, while better-educated individuals displayed higher rates of smoking several decades ago, lower-educated individuals are now twice as likely to smoke (OECD, 2019[23]). The diffusion of information related to smoking risks is likely to have played a significant role in reducing the prevalence of smoking among the better-educated.
- Differences in the quality of schooling, and hence, in the extent to which education systems equip individuals with a well-rounded level of skills matter for education's effect on health outcomes (Lleras-Muney, 2018[27]). Studies that examine the impact of specific skills emphasise the role of high-quality education for health-related outcomes. Low literacy skills among young children aged 5 have, for instance, been associated with worse self-reported health outcomes and worsening

health-limiting conditions during adulthood (Schoon et al., 2015[28]). Similarly, academic achievement, measured by performance on standardised tests in literacy and numeracy across childhood, is related to better self-reported health in adolescence and early adulthood (Shuey and Kankaraš, 2018[4]; Lê-Scherban et al., 2014[29]). In addition, socio-emotional skills equally help predict health-related behaviours in terms of diet, exercise and smoking (Almlund et al., 2011[3]; Heckman, Stixrud and Urzua, 2006[30]). In fact, socio-emotional skills can be more important than cognitive ones for a range of health-related outcomes (e.g. smoking, obesity and self-reported health) (Conti, Heckman and Urzua, 2010[31]; Lance, 2011[19]).

- High-quality early childhood education and care can boost lifetime health outcomes, but the size of its effects can vary widely across beneficiaries. Early childhood education and care can bridge gaps between children of different backgrounds and ensure all children develop a well-rounded set of skills to thrive. For instance, a set of early childhood programmes targeted at disadvantaged children generated substantial benefits to participants in terms of reduced prevalence of heart disease, cancer, stroke and mortality across the lifecycle (García and Heckman, 2020[32]). While the programme resulted in large gains in terms of quality-adjusted life years for men, its benefits were relatively small for women. More generally, the type, beneficiaries and timing of early childhood interventions shape the size of their effects (Lleras-Muney, 2018[27]). Evidence from the Head Start early childhood education programme in the United States shows that the benefits of the programme vary largely across its recipients and depend on the quality of alternative care children would have received instead of Head Start (Kline and Walters, 2016[33]). The benefits are large for students who would otherwise be in home care, whereas they are negligible for those who would otherwise attend a different preschool.

Evidence suggests that the health benefits of education also play out in terms of positive externalities…

At the same time, education can also affect the health outcomes of peers or individuals' own children, and education investment decisions need to account for such positive externalities. Research has documented, for instance, the existence of peer effects for teenagers' excessive drinking or smoking behaviours (Lance, 2011[19]). In addition, parental education can have intergenerational effects on health. If better-educated mothers breastfeed more, provide healthier food for their children or ensure a better living environment for them, children's health-related outcomes are likely to be enhanced. Better-educated parents can either spend more resources on health (e.g. live in better neighbourhoods or buy higher-quality medical products or services) or spend existing resources better (e.g. obtain better information about doctors or be more aware of health dangers and adapt their behaviour accordingly) (Bradley and Green, 2020[16]). Children's health at a given time can therefore depend on children's previous health condition, any parental investment made before and the environment in which children are born or evolve (e.g. parental relationship stability, school environment, whether they live in a better neighbourhood) (Conti and Heckman, 2014[34]). Parental education can thus affect children's health at various life stages, from pregnancy and birth, until later in life when parental education shapes the environment in which children grow up and evolve.

Better-educated individuals also enjoy happier lives

High-quality education helps build the skills, knowledge and attitudes that support individuals' mental health and psychological well-being throughout life...

Around one in two people experience mental health problems at some point in their life and the COVID-19 pandemic further increased the pervasiveness of mental health conditions such as anxiety and depression (OECD, 2021[35]). Increased mental health or psychological problems are costly for individuals, employers and society (OECD, 2021[36]). But education systems can equip individuals with the skills needed to protect

their psychological well-being and thrive in life. Indeed, higher levels of educational attainment are correlated with increased life satisfaction and less pervasive negative feelings and states (Figure 2.2.). It is worth noting though that these education-related inequalities in subjective well-being are smaller in countries whose populations have higher average life satisfaction overall.

There are several channels for education to translate into mental health…

Similarly to physical health, mental health can benefit from high-quality education through a range of channels. Better-educated individuals have access to better resources and develop better health-related behaviours that in turn can favour their mental health. At the same time, they may enter more stressful occupations or face higher pressure to maintain high achievement (academically or professionally) (Dahmann and Schnitzlein, 2019[37]). Causal evidence of education's role for mental health remains nevertheless mixed and less developed relative to research on education's impact on physical health, notably due to data availability challenges.

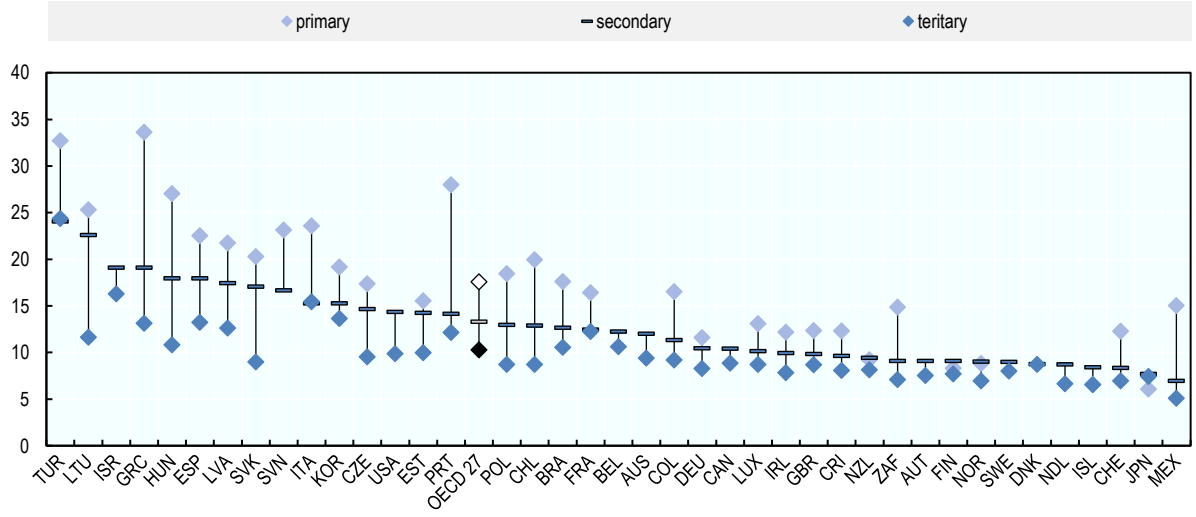
Socio-emotional skills seem to play a key role in shaping mental health outcomes…

Social-emotional skills matter for mental health outcomes. Early socio-emotional skills play a key role in supporting individuals' psychological well-being, from early ages and until adulthood (OECD, 2020[38]; OECD, 2021[39]). Socio-emotional skills related to emotional regulation – optimism, stress resistance and emotional control – are also associated with teenage students' life satisfaction and psychological well-being (OECD, 2021[39]). Among the Big Five personality traits[2] put forward by psychology research Agreeableness (including skills such as co-operation or trust), Conscientiousness (including skills such as the ability for self-control or persistence) and Emotional Regulation (including skills such as stress resistance) relate positively and strongly to both mental and physical health (Strickhouser, Zell and Krizan, 2017[40]). Social and emotional skills are thus strong predictors of life satisfaction across different ages in adulthood, even after accounting for individuals' income and employment status as adults (Flèche, Lekfuangfu and Clark, 2021[41]).

Social-emotional skills are malleable and can be learned. The environments in which individuals evolve (e.g. family, peers, life events) and the learning activities in which they engage shape the development of social and emotional skills (OECD, 2015[42]; OECD, 2021[39]). A range of policy interventions, innovations in teaching practices and parental efforts can support their development (OECD, 2021[39]). While OECD countries' curricula mostly emphasise cognitive skills, they give equal prominence to a range of social and emotional skills students need to develop to thrive in life (OECD, 2020[7]). Interventions focused on social and emotional learning have been found to be effective at increasing pro-social behaviour and reducing the need for behavioural programmes (OECD, 2021[39]). In addition, teachers play a key role in enhancing students' social and emotional development. A range of teaching practices and approaches, including interactions with students, emphasis on critical thinking in specific subjects and classroom organisation are effective at enhancing students' social and emotional development (OECD, 2021[39]).

Figure 2.2. Prevalence of negative affect balance by educational attainment

Share of the population experiencing a negative affect balance yesterday, by highest level of educational attainment, 2010-18 pooled data



Note: The share of the population experiencing a negative affect balance yesterday is the share of the population reporting more negative than positive feelings and states on the previous day. Data are not shown for countries where the sample size in a given education category is fewer than 500 observations (i.e. data for primary education are omitted for Australia, Austria, Belgium, Canada, Denmark, Israel, the Netherlands, Sweden and the United States; data for tertiary education are omitted for Slovenia). These countries are also excluded from the OECD averages shown. Costa Rica is also excluded from the OECD average since it was not an OECD member country at the time of the preparation of this figure.

Source: Adapted from OECD (2020[43]), *How's Life? 2020: Measuring Well-being*, https://dx.doi.org/10.1787/9870c393-en, Figure 8.10.

… While the evidence regarding cognitive skills and well-being is more mixed during school years due to the effects of school climate and test anxiety

While better education tends to be associated with enhanced well-being in adulthood, higher academic achievement can display more ambiguous effects during school years given the risks of test anxiety and bullying.

Early cognitive skills, self-regulation, self-awareness, emotional health and social skills relate positively with adult mental health (Shuey and Kankaraš, 2018[4]; OECD, 2020[38]; Schoon et al., 2015[28]). Five-year-old children with better receptive language skills, better self-regulation and visual-motor skills display better mental health outcomes as adults (Schoon et al., 2015[28]).

During the school years, the relationship between student performance in cognitive assessments and their well-being is more ambiguous. 15-year-old students display lower average levels of life satisfaction than younger ones (OECD, 2021[39]) and better academic achievement does not automatically translate into higher life satisfaction. Students with very high and very low levels of life satisfaction display, for instance, lower reading scores in the PISA (2018) assessment (OECD, 2019[44]).

School climate and test anxiety are likely to shape these patterns. On the one hand, students' life satisfaction is positively related to a good disciplinary climate in school, teacher support and feedback, students' co-operation and sense of belonging in school. Students who were less exposed to bullying were also more likely to report higher life satisfaction (OECD, 2019[44]). On the other hand, more demanding learning environments for 15-year-olds, associated with higher parental and teacher expectations, and increased schoolwork pressure towards the end of compulsory education can limit students' well-being.

Students expressing a greater fear of failure displayed both higher academic achievement but also lower life satisfaction levels. Students' life satisfaction and psychological well-being also relate negatively with test anxiety (OECD, 2021[39]).

Education policies and the focus of curricula on the whole child, including socio-emotional development, play a key role in addressing students' psychological well-being and mental health conditions. Policy interventions should nevertheless ensure that while they seek to enhance all students' well-being, they also provide specific, targeted support for learners experiencing mental health conditions (OECD, 2021[45]). Indeed, the characteristics and impact of mental health conditions require an integrated whole-of-government approach that brings together health, education, social protection and employment services (OECD, 2021[36]).

Educating for more civic, cohesive and inclusive communities and societies

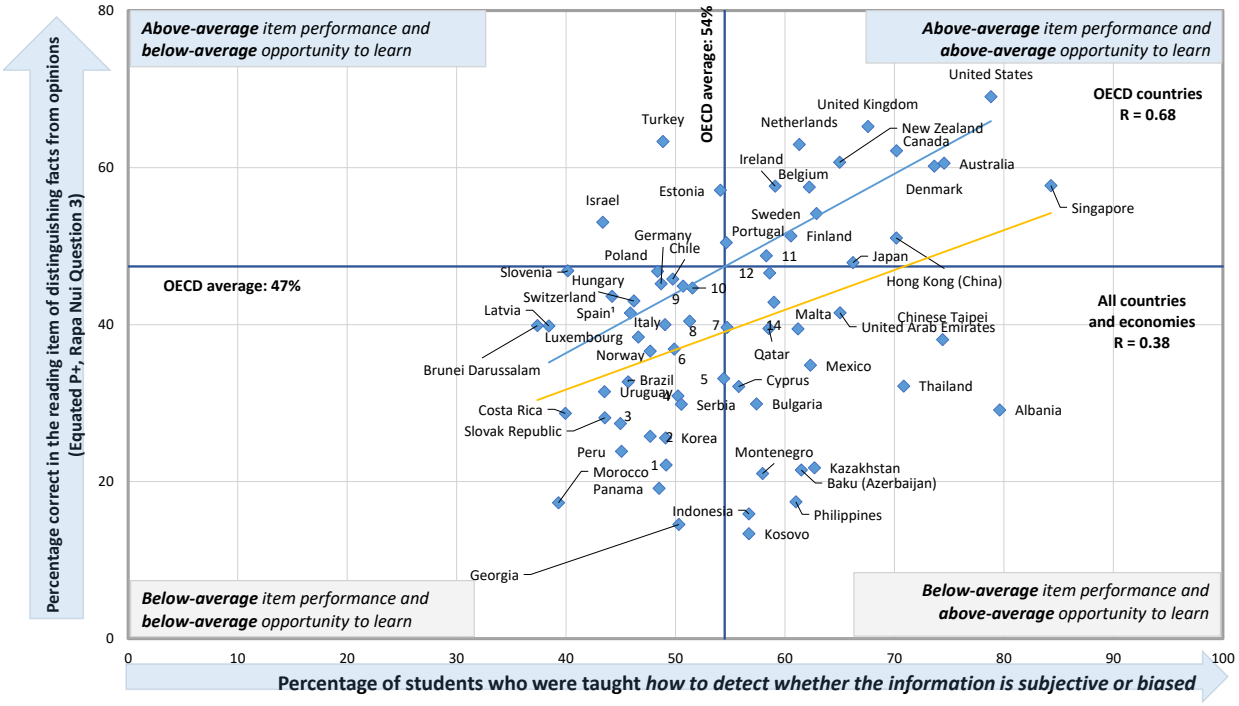
Education supports civic engagement and reduces antisocial behaviour to the benefit of communities and societies

Education also supports the formation of well-informed citizens…

Beyond its role in shaping a range of economic and broader social individual benefits, education supports the formation of engaged and well-informed citizens who can better contribute to their communities. Education systems can instil civic and democratic values in students, through the knowledge, attitudes and skills the latter acquire in schools. Analytical, information-processing and critical-thinking skills developed in schools can make for more enlightened and engaged citizens and, in turn, better-functioning democracies. Creativity helps individuals innovate, thrive from a personal perspective but also challenge existing norms and find new solutions when unexpected disruptions arise in their societies. Critical thinking is a crucial pillar of well-functioning democracies, even more in the digital age with its abundancy of information sources, multiplicity of facts and views, and rise of "fake news" (Vincent-Lancrin et al., 2019[46]).

Evidence from PISA (2018) shows that education systems where more students are taught how to detect biased information in school also display higher proportions of students who are able to distinguish fact from opinion (Figure 2.3.). Yet, on average across OECD countries, only one in two 15-year-old students were trained at school on how to recognise biased information (OECD, 2021[47]), even though critical thinking and creativity can be taught, learned and assessed in primary and secondary education (Vincent-Lancrin et al., 2019[46]). The relationship between students' access to training on how to recognise biased information and their ability to distinguish fact from opinion varies across countries, suggesting there is leeway for education systems to learn from each other and enhance the effectiveness of such training (OECD, 2021[47]).

Figure 2.3. Reading item of distinguishing facts from opinions and access to training on how to detect biased information in school



Note: Numbers in the figure correspond to the following countries/economies: 1. Bosnia and Herzegovina; 2. Malaysia; 3. Colombia; 4. Czech Republic; 5. Croatia; 6. France; 7. Lithuania; 8. Greece; 9. Austria; 10. Iceland; 11. Macao (China); 12. B-S-J-Z (China).

[1] In 2018, some regions in Spain conducted their high-stakes exams for tenth-grade students earlier in the year than in the past, which resulted in the testing period for these exams coinciding with the end of the PISA testing window. Because of this overlap, a number of students were negatively disposed towards the PISA test and did not try their best to demonstrate their proficiency. Although the data of only a minority of students show clear signs of lack of engagement (see PISA 2018 Results Volume I, Annex A9), the comparability of PISA 2018 data for Spain with those from earlier PISA assessments cannot be fully ensured.

Source: OECD (2021[47]), *21st-Century Readers: Developing Literacy Skills in a Digital World*, https://dx.doi.org/10.1787/a83d84cb-en, Figure 2.4.

… and provides students with opportunities to exchange ideas and engage in collective activities to stimulate future civic engagement

In addition, education includes students in social networks, providing opportunities to interact, exchange diverse ideas and engage in collective activities. Schooling teaches students how to socialise in productive ways that matter for subsequent political and civic engagement (Glaeser, Ponzetto and Shleifer, 2007[48]). Collaboration skills can be taught and practiced in cognitive subjects (e.g. science, mathematics) but also in physical education class where students work together to reach common goals (OECD, 2017[49]). School and classroom activities and environments matter for students' ability and attitudes towards collaboration. Students who engage in more communication-intensive activities (e.g. explaining ideas in science class, doing practical experiments and arguing about science questions) display more positive attitudes towards collaboration. Exposure to diversity in schools also relates positively to collaborative skills: students without an immigrant background tend to perform better in terms of collaborative skills when they are in schools with higher concentration of immigrant students (OECD, 2017[49]).

At macro level, there is strong correlation between education and the strength of democratic institutions, but equity of education outcomes seems to matter even more…

High-quality education matters for democracy and well-functioning institutions. Empirical analyses highlight the strong cross-country correlation between education and democracy, supporting the role of education as a crucial pillar for democracy (Lochner, 2011[50]; Apergis, 2018[51]). Macro-economic evidence on the effect of increases in a nation's education on the strength of democratic institutions remains, however, mixed, reflecting a range of methodological challenges and differences in the estimation of a causal relationship. While most studies examine the role of average years of schooling, the distribution of education in a country appears to matter more than the average level of its population's education for the implementation and sustainability of democracy (Castelló-Climent, 2008[52]). Indeed, greater equity in education outcomes is associated with stronger measures of political rights and civil liberties. In addition, evidence based on foreign students' role for institutions in their home countries suggests that education systems' efforts to teach democratic values tend to make a difference (Glaeser, Ponzetto and Shleifer, 2007[48]; Lochner, 2011[50]). Foreign-educated individuals tend to promote democracy at home when they acquire their foreign education in a democratic country (Spilimbergo, 2009[53]).

… While at micro level, education tends to translate into higher voter engagement, but less so in volunteering activities

At the individual level, investment in schooling tends to translate into higher voter engagement (e.g. voter registration, voting), political information (e.g. following campaigns and public affairs) and support for free speech (Lochner, 2011[50]; Bradley and Green, 2020[16]). Available research on the effect of schooling for civic engagement tends, however, to rely on data from the United States, with additional evidence stemming from Germany and the United Kingdom. Evidence from the OECD Survey of Adult Skills shows that adults who have attained a higher educational qualification, even at later stages in life, display higher levels of political self-efficacy - a sense of being able to influence the government (Desjardins, 2020[20]). In contrast, higher educational attainment does not necessarily translate into higher engagement in volunteering activities (Bradley and Green, 2020[16]). The opportunity cost of time, which is higher for better-educated individuals who earn more and hence, may lose more in terms of earnings if they devote time to volunteering, may explain some of these findings.

Education also plays a key role in reducing criminal behaviour

The effects of education on crime can run through a range of channels. Education increases wages and hence, the opportunity cost of crime. Measures that prevent high school dropout and enhance labour market skills can therefore be very effective at reducing crime. Education also keeps children in the classroom and thereby off the streets where they could get involved in criminal activities. In addition, by keeping children away from potential criminal activities, education helps reduce criminal intensity and the risk that students leave school with a criminal record. Students who remain in school longer leave education with better chances of abiding the law later in life, making education a promising instrument for crime reduction (Lochner and Moretti, 2004[54]; Bell, Costa and Machin, 2022[55]).

In addition, education can also teach individuals how to be more patient and change their preferences towards risk, highlighting the crucial role of socio-emotional skills (Lochner, 2011[50]; Bradley and Green, 2020[16]). In fact, research evidence suggests that socio-emotional skills matter more than cognitive ones for predicting low engagement in criminal activity (Jason Baron, Hyman and Vasquez, 2022[56]; Cunha, Heckman and Schennach, 2010[57]) (OECD, 2021[39]). Early socio-emotional skills are associated with a lower likelihood of individual involvement in crime, delinquent or antisocial behaviour later in life (OECD, 2020[38])).

Fostering the development of socio-emotional skills from an early age can thus translate into lifetime social benefits. For instance, a two-year long training on social skills and self-control targeted at disruptive kindergarten boys from low socio-economic backgrounds helped increase self-control and trust later in life (Algan et al., 2022[58]). The intervention enhanced educational achievement, reduced criminality as young adults and increased social capital in adulthood. Even when the labour market returns to the individual are not accounted for, the benefits of the training programme in terms of reduced education costs (e.g. grade repetition), crime (arrest and court costs) and social transfers already compensate the programme's costs (Algan et al., 2022[58]).

Crime entails substantial social costs and education's role in reducing crime translates into social benefits that go beyond the private returns to individuals. Research estimates show that education-related policies can translate into sizeable social benefits (Box 2.2). Increases in years of high school attendance and policies that enhance schooling of individuals who belong to more crime-prone groups (Lochner, 2011[50]). In a similar vein, increases in public school funding – whether these run through operating expenditures (e.g. teacher salaries) or capital expenditure (e.g. building renovations) – that translate into improvements in school can also be a cost-effective crime prevention measure (Jason Baron, Hyman and Vasquez, 2022[56]). In fact, the estimated cost effectiveness of increases in school funding for crime reduction appears to be similar to that of a range of early childhood education interventions (e.g. Head Start in the United States) (Jason Baron, Hyman and Vasquez, 2022[56]; Anders, Barr and Smith, 2022[59]).

Box 2.2. Reducing crime through education: Estimating social benefits in the United States

Research has often relied on changes to compulsory school leaving laws to examine the role of education for crime reduction and estimate the derived social benefits.

Crime reduction generated by an extra year of schooling generates sizeable social benefits. In a landmark study, Lochner and Moretti (2004[54]) exploited changes in compulsory schooling laws between 1914 and 1974 to examine the effect of educational achievement on criminal activity (probability of incarceration and arrest). They estimate sizeable social externalities from education-generated crime reduction thanks to lower incarceration and victim costs. Social savings associated with a 1% increase in men's high school graduation rate in 1990 would have amounted to more than USD 2 billion or more than USD 3 000 per additional male graduate (Lochner and Moretti, 2004[54]; Lochner, 2011[50]). The positive externalities in crime reduction generated by an extra male high school graduate accounted for 14-26% of the private returns to high school completion. Increases in high school graduation rates thus appeared to be more cost-effective in reducing crime than policies increasing the size of police forces (when estimates accounted for both crime reduction and productivity enhancement effects).

Accounting for the dynamic persistence effects of education on crime is key for accurate cost-benefit calculations. While Lochner and Moretti (2004[54]) highlighted that a significant part of education's effect on crime was due to a productivity effect (thanks to higher wages associated with increased education levels), Bell, Costa and Machin (2022[55])show that for compulsory school leaving reforms after the 1980s, education reduced crime mostly by shifting crime-age profiles. Indeed, increases in mandatory schooling reduce crime rates by keeping youth longer in school and preventing them from engaging in criminal activity, but also by reducing the likelihood that individuals engage in crime later in life. Education reforms thus reduce crime at all ages of the lifecycle, with a more pronounced reduction at younger ages.

Thus, more recent reforms led to relatively modest effects on average educational attainment and wages. The more limited contribution to crime reduction of the productivity effect of education raises questions about the net returns of more recent reforms. Using a similar methodology to Lochner and

Moretti (2004[54]), Bell, Costa and Machin (2022[55]) show that by age 18, the social benefits of compulsory schooling law reforms just outweigh their costs. However, the benefit-cost ratio of the reforms increases when estimates also consider crime reduction among the older age groups (19-24): the cost-benefit ratio shows a return of USD 2.10 per dollar spent on the reform.

Education helps build social capital and more inclusive and cohesive societies

Education is a strong determinant of trust…

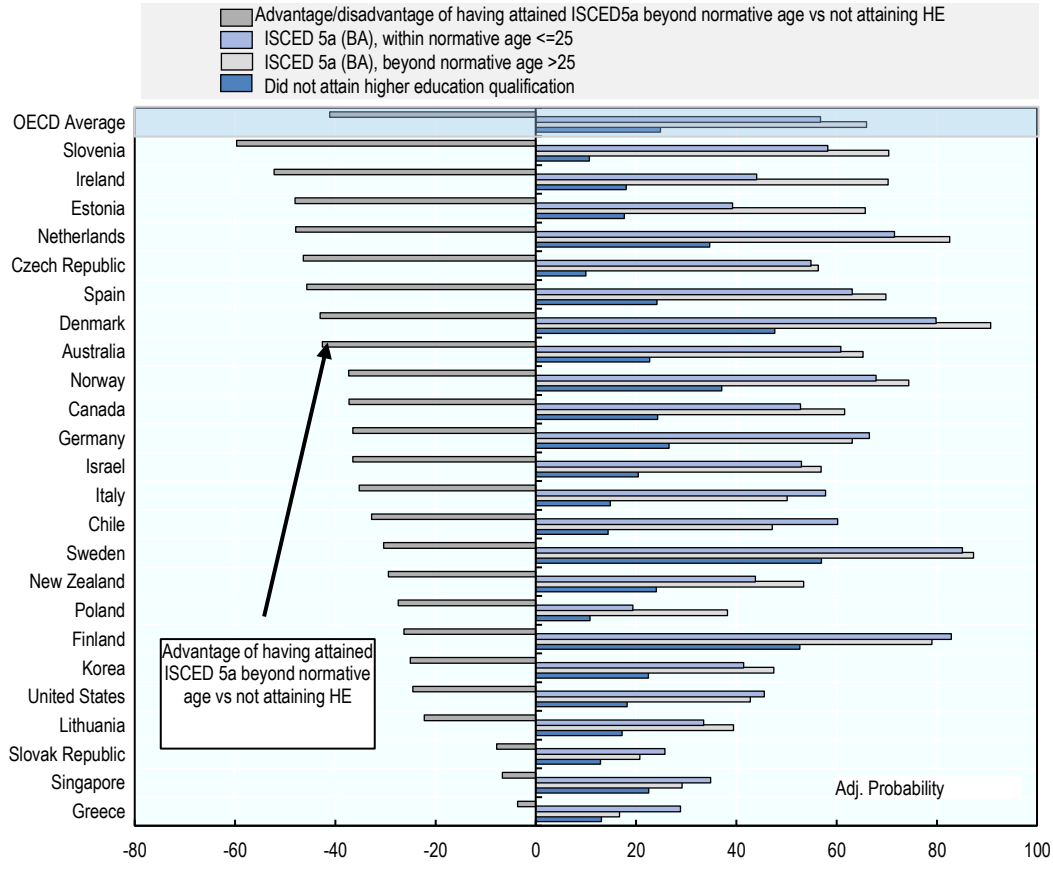
Education is a key predictor of social capital, including actual social relationships and networks (see previous section) and norms of trust and reciprocity that facilitate co-operation between individuals (Borgonovi and Andrieu, 2020[60]; Algan, 2018[61]). A large literature has documented the role of social capital, and particularly of trust (trust in others and trust in institutions), for economic growth, government performance, financial development or economic exchanges, health-related behaviours, crime and well-being (for a review, see (Algan and Cahuc, 2010[62]; Algan, 2018[61])). During the COVID-19 crisis, social capital has played a mediating role in reducing the spread of the virus (Makridis and Wu, 2021[63]). Individuals in communities with high levels of social capital reduced their mobility directed at retail and recreational activities faster than individuals living in communities with low social capital (Borgonovi and Andrieu, 2020[60]). In addition, trust in scientists during the pandemic has shaped support for and compliance with non-pharmaceutical interventions (e.g. closing nonessential businesses, implementing a curfew, mandating the use of face masks in public places) and vaccination (Algan et al., 2021[64]).

Trust is the foundation of social capital (Borgonovi and Burns, 2015[65]) and education is one of the strongest determinants of trust. Increases in individual education and in the average level of education of individuals in the surrounding community are associated with higher levels of trust (Helliwell and Putnam, 2007[66]). Education builds the cognitive and socio-emotional skills needed to interpret the behaviour of other individuals and engage in effective collaborations with them (Borgonovi and Burns, 2015[65]). Evidence from the OECD Survey of Adult Skills shows that information-processing skills related positively with trust (OECD, 2019[22]) and that individuals who attain a higher education qualification are more likely to report trust in others than those who did not reach such a qualification (Figure 2.4.). The effect of education on trust appears progressive: each extra qualification is associated with higher levels of interpersonal trust (Borgonovi and Burns, 2015[65]). Moreover, teaching practices matter for the production of such social capital: horizontal teaching practices, such as working in groups, are associated with more pro-social beliefs, including higher levels of trust (Algan, Cahuc and Shleifer, 2013[67]). While only correlational, evidence based on PISA data suggests that education systems could play a key role in rebuilding trust in scientists, which has proved to be an issue during the COVID-19 pandemic. There is a significant association at the system-level between students' performance in science and trust in scientists (Algan, 2021[68]).

…although consensus on the mechanics driving the relationship between education and trust has not been reached

While education and trust display strong positive associations, the research literature has not yet achieved consensus on the mechanisms underpinning this relationship (Borgonovi and Pokropek, 2017[69]). A range of factors can shape the positive association between education and trust. Personal ability and intelligence can support both higher levels of trust and educational attainment. In addition, better-educated individuals may find it easier to trust others if they engage in more social interactions throughout their studies (Yang, 2019[70]). Evidence based on the OECD Survey of Adult Skills (PIAAC) shows that a large part of the association between education and generalised trust is mediated by literacy skills, income and occupational prestige (Borgonovi and Pokropek, 2017[69]).

Figure 2.4. Adjusted probabilities of reporting trust in others for adults who attained a bachelor's degree (ISCED 5a) as traditional or non-traditional students



Note: Adjusted results control for the degree of labour market attachment as measured by the intensity of working time, as well as gender, immigrant and language status, parents' education, literacy proficiency and earning. The model is fitted using the binary logistic regression procedure and log odds were converted to adjusted probabilities.
Source: Desjardins (2020[20]), *PIAAC Thematic Review on Adult Learning*, https://dx.doi.org/10.1787/864d2484-en, Figure 4.22.

StatLink https://stat.link/lwzsb3

More generally, the social environment in which individuals evolve shapes the strength of the mechanisms that drives the link between education and trust. Greater birthplace diversity supports a stronger positive relationship between literacy skills and generalised trust, while greater income inequality diminishes the strength of the association (Borgonovi and Pokropek, 2017[69]).The quality of government institutions also matters. Evidence based on European countries shows that at the individual level, increases in education translate into higher levels of social trust when individuals reside in a high-quality institutional setting, with impartial and non-corrupt institutions (Charron and Rothstein, 2016[71])). As individuals get better educated, they also become better aware of favouritism and more likely to detect corruption behaviours, which in turn reduces their level of trust in the absence of high-quality government. As a matter of fact, the role of education for trust tends to become negligible in the absence of impartial and non-corrupt institutions.

Education can also help foster social inclusion and support social mobility…

Education systems can help build more inclusive economies and societies. Social inclusion can be broadly understood as "the process of improving the ability, opportunity and dignity of people, disadvantaged on

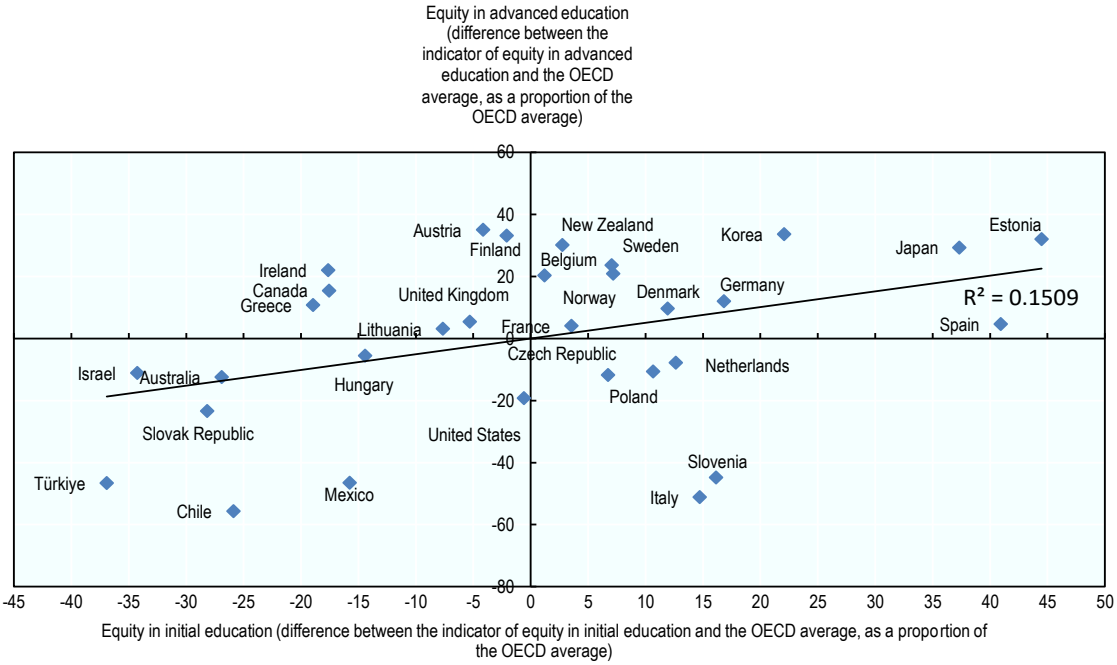
the basis of their identity, to take part in society" (Cerna et al., 2021[72]; World Bank, 2013[73]). Education can promote equal opportunities for all, and ensuring equity of participation and outcomes in initial education is a first step.

Education participation and attainment have largely increased across OECD countries (OECD, 2021[2]). At the same time, education mobility remains a concern: in the last decades, mobility from the lower and middle education levels to the upper levels has been slowing down (OECD, 2018[74]). Although access to education has largely increased in the past decades, large inequalities by socio-economic status remain in the completion of tertiary education (OECD, 2018[75]), and inequality in education is persistent across several generations (Blanden, Doepke and Stuhler, 2022[76]). Rising inequalities and low social mobility hamper growth and productivity, can translate into rising social tensions and societal divides, while increasing individuals' exposure to hazards, violence and reduced capacity to fulfil their potential (OECD, 2018[74]).

Inequalities in learning opportunities start early and for students of low socio-economic backgrounds, a great teacher and a good school are often one of the most powerful paths for moving up the social ladder (OECD, 2019[77]). While in many OECD countries, a student's postal code remains a core predictor of their chances to succeed, evidence from PISA and the OECD Survey of Adult Skills (PIAAC) shows that excellence and equity in education and training systems often go hand in hand (OECD, 2019[77]; OECD, 2019[78]). Indeed, many countries that ensure inclusiveness in skills development also display high levels of foundational skills among their youth, tertiary graduates and adults (OECD, 2019[78]). In contrast, countries that display the lowest equity performance also display low levels of average performance.

Achieving equity within education systems is a key precondition for achieving equity in subsequent lifetime outcomes. Early intervention is key to break the cycle of intergenerational disadvantage and smoothen lifetime income mobility for individuals from lower socio-economic backgrounds (OECD, 2018[74]). Education policies that ensure equitable learning opportunities and outcomes during compulsory schooling can support upward mobility in education and equity in educational attainment (OECD, 2018[75]). While several countries, including Denmark, Estonia, Japan and Korea, maintain equity of learning (in terms of participation and quality) from initial to advanced education, few countries achieve maintaining equity in advanced education in spite of low equity in initial education (Figure 2.5).

Figure 2.5. Equity in initial and advanced education



Note: The indicator of equity in initial education is the average of the normalised scores of different proxy indicators or equity in initial education (from early childhood to secondary education): share of disadvantaged students (bottom quarter of 15 year-olds in PISA 2018) who attended early childhood education for at least two years (equity of participation indicator); and difference in the share of low-achievers in PISA 2018 between top and bottom quarter ESCS 15 year-olds (equity of outcomes indicator).
The indicator of equity in advanced education is the average of the normalised scores of different proxy indicators or equity in advanced education (post-secondary non-tertiary and tertiary education): difference in the share of 28-34 year-olds with tertiary education between those with high and low-educated parents (equity of participation indicator); difference in the share of adults aged 35 years and older enrolled in at least a post-secondary non-tertiary programme (post-secondary non-tertiary education or tertiary education) between those with high and low-educated parents (equity of participation indicator); difference in the share of 16-34 year-olds who have not completed post-secondary or tertiary education between those with high and low-educated parents (equity of outcomes indicator); and difference in the share of 25-64 year-old adults lacking basic skills between those with high and low-educated parents (equity of outcomes indicators).
All country values on the indicators of equity in initial/advanced education are then compared to the OECD average, and the differences expressed in percentages are represented on the chart. The OECD average corresponds to the arithmetic mean of the respective indicators for each of the OECD countries or sub-national entities included in the figure.
For data coming from the OECD Survey of Adult Skills (PIAAC): Data for Belgium refer to Flanders only. Data for the United Kingdom refer to England and Northern Ireland jointly. The United States has collected three waves of data using the PIAAC instruments and data for the United States in the figure are based on mean of the United States observations available (combined data from the 2012 and 2014 collections, and data from the 2017 data collection).
Source: Adapted from OECD (2018[79]) and data from OECD (2018[80]), PISA Database 2018, https://www.oecd.org/pisa/data/2018database/ (for indicators on equity in initial education) and OECD (2012, 2015, 2017[81]), Survey of Adult Skills (PIAAC) Database 2012, 2015 and 2017, https://www.oecd.org/skills/piaac/data/ (for indicators on equity in advanced education).

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…and also help build societies that are more cohesive, through the formation of more tolerant and open-minded individuals

Cohesive societies help support the well-being of their members, fight exclusion and marginalisation, promote trust and foster a sense of belonging, while supporting upward social mobility (OECD, 2011[82]).

Beyond its role for trust and well-being, as well as for helping individuals move up the social ladder, education can also support the formation of more tolerant and open-minded individuals and of more cohesive societies as a consequence.

Education is a key determinant of tolerance and low levels of discriminatory attitudes. Research evidence suggests that lower education levels are associated with greater levels of in-group favouritism, prejudice, ethnic exclusionism, xenophobia and negative attitudes towards immigrants (for a review, see (Easterbrook, Kuppens and Manstead, 2016[83]; Mezzanotte, 2022[84]; Borgonovi and Pokropek, 2019[85])). Encouragingly, across OECD countries, most students are interested in learning about other cultures and students who are different from them. Such an interest is positively associated with students' respect for people from other cultures and awareness of intercultural communication (OECD, 2020[86]). A range of education activities can foster students' global competence or capacity to live in a diverse and interconnected world. Indeed, students' interest in learning about other cultures, their ability to understand different perspectives and their awareness of intercultural communication are all positively associated with the number of learning activities related to such topics they engage in at school (OECD, 2020[86]).

Hence, through its socialisation role, education helps improve communication in society between individuals with different backgrounds (e.g. socio-economic, cultural, and religious), with implications for economic growth (Gradstein and Justman, 2002[87]). Beyond a socialisation role, education can also help reduce perceptions of economic or cultural threat and thereby translate into more tolerance towards individuals who are different. Evidence based on cross-country data suggests that better-educated individuals display lower opposition to migration than lower-educated ones and that this increased acceptance levels are largely due to lower feelings of threat (Borgonovi and Pokropek, 2019[85]).

Educating for an ever-changing world

As economies and societies are becoming more digital than ever, it is critical to ensure that everyone can thrive in the digital age

The pandemic has accelerated the digitalisation of economies and societies, and countries' preparedness to seize the benefits of a digital world largely depends on their populations' skills (OECD, 2019[1]). To thrive in a digital world, individuals need a well-rounded set of skills, including good cognitive and digital skills, and the socio-emotional skills that enable them to be flexible, adapt and manage change.

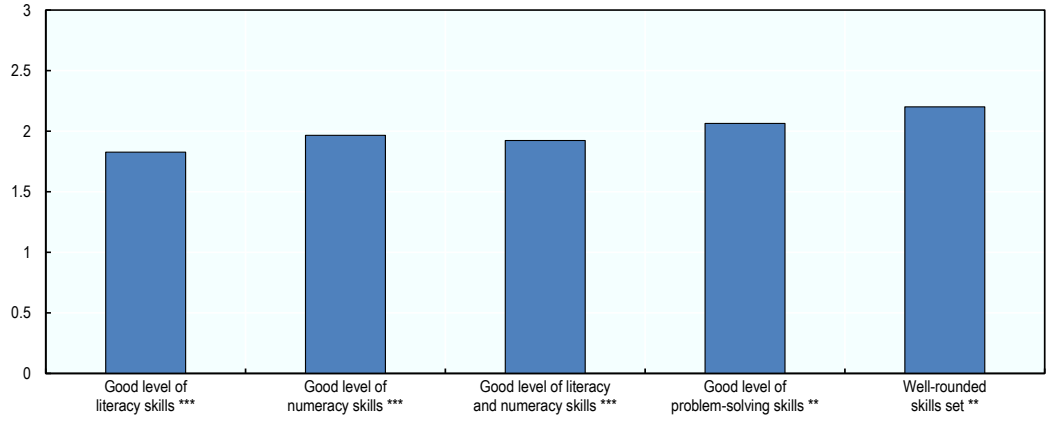
Skills help bridge digital inequalities in access, use and outcomes derived from the use of digital technologies. Increasingly, a lack of skills has become a major source of digital divides in access to Internet. Among European households who lack Internet access, many more report lacking access (44% in 2019) because of a lack of skills than before (32% in 2010) (Eurostat, 2021[88]). In addition, skills shape how effectively individuals can engage in digital societies (OECD, 2019[1]). A well-rounded set of skills enables individuals to move from a simple use of Internet for information and communication to a more complex use, encompassing learning online, e-finance or creativity-related tasks (Figure 2.6.). Not all individuals need to perform such tasks but as societies go digital, individuals may be required to do so and hence, should have the necessary skill set to adapt. Such gaps in uses are also likely to translate and reflect well-being divides between low and high-skilled individuals. Evidence from Internet search engine data from the United States reveals that searches associated with job search, civic participation and healthy habits consistently predict well-being (Algan et al., 2019[89]). While job search is negatively associated with well-being, civic engagement is associated with higher life evaluation and healthy habits, higher positive affect and lower negative affect.

During the pandemic, digital skills have made a difference to continue engage in society, work, learn and to access health care online…

During the pandemic, many public and private services have moved online. Having a well-rounded level of skills has made a difference between continuing to engage in society, work, learn and access health care, and being left out or left behind. Already before the pandemic, lower-educated individuals were more likely to feel left out of society and this perception has become more acute during the COVID-19 crisis (OECD, 2021[8]). While a range of factors may have triggered this feeling, digital divides that prevented individuals from connecting to other people or accessing a range of services during lockdowns are likely to have exacerbated this perception. Without basic skills, individuals are locked out of the benefits of an increasingly digital world. Lacking basic literacy and numeracy skills constitutes a barrier to performing activities online, while lacking problem-solving skills in technology-rich environments is a barrier to performing more diverse and complex activities (OECD, 2019[1]).

Figure 2.6. Effects of skills on the likelihood to perform diverse and complex Internet uses rather than for information and communication only

Relative risk ratios (comparison profile – "Diversified and complex use", reference profile – "Use for information and communication")



Note: People in this "Diversified and complex use" profile perform on average the largest number and greatest variety of activities on line. They carry out the biggest share of online tasks linked to e-finance, learning and creativity, activities that are performed by the smallest range of individuals and that can also be considered more complex. People in the "Use for information and communication profile" mainly use communication tools and access the Internet to obtain information. Each bar displays the relative risk ratio obtained from a multinomial logit regression in which the dependent variable is the profile of Internet user to which each individual belongs and the independent variable of interest is a dummy equal to 1 if the individual has a given level of skills. For a good level of literacy (numeracy) skills: individuals with a good level of skills score at least Level 3. For a good level of literacy and numeracy skills: individuals with a good level of skills score at least Level 3 in literacy and numeracy. For a good level of problem-solving skills (in technology-rich environments: individuals with a good level of skills score at least Level 2 (inclusive) in problem-solving. For the skills mix (all skills): individuals with a well-rounded skill set score at least Level 3 (inclusive) in literacy and numeracy and at least Level 2 (inclusive) in problem solving. The analysis was performed on a matched OECD Survey of Adult Skills (PIAAC) - European Community Survey on Information and Communication Technology (ICT) Usage in Households and by Individuals (CSIS) file including seven countries (Czech Republic, Finland, France, Ireland, Italy, Lithuania and Spain). Other independent variables included in the estimation include: age categories, educational attainment level, employment status, gender and country dummies. The sample for the analysis on the effect of good problem-solving skills and that of having a well-rounded skills set includes individuals from the Czech Republic, Finland, Ireland and Lithuania. France, Italy and Spain did not participate in the problem-solving skills in technology-rich environments assessment. Relative risk ratios are obtained by an exponential transformation of the estimated coefficients from the multinomial logit. Significance levels have been obtained from the estimated coefficients of the multinomial logit. In the Survey of Adult Skills (PIAAC): Lithuania- year of reference 2015; all other countries- year of reference 2012. *** - significant at the 1% level. ** - significant at the 5% level.
Source: OECD (2019[1]), *OECD Skills Outlook 2019: Thriving in a Digital World*, https://dx.doi.org/10.1787/df80bc12-en, Figure 4.12.

Digital skills are also important to protect against the risks associated with digital technologies…

Skills also enable individuals to better protect themselves – and their children – against any risks associated with digital technologies. The increasing use of digital devices and Internet may be detrimental to individuals' well-being and social relationships. While a causal relationship has been challenging to establish, evidence suggests that excessive uses of digital technologies are associated with lower life satisfaction, increased risk of depression and anxiety, lower sleep quality and higher prevalence of negative feelings (e.g. feeling sad and miserable) (OECD, 2021[90]; Hooft Graafland, 2018[91]; OECD, 2019[44]).

Better-educated- individuals are potentially better informed about digital-related risks, have access to other non-digitally based activities during their leisure time, or are more careful about their online engagement. Students who perform better in the PISA assessments are, for instance, less likely to report feeling bad without an Internet connection (OECD, 2019[1]). In addition, skills also shape how individuals take care of their online safety and data privacy. A good level of skills increases the likelihood that individuals take action to enhance their online security by managing access to their personal information, using anti-tracking software or changing settings to limit cookies (OECD, 2019[1]). Digital skills also help children to better cope with cyberbullying, for instance by enabling them to take the necessary actions to block senders and delete messages (Gottschalk, 2022[92]).

By integrating digital technologies in teaching and learning, education can help build the skills needed for a digital world and bridge divides…

Education systems play a key role in laying the foundations for thriving students and citizens in an increasingly digital world. Beyond seeking to equip students with a well-rounded mix of skills and learning attitudes, education systems have equally focused their efforts on integrating digital technologies in students' learning. The introduction and use of digital technologies and Internet in schools has been one of the main drivers of innovation in education practices observed in the past decade in OECD countries (Vincent-Lancrin et al., 2019[93]) and the pandemic has further boosted the digital transformation of education systems. Data from PISA (2018) show that on average across OECD countries, around two-thirds of students had experienced the use of digital devices as part of their science, reading or mathematics classes in the previous month[3]. In science, such uses were in most cases performed either by teachers and students together (for 31% of all science students) or teachers only (for 31% of all science students) in contrast to student-led uses (for 12% of all science students).

The use of digital technologies in education systems can be part of the solution for building the skills needed for a digital world, including digital skills. Although children are exposed to digital technologies from an ever earlier age, not all young individuals are technologically savvy and the use of digital technologies in schools can enhance students' digital skills (OECD, 2015[94]; OECD, 2017[95]) (Malamud and Pop-Eleches, 2011[96]; Malamud et al., 2018[97]; Bulman and Fairlie, 2016[98]). Evidence from PISA (2018) shows that students who had more opportunities to learn digital skills at school are more likely to perform well in emergent aspects of reading, such as distinguishing fact from opinion (OECD, 2021[47]). While divides in access to digital technologies at home persist in many OECD countries, schools can help bridge inequalities in students' access to such technologies and in the extent to which they seize their benefits for learning.

Digitalisation also provides new opportunities for education systems to shift away from a "one-size-fits-all" teaching approach to personalised learning experiences. Smart uses of digital technologies hold great potential in terms of inclusion, through adaptive learning, enhanced personalisation of learning experiences, access to a greater array of learning resources and equipment (e.g. through remote laboratories), or the use of Artificial Intelligence-based tools to accompany instruction with diagnosis and personalisation. Learning analytics[4], based on big data gathered from online navigation, social networks

or networked devices and sensors, also support the development of more personalised learning experiences (OECD, 2019[99]; OECD, 2021[100]). These allow for easier identification of students at risk of dropout and assessment of the effectiveness of a variety of teaching strategies. Such innovative uses of data and digital technologies in education systems provide pathways for more inclusive and high-quality learning experiences.

The use of digital technologies in teaching and learning can enhance student academic performance, but many countries are yet to reap the benefits of digital education

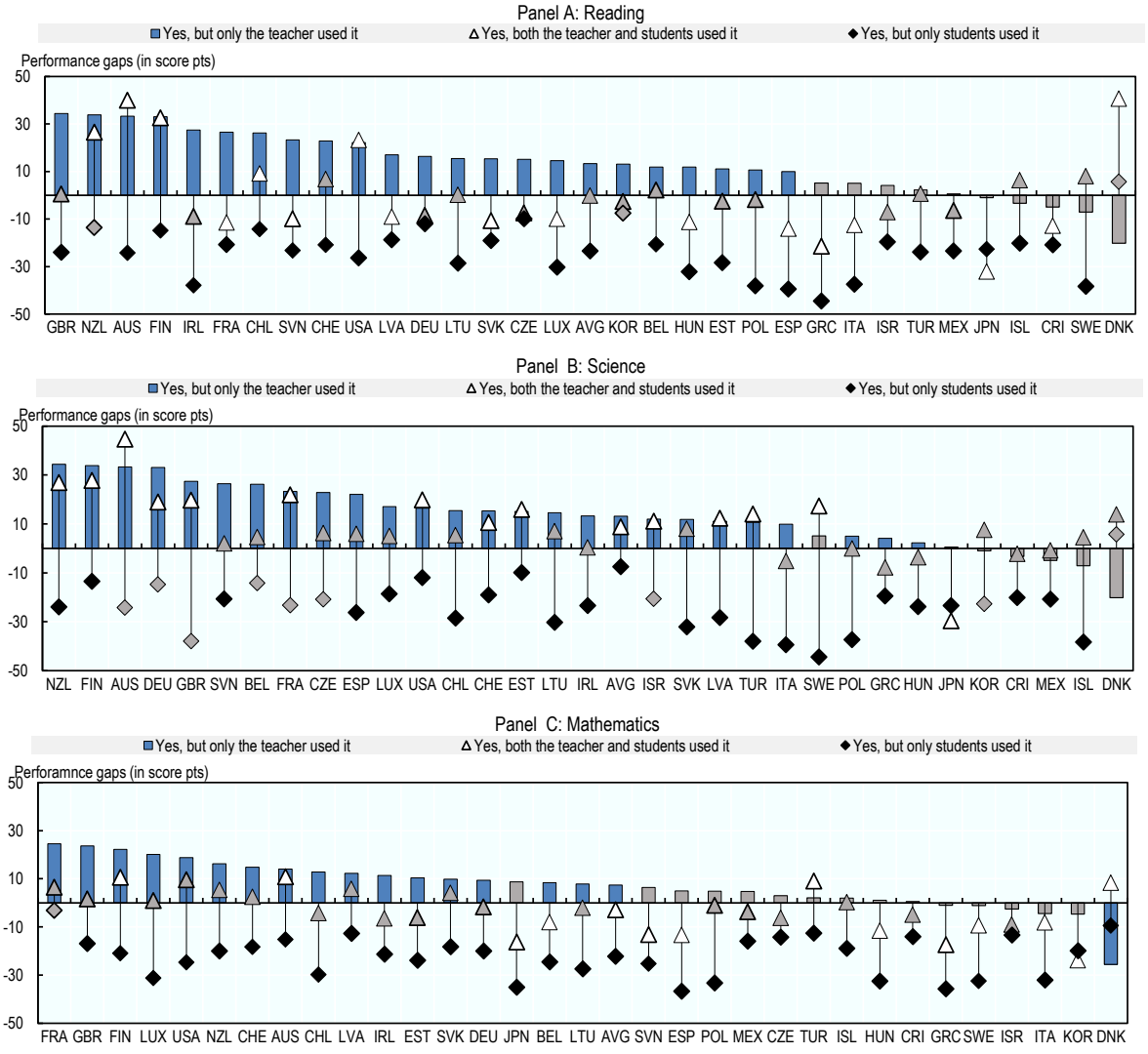
Indeed, when technology enters teaching and learning practices in innovative ways, it can translate into higher student performance and engagement (Paniagua and Istance, 2018[101]; OECD, 2019[1]; OECD, 2021[100]). Evidence from PISA (2018) shows that the use of digital devices as part of teaching activities can support better student performance, although not all education systems have managed to tap into the potential of digital technologies for effective teaching and learning (Figure 2.7).

PISA data also suggests, however, that seizing this potential depends on how technology is being used in the teaching and learning process and the underlying pedagogical intent. Indeed, teacher-led and (though to a somehow lesser extent depending on countries) combined student-teacher uses of digital devices for learning tend to be more positively associated with student performance than student-led uses of digital devices, even after accounting for students and schools' socio-economic background, school digital infrastructure or student perceived digital competence. In Australia and New Zealand, countries where combined teacher-student uses of digital technologies are very frequent (OECD, 2021[47]), such uses also display the largest association with student performance relative to the other types of digital devices use, suggesting that students in these countries are seizing the benefits of digital technologies through enhanced instructional practices. More generally, these findings are in line with research evidence pointing at the importance of engaging teachers in the use of digital technologies rather than sidestepping them, and building capacity within the education system for the pedagogical use of digital technologies instead of merely focusing on digital infrastructure availability (Beg et al., 2022[102]; Sailer, Murböck and Fischer, 2021[103]).

In contrast, student-led uses of digital technologies tend to display mostly negative associations with student performance, suggesting that students may not perform the most productive uses of digital tools, particularly if teachers do not oversee or guide student use and students get distracted or make passive uses of technology. At the same time, student-led uses tend to be more recurrent in socio-economically disadvantaged schools than advantaged ones on average across OECD countries[5]. The potential of digital technologies for inclusion and bridging learning gaps may therefore not be reached in the absence of policies that support more innovative uses of digital technologies in disadvantaged schools (e.g. through targeted teacher professional learning opportunities, provision of external expertise and guidance for the introduction of digital technologies in teaching and learning, development of students' digital skills).

Figure 2.7. Use of digital devices for learning and teaching, and student performance

Performance differences stemming from the use of digital devices for learning and teaching during lessons within the previous month by type of user (only teacher, both teacher and student, only students) relative to no device use



Note: Values that are not statistically significant are highlighted in light grey. The reference category is students who report no uses of digital devices for learning during lessons within the previous month. Regression controls include: the PISA index of student's socio-economic status, schools' socio-economic status, time spent using digital devices outside of classroom lessons for each specific subject, time spent using digital devices during subject lessons, principals' reports on the school capacity to enhance learning and teaching using digital devices (sufficient number of Internet-connected devices, sufficient school Internet bandwidth, availability of adequate software, teachers with necessary skills to integrate digital devices in instruction, availability of professional resources for teachers to learn how to use digital devices, availability of an online learning support platform, incentives for teachers to integrate digital devices in teaching, sufficiently qualified technical assistant staff), availability of digital infrastructure in schools (number of school computers per student and proportion of Internet-connected computers), availability of home computer for school work, students' perceived ICT competence.

Source: Adapted from OECD (2018[80]), PISA Database 2018, https://www.oecd.org/pisa/data/2018database/ (accessed on 10 November 2022).

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Evidence from Figure 2.7 also shows that countries have unequally seized the benefits of the digital transformation in their education systems. The average positive associations between teacher-led or combined student-teacher uses of digital devices in teaching and learning suggest that there is great potential for most countries to further leverage the digital transformation in education, but that countries need to adopt a range of policies to support effective digital education. Students in a number of education systems, including Australia, Finland, New Zealand or the United Kingdom, appear to derive more substantial benefits from teacher-led and combined student-teacher uses of digital devices in contrast to their peers in other OECD countries. Evidence from TALIS (2013) shows that Australia, Finland, New Zealand or the United Kingdom were also ahead already in 2013 in terms of the preparation and training of their teachers for digital technologies use (OECD, 2019[1]). These countries have likely managed to design a digital education policy ecosystem (including polices to ensure the availability of digital education infrastructure and foster innovation in digital education technologies, capacity building to ensure their effective use, etc.) that enables more effective and innovative uses of digital technologies for learning and teaching.

The challenges and opportunities of our times require, more than ever, developing resilient and proactive citizens for a sustainable future

Education plays a key role in raising awareness and sensitivity about a range of global and environmental issues…

Education is instrumental in raising awareness and sensitivity about a range of global issues and forming citizens who are prepared to live and act for a sustainable future. Skills shape students' and citizens' ability to live in an interconnected world and take action for collective well-being (OECD, 2020[86]). Building a sustainable future also requires behavioural changes, understanding and acceptance of climate action policies.

The PISA 2018 assessment has examined the competences students need to develop to be able to thrive in a diverse and interconnected world. Students who display higher values in indices that reflect their attitudes and dispositions regarding global issues (e.g. awareness of global issues, interest in learning about other cultures, cognitive adaptability) are more likely to report that they take actions for collective well-being and sustainable development (OECD, 2020[86]). Such positive attitudes and dispositions regarding global issues are positively related to students' global competence test performance. While positive attitudes and dispositions towards global issues are likely to shape students' motivation and performance in learning about these topics, it is also likely that better understanding such issues can result in more positive dispositions and likelihood that students take action.

When it comes to students' preparedness for building a sustainable future in particular, evidence from several PISA rounds highlights that students' environmental awareness and pro-environmental attitudes are positively associated with their science performance (OECD, 2021[6]). Students with a better understanding of science are thus more likely to be environmentally aware and equally display a deeper sense of responsibility for sustainable development issues (OECD, 2021[104]; Echazarra, 2018[105]). The number of science activities in which students participate at school and their exposure to enquiry-based teaching also matter for their attitudes towards the environment. More generally, students' attitudes regarding global issues relate positively with the number of global competence activities they engage in at school, even after accounting for students' and schools' socio-economic profile (OECD, 2020[86]).

Students' awareness of environmental problems is strongly associated with the content of students' curriculum…

Beyond learning activities organised in schools, the content of formal curricula can also help improve students' awareness of and attitudes towards such issues. A number of countries (e.g. Australia, Denmark

and Estonia) already prioritise environmental awareness and stability among their education goals (OECD, 2020[5]). Evidence from PISA 2018 shows that almost all students have environmental issues included in their curricula and that including such topics in the curriculum matters. Students' awareness of climate change and global warming is strongly associated with their inclusion in students' curriculum on average across OECD countries (OECD, 2020[86]). At the same time, students' environmental sustainability competence displays large overall variance and a high level of general educational achievement is not sufficient for developing greater awareness of environmental problems (Borgonovi et al., 2022[106]; Borgonovi et al., 2022[107]). In contrast, being a top performer in science is positively associated with higher levels of environmental awareness even after accounting for students' reading and mathematics achievement. These findings highlight the importance of the content of education curricula, and of science education in particular, for equipping students with the relevant skills needed to promote a sustainable future (Borgonovi et al., 2022[106]; Borgonovi et al., 2022[107]).

But educating citizens who take action for a sustainable future also requires developing students' agency and sense of empowerment

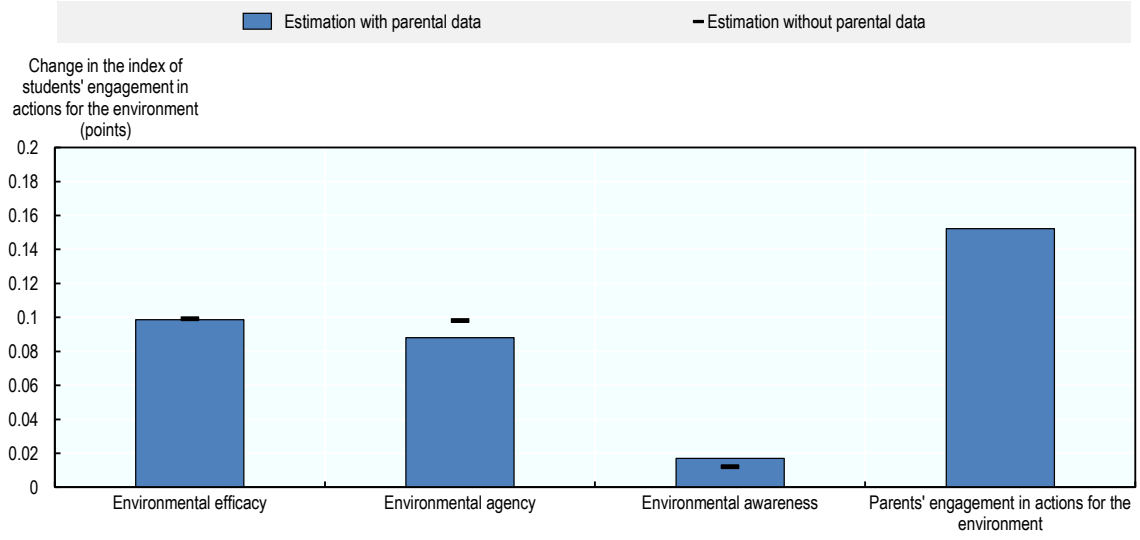
To form citizens who can promote a sustainable future, education systems also need to focus on developing students' agency and sense of empowerment that enable them to take impactful actions for the future (OECD, 2021[104]). Although students have a high level of awareness, self-efficacy and interest in environmental issues, only one in two students feels that they can do something about the problems of the world (OECD, 2021[104]). Students with higher levels of science proficiency tend to be more pessimistic about the future of the environment. While complacency with environmental issues may be problematic, pessimism about the future that impedes students to take action is equally undesirable (OECD, 2021[104]; Echazarra, 2018[105]).

Educating students and citizens for a sustainable future thus requires going beyond the core set of knowledge and skills related to environmental issues. Building a sense of empowerment and resilience is crucial. Indeed, students who display a higher sense of agency and self-efficacy regarding the environment are more likely to take action for the environment (Figure 2.8). Specific pedagogies such as learning in real-life contexts, project- and enquiry-based learning, and discussion-based teaching can be effective at developing both knowledge and students' agency and confidence to take action (OECD, 2021[6]). Evidence in Figure 2.8 shows that students' engagement in actions for the environment also relates to their parents' engagement in such actions. Whether this positive association reflects the crucial role played by parents in the socialisation of their children or the scope for children to shape their own parents' participation in actions for the environment, it highlights the need for education systems to involve parents and caregivers in the development of children's skills for a sustainable future (Borgonovi et al., 2022[107]).

In addition, evidence from PISA (2018) shows that building students' cognitive adaptability can be a pathway for fostering resilience, a capacity to deal with uncertainty and an ability to understand different perspectives (OECD, 2020[86]). Indeed, cognitive adaptability refers to students' ability to adapt their "thinking and behaviour to the prevailing cultural environment or to novel situations and contexts that might present new demands or challenge" (OECD, 2020[86]). Students' cognitive adaptability and resilience are positively associated across all countries and other participants in PISA 2018, even after accounting for students and schools' socio-economic profiles.

Figure 2.8. Students' environmental awareness and self-efficiency, and engagement in actions for the environment

Change in students' engagement in actions for the environment index associated with a one-unit increase in indices of students' environmental-related attitudes and parents' environmental engagement in actions for the environment



Note: The index of students' engagement in actions for the environment for the environment is computed as the average over the following dummy variables, where student report to: reduce the energy used at home (e.g. by turning the heating or air conditioning down or by turning off the lights when leaving a room) to protect the environment; choose certain products for ethical or environmental reasons, even if they are a bit more expensive; sign environmental or social petitions on line; boycott products or companies for political, ethical or environmental reasons; participate in activities in favour of environmental protection. Environmental efficacy is defined based on students' ability to: explain how carbon-dioxide emissions affect global climate change; explain why some countries suffer more from global climate change than others; discuss the consequences of economic development on the environment. Both estimations (with and without parental data) account for students' performance in science, the PISA index of economic, social and cultural status, gender, learning minutes (per week) in science and the inclusion of climate change and global warming topics in students' formal curriculum. The estimation with parental data also accounts for parents' engagement in actions for the environment, interest in environmental issues in their own country and in other countries, and extent to which parents feel well-informed about climate change and global warming. The estimation with parental data is performed on countries with available data in the PISA 2018 parental questionnaire, namely: Chile, Germany, Ireland, Italy, Korea, Mexico and Portugal.
Source: Adapted from OECD (2018[80]), PISA Database 2018, https://www.oecd.org/pisa/data/2018database/ (accessed on 10 November 2022).

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Education systems thus play a major role in nurturing resilient learners who can tackle disruptions and adapt to changing environments, capitalise on existing opportunities and reach their potential (OECD, 2021[45]). Most countries/jurisdictions with available data in the OECD Future of Education and Skills 2030-Curriculum database embed student agency concepts in around one-third of their curricula and not all teachers feel prepared to support the development of student agency (OECD, 2020[7]). Beyond the inclusion of student agency in future-oriented curricula and support for teachers' professional learning, a range of other approaches can foster learners' resilience and ability to shape a sustainable future. Education systems that foster student agency are those where teachers and students co-construct active learning environments instead of putting teacher-led instruction at the core (Schleicher, 2021[108]). In addition, policy efforts that encourage student engagement and nurture positive learning climates, provide adaptive pedagogies for all and support to the most vulnerable learners can equally help develop more resilient students (OECD, 2021[45]). Empowering learners to navigate confidently in uncertain and changing worlds also requires a whole-child approach of education that brings together the development of students' social and emotional skills, their well-being and mental health (OECD, 2021[45]).

Key messages

Overall, high-quality education pays off for individuals, communities and societies in significant and diverse ways. It is thus important, when considering public investments in education, to go beyond the sole economic benefits, and to also consider its many broader social outcomes and education's contribution to thriving individuals and societies.

Better-educated individuals live healthier and longer lives. They display higher levels of self-reported health, with externalities on their children and peers, and by age 25, those with tertiary education benefit from a 5 to 8 years life expectancy premium relative to their low-educated peers. They also enjoy happier lives, as education helps build the skills, knowledge and attitudes that support individuals' mental health and psychological well-being in adulthood.

Education also supports civic engagement and reduces antisocial behaviour to the benefit of society. Analytical, information-processing and critical-thinking skills developed in school build more enlightened and engaged citizens and, in turn, better-functioning democracies. Education also develops tolerance and open-mindedness as a basis for more cohesive societies. Cognitive and socio-emotional skills also play a key role in reducing criminal behaviour, translating into lower crime-related costs and large social benefits.

In addition, education helps build social capital and more inclusive societies. It is a strong determinant of trust, which constitutes the foundation of social capital and holds key implications for economic growth, government performance, economic exchanges, health and well-being. In addition, education systems can support more inclusive economies and societies through social mobility. Achieving equity within education systems is a key precondition for achieving equity throughout an individual's learning pathway, and across generations.

Last but not least, sustained high-quality education also helps individuals and communities make the most of new opportunities, such as the digital transformation, and proactively addressing emerging challenges, such as climate change. Education and skills have made a difference during the pandemic to continue engage in society, work and learn, and not be left behind in an increasingly digital world. By integrating digital technologies in teaching and learning, education can help build the skills needed for a digital world and bridge divides. In addition, education plays a key role in raising awareness and sensitivity about a range of global and environmental issues. Developing students' agency and sense of empowerment that enables them to take impactful actions for the future is critical for building proactive citizens who take action for a sustainable future.

The broader social outcomes of education thus include both private benefits (e.g. better health, better opportunities for one's children) and societal ones, as private benefits translate into positive externalities and collective benefits. While many such returns can be considered as outcomes in themselves, they also yield economic and monetary benefits, albeit in indirect ways, thereby strengthening the economic returns to education discussed in Chapter 1.

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Notes

[1] Source: Indicators on A. Curriculum Redesign, 4. Contents in curriculum: (a) Learning areas/ subjects, Table "Types of cross-curricular themes reported by countries/jurisdictions".

[2] The Big Five represent personality traits that summarize more specific personality traits. They are defined as: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (also called Emotional Stability) (Almlund et al., 2011[3]). For a review of the Big Five, see (Almlund et al., 2011[3]) (Chernyshenko, Kankaraš and Drasgow, 2018[109]).

[3] On average across OECD countries, 75% of science students reported a digital device use in science lessons in the previous month, relative to 72% of students in test language classes and 64% in mathematics (OECD, 2020[110]).

[4] Learning analytics focuses on "how to employ data mining, machine learning, natural language processing, visualization, and human-computer interaction approaches among others to provide educators and learners with insights that might improve learning processes and teaching practice" (OECD, 2019[99]).

[5] While student-led uses of digital devices are more frequent in socio-economically disadvantaged schools, their negative association with student performance is not also larger in socio-economically disadvantaged schools. Further analyses show that performance gaps by type of digital device users do not differ significantly between socio-economically advantaged and disadvantaged schools, and hence, that observed average negative associations between student-led uses and student performance are not driven by more pronounced negative gaps in socio-economically disadvantaged schools.

3 Governing and distributing school funding: Effectively connecting resources and learning

Efficient and equitable resourcing of schools is the foundation for quality education and marks a key challenge for education systems. Beyond a sufficient level of funding, effective resourcing requires adequate governance arrangements and well-designed allocation mechanisms for education funding. This chapter examines whole-system approaches to managing the complexity of school funding governance in the context of fiscal decentralisation and growing school autonomy. It also presents a series of questions that need to be addressed when designing school funding allocation mechanisms, highlighting the potential of needs-based funding formulas. Finally, the chapter underlines the importance of adequate regulatory frameworks for the public funding of private providers to mitigate unintended consequences and harmful effects on equity.

Introduction

The COVID-19 pandemic triggered a surge of education expenditure among OECD countries: About two-thirds of governments raised their budget, with the remainder maintaining spending at a constant level (OECD, 2021[1]). However, the lagging economic recovery and new budget priorities deriving from the consequences of Russia's war of aggression against Ukraine confronts governments across the OECD with difficult budgetary choices. Governments must allocate scare public resources between and within different policy fields, including education, health and welfare programmes, to support the economic recovery and balance short- and long-term economic and social goals. While investment in education plays a crucial role in the economic and social recovery from the COVID-19 pandemic, ensuring an efficient and equitable use of education resources becomes a clear policy priority.

The overall levels of school funding clearly matter for the quality of teaching and learning, as has been underlined by recent quasi-experimental research on school spending and student outcomes in the United States (Jackson, 2018[2]). Overall levels of spending arguably also determine the ability of school systems to respond to new challenges, such as the COVID-19 pandemic. In general, school systems that lack quality teachers, school leaders and support staff as well as adequate educational facilities and materials will struggle to promote quality education (OECD, 2017[3]). Insufficient investments in education staff reduces the attractiveness of a career in schools and makes it harder to recruit and retain qualified professionals. Resource constraints, such as a lack of quality staff, may also hinder schools' capacity for pedagogical innovation (OECD, 2019[4]). Similarly, although investments in physical resources are rarely the most effective way to improve students' learning, inadequate facilities that fail to support teaching and learning can thwart a school system's pursuit of excellence (OECD, 2018[5]; Gunter and Shao, 2016[6]).

Overall levels of spending matter, but beyond a certain level of investment, the governance and distribution of school funding is at least as important to promote student learning.

Beyond a certain level of investment, however, the governance, distribution and effective use of school funding is at least as important to promote student learning at its overall amount. The governance of school funding concerns the different authorities involved in raising, managing and allocating resources and the relationship between these authorities. In many countries, the governance of school funding is characterised by increasing financial decentralisation, enhanced school autonomy and growing public funding of private school providers. While these trends come with new challenges, they can provide opportunities for the more effective and equitable use of funds, insofar as they are accompanied by adequate institutional arrangements. Further, the design of effective mechanisms to allocate and distribute funding – across levels of administration or to individual schools – is also essential to ensure that school funding advances student learning, equity and related policy objectives (OECD, 2017[3]).

This chapter describes practices and procedures involved in effectively governing and distributing school funding and analyses the key challenges involved. The chapter is organised around five themes:

- First, this chapter reviews the distribution of responsibilities for raising and allocating funding for school education. This includes the role and design of fiscal transfers to equalise spending capacity across jurisdictions as well as the use of monitoring and evaluation to ensure transparency in the flow of resources.
- Second, this chapter explores the importance of whole-system approaches to address complexity challenges in school funding governance, which can give rise to inefficiency and a lack of transparency. Effective school funding governance requires a clear delineation of responsibilities for school funding, adequate co-ordination mechanisms and systematic capacity building.
- Third, this chapter analyses the trend towards giving schools greater autonomy in managing their own budgets, and the conditions that need to be in place for schools to use this autonomy in a

constructive way. This includes competent education leadership, technical support and accountability, as well as adequate institutional frameworks to address the risk of increased inequities across schools.

- Fourth, the note reviews the public funding of private providers as part of broader policies to promote parental choice and education quality, and the design of adequate regulatory frameworks to counteract potential adverse effects of such policies on equity.
- Finally, the note discusses a series of fundamental questions that need to be addressed when designing a funding allocation model to ensure that resources are distributed in a transparent and predictable way. This includes the balance between regular and targeted funding, the methods used to determine the size of funding allocations as well as the implementation of new funding allocation mechanisms. This theme covers country approaches for distributing funding for current and capital expenditures. For current expenditures, the analysis also focuses on the design of funding formulas that can be adjusted to support policy objectives aiming for greater efficiency, equity and quality.

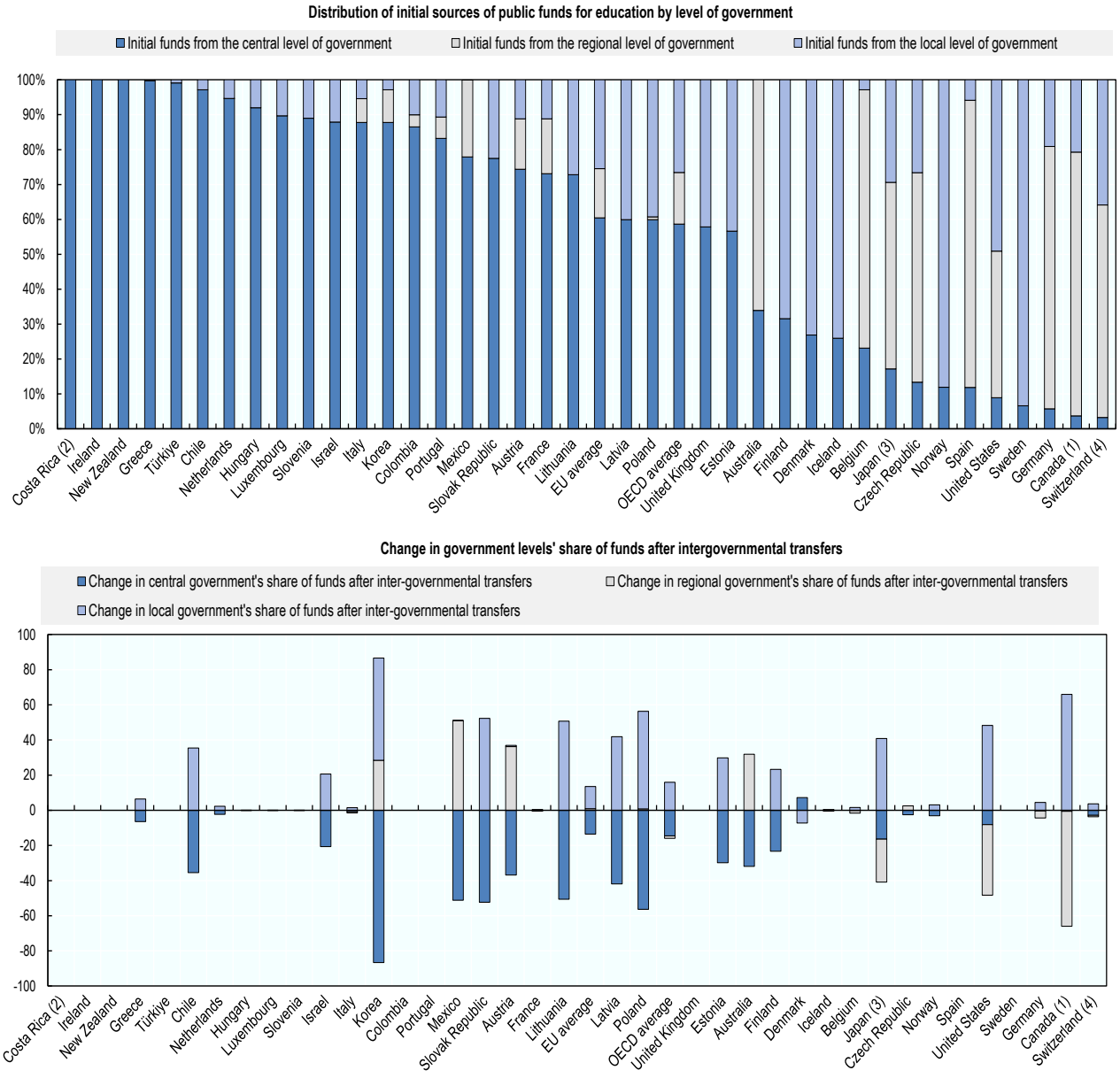
Distributing responsibilities for revenue raising and spending in school education

The majority of initial funding for school education originates at the central level, but in many countries sub-central authorities are important actors in school funding

The majority of initial funding for school education is raised at the level of central governments, mainly through tax revenues. However, sub-central authorities typically complement central funding from their own revenues generated for instance through local taxes or user fees (OECD, 2017[3]).[1] In 2019, on average across OECD countries, 59% of the public funds for non-tertiary education came from the central government prior to intergovernmental transfers (Figure 3.1) (OECD, 2022[7]). Local authorities contributed another 27% of initial funding, and regional governments 15% (OECD, 2022[7])[2].

Figure 3.1. Distribution of initial sources of public funds for education and change in government levels' share of funds after intergovernmental transfers (2019)

Primary, secondary and post-secondary non-tertiary education, in per cent



Note: Countries are ranked in descending order of the share of initial sources of funds from the central level of government.

[1] Primary education includes pre-primary programmes.

[2] Year of reference 2020.

[3] Data do not cover day care centres and integrated centres for early childhood education.

[4] Year of reference 2018.

Source: Adapted from OECD (2022[7]), Education at a Glance 2022: OECD Indicators, https://doi.org/10.1787/3197152b-en, Table C4.2.

StatLink https://stat.link/uv3w80

Decentralised school funding arrangements require an alignment of revenue raising and spending powers and a careful balancing of accountability and trust between actors

In many countries, sub-central authorities have emerged as important actors in the allocation and management of school funding (OECD, 2017[3]). While fiscal decentralisation offers the potential for sub-central governments to adapt school funding decisions to local needs, there are also trade-offs involved (e.g. loss of economies of scale) (OECD, 2021[8]). Hence, decentralised approaches to school funding need to be designed in ways that ensure sub-central authorities have both adequate resources to meet the needs of their students and the capacity to fulfil their funding responsibilities. This requires efforts among different levels of government to arrive at a shared assessment of funding needs as well as a careful balancing of accountability and trust between levels of governance (OECD, 2017[3]). Even if funding responsibilities are decentralised, the central government often remains responsible for ensuring high quality, efficient and equitable education nationally. Therefore, it may have an interest in controlling sub-central spending and performance. Sub-central authorities, on the other hand, may perceive such central monitoring as interference in their areas of responsibility (Schaeffer and Yilmaz, 2008[9]).

Responsibilities for raising and spending school funding need to be well aligned to encourage an efficient use of fiscal resources (OECD, 2017[3]). The dispersion of responsibilities for education financing and spending across different levels of government might result in a lack of incentives for a fair allocation of resources on the one hand and responsible use of resources on the other (OECD, 2017[3]). For instance, where responsibilities for raising funds to cover the teacher payroll and for deciding on teacher employment are misaligned, incentives to ensure efficient staffing levels in line with changing enrolment are reduced (OECD, 2019[4]).

School systems that grant sub-central authorities large spending powers might address this tension by increasing sub-central responsibilities for revenue raising and fiscal autonomy at the margin. For example, the Nordic countries typically give local governments substantial control over personal income tax rates, a practice that has also been picked up by some Central and Eastern European countries. Reliance on own tax revenues may support sub-central authorities in determining public service levels in line with local preferences, help mobilise additional resources for school education, and discourage overspending by creating a hard budget constraint (OECD, 2017[3]; OECD, 2021[8]).

Fiscal decentralisation entails risks of creating inequalities in available resources across localities, which requires adequate fiscal equalisation mechanisms

At the same time, raising the proportion of own revenue in sub-central education budgets also entails the risk of creating inequities in the availability of funding for schools across different localities. Typically, wealthier jurisdictions will be in a better position to raise their own revenues and to provide adequate funding per student. In the United States, for example, prior to the 1970s the vast majority of resources spent on compulsory schooling was raised at the local level, primarily through local property taxes. Since the local property tax base is generally higher in areas with higher home values, the heavy reliance on local financing contributed to higher per-student spending in wealthier jurisdictions (Jackson, Johnson and Persico, 2015[10]).

Schemes that transfer fiscal resources from the central government to sub-central authorities (vertical transfers) or between sub-central governments (horizontal transfers) can help ensure that all jurisdictions have the necessary resources to provide similar services at similar tax levels, and to provide equal opportunities for their students. Fiscal transfers can also help address gaps in sub-central revenues and expenditures. Indeed, sub-central spending responsibilities have grown much faster than their tax collection responsibilities, creating fiscal imbalances (OECD, 2017[3]; OECD, 2021[8]). Once transfers to sub-central levels of government are accounted for, the share of central funding for non-tertiary education falls from 59% to 44%, while the share of local funds rises as a result, from 26% to 42% (Figure 3.1.

above). In Korea, Lithuania, Mexico, Poland and the Slovak Republic, the difference in funding power before and after transfers represents more than 50 percentage points (OECD, 2021[11]).

The OECD School Resources Review provides examples from different countries that have introduced fiscal transfer and equalisation mechanisms alongside reforms devolving funding responsibilities to sub-central governments (Box 3.1).

Box 3.1. Fiscal transfer and equalisation mechanisms as part of education finance decentralisation reforms in select countries

- When **Brazil** decentralised its education finance system in the mid-1990s, it created the Fund for the Maintenance and Development of Basic Schools and the Valorisation of the Teaching Profession (*Fundo para Manutenção e Desenvolvimento do Ensino Fundamental e Valorização do Magistério*, FUNDEF) to reduce the large regional inequalities in per-student spending. State and municipal governments were required to transfer a proportion of their tax revenue to FUNDEF, which was then redistributed to state and municipal governments that could not meet specified minimum levels of per-student expenditure. Although FUNDEF did not prevent wealthier regions from increasing their overall expenditure at a higher rate than poorer regions, it did play a highly redistributive role and increased both the absolute level of spending and the predictability of transfers. In 2007, FUNDEF was revised and transformed into the Maintenance and Development Fund for Basic Education (*Fundo de Manutenção e Desenvolvimento da Educação Básica*, FUNDEB) and, in 2021, relaunched with a new mandate and as a permanent feature of the school funding system.
- **Colombia**'s school system is relatively decentralised: The regional and local authorities that serve as education providers are mostly funded from the central budget but can contribute their own resources. The main financing mechanism is the General System of Transfers (*Sistema General de Participaciones*, SGP) which allocates revenues for different public services among the central and sub-central governments. The distribution of SGP resources is specific to each sector. In education, the SGP allocates a specific budget share for every student to the sub-central governments. These shares are determined based on different criteria related to equity and efficiency, the geographic area (urban-rural) and based on the number of students enrolled the previous year. Additional funding is provided for specific student characteristics (e.g. students with special education needs). In addition, the SGP allocates resources for quality improvement in schools or the financing of pensions and healthcare in education.
- In **Denmark**, municipalities are the main providers of public services, including primary and lower secondary education. Municipal spending is primarily financed through central government grants and local taxes. The total volume of the grants is decided through annual negotiations between the central and local governments. The grant level for a given municipality is primarily based on the size of its population. In addition, there is a fiscal equalisation scheme which takes into account both tax revenues and expenditure needs depending on the age composition and socio-economic structure in the municipalities. Thus, the fiscal equalisation scheme seeks to ensure a similar level of service provision across municipalities by adjusting local budgets to the size and composition of local populations.
- In **Poland**, the decentralisation of education was part of the wider national decentralisation process initiated in 1990. The main transfer of funding from the central to local budgets (the "general subvention") comprises several components that are separately calculated. The education component is calculated based on student numbers and a range of coefficients reflecting cost differences in educating different groups of students. The equalisation component is based on a formula and provides poorer jurisdictions with up to 90% of the

discrepancy in average per-capita revenues compared to local governments with similar student populations.

Source: OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264276147-en; Radinger et al. (2018[12]), *OECD Reviews of School Resources: Colombia 2018*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264303751-en.

The nature of fiscal transfers influences sub-central autonomy for and central steering of spending in school education

The conditions attached to intergovernmental transfer can have considerable influence on how the money is spent. Grants may be tied to a particular purpose (i.e. earmarked grants), allocated to a certain type of expenditure more generally (i.e. a block grant), or transferred for general use for the public sector (i.e. lump sum grants). The type of conditions attached to a grant will influence the actual balance of responsibilities between levels of governance and determine the scope of decision making for sub-central authorities as well as the steering power of the central level (OECD, 2017[3]).

Lump sum grants give sub-central authorities the greatest degree of freedom by allowing them full discretion over the proportion of funding allocated to school education. Lump sum funding may, however, make it more difficult to shield local education budgets from pressures arising from the funding needs of other public services provided at a local level. Block grants are allocated on the condition that they are spent on a certain type of expenditure (e.g. current spending in pre-school and primary education). They still leave a high degree of discretion to sub-central authorities, for example, over the share to spend on salaries vs. operational costs. Earmarked grants impose greater restrictions and offer greater central control over local spending and policy by requiring grants to be used for a specific purpose or item of expenditure (OECD, 2017[3]). Funding can, for example, be earmarked to ensure a minimum level of expenditure on particular staff types, education materials, or a specific student group (OECD, 2018[5]; OECD, 2019[4])

Some countries, like **Denmark** and **Sweden,** have increased the use of targeted subsidies over the years as a means to steer municipal funding allocation (OECD, 2017[3]). However, across the public sector and internationally, a slight trend from earmarked grants to non-earmarked grants could be observed, combined with steering through regulations and a focus on outcomes and performance (Blöchliger and Kim, 2016[13]; OECD, 2021[8]).

The design of fiscal transfer mechanisms needs to address a range of challenges

While fiscal transfers play an important role in providing sub-central revenue for service provision and equalising sub-central revenue levels, they come with a set of challenges (OECD, 2017[3]; OECD, 2021[8]). First, fiscal transfers from central governments may exacerbate fluctuations in sub-central revenues and complicate medium-term planning as they are often pro-cyclical (i.e. likely to increase in times of strong growth and decrease in times of crisis). Second, if grants are adjusted on the basis of local revenues, sub-central authorities might be discouraged from raising their own resources, reducing the total mobilisation of resources for education. This incentive effect is particularly pronounced for wealthy municipalities which might need to raise significant additional revenues in order to marginally increase their spending on local public goods (Hoxby, 1998[14]). Third, a high reliance on central grants may encourage overspending in the hope that it will be compensated with additional grants, and thereby increase deficits and debt. Finally, the determination of grant levels and calculation methods themselves may also be problematic (Blöchliger and Kim, 2016[13]; Busemeyer, 2008[15]). In the design of fiscal transfer mechanisms, it is therefore important to strike a balance between ensuring stakeholder involvement and limiting the risk of rent-seeking and

political distortions (e.g. through independent agencies or two-stage budget procedures) (OECD, 2017[3]; OECD, 2021[8]).

The COVID-19 pandemic has introduced a particular set of challenges for equalisation systems that are not well-adapted to respond to emerging, short-term crises. Where funds for equalising transfers are tied to dedicated revenue streams or capped at a certain growth rate, revenues may shrink as a result of the pandemic, thus lowering transfers. Moreover, it is common for countries to link equalising transfers to lagged indicators of fiscal capacity or to a moving average .Thus, intergovernmental transfers might further drive inequalities between localities in times of crises when the need for support might deviate from previous patterns (OECD, 2021[8]).

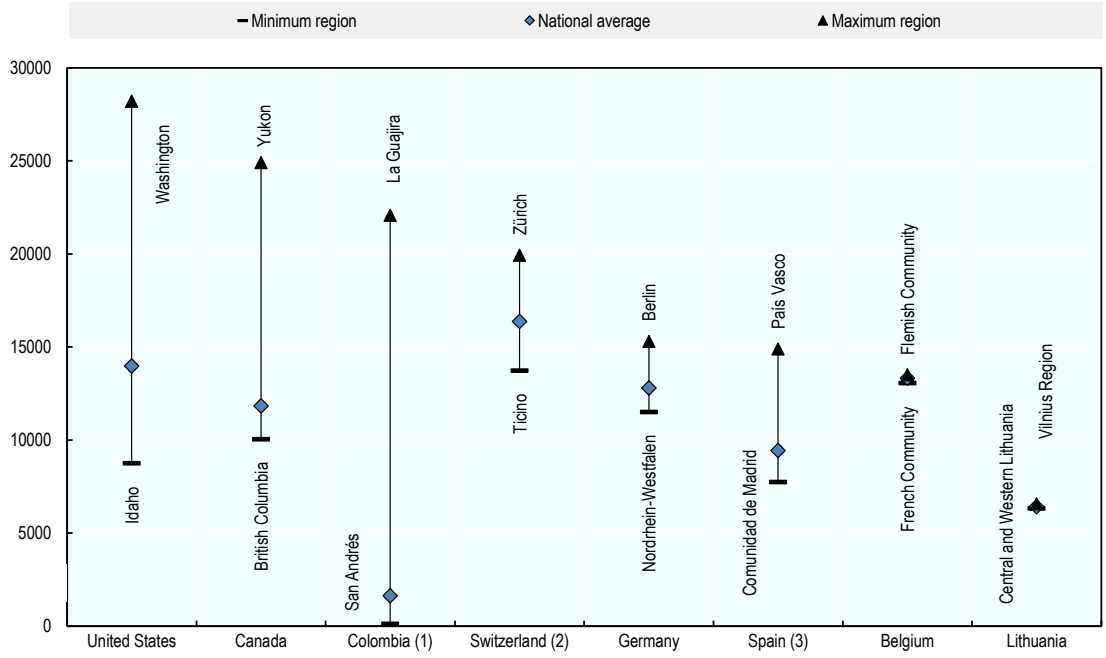
Even if well-designed fiscal equalisation mechanisms are in place, education spending might still differ considerably across jurisdictions in decentralised systems. For example, according to data from Education at a Glance 2021, the region with the highest level of per-student expenditure in the United States spends almost three times as much as the region with the lowest level of spending. Smaller regional differences are found in Germany, Spain and Switzerland (Figure 3.2) (OECD, 2021[11]). Such spending differences might indicate different priorities for public education, a potential for efficiency savings in some jurisdictions and/or potential inequities in the education services provided to students. One option to ensure a basic level of funding for all schools is to earmark some central funding for schools based on assessed needs while another part can be used at the discretion of sub-central authorities. Sharing experiences in approaches to school funding between sub-central jurisdictions should also be encouraged and facilitated (OECD, 2017[3]).

Fiscal decentralisation should be accompanied by adequate monitoring, evaluation and reporting to ensure transparency in the flow of resources

Finally, the expansion of sub-central spending, revenue collection and borrowing powers creates challenges for fiscal control and financial reporting (Schaeffer and Yilmaz, 2008[9]). Adequate monitoring, evaluation and reporting processes need to be in place to ensure that funds transferred from central to sub-central governments are used efficiently and in line with laws and regulations. Sub-central authorities should provide adequate information about their education budgets to increase transparency about the flow of resources (OECD, 2017[3]).

Figure 3.2. Subnational expenditure on educational institutions per full-time equivalent student (2018)

Primary and secondary education, in equivalent USD converted using PPPs



Note: To ensure comparability across countries, expenditure figures were converted into common currency (USD) using national purchasing power parities (PPPs). However, differences in the cost of living within countries were not taken into account. Countries are ranked in descending order of maximum subnational expenditure on educational institutions per full-time equivalent student.

[1] Government expenditure data transferred to subnational entities.

[2] Only expenditure for teaching and non-teaching staff.

[3] Public expenditure on education in public institutions.

Source: OECD (2021[11]), *Education at a Glance 2021: OECD Indicators*, https://doi.org/10.1787/b35a14e5-en, Figure C1.2.

Addressing the complexities of decentralised school funding systems through whole-system approaches

The distribution of responsibilities for school funding is complex in many countries

Many school systems have a complex distribution of funding responsibilities, which may differ by resource category (e.g. current or capital spending), by level of education (e.g. primary or secondary) and by type of school education (e.g. general or vocational education) (OECD, 2021[11]). For instance, in most countries the local government levels have retained responsibility for managing and funding lower levels of schooling (mainly pre-primary, primary and sometimes lower secondary education) whereas regional or central governments are more often in charge of secondary and upper secondary education (OECD, 2017[3]). Another example is the more centralised control over capital investments as compared to current expenditure. While the OECD School Resources Review indicates that central authorities are more involved in capital investment compared to current expenditure, all except one participating country declared that responsibilities for capital investments were shared between more than one actor, most commonly involving both central and local authorities (OECD, 2018[5]). Finally, the staffing of schools and the management of the related budgets also typically involves multiple actors. For example, schools may

be responsible for employing their teachers for which they receive central funding, while local authorities cover the payroll of administrative staff (OECD, 2019[4]).

Successful decentralisation requires clearly delineating responsibilities, establishing well-functioning co-ordination mechanisms and adequate data management

In order to ensure the effectiveness and transparency of school funding, a clear distribution of responsibilities as well as mechanisms for co-ordination between different actors are required. It needs to be clear which authority is responsible for funding particular levels and types of education as well as categories of resources, such as the employment of teachers, school leaders and other staff; infrastructure investment and maintenance; and ancillary services, including school meals and transportation. In decentralised contexts, it is important that each level of government is accountable for its specific spending decisions. Effective accountability of sub-central authorities likewise requires reliable and co-operative control structures across levels of government (OECD, 2017[3]).

Co-ordination is also crucial for managing trade-offs and balancing short and long-term considerations in the use of school resources in multi-level systems. For instance, the distribution of responsibilities for the use of staff funding will influence actors' scope to determine the number and profile of staff hired and the degree to which hiring decisions reflect specific school needs (OECD, 2019[4]). Similarly, the division of responsibilities for capital investments and current maintenance funding will influence the scope for assessing the interactions between both types of spending and for determining the most efficient resource allocations. Capital investments can have a significant long-term impact on maintenance costs, just as putting off repairs can result in the need for major overhauls (OECD, 2018[5]).

As the experience of the OECD School Resources Review participants shows, complex governance arrangements for school funding entail the risk of inefficiency arising from overlapping responsibilities as well as a lack of transparency, accountability and trust in the use and flow of financial resources. Efficiency challenges may emerge where parts of a school system are managed by different levels of administration in relative isolation. This may also raise difficulties for managing information on the use of funding and its impact on equity and quality in student learning, well-being and development (OECD, 2017[3]).

Solving such complexity challenges in school funding governance requires a whole-system approach that involves a reflection about both structures (e.g. the most efficient number of governance levels involved in school funding) and processes (e.g. stakeholder involvement, open dialogue and use of evidence and research). Thinking of structures in isolation without connecting them to supporting processes will not provide systemic and sustainable solutions. In general, reducing the number of intermediary government tiers that funding flows through before reaching schools, can decrease the bureaucratic burden and promote possibilities for central steering. Further, improving the availability of data on different aspects of school funding across levels of governance and institutions, can help monitoring the effectiveness of school funding and create transparency in resource use at different levels of a school system (OECD, 2017[3]).Box 3.2 provides an example from Austria for a large-scale reform aiming to reduce complexity in the management and distribution of resources.

Box 3.2. School funding governance reform: the example of Austria

As part of a larger school reform package adopted in 2017, Austria reorganised its administration of federal and provincial schools. The reform entailed the creation of joint Boards of Education (*Bildungsdirektionen*) in each province as of 2019. Previously, responsibilities were fragmented by school level and type between the federal government and the provinces, resulting in an obscure and inefficient use of resources. Next to the administrative re-organisation, the reform sought to improve transparency, effectiveness and efficiency in resource use through the introduction of a more comprehensive education controlling system. The controlling system covers all schools and includes quality management, education monitoring and resource controlling. Further, a framework for index-based resource allocations (*Chancenindex*) was introduced to establish more uniform and transparent criteria for the distribution of funding teacher resources. The *Chancenindex* allocates additional resources based on student background and school inspections are used to enable more nuanced targeting of schools. Transparency and efficiency in resource use should also be improved through a uniform electronic personnel management system for all federal and provincial teachers.

Sources: OECD (2019[16]), *Education Policy Outlook 2019: Working Together to Help Students Achieve their Potential*, https://dx.doi.org/10.1787/2b8ad56e-en; OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264276147-en; BMBWF (2017[17]) Bildungsreform: Autonomiepaket und Bildungsdirektion Informationsunterlage (*Education reform: school autonomy deal and Joint Boards of Education Information sheet)*, https://www.bmbwf.gv.at/dam/jcr:24746cd7-9c94-4468-90e0-bac523eb225a/brf_ueb.pdf.

In decentralised systems, building capacity at the local level for managing school funding is also essential

Wherever sub-central authorities play a key role for managing school funding, it is crucial to build the necessary technical skills and administrative capacity at a local level. Decentralised school funding arrangements place significant demands on local authorities for budget planning and financial management. Smaller municipalities may have less experience and staff and thus face significant capacity constraints, which can create or exacerbate regional inequities (Dafflon, 2006[18]). Capacity building at a local level is of particular importance in countries with a large number of small municipalities, such as the Czech Republic, France, the Slovak Republic, Hungary, Switzerland and Austria. In these countries, the horizontal fragmentation of responsibilities for school funding can undermine the quality of public services and cause inefficiency (OECD, 2017[3]; OECD, 2021[8]).

Professional training and support are important aspects to consider for improving capacity at the local level. Competency frameworks for local leaders and administrators that reflect the skills necessary for financial management can be used to guide training and professional development as well as recruitment processes (OECD, 2017[3]). However, the professionalisation of local management depends not only on the capacity of local actors themselves, but also on the institutional settings in which they operate. This includes their access to key information, as well as mechanisms to monitor and provide feedback on the work of municipalities and their services. A further – so far often underdeveloped – way for building the capacity of local authorities lies in the creation of networks and collaborative practices (e.g. jointly employing specialised staff for budgeting, financial control and the use of performance data) (OECD, 2017[3]). Since capacity building is a complex enterprise and takes time, it is ideally thought out from the beginning and planned strategically (Burns, Köster and Fuster, 2016[19]).

Norway provides an example for systematic investment in building capacity at all levels of the system, based on local analysis and decision making in networks of municipalities. The country has a long-standing tradition of decentralisation, with counties responsible for upper secondary schools and municipalities

responsible for early childhood, primary and lower secondary education. While governance arrangements promote local engagement, there have been concerns about local capacity. To establish a more sustainable approach for education improvement and address capacity differences across local authorities, a new collective competence development model for schools has been introduced. The model relies on three complementary pillars: 1) a decentralised scheme that aims to ensure that all municipalities implement competence-building measures, by channelling state funds to the municipalities; 2) a follow-up scheme in which municipalities and county authorities that report weak results in key education and training areas over time are offered state support and guidance; and 3) an innovation scheme that is intended to result in research-based insights on the school system. As part of a local government reform in effect since 2020, the number of municipalities and counties was reduced, also seeking to improve quality, equity and efficiency (OECD, 2019[20]; OECD, 2020[21]).

Networks of advisors can also support the education work of local authorities and complement other capacity building strategies. In **Denmark**, for instance, the education ministry has created a national body of education consultants who advise municipalities (and schools) in their improvement efforts. This initiative promotes mutual learning processes by both sharing expertise with local authorities and reporting back local experiences to the central level (OECD, 2019[4]).

Some countries with a large number of small providers have responded to capacity challenges by merging providers and thereby consolidating capacity for effective resource management (see the example of Norway above). Others are considering to move responsibilities to higher levels of the administration or to create new administrative bodies to administer resources for a larger number of schools. **Chile**, for example, has been undergoing a process of recentralisation of its public school system since 2015, with a number of Local Education Services and a national Directorate for Public Education gradually taking over responsibilities from municipalities. This process is expected to be completed by 2025 (OECD, 2019[16]). An evaluation of the reform's first year of implementation suggests that such structural reorganisations should be accompanied by sustained capacity building, including the formation of horizontal networks, in order to lead to tangible improvements in teaching and learning (Anderson, Uribe and Valenzuela, 2021[22]). In a similar reform, the central government in **Hungary** took over the maintenance of schools from local governments in 2011 to respond to challenges identified with decentralisation (OECD, 2019[16]). Where responsibilities are re-centralised, it is important that funding decisions involve consultation with local stakeholders and remain responsive to local needs (OECD, 2017[3]).

Giving schools autonomy for managing and allocating funding

Schools have different degrees of resource autonomy across countries

Since the early 1980s, many countries within and outside the OECD, such as Canada, Finland, Hong Kong (China), Singapore, Spain and Sweden have granted their schools greater autonomy with respect to both curricular design and resource allocation decisions, albeit starting from different levels (Eurydice, 2007[23]; Wang, 2013[24]). While the motivation for these reforms varied across countries, they were typically expected to increase schools' responsiveness to the demands of local communities, reduce bureaucracy and create an environment conducive to innovation (Burns and Köster, 2016[25]; Bullock and Thomas, 1997[26]).

Schools enjoy most freedom over the use of their resources when central or sub-central authorities allocate a large proportion of their funding in the form of unrestricted block grants, which gives schools the discretion to allocate resources freely across all areas of spending. In other school systems, schools have intermediate levels of autonomy since they receive financial resources linked to certain conditions for spending. Grants may, for instance, be restricted to a particular area of spending (e.g. operating costs) or be earmarked for a specific item (e.g. professional development). By contrast, systems that provide

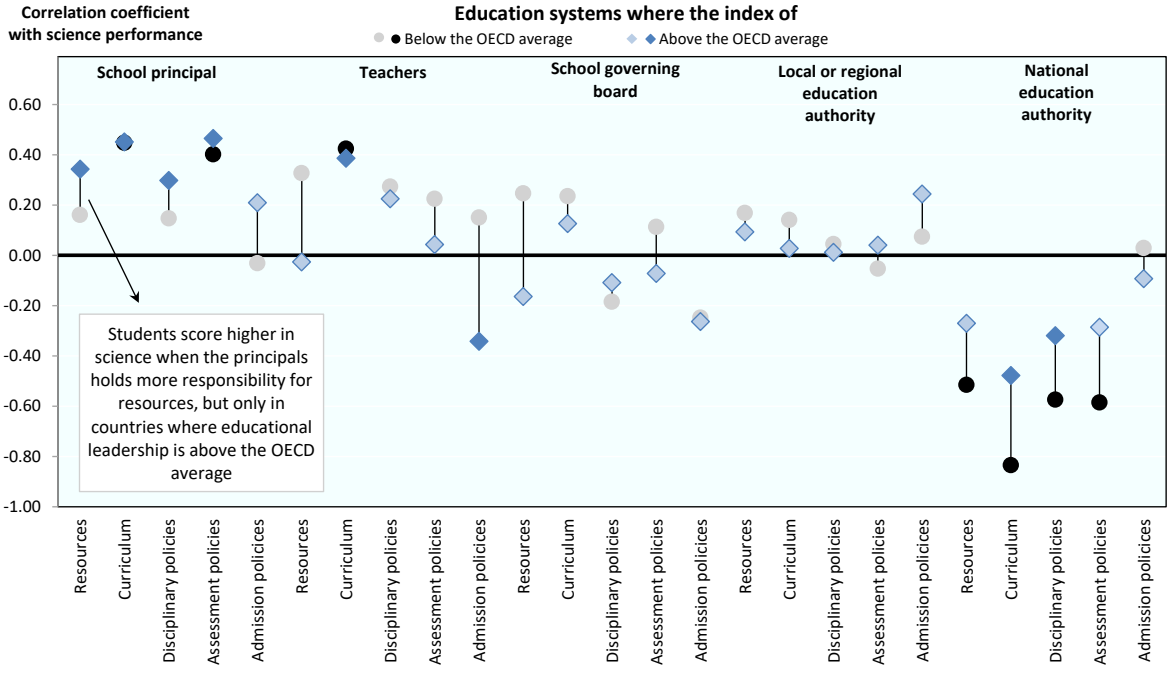
schools with "in kind" resources or cover payments directly through higher authorities provide little resource autonomy (OECD, 2017[3]).

Reaping the benefits of resource autonomy requires strong educational school leadership and technical support

While budgetary autonomy for schools may yield a range of benefits, research and experience suggest that the relationship between budgetary autonomy and school performance is not clear cut and that greater financial responsibility is not a one-size-fits-all solution. Overall, students' science performance in PISA 2015 was higher where school leaders held more responsibility for managing resources (e.g. formulating the budget, hiring and firing staff), but only when comparing countries where principals' reported stronger educational leadership than the OECD average (Figure 3.3).

Figure 3.3. Correlations between the responsibilities for school governance and science performance, by index of educational leadership (2015)

Results based on system-level analyses



Note: The responsibilities for school governance are measured by the share distribution of responsibilities for school governance in PISA 2015 Table II.4.2; Results based on 26 education systems where the index of educational leadership is below the OECD average, and 44 education systems where it is above the OECD average; Statistically significant correlation coefficients are shown in a darker tone.
Source: OECD (2016[27]), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, http://dx.doi.org/10.1787/9789264267510-en, Figure II.4.10.

The benefits of budgetary devolution therefore likely depend on schools' ability to use their autonomy in a constructive way and to deal with the related challenges. This requires investment in school leadership, as well as adequate administrative and technical support. Measures that are comparatively easy to implement, such as training on time-management, could help school leaders to resolve tensions between pedagogical and administrative leadership responsibilities, increase their time spent on high-priority tasks and reduce stress (OECD, 2019[4]). As schools administer their own funds, they need to set up budgeting

and accounting systems, manage contracts and procurement, and discuss resource matters with the school community. Some systems, such as **England (United Kingdom)** provide practical support to schools to meet such responsibilities and improve efficiency in spending (e.g. on non-staff goods and services) (Box 3.3).

Extending the budgetary responsibilities of schools requires strategies to mitigate potential inequalities and to hold schools accountable for resource use

Furthermore, if school autonomy is not to exacerbate inequities across schools, a comprehensive regulatory and institutional framework needs to be in place (Bullock and Thomas, 1997[26]). Building capacity for resource management tasks is particularly challenging for small schools and those in disadvantaged circumstances. One way to reduce potential inequities is to extend budgetary autonomy selectively to schools with sufficient capacity or to pool administrative resources across multiple schools (e.g. sharing human resources, facilities and back-end infrastructure). The school associations established in the **Flemish Community of Belgium** provide a good example of collaborative platforms that promote cost saving across schools by allowing them to share resources. While the formation of and participation in school communities is voluntary, the government provides incentives in the form of additional staff resources that can be shared between the schools of an association (OECD, 2017[3]).

Finally, extending schools' budgetary autonomy needs to be accompanied by effective monitoring and evaluation processes to ensure that funds are used in line with overall objectives and that all students receive a high-quality education. School boards can play a key role in local monitoring and in providing horizontal accountability, and should be supported through guidance, resources and information. Approaches to school evaluation should consider how schools use their funds to promote the general goals of the school system as well as student learning and development. Countries with a large degree of school autonomy should also encourage the dissemination of information about school budgets together with information about school development plans and other activities at the school (OECD, 2017[3]).

Box 3.3. Initiatives to support schools in their resource management responsibilities and increase the efficiency of non-staff spending in England (United Kingdom)

England (United Kingdom) has launched multiple initiatives to support schools in their resource management and increase the efficiency of school's non-staff spending to respond to the budgetary pressures.

The **Schools' Buying Strategy**, launched by the Department for Education in 2017, sought to support schools in saving on their non-staff-expenditure by sharing various tools and knowledge on budget management with school leaders and financial administrators (typically "School Business Managers"). As part of a wider effort to advance the professionalisation of schools' financial staff, the ministry collected best-practice guidance and practical support such as templates for each step of an effective procurement procedure. The tools provided by the ministry also include an online benchmarking system that allows schools to compare their overall spending patterns and specific expenditure lines with those of similar schools to identify inefficiency and cost-saving potentials.

Since many schools have difficulty procuring a wide range of goods and services in a complex market environment, the ministry has offered them the opportunity to take advantage of prices negotiated at the national level and benefit from economies of scale through "**National Deals**" – framework agreements. These National Deals give schools an opportunity to save on their existing contracts, for instance on water and electricity; software licenses; and Information and Communication Technologies (ICT) supplies. The National Deals programme also offers interest-free loans to fund energy-saving improvements and the popular Risk Protection Arrangement, which provides schools with a cheaper

alternative to commercial insurance providers.

By April 2020, the Schools' Buying Strategy had secured savings of GBP 425 million and was being evaluated and revised based on lessons learnt throughout the implementation.

Source: Adapted from OECD (2018[5]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, https://dx.doi.org/10.1787/9789264306707-en; Department for Education (2021[28]), *Schools' Buying Strategy*, London, https://www.gov.uk/government/publications/schools-buying-strategy (accessed on 10 January 2022).

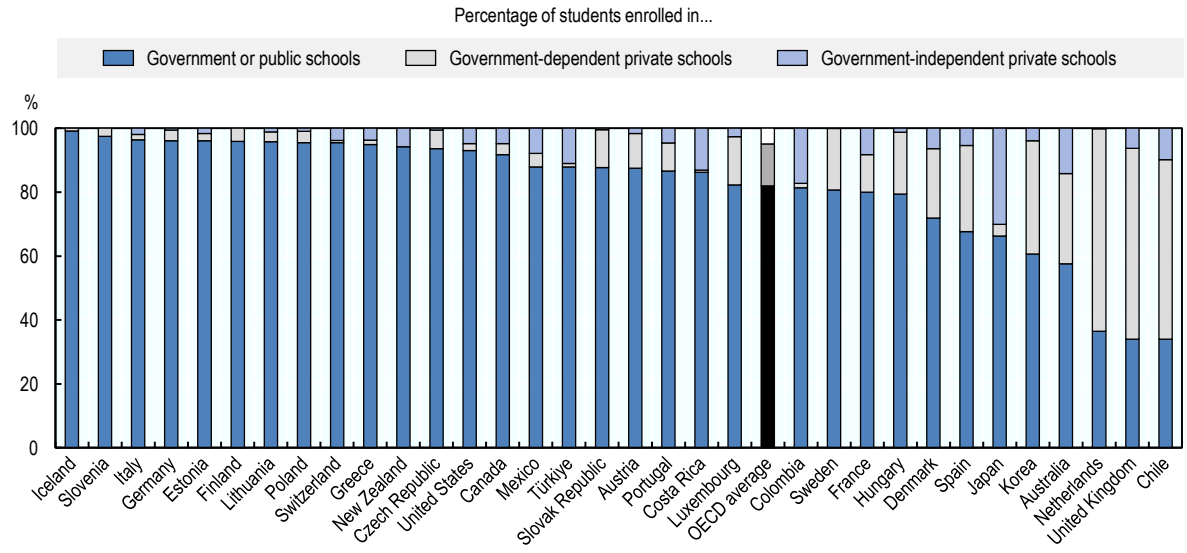
Setting regulatory frameworks for the public funding of private providers

The public funding of private providers seeks to improve choice and efficiency…

Over the past 30 years, more than two-thirds of OECD countries have introduced measures to increase school choice (Musset, 2012[29]), often by publicly funding private providers and letting students and families decide which schools to attend. Financial support for private providers is usually embedded in parental choice systems where public funding either "follows the students" to whichever eligible school they choose to attend or is used to compensate parents for their expenses on private school tuition fees through vouchers or tax credits. These measures have resulted in some countries developing a substantial publicly funded private sector (OECD, 2017[3]; OECD, 2018[5]) (Figure 3.4).

The public funding of private schools may be motivated by a range of different arguments whose relative importance varies across national contexts (for a review, see (Boeskens, 2016[30])). In some countries the policy is intended to guarantee the right of families to send their children to their preferred school, free of legal restrictions or financial barriers. In other countries, there is greater focus on school choice as a means to stimulate competition among schools and incentivise them to improve quality, stimulate greater diversity in the educational offer or encourage innovative pedagogical and governance arrangements that will increase efficiency and improve learning outcomes in the long run (OECD, 2017[3]; OECD, 2018[5]).

Figure 3.4. Student enrolment in public and private schools (2018)



Note: Countries are ranked in descending order of the percentage of students enrolled in government or public schools.
Public schools are those managed by a public education authority, government agency, or governing board appointed by government or elected by public franchise. Government-independent private schools are those funded mainly through student fees or other private contributions (e.g. benefactors, donations); government-dependent private schools are privately managed schools that receive more than half of their funding from government sources
Source: Adapted from OECD (2020[31]), PISA 2018 Results (Volume V): Effective Policies, Successful Schools, https://doi.org/10.1787/ca768d40-en, Figure V.7.2.

…but there are risks of increasing social segregation and harming the public system

Experience from multiple countries indicates that the impact on equity and education quality of publicly funding private providers is influenced by the institutional arrangements in which they are embedded (OECD, 2017[3]; OECD, 2018[5]). In particular, the conditions which private schools must fulfil to qualify for public funding are central to the successful governance of school choice systems. Among these eligibility criteria, private schools' ability to select students and charge add-on tuition fees are particularly salient concerns. Allowing subsidised schools to select their students based on prior performance and aptitude tests may create barriers to inclusion which might jeopardise equity and education quality (OECD, 2017[3]).

Selective admission permits private schools to "cream skim" high-ability students from the public sector. Since parents often mistakenly evaluate a school's quality based on its student composition, engaging in selective admission can allow schools to attain a competitive advantage without actually improving their education provision. Selectivity threatens to exacerbate student segregation between the public and private sectors and can widen existing achievement gaps. This process might deprive the public school system of high-ability students and harm those who are left behind by depleting public schools of vital resources and leaving them with a high share of disadvantaged students with greater resource needs (Boeskens, 2016[30]). In addition, school choice systems that permit private schools to demand significant parental contributions beyond the amount covered by the public subsidy could aggravate socio-economic segregation across schools (OECD, 2017[3]).

To mitigate this risk, adequate regulatory frameworks are required for the public funding of private providers

To mitigate risks to equity, it is important that all publicly funded providers are required to adhere to the same regulations regarding tuition and admission policies, and that compliance with these regulations is effectively monitored. In order to ensure that vouchers and other forms of public funding increase the accessibility of private schooling options, regulations should prevent subsidised private schools from charging fees that could constitute barriers to entry. Also, in order to ensure that school choice improves access to high-quality education rather than leading to selectivity and "cream skimming", governments should regulate admission procedures and ensure that private providers adhere to the same standards of selection as public schools. Admission practices for oversubscribed schools should therefore be transparent and homogeneous across school sectors. The use of lottery systems to assign places in oversubscribed schools or formulas aimed at maintaining a diverse student composition could be considered (OECD, 2017[3]).

Chile's 2015 Inclusion Law (*Ley de Inclusión Escolar*) reformed the regulation of the public funding of private providers to ensure an effective exercise of free school choice and reduce socio-economic segregation. Three main changes were made to the eligibility for public funding. First, the law mandated that private, subsidised schools must be owned by non-profit organisations to ensure that public funds are used for education purposes only. Second, the law eliminated "shared financing" (*co-pago*) where tuition fees were paid to schools by families to supplement public grants, although voluntary contributions by parents for extracurricular activities are still allowed. To compensate for the loss of funds for private, subsidised schools, the law increased the amount of resources allocated to school providers. Finally, the law prevented public and private-subsidised schools from employing any form of selection criteria when enrolling students (OECD, 2019[16]).

Mechanisms to ensure accountability and transparency are also important to ensure that subsidised private schools serve the public interest by delivering high-quality education, as well as to provide parents with the information they need to evaluate different schools' processes and outcomes. Finally, these measures need to be complemented with initiatives to raise awareness of school choice options, improve disadvantaged families' access to school information, and to support them in making better-informed choices (OECD, 2017[3]).

Establishing the overall approach to school funding

Different mechanisms can be used to allocate funding in school education, whether this is between different levels of the education administration or to individual schools. As a basic principle, a funding model needs to ensure that resources are allocated in a transparent and predictable way. A stable and publicly known system to allocate public funding allows schools and authorities to plan their development in the coming years. At the same time, a degree of flexibility in funding is also necessary to respond to unforeseen financial needs arising, for instance, from changes in student enrolment (e.g. through negotiations in the application of funding rules or an adjustable component) (OECD, 2017[3]). Even a small decrease in student numbers can result in a decrease of funding for staff salaries, which remain fixed. Flexibility is also provided through human resource management tools, such as working time (e.g. full-time and part-time work) and contract conditions (e.g. permanent and temporary employment) (OECD, 2019[4]).

In designing a funding allocation model that best fits the school system's governance structures, school systems need to consider a series of questions that are discussed below.

The overall approach to school funding needs to balance regular funding to schools and targeted funding to support given objectives

Targeted funding has the potential to support specific policy objectives…

Besides the distribution of responsibilities for school funding and the conditions that are attached to different funding allocations, it is important to consider the channels through which funding is distributed. In particular, systems must choose the proportion of public funding that will be distributed via the main allocation mechanism as opposed to other mechanisms, such as targeted funding offered via special programmes. The main allocation mechanism refers to the regular funding to cover the payroll of staff as well as other fixed expenditures and is typically based on student enrolment, but also other factors depending on policy goals (OECD, 2017[3]).

While the funding of special programmes has its drawbacks, funding mechanisms external to the main allocation offer a certain degree of flexibility to the overall funding model and can support specific policy objectives and pilots of innovative practice. Targeted programmes can also help to compensate for inequities, especially if combined with a stable funding allocation. Other arguments for retaining a proportion of funding at a more central level for targeted programmes include: the need to respond to short-term or emergency expenditures occurring unevenly across schools (e.g. structural repairs); to support emerging needs (e.g. digital learning, tutoring interventions); and to ensure the adequate provision of services (e.g. in-service training for staff, availability of support staff) (OECD, 2017[3]).

A number of countries have employed targeted programmes for different purposes (e.g. to support mainstreaming of students with special education needs or to support rural schools) (Box 3.4). During the COVID-19 pandemic, a range of targeted programmes have been used to bridge socio-economic gaps in education. Across OECD countries, subsidies for ICT devices (personal computers, laptops) were the most common measure to target populations at risk of exclusion from distance education platforms. Some countries also provided financial incentives and support to vulnerable students, such as for food or transport (OECD, 2021[32]). Programmes to minimise declines in achievement due to remote learning have also been instituted (Box 3.4).

…but should be used in adequate balance vis-à-vis regular funding

Although targeted funding affords greater flexibility and control, distributing a larger proportion of funding through the main allocation mechanism can promote stability and lead to efficiency gains. In **England (United Kingdom)**, for example, the central funding mechanism was found to be more efficient as a greater proportion of overall funding was delegated to schools, excluding only major capital expenditures and a few local services from the main funding allocation. This was coupled with a requirement that the major proportion of the local funding formula must be driven by student numbers and characteristics (OECD, 2017[3]).

An excessive reliance on targeted funding can result in overlaps and create a lack of predictability about future resource allocations. While targeted programmes allow for better steering and monitoring of resource use, they come with greater transaction costs and an administrative burden. Moreover, the accumulation of numerous targeted funds can lead to a piece-meal re-centralisation of funding, increase complexity and reduce transparency in school funding. Indeed, the use of targeted funding mechanisms – external to the main allocation– can lead to governance challenges and a lack of clarity on how funding is used at sub-central or school levels (OECD, 2017[3]).

The OECD School Resources Review thus highlighted the importance of striking a balance between regular and targeted funding to achieve the goals of funding systems more efficiently and simplify funding systems overall. This includes decisions about the best mechanism to support equity and channel extra resources to student groups with additional needs. There are arguments to reduce transaction costs by

including equity-enhancing adjustments for particular student groups within the major part of the funding allocation rather than relying on targeted funding (OECD, 2017[3]).

Box 3.4. Examples for targeted funding for specific programmes in selected countries

Programmes to promote policy objectives and priorities

- In **Colombia,** the education ministry is the main institution that plans, manages and supervises the financing of public education. The ministry can also support initiatives in the school system, according to government priorities through the ministry's investment budget. In the past, financing has promoted teacher development as well as initiatives related to rural education.
- In the **Czech Republic**, a number of specific education grants are used to fund specific experimental or piloting programmes and new education initiatives, often developed or proposed at a local level. If these programmes show positive outcomes, they may eventually be integrated into the mainstream financing scheme.
- In **England (United Kingdom)**, schools serving disadvantaged students receive resources through a targeted programme (Pupil Premium), in addition to their regular funding allocation. They are free to spend these according to their needs but are also held accountable for their decisions.
- In **New Zealand**, the education ministry funds schools (which are administered by boards of trustees) directly, but may also provide targeted services and programmes. For instance, the ministry funds a dedicated learning and behaviour service (Resource Teachers: Learning and Behaviour, RTLB) which is more efficiently provided for a greater number of schools. This service covers education support, release time for classroom teachers, and professional development in behaviour management or curriculum development.

Programmes to minimise declines in achievement due to remote learning during the COVID-19 pandemic

- In **France** the programme "Learning Holidays" was implemented in 2020 and 2021 to support students that may have been particularly affected by school closures. This initiative builds on co-operation with local authorities and associations and has two main objectives: 1) addressing learning gaps and reducing the risk of dropout; and 2) ensuring children's access to enriching experiences during summer vacations.
- In **Portugal**, all public schools have been able to apply for additional resources under the umbrella of the "*Plano 21|23 - Escola+",* a programme with more than 40 measures for education recovery.

Sources: OECD (2021[32]), *The State of School Education: One Year into the COVID Pandemic*, https://doi.org/10.1787/201dde84-en; OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*, https://dx.doi.org/10.1787/9789264276147-en, OECD (2019[4]), *Working and Learning Together: Rethinking Human Resource Policies for Schools*, https://dx.doi.org/10.1787/b7aaf050-en.

It is important to choose the right method to determine the amount of regular funding for schools…

Regular funding can be allocated to schools using broadly one of four main approaches, the use of which also differs depending on whether funding is allocated for current or capital spending:

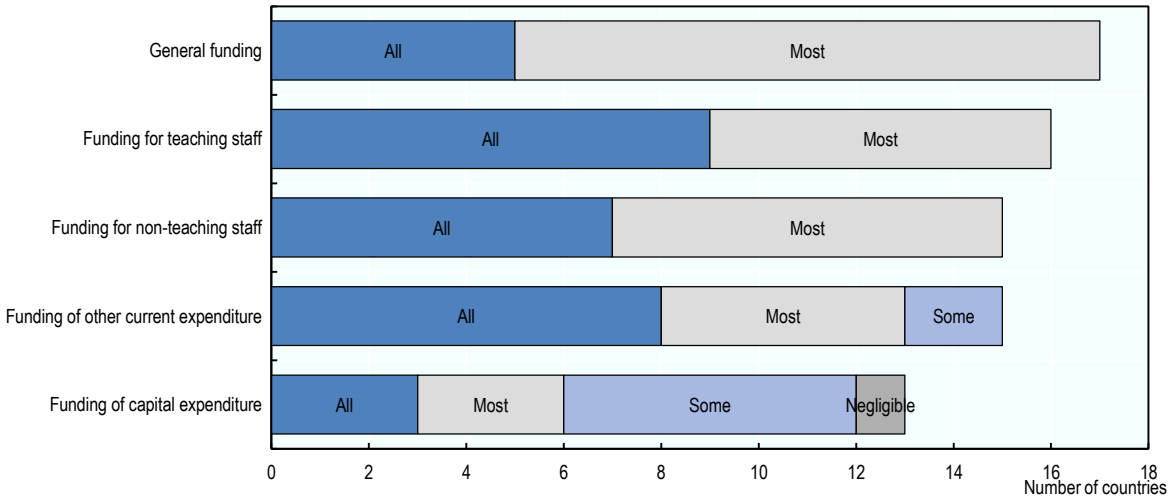
- **Administrative discretion**, which is based on an individual assessment of the resources that each school needs. While this can involve the use of indicators, these indicator-based calculations are non-binding and might not be universally applied to all schools.
- **Incremental costs**, which consider historical expenditure to calculate the allocation for the following year, with minor modifications to take into account specific changes (e.g. student numbers, school facilities, input prices). This approach is often combined with the use of administrative discretion, and both approaches are usually used in centralised systems.
- **Bidding and bargaining**, which involves schools responding to open competitions for additional funding offered via a particular programme or making a case for additional resources.
- **Formula funding**, which involves the use of objective criteria through a universally applied rule to establish the amount of resources to which each school is entitled. Formula funding relies on a mathematical formula which contains a number of variables, each of which has a coefficient attached to it to determine school budgets (OECD, 2017[3]).

Allocating funding based on the needs of a given school (i.e. administrative discretion and bidding and bargaining) is more direct than funding based on a set of indicators of needs. However, when allocating resources to a large number of schools it is difficult to be aware of specific needs, and the distribution of funding on a discretionary or incremental basis is rarely efficient or equitable. When funding is allocated on a historical basis, this funds existing staff year after year and gives no incentives for schools to reduce their expenditures, increase their efficiency, or improve quality of provision. Historical funding provides stability and predictability, but it may also inhibit the expansion of schools with increasing demand, while supporting those whose development is lagging behind (European Commission/Eurydice, 2000[33]).

While administrative discretion plays an important role in the allocation of school funding in many countries, the use of formula funding is well suited to the distribution of current expenditure and has been taken up in many countries (see Figure 3.5). The use of formula funding contributes to more transparent and predictable allocation systems, in particular when funding is linked to student numbers (European Commission/Eurydice, 2000[33]). The transparency that a funding formula provides can have a beneficial impact on policy debates and help building general acceptance of a funding model as funding criteria and allocations can be scrutinised and debated. A well-designed funding formula is, under certain conditions, the most efficient, equitable, stable and transparent method of distributing funding for current expenditures to schools (OECD, 2017[3]).

Figure 3.5. Proportion of public funding allocated by central or state governments to public primary educational institutions (or the lowest level of governance) using funding formulas (2019)

By category of funding



Source: OECD (2021[11]), *Education at a Glance 2021: OECD Indicators*, https://doi.org/10.1787/b35a14e5-en, Figure D6.3.

… and to regularly review funding mechanisms and establish implementation strategies when introducing new funding mechanisms

To succeed, funding mechanisms must not only be well-designed but also implemented effectively. This is particularly so as the introduction of any new funding model will create winners and losers - unless additional resources are made available (OECD, 2017[3]).

In **Austria**, for example, the introduction of socio-economic criteria into the existing formula to distribute resources caused significant tensions. While social partners supported the introduction of an index-based resource distribution, some provinces with a large share of rural schools opposed this change since it would likely have resulted in the redistribution of funding from rural to urban schools. Finally, as part of a major school reform in 2017, the education ministry was given the opportunity to introduce a socio-economic index into the resource allocation, but this required the introduction of new regulations (see Box 3.2).

Funding model reforms in **England (United Kingdom)** and **New Zealand** have also been controversial (OECD, 2017[3]). As of January 2022, both countries were considering and debating further changes to their school funding systems. England (UK) is still exploring the introduction of a hard national funding formula which would reduce the role of local authorities in deciding funding allocations to schools (Roberts, 2022[34]), while New Zealand continues to assess how resources might enhance equal learning opportunities, especially for socio-economically disadvantaged students (Ministry of Education, 2021[35]).

Experiences in many countries thus highlight the importance of effectively managing the political economy of reforms and forming realistic expectations of their implementation costs. Adequate stakeholder consultation is important to increase the perceived fairness of an allocation system and can help ensure that funding mechanisms respond to unanticipated challenges. For instance, the introduction of a new funding model based on per-capita financing can set incentives for efficiency and balanced student-teacher ratios. However, when facing a decline in the school-age population schools under such funding systems may struggle to keep existing teaching staff on the payroll or to find them alternative employment in the

school system. In such contexts, securing additional funding for teacher redundancy packages in advance may be an important factor for success (OECD, 2017[3]; OECD, 2019[4]).

The examples of Australia, the Flemish Community of Belgium and the Czech Republic demonstrate the need to form realistic expectations about the costs of rolling out new funding models. In **Australia**, the government explicitly assured the public that no school would lose funding as a consequence of a major review of the country's funding model. The aim of the review was to better ensure adequate funding for students with greater education needs. As such, the government needed to commit significant additional resources to implement the reform. In the **Flemish Community of Belgium**, changes to the system for distributing operating grants and staffing went in line with substantial increases in the overall budget (OECD, 2017[3]). In the **Czech Republic**, a school funding reform in force since 2020 shifted the basis of national funding from student numbers to the number of teachers or hours taught. This change was accompanied by an increase in the total amount of resources for public education in the national budget (about 12 % in 2020) (OECD, 2019[16]; Eurydice, 2022[36]).

The OECD School Resources Review has also highlighted the importance of conducting periodic reviews of funding allocation mechanisms to ensure they optimally serve the goals of the education system. The experience of countries that engaged in such reviews, such as **England (United Kingdom)** and the **Flemish Community of Belgium** suggest some common procedural and design practices. For instance, independent bodies (e.g. an existing independent agency or a panel of independent researchers) typically take a substantive role in providing recommendations for reform, with government officials providing data, administrative and analytical support. Other common elements include: a clear mandate for the review in terms of focus and scope; a designated timeline and positioning of the review within the broader policy context; information on mechanisms for collecting evidence (e.g. for stakeholder consultations, the analysis of funding in a sample of schools and research) (OECD, 2017[3]).

Current expenditure needs to be distributed in a predictable and transparent way

Funding formulas are a transparent mechanism to align the distribution of funding to schools with policy objectives…

Any funding allocation mechanism should be designed to fit the governance and policy context of the school system. In the allocation of funding for current expenditure, there may be different goals that are more important than others depending on the overarching policy objectives (OECD, 2017[3])

Funding formulas are used in many countries to distribute regular funding for current expenditure such as staff salaries. Through differential weighting given to each of the main components included in the formula, funding formulas can be designed to support a balance of different policy goals (OECD, 2017[3]):

- Promoting equity is one of the most important functions of formula-based funding. Universal per-capita allocations for students in specific grades can ensure horizontal equity (i.e. the similar treatment of recipients with similar needs). To promote vertical equity (i.e. the provision of different funding levels for recipients with different needs), the basic allocation can be adjusted systematically using need-based coefficients.
- Setting incentives for funding recipients and supporting particular policies (i.e. a directive function).
- Regulating the market (i.e. supporting school choice policies). The greater the proportion of funding that is allocated on a simple per-student basis, the more this function will be emphasised.

While there is no single best-practice funding formula, there are a set of principles that can guide the design of an effective formula. One major challenge lies in accounting for the differences in costs associated with the varying education needs of students and providing different funding levels to schools based on legitimate differences in unit costs that are beyond the control of the school. This calls for a formula which incorporates coefficients to adjust for these differences. However, funding formulas must strike a balance

between complexity – which is needed to capture differences in schools' needs – and transparency – which ensures that the funding model is accessible and understandable to stakeholders.

As a guide for designing formulas to better meet differential needs, research has identified four main components: 1) a basic allocation per-student or per class that is differentiated based on students' grade or level of schooling; 2) an allocation for specific education profiles or curriculum programmes (e.g. different vocational fields or special education needs programmes); 3) an allocation for students with additional education needs adjusting for different student characteristics or types of disadvantage; and 4) an allocation for specific needs related to school site and location, adjusting for structural differences in operational costs, such as for rural areas with lower class sizes. Comprehensive and compelling analysis and empirical evidence on the exact cost differences can support policy discussions to adjust parameters included in funding mechanisms. Reliable evidence should be gathered on the adequacy of funding in general, and for specific elements that the funding mechanism aims to address (OECD, 2017[3]).

… and can be designed to set desirable incentives for schools

Funding formulas should also promote budgetary discipline at the local and school levels. Student enrolments will be an important factor determining resource allocations in all school systems to ensure sufficient teaching staff for the required instruction time. The required resources can be determined based on student numbers or the number of classes. Allocating funding on a per-student basis promotes competition and efficiency. At the same time, fixed costs are not responsive to changing student numbers. Per-student funding can therefore create pressures for schools with small or declining enrolments and increasing staff-student ratios. To acknowledge that not all costs are linear, a funding formula can incorporate weights for smaller schools. Such an approach would incentivise most schools to reduce the number of classes by raising class sizes, while granting more resources to particular schools (OECD, 2017[3]; OECD, 2018[5]). Box 3.5 provides examples of some approaches to funding formulas in OECD countries.

Teachers' salaries (over which sub-central authorities or schools may have no control) will be a further important factor that determines schools' resource needs. Some school systems therefore allocate funding based on some kind of estimation of average cost as part of their funding formula. Such systems: 1) provide a framework for balancing actual teacher salary expenses with the amount of funding available to pay for staff and 2) can act in an equalising way as they promote similar staffing levels across schools. In **Estonia** and **Lithuania**, for example, average teacher salaries have been important input variables in the formula determining resource allocations (OECD, 2017[3]; OECD, 2019[4])

Periodical reviews are necessary to ensure funding formulas remain fit to address dynamic policy needs. Such reviews can allow governments to identify whether there is a need to revise the formulas' adjustments for student and school needs, as well as the weight of formula-based funding relative to targeted funding programmes within the overall funding envelope (OECD, 2017[3]).

Box 3.5. Examples for formula-based funding to schools in select jurisdictions

The Netherlands have introduced formula-based funding for both primary and secondary education. Since a reform in 2019, the equity funding for primary education estimates students' disadvantage on the basis of an indicator, which consists of five background characteristics: the level of education of both the mother and the father, the country of origin of the parents, whether parents are in debt restructuring, the duration of the mother's stay in the Netherlands, and the average level of education of mothers of students at school. Schools receive additional resources for students belonging to the 15% with the greatest estimated disadvantage. The additional budget for secondary schools used to be calculated based on the number of students whose parents have a weak education background and

the socio-economic characteristics of the school's neighbourhood. A corresponding indicator of student disadvantage in secondary education is currently under development. The Dutch equity funding system is an example of an encompassing index-based approach, although the share of index-based funding as a percentage of total education funding is relatively low (about 4.5%).

Toronto (Canada) applies a "Learning Opportunities Index" (LOI) to govern the distribution of resources across schools in the municipal school district. The funding needs of schools are evaluated based on six variables: 1) Median income in the students' residential area; 2) the share of low-income families in a particular area; 3) the share of families receiving social assistance; 4) the share of adults without high school diploma; 5) the share of adults with a university degree; and 6) the share of single parents. Students are matched to neighbourhoods based on postal codes. Similar to the Netherlands, the share of resources distributed according to the needs-based formula only amounts to about 5% of total education spending.

The **Swiss canton of Zurich** uses a social index to distribute teaching resources across schools since 2004/05. The social index contains three elements based on official statistics: first, the share of foreigners (excluding immigrants from Austria, Germany and Liechtenstein), the share of children receiving social assistance, the share of tax-payers with a low income. Different from the other indices, this index does not provide additional resources for disadvantaged students but uses the index to distribute regular teaching resources.

Source: Nusche, D., et al. (2016[37]), *OECD Reviews of School Resources: Austria 2016*, https://doi.org/10.1787/9789264256729-en.

… but indicators to distribute funding to schools need to be carefully selected

The OECD School Resources Review has revealed the importance of paying adequate attention to the choice of indicators for allocating funding and understanding the technical and analytical demands for the design of effective allocation mechanisms. This applies both to systems using funding formulas as well as those using other methods, even if they do not systematically use a single set of criteria to allocate funding (OECD, 2017[3]).

A range of different indicators can be used to determine the proportion of students with identified needs for additional resources. For instance, area-based funding aims to address the additional challenges that arise from a high concentration of socio-economically disadvantaged students. However, such approaches risk leaving out a proportion of the disadvantaged population and include many individuals who are not disadvantaged. There is also evidence that the "target area" label can be stigmatising and encourage the flight of middle-class families from these areas. As a result, there has been a broad shift to using indicators that are more specific to the actual composition of the student body in schools (OECD, 2017[3]), as illustrated in Box 3.6.

Box 3.6. Initiatives to account for school-specific student characteristics in the allocation of funding: Examples from the French and Flemish Communities of Belgium

In the **French Community of Belgium**, the socio-economic index (*indice socio-économique*) is based on the student's residential area, using indicators such as income, qualification level and unemployment rate. These indicators are subject to review every five years. School leaders report the required information on their students annually which - upon verification from central authorities – is used to attribute a value on the socio-economic index to each student. The funding allocation is determined by ranking schools based on the average of students' socio-economic indexes. The bottom quartile of schools then qualifies for additional teaching periods or funding allocations.

The **Flemish Community of Belgium** uses a similar system to allocate additional resources to compensate for socio-economic disadvantage. The Flemish school financing system is designed to support equal access to education opportunities for all students and to compensate for differences in students' backgrounds. To help schools meet the needs of students from diverse backgrounds, a part of the school operating grants is weighted with respect to socio-economic status (SES). This weighing is based on factors that are strongly associated with education outcomes – the mother's education level, (foreign) language spoken at home, the family's financial capacity and the student's neighbourhood characteristics. Students' socio-economic characteristics are also used in the calculation and allocation of teaching hours to primary schools (primary and pre-primary education) while secondary schools receive a top-up of teaching hours based on such characteristics. The SES weights may enable remedial classes to be run, classes to be split and teachers to be released for a range of pedagogical and support activities. In these ways the Flemish authorities seek to balance choice and autonomy with equity.

Sources: OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*, https://dx.doi.org/10.1787/9789264276147-en; Nusche, D., et al. (2015[38]), *OECD Reviews of School Resources: Flemish Community of Belgium 2015*, http://dx.doi.org/10.1787/9789264247598-en.

Whether indicators are based on geographic areas, schools or students, there is a trade-off between simplicity and transparency, on the one hand, and accuracy and fairness, on the other (Atkinson et al., 2005[39]). No perfect indicator exists. For more precise targeting to local contexts, more complicated indicators need to be established, although a higher degree of complexity makes these less transparent and understandable to a wider public. In many countries there is an ongoing debate as to how many indicators can be included in funding allocation mechanism to track additional needs. There are also examples where the use of simpler indicators did not make a large difference to schools' funding levels (OECD, 2017[3]).

The availability and quality of data are key concerns when compiling indicators. A major issue of many indicators used to allocate additional resources to areas and schools is the lack of up-to-date data. A further problem is misclassification and missing data on part of schools, areas or students. For example, data on free school lunch status in the United States are missing for a significant number of students. Students without records are often simply classified as not eligible for free school lunch (Harwell and LeBeau, 2010[40]). Finally, to give greater integrity to the funding system, indicators should resist manipulation since there may be incentives to inflate or deflate numbers in order to benefit from additional resources (OECD, 2017[3]).

Many funding systems aim to strike a balance between using census-based and school-based indicators. For instance, one option is to use individually targeted funding for students with more severe special education needs, complemented by a census-based funding approach for students with milder special

education needs or those linked to socio-economic disadvantage. Using census-based data as a proxy for individual student needs can be less accurate, but research can help choose the best proxy indicator or combination of indicators. The use of census-based data also holds the advantage of reducing the reporting burden for schools. All systems should make sure to regularly review the indicators used so they reflect evolutions in data systems, and to build adequate technical and analytical capacity for the design, implementation and maintenance of an effective allocation mechanism (OECD, 2017[3]) (Box 3.7).

Box 3.7. Reviewing indicators used for the allocation of funding to schools: the French and Irish experiences

In 2020/21, **France** introduced a new model for allocating teaching resources for public secondary education from the Ministry of National Education to the regional level – organised in the form of regional *academies*. At the core of the model, teaching resources are allocated annually, taking into account available budgetary resources, changes in student numbers, the impact of specific policy measures, and local needs (including socio-economic factors, school size, location and education offer). This reform followed earlier changes to resource allocations for primary education (Le Laidier and Monso, 2017[41]). A new methodology and indicators were chosen, based on input by the ministry's Department of Evaluation, Foresight and Performance (DEPP) and involvement of selected regional authorities in a working group. The changes sought to address concerns that the existing model did not sufficiently reflect regional differences, account for education inequities, or provide transparency in final resource allocations. In lower secondary education (*collèges*), the previous social criterion did not sufficiently correct for social disadvantage, while such a criterion was missing in the case of upper secondary education (*lycées*). Differences in resource needs between different vocational programmes were also not accounted for. Following technical work between 2015 and 2019, a prototype of the new model was discussed with the regions before finalisation. The new model calculates teaching hours for each school, which are then aggregated to a regional level. This better accounts for the heterogeneity within regions and provides a more stable parameter for resource allocations. It includes criteria related to students' socio-economic background (based on a social position index calculated by parents' socio-professional status and the share of students receiving grants) as well as schools' structural characteristics (such as programme offer, size and remoteness). Using two sources of information for the socio-economic criterion makes targeting to territorial contexts more accurate. Both types of variables – socio-economic and structural – are now almost exclusively continuous rather than categorical, eliminating previous threshold effects. The model is expected to evolve over time as new variables become available or others are deemed less important (Evain and Monso, 2021[42]).

In **Ireland**, the government undertook a review of the basis used to determine the allocation of additional supports to schools with high concentrations of learners at risk of disadvantage through the country's Delivering Equality of Opportunity in Schools (DEIS) programme. The review highlighted the potential to exploit general developments in data collection in the public sector to improve the standardised system for identifying levels of disadvantage in schools, and reduce the burden on schools to report data and the central education authorities to control data quality. The review underlined the importance of adequate resources within the education ministry to support the data collection and analysis functions associated with the identification methodology. In 2017, as a proof of concept, the new methodology was used to extend the DEIS programme to 79 additional schools. An extensive body of work has been undertaken since then to refine the methodology and it will be used to further extend the programme to additional schools with the highest levels of concentrated disadvantage from 2022 (OECD, 2017[3]).

Sources: Evain F. and O. Monso (2021[42]) , "La rénovation du modèle d'allocation des moyens d'enseignement dans le second degré public", in *Education et formations* n° 102, DEPP, pp . 235-260, available at https://www.education.gouv.fr/les-territoires-de-l-education-des-approches-nouvelles-des-enjeux-renouveles-education-formations-323741 (accessed on 18 January 2022). Le Laidier S. and O. Monso (2017[41]), "L'allocation des moyens dans le premier degré public : Mise en œuvre d'un nouveau modèle", in *Education et formations*

n° 94, DEPP, pp . 59-89, available at https://halshs.archives-ouvertes.fr/halshs-01699266 (accessed on 19 January 2022).
Adapted from OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*, https://dx.doi.org/10.1787/9789264276147-en.

Capital expenditure needs to be distributed in ways that promote an equitable access to capital funding and the efficient management of investments

Countries typically rely on different funding streams for capital investments in school education

Although – compared to staff salaries – a relatively small share of education expenditure is devoted to physical resources, funding for education materials and the construction and maintenance of school buildings is one of the most significant investments in public infrastructure. Together with the effective management and steering of the school network in line with evolving needs, the mechanisms by which capital and maintenance funds are distributed play an important role in ensuring that these funds are used effectively and reach the areas and school facilities most in need of investment (OECD, 2018[5]).

Many systems use different funding streams to distribute funding for the construction of new schools, the expansion of established schools, or the renovation of existing facilities. While funding for current expenditure is usually allocated using different types of annually recurrent grant allocations, capital expenditure is more commonly covered through ad-hoc grants or investment programmes. In some countries, funding from international agencies such as the European Commission's Structural Funds or the Inter-American Development Bank complements these national sources of infrastructure funding (OECD, 2018[5]; OECD, 2017[3]).

Box 3.8 illustrates some OECD countries' approaches to funding construction projects, maintenance or renovation through infrastructure investment programmes.

Box 3.8. Infrastructure investment programmes in select countries

Following the global financial crisis, **Australia** launched a federal investment programme, Building the Education Revolution (BER), in 2009, which provided AUD 16.2 billion in earmarked grants to fund infrastructure projects at every primary and secondary school in the country. The programme was intended to provide an economic stimulus to local communities and generated 23 564 construction projects delivered by 22 government and non-government education authorities (Commonwealth of Australia, 2011[43]).

In **Austria**, long-term school development programmes (*Schulentwicklungsprogramm*, SCHEP) support the modernisation of the infrastructure of schools under federal administration, typically over periods of five to ten years. They are based on principles of results orientation, transparency and efficiency. The investments are transferred to the owners of school buildings, mostly the Federal Real Estate Company (*Bundesimmobiliengesellschaft*) and municipalities, via increased rental payments. Funding allocations are based on medium- and long-term prognoses of infrastructure needs developed with bottom-up input. The current programme (SCHEP 2020) provides EUR 2.4 billion for the period 2020-2030 to upgrade the federal school infrastructure in line with new pedagogical requirements (e.g. digital learning, all-day school), ecological considerations and spatial-demographic developments. A total of about 270 projects is envisaged (BMBWF, n.d.[44]).

In **Chile**, a national Strategic Plan for School Infrastructure (*Plan Estratégico de Infraestructura Escolar*) made available an estimated investment of over USD 500 million to upgrade the school infrastructure

between 2014 and 2018. The plan was based on an assessment of the state of infrastructure conducted between 2012 and 2014 that had identified serious shortcomings in a considerable share of existing school facilities (OECD, 2019[16]).

As part of a national policy to extend the school day, **Colombia** has put in place a National Infrastructure Plan to create the necessary infrastructure requirements. To secure the resources to finance infrastructure and equipment, an Education Infrastructure Fund (*Fondo de Financiamiento de la Infraestructura Educativa*, FFIE) was created, which seeks to consolidate resources from different sources, manage them efficiently, and prioritise projects with the greatest potential impact. The fund announces public bids for regional and local education authorities to put forward their investment projects, which are then co-financed nationally (MEN, n.d.[45]).

Sources: Commonwealth of Australia (2011[43]) Building the Education Revolution Implementation Taskforce: Final Report; BMBWF (n.d.[44]), Schulbau, https://www.bmbwf.gv.at/Themen/schule/schulsystem/schulbau.html (accessed on 06 December 2021); OECD (2019[16]), *Education Policy Outlook 2019: Working Together to Help Students Achieve their Potential*, https://dx.doi.org/10.1787/2b8ad56e-en;MEN (n.d.[45]), Fondo de Financiamiento de Infraestructura Educativa, https://ffie.com.co (accessed on 03 December 2021).

Funding allocations for capital expenditure are often based on an ad-hoc assessment of needs, providing flexibility to redress infrastructure needs…

In contrast to funding allocations for current expenditure, the level of capital expenditure grants is rarely determined through funding formulas (see Figure 3.5 above). The value of capital resources fluctuates over time as they deteriorate and age or benefit from maintenance works and renovation. As a consequence, there are significant differences in the state and value of fixed assets and the associated need for capital funding across sectors and individual schools, which must to be taken into account when allocating funding for capital expenditure (European Commission/Eurydice, 2000[33]; OECD, 2018[5]).

Instead, the level of capital funding is typically based on an assessment of needs or administrative discretion, which commonly involves efforts to target funding to schools with the greatest need for renovations or emergency repairs. Some school systems also allocate capital funding on a competitive basis and many local authorities ask schools to provide an application dossier based on which their requests for financial support are assessed. Regular surveys assessing the condition of school buildings can support authorities in identifying the investment needed – both overall and at a school-level – and in evaluating the effectiveness of these investments. Improved data on site conditions can inform the allocation of funding and strengthen the education ministry's evidence base in inter-ministerial budget negotiations (OECD, 2018[5]).

… but potentially creating inequities in access to capital funding

While these funding mechanisms provide the requisite flexibility to redress the greatest infrastructural needs as they arise, they often require technical capacity and experience on the part of schools or local authorities, which can exacerbate inequities. Even where capital funding is successfully obtained, some authorities may lack the means to effectively manage large infrastructural developments, procurement processes and the purchase of materials and services. This also applies to access to international sources of funding, which require capacity to apply for project resources and to then absorb and use funding at the local level. To ensure a fair distribution of capital funding, funding mechanisms should minimise barriers for recipients with less technical expertise. Central guidelines can reduce the costs of planning procedures and help ensure that quality standards and policy objectives are met (OECD, 2018[5]).

Key messages

Overall, responsibilities in education finance as well as models of allocating education funding must be designed to incentivise efficient spending, increase transparency of financial flows and mitigate inequalities between different schools and localities. To achieve these goals, this chapter highlights five promising policy levers.

First, the analysis underlines the importance of aligning revenue raising and spending powers across different levels of government. However, while local revenue raising responsibilities impose incentives for efficient spending, they might create disparities in spending powers across localities. Intergovernmental transfers can serve to address these equity concerns.

Second, policy makers must address the complexity challenges arising from the dispersion of competencies in school funding across different levels of government. This requires setting clear responsibilities, providing adequate co-ordination mechanisms and building the necessary technical and administrative capacity for smart spending decisions at a local level.

Third, increases in school autonomy call for policies that enable schools to constructively use their decision- making powers whilst being held accountable for their spending choices. This requires building capacities at a school level and ensuring effective monitoring and evaluation of schools through central authorities.

Fourth, where public funding is allocated to private education providers, policy makers must prevent adverse effects on equity. Particularly, public funding must be tied to regulations that prohibit private schools from imposing barriers to entry and to clear structures of accountability. Further, parents must receive the necessary information to choose schools to optimise their children's learning outcomes.

Finally, the chapter suggests that funding systems must strike a balance between regular and targeted school funding to ensure both sufficient flexibility and transparency of funding arrangements. With respect to regular funding, carefully designed funding formulas that take into account the different cost structures of schools can serve as a transparent way to cover schools' current spending. While capital spending usually requires targeted funding, regular surveys assessing schools' investment needs and central guidelines for funding requests can increase the transparency and fairness of funding allocations.

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Notes

[1] The central level specifies authorities that make decisions or participate in different aspects of decision making on a national scale. This includes, among others, the central government, central education, financial and legislative authorities and central auditing services. All authorities below the central level in administrative terms are referred to as sub-central level, which includes regional and local authorities, for example.

[2] Due rounding up, the proportions of funds contributed by each level of government do not add up to one hundred percent.

4 Using school funding to achieve both efficiency and equity in education

Most countries explicitly aim to improve access, quality, equity and efficiency in their education systems. However, fulfilling these objectives at the same time is a challenge for policy makers. The pursuit of equity and efficiency in particular has often been presented as a trade-off when it comes to the allocation of resources in education. Nevertheless, efficiency and equity can go hand in hand and this chapter examines how the two can be brought together. It presents insights and promising policies from OECD countries in four areas that can help improve both equity and efficiency: Investing in high-quality ECEC; investing in teacher quality; reducing educational failure; and adapting school networks to changing demand.

Introduction

Most countries worldwide have formulated explicit goals for broadening access and enhancing the quality, equity and efficiency of their education systems. Yet school systems have limited resources with which to pursue these objectives and are thus confronted with difficult spending choices and resource trade-offs.

The context of the COVID-19 pandemic has provided a vivid illustration of these dilemmas and further complicated resource allocation choices given the emergence of a new priority: containing the spread of the virus within schools as a way 1) to ensure the safety of students, teachers and other school staff, and 2) to maintain education continuity and face-to-face social interactions following the 2020 school closures. In addition, the episodes of school closures have increased socio-economic disparities and thus renewed the priority of addressing inequities in the education system. Finding the best possible allocation of limited resources among competing priorities has, therefore, only gained in importance. These concerns gained even more prominence in the aftermath of Russia's war of aggression against Ukraine and the surge in new budgetary priorities that resulted from this new crisis, e.g. in boosting investments into national defence and military equipment for many countries.

Regardless of which areas of school spending – such as infrastructure, staff or ancillary services – are concerned, school systems need to make sure that resources are used efficiently and directed where they have the greatest impact on students, informed by an analysis of national and local contexts. Educational efficiency is typically conceptualised as the property of fulfilling maximum educational potential at the lowest possible cost. In this context, efficiency improvements in school education can be achieved in two ways: either by maintaining identical levels of outcomes while lowering the amount of school funding, or by attaining better outcomes with the same level of funding (OECD, 2017[1]).

The pursuit of equity and efficiency in education has often been presented as a trade-off when it comes to the allocation of resources, but these two objectives can go hand in hand.

Efficiency and equity are sometimes seen as competing goals in education since equity measures often entail additional investment for disadvantaged student groups, which may not translate into proportional increases in student achievement at the aggregate level. This could lead to lower efficiency and thus a potential trade-off between the two objectives. However, the relationship between efficiency and equity is not that clear-cut. Research points to a number of policy approaches that can support both efficiency and equity objectives and which, therefore, warrant attention from policy makers considering where to invest resources. These policy approaches are also likely to be relevant to inform reflections in countries on how to allocate funding as they recover from the COVID-19 pandemic and face competing budget priorities in a time of deteriorating geopolitical and economic situation. Acknowledging that efficiency and equity can go hand in hand redirects the focus of policy debates from zero-sum conflicts towards enabling synergies between equitable education, better learning outcomes and the best use of the available resources (OECD, 2017[1]).

This chapter analyses some of these policy areas that can support both efficiency and equity in school education. The chapter is organised around four selected key themes:

- First, this chapter discusses the importance of investing in high-quality early childhood education and care, and in particular 1) increasing participation for children from disadvantaged backgrounds, and 2) fostering process quality in settings to enhance the quality of children's experiences and interactions.
- Second, this chapter analyses trade-offs in teacher policies and the critical importance of investing in teacher quality, with a particular focus on 1) making a career in schools attractive for high-quality

candidates including adequate compensation, and 2) working towards an equitable and effective distribution of teachers across schools.

- Third, this chapter delves into the structural factors influencing students' transition through the system and efforts to reduce the risk of educational failure and dropout. Educational failure and dropout typically result from a lack of co-ordination and early intervention, grade repetition practices or early tracking, which can lead to inefficiency and inequity.
- Fourth, the chapter concludes with a discussion of strategies to effectively manage and adapt school networks to changing demand, while safeguarding quality, equity and well-being. In this context, the chapter also investigates the complementary strategies that are necessary to support access to educational opportunities for students in remote rural areas.

Supporting high-quality early childhood education and care

Policy makers worldwide recognise the myriad of advantages of ECEC

High-quality early childhood education and care (ECEC) holds tremendous potential for children, families and societies. Clear evidence spanning research from neuroscience to economics demonstrates that ECEC can give all children a stronger start by supporting their development, particularly those from less privileged backgrounds (OECD, 2021[2]; OECD, 2018[3]).

Children's early learning and development is closely connected across domains. Cognitive, social and emotional, as well as self-regulatory skills grow together during early childhood, with gains in one area contributing to concurrent and future growth in other areas (OECD, 2020[4]). Participation in high-quality ECEC supports children's development in all these areas, with implications for learning beyond early childhood. For example, children in Denmark who participated in higher-quality ECEC performed better on a written exam at the end of lower secondary schooling (ten years after their ECEC participation) than their peers whose ECEC experiences were of lower quality (Bauchmüller, Gørtz and Rasmussen, 2014[5]). Similarly, findings from the United Kingdom show that participation in high-quality ECEC is associated with stronger performance at the end of compulsory schooling, enough to generate a 4.3% increase in gross lifetime earnings per individual (Cattan, Crawford and Dearden, 2014[6]).

In addition to educational and economic benefits, quality ECEC also supports social and emotional well-being (see also Chapter 2 on the broader social outcomes of education for individuals and societies). In a sample from the United States, at age 15, adolescents reported fewer behavioural and emotional problems when they had participated in higher-quality ECEC (Vandell et al., 2010[7]). In the longer term, participation in ECEC positively predicts well-being across a range of indicators in adulthood, including physical and mental health, educational attainment and employment (Belfield et al., 2006[8]; Campbell et al., 2012[9]; García et al., 2020[10]; Heckman and Karapakula, 2019[11]; Heckman et al., 2010[12]; Karoly, 2016[13]; Reynolds and Ou, 2011[14]). Finally, societies benefit from high-quality ECEC in the long term through greater labour market participation and earnings, better physical health and lower crime rates (OECD, 2021[2]).

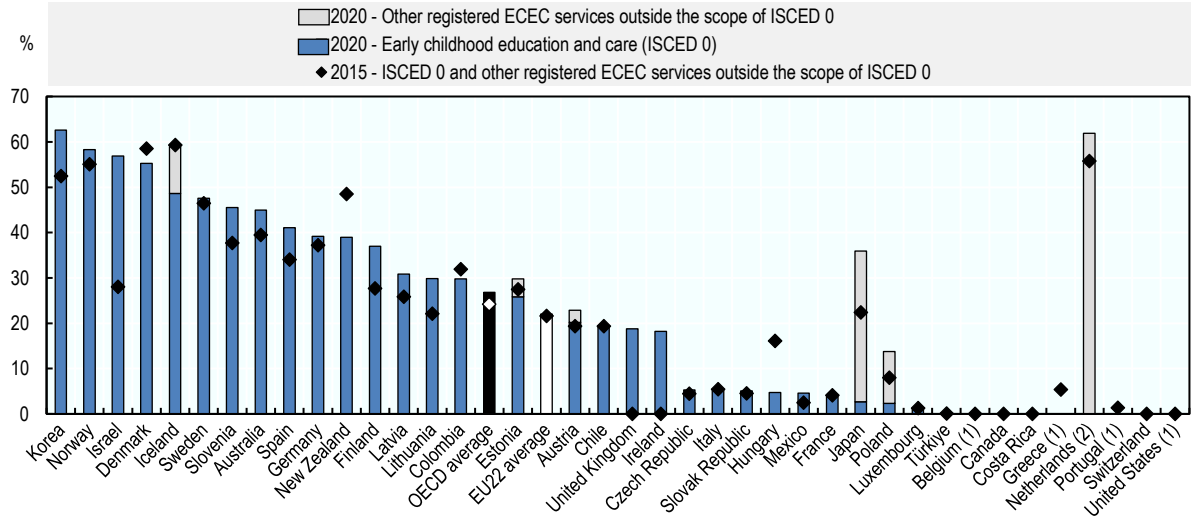
In this context, investing in high-quality ECEC pays off, and ECEC enrolments have been growing…

Investing in high-quality ECEC, while targeting it particularly to disadvantaged children, is therefore a fundamental policy lever for achieving both efficiency and equity in education (OECD, 2017[1]), although more research is needed on the specific types of investments that ensure ECEC delivers high rates of return (Rea and Burton, 2020[15]; Whitehurst, 2017[16]), and how to sustain gains in early childhood through investments in primary school and beyond (Johnson and Jackson, 2019[17]).

As awareness on the importance of ECEC has grown worldwide, OECD countries have expanded the provision of pre-primary education (ISCED 02) and targeted measures for children from disadvantaged backgrounds. As a result, enrolment rates in ECEC have increased, reaching universal or near-universal levels for children aged 3 to 5 in several countries, and in most countries in the year before primary school entry. ECEC enrolments of children under the age of 3 – who are growing and learning at a faster rate than at any other time in their lives – are also increasing across OECD countries, although enrolment rates for this age group are still more variable than for older children (Figure 4.1) (OECD, 2021[18]).

Figure 4.1. Enrolment rates of children under age 3 in early childhood education and care, by type of service (2015 and 2020)

ISCED 0 and other registered ECEC services outside the scope of ISCED 0



Note: Countries are ranked in descending order of the enrolment rates in ISCED 0 of children under the age of 3 in 2020.
2015 refers to both early childhood education and care (ISCED 0) and other registered ECEC services outside the scope of ISCED 0 (except for OECD and EU averages which only cover services within ISCED 0).
[1] Excludes ISCED 01 programmes. For Belgium, excludes ISCED 01 programmes for the French Community of Belgium.
[2] Year of reference 2019 for other registered ECEC services.
Source: Adapted from OECD (2022[19]), Education at a Glance 2022: OECD Indicators, https://doi.org/10.1787/3197152b-en, Table B2.1.

StatLink https://stat.link/x8zsed

Yet children from disadvantaged backgrounds, who stand to gain the most from ECEC, still tend to participate less in ECEC…

ECEC is a powerful policy tool to reduce inequalities and help all children have strong foundations for learning and well-being. In general, however, children from socio-economically disadvantaged families are less likely than their more advantaged peers to participate in ECEC (OECD, 2017[20]; Adema, Clarke and Thévenon, 2016[21]).

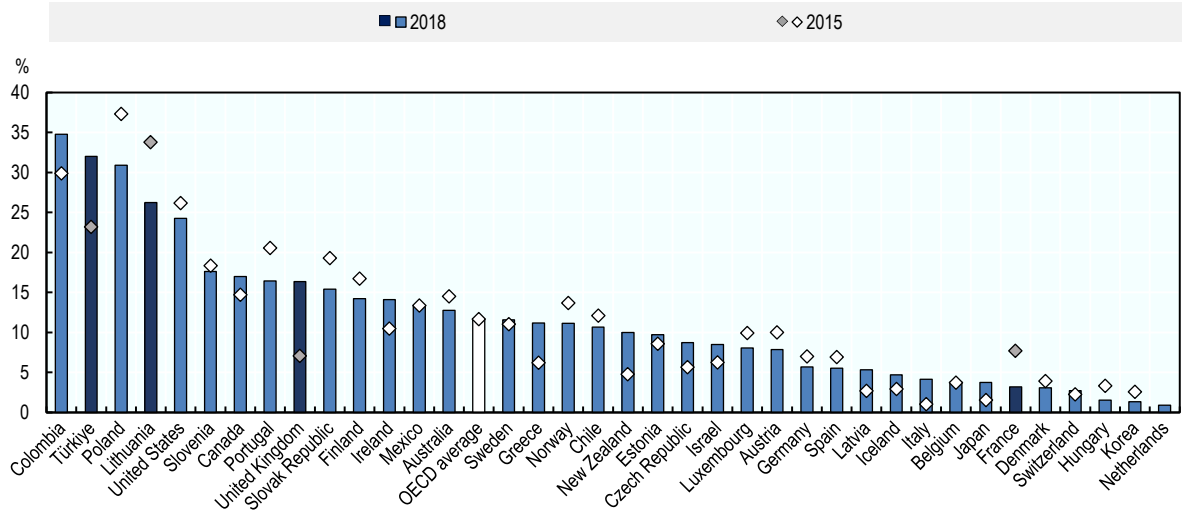
Data from the Program for International Student Assessment (PISA) 2018 show that, on average across OECD countries, 86% of students from socio-economically advantaged backgrounds attended ECEC for at least two years, whereas this was the case for only 74% of their less advantaged peers (Figure 4.2). Importantly, the gap in ECEC participation between students of different socio-economic backgrounds did not change much on average across OECD countries between PISA 2015 and PISA 2018, suggesting that despite overall trends of growing participation in ECEC, inequities remain. However, these data must be

interpreted with caution, as students reporting on their ECEC participation for PISA in 2018 attended ECEC settings more than a decade ago (OECD, 2021[2]).

These disparities not only deprive many disadvantaged children of the benefits of participating in high-quality ECEC, they also deprive their families of economic opportunities since caretaking activities hinder their participation in ongoing education or the labour market. The COVID-19 pandemic may have aggravated this participation gap: Rising unemployment in the first year of the pandemic has particularly affected women and mothers' labour market participation, which has been a good predictor of enrolment rates in ECEC before the pandemic (OECD, 2021[2]).

Figure 4.2. Gaps in pre-primary education participation by students' socio-economic background (2015 and 2018)

Difference in the percentage of 15-year-old students who had attended pre-primary education for at least two years between the top and bottom quarters of socio-economic background



Note: Statistically significant differences between 2015 and 2018 are marked in a darker tone. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS). A socio-economically disadvantaged (advantaged) student is a student in the bottom (top) quarter of the index of ESCS in the relevant country.
Countries are ranked in descending order of the percentage point difference of students who had attended pre-primary education for at least two years between the top quarter of socio-economically advantaged and disadvantaged students.
Source: OECD (2021[2]), Starting Strong VI: Supporting Meaningful Interactions in Early Childhood Education and Care, https://dx.doi.org/10.1787/f47a06ae-en, Figure 1.6.

This requires further strategies to raise ECEC participation for disadvantaged children, such as universal free access balanced across age groups

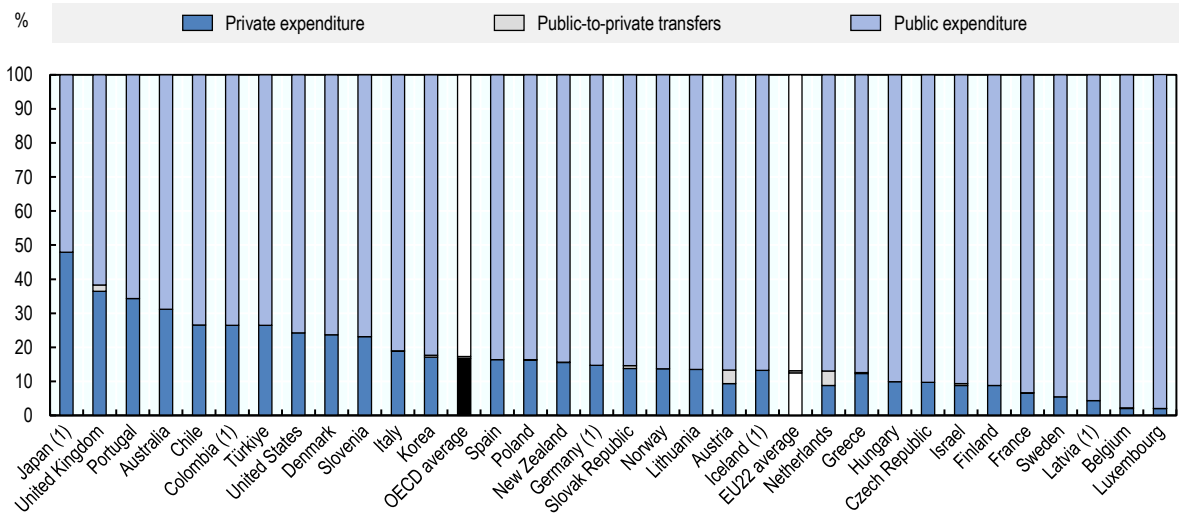
Possible strategies to provide equal access to ECEC and raise overall participation include increasing the provision of free ECEC, for at least some hours, ages, or targeted population groups. Universal free access to at least one year of ECEC is now common across OECD countries and having accessible, high-quality ECEC can encourage broad participation from diverse families. However, countries need to carefully balance their investments across different age groups (OECD, 2021[2]). Universal free access is typically targeted to pre-primary education, potentially limiting the available public resources to support participation of children under the age of three (OECD, 2017[20]). The expansion of free or subsidised ECEC, targeted to families who face income losses due to furlough or unemployment, may also help ensure that children can continue to engage in ECEC should their parents become unemployed (OECD, 2021[2]).

Alongside universal free access, governments can use other tools to encourage equitable participation in ECEC. This includes regulatory frameworks to foster high-quality public and private ECEC provision, or mechanisms to adapt ECEC settings to the needs of disadvantaged families (OECD, 2020[22]; Blanden et al., 2016[23]).

Despite the growing recognition of the importance of high-quality ECEC, funding for the sector has remained lower than for later stages of education

According to data from Education at a Glance, on average, OECD countries spent 0.9% of their gross domestic product (GDP) in 2018 on ECEC as compared to 1.5% and 1.9% of GDP on primary and secondary education, respectively (OECD, 2021[18]). In some countries, pre-primary education has a shorter duration than primary education, potentially justifying lower overall expenditures. However, the proportion of private spending in total spending is higher for pre-primary education than for primary education, highlighting the gap between funding that is needed in the sector and public investments (Figure 4.3) (OECD, 2021[2]). On average across OECD countries, private funding represented 29% of total expenditure on early childhood educational development (ISCED 01) and 17% on pre-primary education (ISCED 02) in 2018. At the primary level, by contrast, only 8% of expenditure on educational institutions came from private sources, on average across OECD countries (OECD, 2021[18]). Also, expenditure per child in pre-primary education is lower than spending per student at higher levels of education, on average across OECD countries, even if several countries, notably Nordic ones, combine strong investments per child with widespread access to ECEC (OECD, 2021[18]).

Figure 4.3. Distribution of public and private expenditure on educational institutions in pre-primary education (2018)



Note: Countries are ranked in descending order of the share of private expenditure after public-to-private transfers.
[1] Information on public-to-private transfers is missing.
Source: Adapted from OECD (2021[18]), Education at a Glance 2021: OECD Indicators, OECD Publishing, Paris, https://dx.doi.org/10.1787/b35a14e5-en, Figure B2.3.

Besides fostering access to ECEC for disadvantaged children, investments in ECEC need to also advance quality in provision

Policy makers strive for a better understanding of what marks the success of public investments in the early years of education and how it can be improved. Research consistently underscores the importance

of ensuring that ECEC is of high quality to unlock the full potential of investments in early education (OECD, 2021[2]). In particular, process quality has been identified as the primary driver for children's development in ECEC (Melhuish et al., 2015[24]), which refers to children's experience of ECEC and their interactions with other children, staff, space, materials, their families and the community (OECD, 2021[2]).

The complex nature of quality in ECEC requires multifaceted policy solutions. The OECD's work on ECEC has highlighted five policy levers which are instrumental for building ECEC systems that can foster process quality: governance, standards and funding; curriculum and pedagogy; workforce development; data and monitoring; and family and community engagement (OECD, 2021[2]). The ECEC workforce is, of course, central to ensuring high-quality ECEC for all children. However, in part due to historical conceptions of childcare as an unpaid activity undertaken by women, ECEC staff is not always recognised for the professionalism that their work requires. Increasing qualification requirements can, in countries where they are low, be one policy option for raising the status of ECEC professionals and help attract stronger candidates to the sector (Box 4.1) (OECD, 2021[2]).

Higher qualification requirements, however, need to be accompanied by opportunities for existing staff to meet these new requirements through training and the recognition of prior learning. This requires granting time and funding to increase access to and engagement in professional development. To ensure that the demands on the workforce and wages are aligned in the long term, and to attract and retain high-quality staff, countries can set long-term objectives for improving salaries and career development opportunities (OECD, 2021[2]).

Box 4.1. Initiatives to increase the number of qualified staff in ECEC: Australia, Canada and Ireland

Several countries have employed a range of strategies to increase the number of qualified teachers in ECEC over time, such as setting higher standards, incentive mechanisms, or offering workplace education opportunities for staff working in the sector.

In **Australia**, since 2012, higher workforce requirements have been progressively introduced. Centre-based services with children in pre-primary education are required to ensure a minimum level of access to qualified early childhood teachers, based on service operating hours and the number of children attending each day. From 2020, services must ensure access to two early childhood teachers if 80 or more children are in attendance. Furthermore, requirements cover both teachers and assistants: half of the staff must hold or be working towards at least a short-cycle (Diploma level) tertiary qualification (ISCED 5), and the other half must hold or be working towards at least a post-secondary (Certificate III level) qualification (ISCED 4). In line with the progressive implementation of the regulatory requirements introduced in 2012, the qualification levels of early childhood teachers in the ECEC workforce have increased in Australia over recent years.

In **Canada**, many provinces and territories have recently set new standards for initial education. For example, in the province of Nova Scotia, the curricula of post-secondary programmes have been updated to meet the newly adopted teaching standards. The province also introduced a process of recognition of prior learning to provide individuals who have been working in the ECEC field for ten years or more with the opportunity to demonstrate that they have acquired the necessary knowledge and skills to obtain an ECEC qualification.

In **Ireland**, new qualification requirements have been introduced in the past years, as well as incentives for ECEC centres to hire staff with higher qualifications. Teachers – so-called "lead educators" in the Early Childhood Care and Education programme (for 3 to 5-year-olds) – are now required to have an ISCED 5 diploma at the minimum. However, centres with teachers who hold a university degree (ISCED 6) in early childhood receive higher funding. The proportion of ECEC staff (working with children of all ages) who are graduate teachers has increased in the last decade, rising from 12% in 2012 to 34% in 2021. For all staff who work directly with children, the minimum requirement is a major awarded in ECEC at ISCED 4.

Source: OECD (2021[2]), *Starting Strong VI: Supporting Meaningful Interactions in Early Childhood Education and Care*, https://dx.doi.org/10.1787/f47a06ae-en.

Investing in teacher quality

Teachers are the most important resource in schools, and there is solid evidence showing that teachers can have long-term impacts on adult outcomes

Teachers are arguably the most important resource in schools. There is a solid evidence base indicating that teachers are key in improving learning opportunities for students, likely more than anyone else in children's lives outside their families, and that they can have long-term impact on adult outcomes, such as earnings and tertiary education attendance (Chetty, Friedman and Rockoff, 2014[25]; Rivkin, Hanushek and Kain, 2005[26]; Rockoff, 2004[27]). Recent research has also documented teachers' impact on other desirable outcomes, including students' behaviours at school, such as attendance and drop-out (Liu and

Loeb, 2019[28]; Gershenson, 2016[29]; Koedel, 2008[30]), and socio-emotional skills, such as resilience, growth mindset and self-efficacy (Kraft, 2019[31]; Blazar and Kraft, 2016[32]; Jennings and DiPrete, 2010[33]).

Insufficient investments in the teaching workforce, then, risk creating challenges to quality, equity and efficiency in school education in the long run. Spending reforms driven by reductions in teachers' salaries or cuts to professional development may make a career in schools less attractive and motivating, and thus make it more difficult to recruit qualified staff (OECD, 2017[1]). Effective human resource policies, by contrast, develop attractive and stimulating careers, distribute teachers effectively and equitably, and support powerful professional learning so teachers maintain the quality of their teaching (OECD, 2019[34]).

Nevertheless, many countries face a number of shared challenges. Notably, careers, salaries and working conditions often remain unattractive and act as a barrier for talented individuals to pursue or remain in the teaching career (OECD, 2019[34]). According to data from Education at a Glance, teacher attrition, that is the proportion of teachers leaving the profession during their career, exceeded 8% in half of the countries with available data for 2016 (OECD, 2021[18]). Moreover, the most effective and experienced teaching staff are often not matched to the schools and students that need them the most (OECD, 2019[34]).

Further challenges relate to the quality of initial teacher education programmes, which may not adequately screen candidates and prepare them for a career in teaching. This can result in candidates dropping out of teacher education programmes or graduates not going into teaching at the end of their studies, creating considerable inefficiency. Finally, teachers' time can be used more or less effectively, which influences the cost and the quality of education (Boeskens and Nusche, 2021[35]).

But countries face important trade-offs in their human resource policies, which are also relevant as countries respond to the impact of the COVID-19 pandemic

The experience of countries suggests that the resource implications of teacher policies are often underestimated at the design stage. Human resource policies must recognise important resource trade-offs and be implemented in ways that are sensitive to the unique contexts faced by schools. For instance, policies that require smaller class sizes, longer teacher working hours or less instructional time per teacher all increase the number of teachers required and raise per-student spending (OECD, 2019[34]).

School systems have also been facing these trade-offs as they have sought to respond to the impact of the COVID-19 pandemic. As a Survey on Joint National Responses to COVID-19 School Closures suggested, nearly half of countries surveyed (48%) had recruited temporary teachers and/or other staff to support student needs in at least one level of education for the school year 2020/21. These additional teacher resources were deployed to ensure substitution for teachers on sick leave, to facilitate social distancing through class size reductions as well as for remedial teaching. Some countries decided to increase teachers' salaries to compensate for additional workload (**Latvia**, **Lithuania** and **Slovenia**), while others increased teachers' working time to give schools the autonomy to reduce class size or provide tutoring (**Austria**) (OECD, 2021[36]).

The size of classes is a much-debated topic, yet does not show strong potential for efficiency gains, except for younger and disadvantaged students

Teacher-student ratios and class size are controversial topics in education policy. Strategies targeted at reducing class size are generally supported by arguments related to closer ties between teachers and students, increased time on task and more attention paid to individual students (OECD, 2017[1]). Data from TALIS 2018 show that smaller classes tend to be associated with more actual teaching and learning time, but that they are not related to key indicators of teaching quality, such as the use of cognitive activation practices and teachers' reported self-efficacy in teaching (OECD, 2019[37]).

Moreover, any potential benefits of small classes need to be weighed against other potential investments such as improvements in professional development and working conditions. Organising students in smaller classes is an expensive policy since it requires more staff resources per student. In other words, there may be a policy trade-off between investing in more teaching staff to reduce class size and investing in better human resources and new approaches to teaching and learning (OECD, 2017[1]).

Given the high cost of class size reduction policies, they appear comparatively less efficient than other interventions to support student learning (Rivkin, Hanushek and Kain, 2005[38]). Some high-performing school systems, such as Shanghai and Singapore, have chosen to reduce teacher workloads instead in order to free time for professional development (Jensen et al., 2012[39]). While the effects of class size on students' achievement are still debated (Santiago, 2002[40]), there is substantial evidence pointing to strong positive effects of small classes on the learning of particular student groups. This includes learners in their earlier years and from disadvantaged backgrounds (Krueger, 1999[41]; Angrist and Lavy, 1999[42]; Chetty et al., 2011[43]; Dynarski, Hyman and Schanzenbach, 2013[44]). This indicates that additional teacher resources – for example in school systems with declining student numbers – should be allocated to disadvantaged students and students in pre-primary and primary education, who benefit the most from such interventions (OECD, 2017[1]).

For school systems more broadly, there still seems to be room for more creative solutions in organising smaller student groups. For example, teachers can be encouraged and supported to set up their classroom space in a way that is conducive to more individualised and active learning approaches. School leaders can also be given increased discretion to use staff more flexibly within schools and thus enable teachers to work with smaller groups at least part of the time (OECD, 2019[37]).

Attracting, retaining and motivating talented individuals for a teaching career is a pressing concern that requires attention to both intrinsic and extrinsic factors

Attracting and retaining the best teachers, motivating them throughout their careers and enabling them to use their talents effectively to foster student learning and well-being is at the heart of what makes a successful school system (OECD, 2019[34]).

Evidence from TALIS 2018 suggests that although individuals choose a career in education for a variety of reasons, the great majority of serving teachers were motivated by a strong commitment to public service and the social impact of teaching (OECD, 2019[37]). Working with young people and inspiring them to learn are powerful sources of intrinsic motivation. At the same time, a substantial number of teachers report that extrinsic factors, including career prospects (61%), job security (71%) and the ability to reconcile their work schedule and private life (66%) also mattered for their decision to join teaching. Moreover, working conditions, salaries and administrative workload represent the top concerns of practicing teachers in many OECD countries (OECD, 2019[37]).

Intrinsic and extrinsic motivations are thus closely intertwined, and countries need to consider both when seeking to raise the attractiveness of a career in schools, to motivate school staff and to enable them to support student learning. Countries need to make teaching a financially rewarding career, while also making it intellectually satisfying and allowing teachers to focus on their instruction (OECD, 2019[34]).

Comparatively low salary levels can be one factor contributing to teacher shortages and high rates of turnover

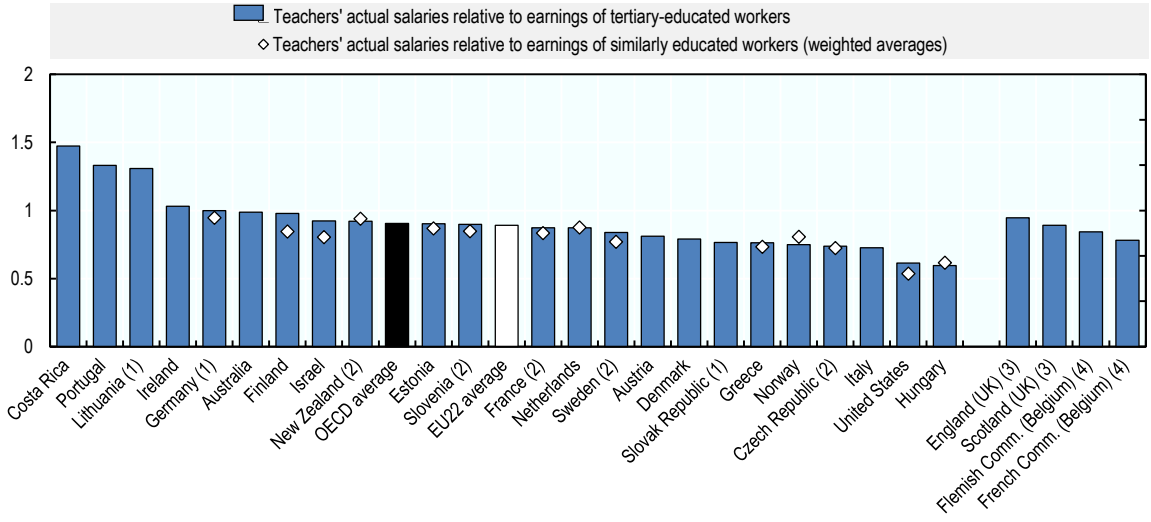
While remuneration is only one among many factors that can render a profession attractive, salary levels, the structure of salary scales and the factors that determine salary progressions are critical policy levers that need to be considered for the supply, retention and motivation of teachers (OECD, 2019[34]).

It is widely recognised that teachers' remuneration should be competitive with that of similarly educated adults working in comparable occupations in order to attract and retain high-potential candidates. Yet, according to OECD Education at a Glance, teachers' actual salaries are lower than those of similarly educated workers in almost all countries with available information, although salaries tend to increase with the level of education taught (Figure 4.4). In 2020, pre-primary teachers' average salaries amounted to 81% of the full-time earnings of tertiary-educated adults between the ages of 25 and 64, while primary teachers earned 86% of this benchmark, lower secondary teachers 90%, and upper secondary teachers 96%. Teachers' relative earnings nevertheless vary widely across countries. In Costa Rica, Lithuania, Portugal and Ireland teachers earn more than other tertiary-educated adults at all levels of education, while teachers at some levels of education in Hungary and the United States earn only two-thirds or less (OECD, 2022[19]).

Comparatively low salaries are frequently regarded as one of the factors contributing to teacher shortages and a lack of qualified candidates for the profession. Uncompetitive salaries may also contribute to teacher attrition as some evidence suggests that teachers' salaries (and the opportunity cost of forgone wages from a career outside of teaching) affect their likelihood of leaving the profession (Falch, 2011[45]), particularly in the early years of their careers (Hendricks, 2014[46]; Murnane, Singer and Willett, 1989[47]). Competitive salaries may therefore also support schools in reducing high rates of turnover that can adversely affect student achievement and that tends to particularly affect disadvantaged schools (Ronfeldt, Loeb and Wyckoff, 2013[48]).

Figure 4.4. Lower secondary teachers' actual salaries relative to earnings of tertiary-educated workers (2021)

Ratio of salaries to the earnings of full-time, full-year workers with tertiary education



Note: Data refer to ratio of salary, using annual average salaries (including bonuses and allowances) of teachers and school heads in public institutions relative to the earnings of workers with similar educational attainment (weighted average) and to the earnings of full-time, full-year workers with tertiary education. Earnings of workers with similar educational attainment than teachers are weighted by distribution of teachers by qualification level. Countries and other participants are ranked in descending order of the ratio of teachers' salaries to earnings for full-time, full-year tertiary-educated workers aged 25-64.

[1] Data for school heads is missing for Germany, Lithuania and the Slovak Republic.

[2] Year of reference for salaries of teachers/school heads differs from 2021. Refer to the source table for more information.

[3] Data on earnings for full-time, full-year workers with tertiary education refer to the United Kingdom.

[4] Data on earnings for full-time, full-year workers with tertiary education refer to Belgium.

Source: Adapted from OECD (2022[19]), Education at a Glance 2022: OECD Indicators, OECD Publishing, Paris, https://doi.org/10.1787/3197152b-en, Figure D3.1.

Several countries where teachers' salaries were significantly lower than those of similarly educated workers have considered reducing this gap to make teaching more attractive (Box 4.2). Yet, while absolute and relative salary levels are an important factor shaping the financial attractiveness of a career in schools, other aspects associated with remuneration should also be considered when assessing their competitiveness. For instance, in many countries, teachers are civil servants and enjoy a high level of job security or benefits like pensions, tax exemptions, family allowances and annual leave that workers in comparable private sector positions lack. The competitiveness of teachers' salaries, therefore, needs to be assessed against a relevant comparison group, bearing in mind both financial and non-financial benefits (OECD, 2019[34]).

Box 4.2. Teacher salary increases to enhance the attractiveness of teaching careers in the Czech Republic, Estonia and Sweden

In the **Czech Republic**, poor salaries and working conditions have been identified as drivers of the low social status and attractiveness of the teaching profession. Following an initial increase in teachers' salaries by 22% in real terms between 2009 and 2014, the government made it a priority to continue raising salaries to tackle staff shortages as part of its Strategy for Education 2020, adopted in 2014. As a result, teachers' salaries have risen annually since 2015, with an 8% increase of teaching staff in 2016. In 2017, the government implemented a programme to increase salaries by 15%. Following pressure from and negotiations with regional teacher unions, the 2019 education budget earmarked CZK 95 billion for teacher salaries, an increase of CZK 16.1 billion from 2018 and constituting an average teacher salary increase of 10%. The country's new sector strategy (Strategy 2030+) foresees further increases in teachers' wages, both relative to the average wage in the national economy and the average salary of university-educated workers. Actions considered in the strategy also include the review of the salary system and increasing the share of funding for bonus-pay components so that school leaders can reward teaching quality (MSMT, 2020[49]; OECD, 2020[50]).

In **Estonia**, ensuring teachers' satisfaction and their image in society was at the core of the Lifelong Learning Strategy 2014-2020. The government's actions included, among others, salary raises and reforms in work organisation to improve the reputation of the teaching profession. To attract the best candidates, average salaries of teachers were adjusted to make them consistent with the qualifications required and the set of skills developed. Novice teachers' salaries were specifically targeted to promote the appeal of a career in teaching for young people. The salary system for teachers also incorporated incentives for participation in professional development, with the possibility of taking half a year away from teaching to fulfil definite developmental assignments (OECD, 2020[51]).

In **Sweden**, the government introduced the National Gathering for the Teaching Profession in 2014, which contained measures to avoid teacher shortages and boost the attractiveness of the profession. This initiative included salary increases and more rapid wage progression for teachers, linked to their competences and development. In 2016, this was followed by the Teacher Salary Boost initiative (*Lärarlönelyftet*), which rewarded teachers for participation in professional development programmes. Furthermore, the government sought to encourage entry to the profession by promoting alternative pathways to teaching and increasing government grants for new teachers. Grants were also implemented to improve working conditions and career opportunities, thereby increasing retention. These measures were complemented by an information campaign (*För det vidare*) to attract more people to teaching, encourage retention and boost the social prestige of the profession (OECD, 2020[51]).

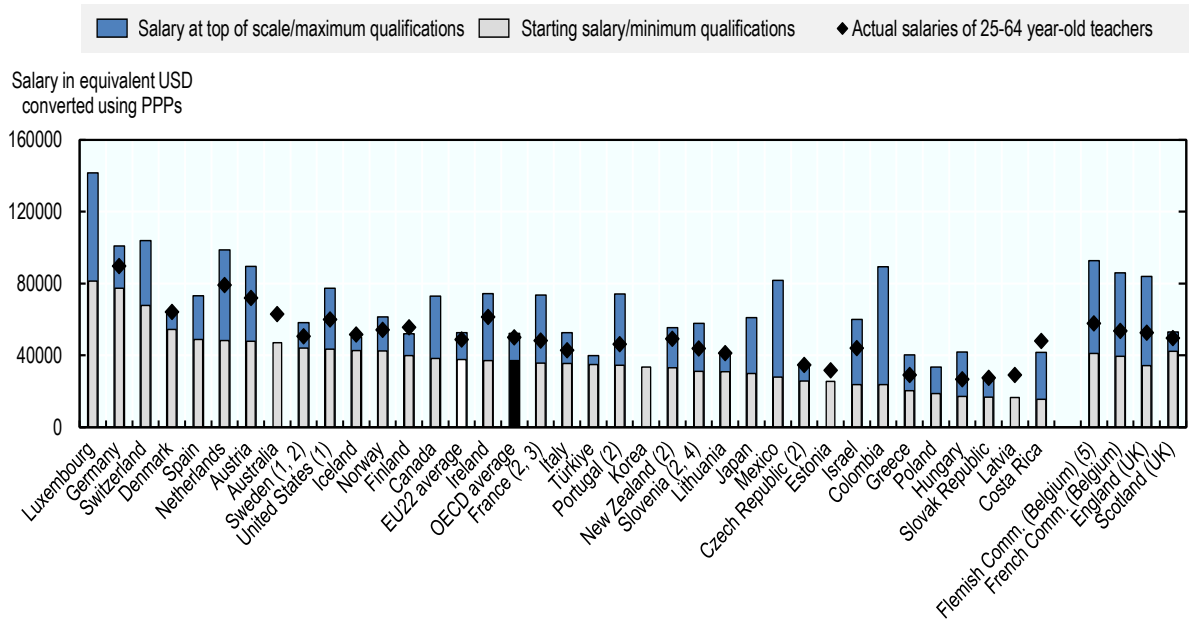
Source: OECD (2020[51]), *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals*, OECD Publishing, Paris, https://dx.doi.org/10.1787/19cf08df-en; (OECD, 2020[50]), *Education Policy Outlook 2020: Czech Republic*, https://www.oecd.org/education/policy-outlook/country-profile-Czech-Republic-2020.pdf (accessed on 31 January 2022); MSMT (2020[49]), Strategy for the Education Policy of the Czech Republic up to 2030+, https://www.msmt.cz/uploads/brozura_S2030_en_fin_online.pdf (accessed on 31 January 2022).

The design of the salary scale and criteria for salary progression also need to be considered when seeking to raise the attractiveness of a career in teaching

Apart from the competitiveness of teachers' lifetime earnings, policy makers must pay attention to the distribution of earnings over the course of the career and the factors that determine salary progression. Higher starting salaries, for example, may need to be weighed against the benefits of greater pay raises over the course of the career. Indeed, many countries face the dual challenge of providing competitive starting salaries to attract high-calibre entrants to the profession while also seeking to retain, motivate and recognise experienced, high-quality teachers through salary increases (OECD, 2019[34]).

According to Education at a Glance, the range of teachers' pay scales and their slope (i.e. the rate at which salaries increase over the course of the career) vary significantly across OECD countries with available data. In a number of countries, teachers earn comparatively little as they start their career but experience a stronger salary progression as they gain further qualifications or seniority. In Chile, Costa Rica, Hungary, Israel, England (United Kingdom), Korea and Mexico, for example, top-end salaries can be more than 2.5 times as high as starting salaries. In Colombia, salaries at the top of the scale are more than three times as high as starting salaries. By contrast, the salary scales in countries like Denmark, Germany and Spain, which offer some of the highest starting salaries, are comparatively compressed (Figure 4.5) (OECD, 2022[19]).

Figure 4.5. Lower secondary teachers' average actual salaries compared to the statutory starting and top of the scale salaries (2021)



Actual salaries include bonuses and allowances. Countries and other participants are ranked in descending order of the starting salaries for lower secondary teachers with the minimum qualifications.

[1] Actual base salaries for starting salary and salary at the top of the scale.

[2] Year of reference for actual salaries differs from 2021. Refer to the source table for more information.

[3] Starting salary and salary at the top of the scale include the average of fixed bonuses for overtime hours.

[4] Salaries at the top of the scale and the minimum qualifications, instead of the maximum qualifications.

[5] Salaries at the top of the scale and the most prevalent qualifications, instead of the maximum qualifications.

Source: OECD (2022[19]), Education at a Glance 2022: OECD Indicators, https://doi.org/10.1787/19991487, Figure D3.2.

…but there is no one-size-fits-all solution to the design of effective salary scales…

However, there is no one-size-fits-all solution to the design of effective salary scales. Instead, policy makers' decisions need to reflect the specific challenges their country has to address as well as their local labour markets. While a failure to attract graduates to the profession might call for higher starting salaries, high attrition rates among mid-career teachers may indicate the need for a more attractive progression of earnings. Likewise, broader economic developments, such as the level of private sector wages or unemployment rates, can affect whether, and up to which point, higher starting salaries can be an effective means to attract high-performing candidates and what forms of salary progression are best suited to recognise and amplify teachers' profound impact on student learning and development (OECD, 2019[34]).

Compressing the salary scale can free up resources to increase starting salaries at the expense of salaries of more experienced staff. This might help to attract more students to teaching and reduce attrition in the early years of teachers' careers. Austria's 2015 teacher service code provides an example of a reform towards a more compressed salary scale (Box 4.3). By contrast, increasing the rate at which salaries rise over the course of the career can create space to provide higher salaries at the top end of the scale. Such scales may serve to retain and motivate more experienced staff or offer a wider scope for salary differentiation among teachers (OECD, 2019[34]).

Box 4.3. Reforming the teacher salary scale to make teaching more attractive to new entrants: the example of Austria

In 2015, **Austria** implemented a new teacher service code which has been mandatory for all teachers entering the profession since 2019/20. It implied a compression of the salary scale, thus offering more attractive starting salaries while reducing top-end salaries, keeping the expected lifetime earnings of teachers roughly constant. The changes have been accompanied by a raise in qualification requirements for new teachers in provincial schools and an increased teaching load in federal schools.

It is expected that flattening the salary structure in Austria (whose slope had been considerably steeper than the OECD average) may lead to an increase in spending in the medium term until the more highly paid senior teachers - who have a right to continue serving under the old salary system – will retire. Part of this effect may be offset by longer teaching hours and the new service code's overtime regulations. Fewer teachers than anticipated chose to enrol under the new service code during the transition period (2015-2019) in which its adoption was voluntary.

Note: In Austria, responsibilities for school education differ between so-called federal schools and provincial schools. Federal schools (*Bundesschulen*) comprise academic secondary schools as well as upper secondary vocational schools and colleges (ISCED 2-3). Provincial schools (*Landesschulen*) include primary schools, general lower secondary schools, New Secondary Schools, schools for students with special education needs, pre-vocational schools and part-time upper secondary vocational schools (ISCED 1-3).
Source: OECD (2019[34]), *Working and Learning Together: Rethinking Human Resource Policies for Schools*, OECD Publishing, Paris, https://dx.doi.org/10.1787/b7aaf050-en.

… and significant implementation challenges need to be anticipated when reforming compensation systems

Compensation reforms always involve a degree of uncertainty about the size and distribution of their benefits and are likely to cause resistance among those who fear to lose out, whether in absolute or relative terms. They therefore require an open dialogue with and involvement of stakeholders, including teacher unions. To build and sustain trust for the implementation of compensation reforms, they must be underpinned by clear communication, consensus building, and a process for prioritising competing claims on resources. Failing to effectively engage stakeholders at the design stage of reforms can come at a high cost as shown by examples of OECD countries that had to delay or abandon compensation reforms due to stakeholder resistance.

The experience of OECD countries also highlights the importance of anticipating the costs and challenges involved in compensation reforms. For example, although adjusting the slope of salary scales and shifting resources towards their lower or upper end can be budget neutral in theory, fiscal consequences are often hard to predict and reforms may involve significant transition costs over the course of their implementation. Finally, policy makers need to bear in mind the inertia of reform processes and the significant amount of time that it can take for a change in teachers' compensation systems to reach all or even just a majority of the profession (OECD, 2019[34]).

Some countries have sought to strengthen the link between teachers' compensation and their performance to promote quality teaching, which is fraught with difficulties

In addition to linking salaries to seniority, many systems seek to incentivise continuous improvement by differentiating compensation based on teachers' education and training or responsibilities. Other forms of differentiated pay have aimed to more explicitly link teacher pay to their assessed effectiveness. For instance, starting in 2006, the US Department of Education competitively awarded Teacher Incentive Fund

grants to school districts to fund the development and implementation of performance pay programmes aimed at teachers and principals. Participating districts were required to use measures of student achievement growth and at least two observations of classroom or school practices to evaluate effectiveness (OECD, 2019[34]).

In theory, performance-based compensation is meant to motivate teachers to improve their practice and raise students' achievement by rewarding effective teaching (OECD, 2019[34]). However, research from different contexts has underlined the difficulty of measuring performance at the level of individual teachers and the potential. It has also showed potential perverse effects associated with incentive schemes to improve teacher performance , such as teachers narrowing the curriculum or reducing their efforts on tasks not explicitly rewarded by the programme (Ballou and Springer, 2015[52]; OECD, 2013[53]; Papay, 2011[54]; Rothstein, 2010[55]). An excessive reliance on extrinsic incentives may also undermine teachers' intrinsic motivation and have a negative impact on collegial relationships (Bénabou and Tirole, 2003[56]; Frey, 1997[57]).

As an alternative, linking salaries to career advancement creates a more indirect link between teachers' growing expertise and their compensation and can address some of the challenges associated with conventional performance pay (Box 4.4). First, this can combine extrinsic rewards for high performance (in the form of salary increases) with intrinsic rewards in the form of professional opportunities and responsibilities that grow in line with teachers' knowledge and skills. Second, this offers both beginning and experienced teachers realistic goals based on their current position on the career ladder and a clear pathway to achieve them. Implementing such systems may require countries to further develop and integrate their teaching standards, appraisal systems, career structures and salary scales (OECD, 2019[34]).

Box 4.4. Linking salaries to career advancement: the examples of Colombia and Chile

Colombia's new teacher career structure, introduced in 2002 and applicable for teachers appointed following its introduction, illustrates how indirect links between appraisal and compensation can be established. In contrast to the seniority-based system in place for teachers appointed prior to 2002, teachers need to undergo a system of Diagnostic and Formative Evaluation (*Evaluación de Carácter Diagnóstico Formativo*, ECDF) to advance their career and reach the next step of the salary scale. While initially based on a written assignment, the evaluation process was reformed in 2015 to measure teachers' effectiveness in the classroom more directly. The process has since focused on peer evaluations based on video observations, on identifying professional development needs and providing access to professional development opportunities for teachers. While the details of the process have been subject to frequent negotiations since it was introduced (e.g. concerning the evaluation method's reliability), the system signals a clear commitment to strengthening the indirect linkages between teachers' performance and their compensation.

Similarly, **Chile** uses a certification process (*Sistema de Reconocimiento*) to regulate teachers' progression across the five stages of their career structure (*Carrera Docente*) based on competencies specified in the national teaching standards (*Marco para la Buena Enzeñanza*). Progression through the career structure is linked to better remuneration through specific salary supplements (*Asignación por tramo de desarrollo profesional docente*) and a higher base salary (*Bonificación de Reconocimiento Profesional*). It also provides access to new professional opportunities, such as teacher networks, and professional learning to improve practice. The certification process includes a standardised written assessment, the evaluation of teachers' professional portfolio through external markers, as well as classroom observation. While advancing to the two highest stages of the teaching career (Expert I and Expert II) is voluntary, teachers are expected to move from the first stage (Initial) to the second or third

(Early, Advanced) after four to eight years. This also serves as a means to make underperforming teachers leave the profession if they fail the examination more than twice.

Source: OECD (2019[34]), Working and Learning Together: Rethinking Human Resource Policies for Schools, OECD Publishing, Paris, https://dx.doi.org/10.1787/b7aaf050-en.

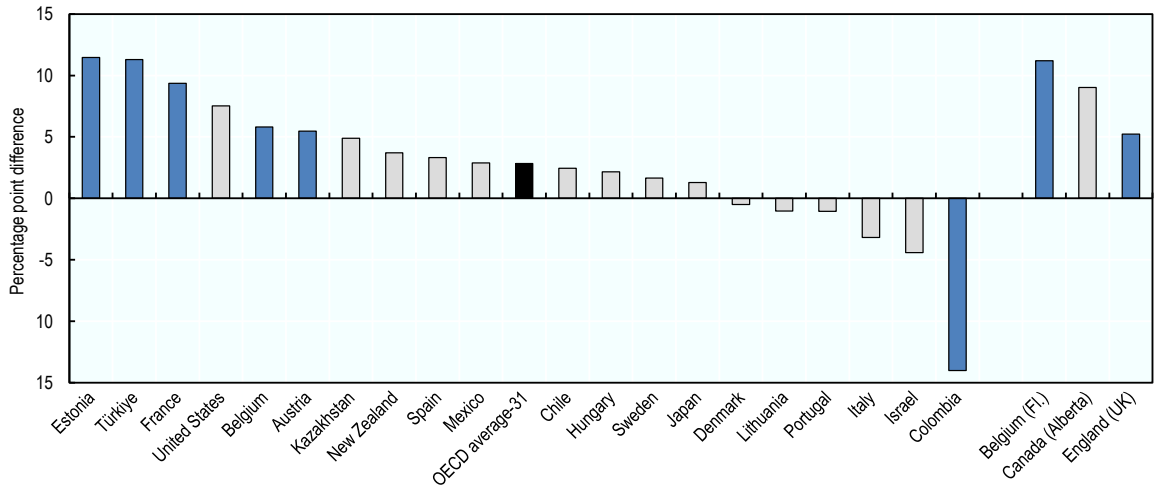
Inequities in the distribution of teachers are problematic in many countries…

Inequities in the distribution of staff across schools in different socio-economic circumstances mark a problem in many countries as a rich research literature and data from the OECD have established (OECD, 2018[58]; OECD, 2019[34]). Data from PISA 2015, for example, show that teachers in the most disadvantaged schools are less qualified or experienced than those in the most advantaged schools in more than a third of the participating school systems. Further, the gaps in student performance related to socio-economic status are wider when fewer qualified and experienced teachers work in socio-economically disadvantaged schools (OECD, 2018[58]).

More recent data from TALIS 2018 similarly show that, on average across OECD countries, novice teachers tend to work in more challenging schools that have higher concentrations of students from socio-economically disadvantaged homes and immigrant students (Figure 4.6) (OECD, 2019[37]). As new teachers often struggle with classroom challenges in the initial phase of teaching (Jensen et al., 2012[59]), this may reduce their sense of efficacy and make them more likely to move schools or to leave teaching altogether.

Figure 4.6. Distribution of novice teachers by concentration of students from socio-economically disadvantaged homes (ISCED 2) (2018)

Difference in percentage of novice teachers between schools with “more than” and “less than or equal to” 30% of students from socio-economically disadvantaged homes



Note: Results based on responses of teachers and principals. Novice teachers are teachers with five or less years of teaching experience. Socio-economically disadvantaged homes refers to homes lacking the basic necessities or advantages of life, such as adequate housing, nutrition or medical care. Statistical significant differences are indicated in a darker tone. The number of countries or other participants included in the OECD average is indicated next to that average. On 25 May 2018, the OECD Council invited Colombia to become a Member. While Colombia is included in the OECD average reported in this figure, at the time of its preparation, Colombia was in the process of completing its domestic procedures for ratification and the deposit of Colombia’s instrument of accession to the OECD Convention was pending.
Source: OECD (2019[34]), Working and Learning Together: Rethinking Human Resource Policies for Schools, OECD Publishing, Paris, https://dx.doi.org/10.1787/b7aaf050-en, Figure 3.7.

… which can be driven by a number of factors, including recruitment processes and regulations as well as staff preferences

There are concerns that, while facilitating a more effective matching of staff and workplace, giving schools autonomy in the recruitment of their teachers may lead to greater disparities in staff qualifications and experiences among schools. Teacher allocations through higher-level authorities, by contrast, may help steer a more equitable teacher distribution across advantaged and disadvantaged schools and help fill hard-to-staff positions in schools (OECD, 2019[34]).

International data nevertheless suggest that inequities in the distribution of teachers can be observed both in systems with higher-level teacher recruitment and those with school-based recruitment (OECD, 2018[58]). This indicates that an effective and equitable distribution of teachers depends not only on the level of decision making but also on recruitment processes and teacher incentives and preferences. In a number of systems, teachers’ interests rather than students’ needs drive the deployment of teachers and make it difficult to match the mix of teachers’ experiences and skills to school contexts. For example, in centralised recruitment systems, the preferences of teachers with the highest rank may be prioritised in choosing schools to work at. In decentralised systems, schools or sub-central authorities may have to safeguard teachers’ statutory rights, such as permanent contracts or higher levels of seniority, when recruiting staff (OECD, 2019[34]).

… and be potentially addressed through both financial and non-financial incentives

Some school systems have introduced financial incentives to channel teachers to the schools that need them the most. For instance, such measures include higher salaries in schools enrolling large proportions of students from disadvantaged backgrounds, differential pay for particular expertise, or scholarships and subsidies for working in disadvantaged schools (Box 4.5).

Box 4.5. Financial incentives to attract and retain high-performing teachers in disadvantaged schools in Chile and France

Chile's government has designed different awards that provide a financial bonus for high-performing teachers choosing to work in disadvantaged schools. The *Asignación de Excelencia Pedagógica* (AEP) programme sought to reward the most effective teachers and to increase retention in the teaching profession. The programme was in place between 2002 and 2021 and incorporated a monetary bonus for teachers working in disadvantaged schools since 2012. An evaluation of the programme suggested that the incentive was not sufficient to redirect high-performing teachers to disadvantaged schools but was effective in retaining quality teachers in high-need schools. Since 2017, a separate monetary incentive has been in place (*Asignación de Reconocimiento por Docencia en Establecimientos de Alta Concentración de Alumnos Prioritarios*), which is also focused on attracting and retaining teachers to work at schools with a large proportion of students from disadvantaged backgrounds.

In 1981, **France** established the *Zones d'Éducation Prioritaire* (ZEP), a compensatory education policy directing additional resources to disadvantaged schools. In 1992, for example, an annual bonus of EUR 600 was awarded to teachers working in ZEPs. The policy scheme has substantially evolved since then. For instance, since September 2015, teachers working in schools serving disadvantaged communities are awarded an annual bonus, which may vary between EUR 1 734 and EUR 2 312 (gross amount). Since September 2019, teachers working in schools in the most deprived areas (REP+) are awarded an annual gross salary bonus of EUR 4 646.

Source: OECD (2020[51]), *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals*, OECD Publishing, Paris, https://dx.doi.org/10.1787/19cf08df-en.

In some contexts, monetary incentives have shown promising results to deploy teachers where they are needed the most (Steele, Murnane and Willett, 2010[60]; Clotfelter et al., 2008[61]). But such policies will work differently depending on the design and size of the incentives and the general framework for teacher employment and career progression. The financial incentive for working in disadvantaged schools in France described in Box 4.5 , for example, did not show positive results. This highlights that the size of the financial bonus and the perception of the policy are crucial to achieve the policy's objectives (Prost, 2013[62]). Financial incentive schemes therefore require adequate evaluation and monitoring.

Of course, non-financial incentives also matter. For example, recognising experience in difficult or remote schools for teacher career development is a further option. Professional factors, such as opportunities to take on extra responsibilities and to engage in research and innovation, also need to be considered as do working conditions, such as preparation time, leadership, collegiality, accountability demands, class size or facilities. Hence, it is equally important to ensure that schools in difficult contexts provide attractive conditions for staff to work in (OECD, 2019[34]).

Reducing educational failure

Educational failure entails high costs for individual students, and is a major source of inefficiency in education systems

Formal education is a cumulative – if not linear – process. When students' progression through school is compromised by knowledge gaps or disrupted by grade repetition, students are more likely to drop out, fail to progress to tertiary education and to face lower prospects in the labour market (OECD, 2018[63]). When students do not progress through the system as expected and leave school with insufficient knowledge, skills and competencies, this has a high cost for school systems and individuals, constituting an important source of inefficiency in many countries (OECD, 2017[1]). In the context of the COVID-19 pandemic, addressing the urgent needs of students who may have left school early or are at increased risk of doing so will be a critical educational and economic priority in some contexts, for example through high-quality second-chance or early acceleration programmes (Box 4.6).

Box 4.6. Complementary second chance and early acceleration programmes to re-engage struggling learners and minimise school dropout

Second chance and early acceleration programmes are specific types of interventions for students who have struggled or are struggling to make successful transitions through secondary education and into post-secondary education or the labour market. They provide a different curriculum and structure to re-engage students, rather than aiming to better support students in the regular curriculum.

Second-chance programmes are a common way of addressing students who have dropped out of school, but later express interest in gaining skills and credentials at the secondary level as adults. These programmes can tackle skill gaps and school failure in a variety of ways including literacy and numeracy remediation, course repetition through online or in-person classes, test-based competency demonstrations and work experience.

For example, in **France**, a network of second chance schools (*Écoles de la 2e Chance*, E2C) provides practical training for early school leavers. The training, which targets 16- to 25-year-olds without qualifications, focuses particularly on individualised learning pathways and practical work experience. As part of the government's investment plan for 2018-2022 (*Grand Plan d'Investissement*), the Ministry of Labour provides financing for places in the programme between 2019 and 2022, for the development of the network's information systems, and the development of a skills-based approach.

In **Denmark**, a new type of educational programmes (Preparatory Basic Education and Training, FGU) was launched in 2019 to rethink and strengthen second-chance education and lower the share of youth not in education or training by 50% until 2030. This type of programme is offered by dedicated institutions serving a number of schools and is embedded within the youth initiatives of the country's 98 municipalities. It offers various educational tracks, a strong element of guidance and counselling and new pedagogical approaches to support youth under 25 in entering upper secondary education or the labour market.

An alternative to the traditional second-chance programme is to alter a student's trajectory before they experience failure in the first place. These types of early intervention programmes are often premised on an idea of acceleration rather than remediation. Though such strategies vary in nature, a common structure involves providing students with the opportunity to earn tertiary credits and credentials while enrolled in secondary school, coupled with the opportunity for embedded employer internships. Students are assigned professional mentors, visit multiple workplace environments on learning missions and access paid or unpaid internships. In some cases, graduates from these early acceleration

programmes are given priority in job opportunities with partner private employers.

One such Early College High School in New York City (**United States**) is the Pathways in Technology Early College High. "The school provides students with an enriched curriculum that is aligned with actual employment opportunities with industry partner IBM and that enables them to earn both a high school diploma and a cost-free Associate in Applied Science (AAS) degree in six years. Students have professional mentors, substantive workplace experiences … and internships."

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264306707-en. EPALE (2019[64]), Preparatory basic education and training, https://epale.ec.europa.eu/en/blog/preparatory-basic-education-and-training (accessed on 31 January 2022); Réseau E2C France (n.d.[65]), *Qui sommes nous?*, https://reseau-e2c.fr/qui-sommes-nous (accessed on 31 January 2022).

Many school systems face challenges in supporting student transitions, potentially leading to educational failure, inefficiency and inequity in resource use

Students' experiences as they progress through the school system differ markedly across OECD countries, but vertical (that is upward) transitions play an important role in every student's educational experience, often right from the beginning. In any school system, students accumulate years of educational attainment before leveraging these educational milestones to seek success in the labour market (OECD, 2018[63]).

However, many school systems face challenges in supporting students in their transitions through the system. Practices and policies to facilitate transitions from early childhood education and care to primary school providers vary widely. Also, school systems across the OECD have struggled finding the best ways to address the unique learning and social needs of students transitioning from primary into lower secondary education. Lastly, the transition between lower and upper secondary education is often one of the most fraught, frequently coinciding with the end of compulsory schooling (OECD, 2018[63]).

Where the organisation of the educational offer fails to support students' smooth progression through the system and to guide them to programmes that correspond to their interests, this can lead to disengagement, educational failure and skill mismatches resulting in an inefficient and inequitable use of school resources. Smooth transitions, on the other hand, facilitate human capital development, ease entry into the labour market and reduce costs associated with youth unemployment and poor adult health outcomes (OECD, 2018[63]).

Greater co-ordination between educational levels and sectors can have benefits for students' transitions through the system

Accomplishing smooth transitions for students requires careful co-ordination between the different and oftentimes fragmented levels and sectors of school education as well as their responsible governing bodies. For instance, early childhood education and care and primary education tend to be more locally managed than secondary education, which tends to be the responsibility of central governments. Enhancing the co-ordination between different levels of education yields efficiency, quality and equity improvements:

- First, the effective co-ordination of the educational offerings can reduce the duplication of educational services, reinforce professional collaboration and supervisory capacity.
- Second, it can facilitate and incentivise the sharing of resources, such as facilities and materials, between schools providing different levels of education and their governing bodies.
- Third, co-ordination can help to better articulate the curricular and pedagogical offer, to facilitate the progression of students throughout the system, to allow them to integrate skills acquired at each level of education and to minimise reasons to drop out of school (OECD, 2018[63]).

Designing explicit transition programmes or combining different levels of schooling into a single organisation in areas with high rates of early school leaving can also help to ease vertical transitions for all students. More generally, the configuration of years and levels of education will affect the nature and ease of students' transitions as well as the extent to which services, facilities and materials can be efficiently shared. Policy makers should therefore assess the relevant curricular options in consultation with stakeholders and reflect on the best configuration of years and levels of education (OECD, 2018[63]):

- For example, several studies in the **United States** have found that entirely eliminating the transition between primary and lower secondary schooling by keeping students in the same school up to eighth grade is beneficial for student outcomes (Rockoff and Lockwood, 2010[66]; Schwerdt and West, 2013[67]).
- In **Sweden**, a reform in 1994 aimed at integrating grades seven to nine in locally run basic schools, led students to keep attending smaller schools closer to their homes, while having no significant impacts on educational outcomes (Holmlund and Böhlmark, 2017[68]).

A greater integration of different levels of education can also be achieved through an alternative administration of schools and curricula. **Colombia** and **Portugal**, for example, have organised their educational provision in school clusters which group schools offering different levels of education. This enables students to complete their entire schooling within the same extended school community if they wish so and allows for a more efficient resource use (OECD, 2018[63]).

High rates of grade repetition challenge efficiency and equity in some countries…

Students' vertical progression through the school system is also affected by institutional factors and educational regulations, such as academic standards, promotion examinations, grade repetition practices, or structures to support struggling learners. School systems must constantly navigate a tension between adopting policies intended to ensure adequate student learning through imposing high standards for students' knowledge and skills, and policies that do not unnecessarily inhibit students' vertical progression (OECD, 2018[63]).

Whether students acquire specific academic skills may or may not determine whether they progress from one year to another, depending on system policies and cultural contexts (Goos et al., 2013[69]). Norway and Japan represent extreme examples among OECD countries, where – according to data from PISA 2018 – there is no grade repetition at all. In contrast, 41% of 15-year-olds in Colombia, 32% of students in Luxembourg and 31% of students in Belgium had repeated a grade at least once by the time they reached the age of 15 (OECD, 2020[70]).

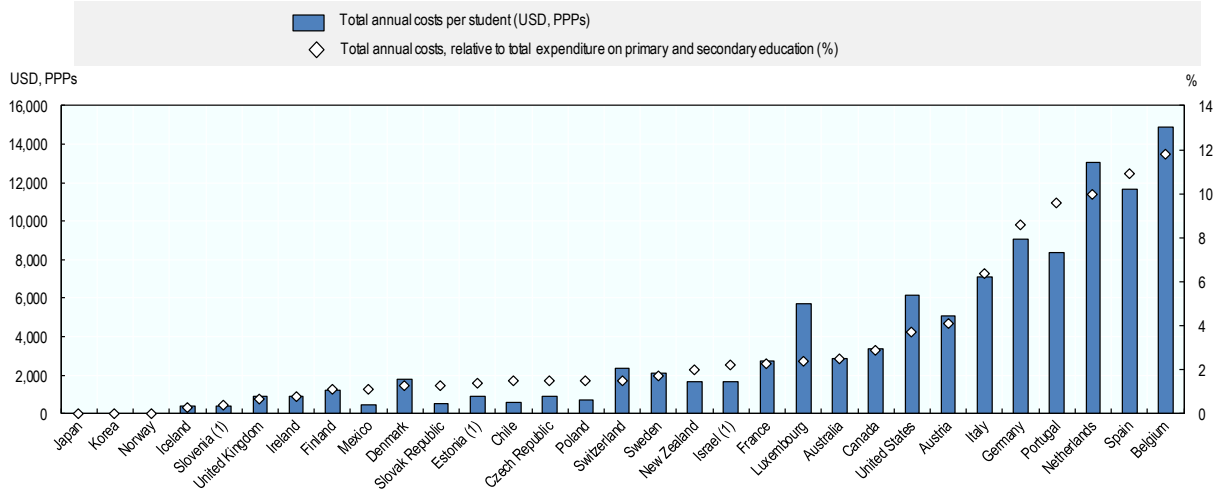
International evidence provides no support for systematic grade repetition practices. Research clearly shows that students who repeat years do worse on a host of measures than students who have never repeated (Ikeda and García, 2014[71]). The evidence points to worse – or at best mixed outcomes for repeaters, which may be partially explained by the fact that year repetition is rarely accompanied by a modified curriculum or additional instructional resources (Schwerdt, West and Winters, 2017[72]; Allen et al., 2009[73]; Jacob and Lefgren, 2004[74]; Jimerson, 2001[75]; Jimerson, Anderson and Whipple, 2002[76]).

… as it is a costly practice for school systems and individuals

Grade repetition, which adds an additional year of schooling, is a costly practice. The retention of students in the system increases the number of enrolled students and thus the level of funding required, besides delaying students' entry to the labour market (Manacorda, 2012[77]; Alet, Bonnal and Favard, 2013[78]; Benhenda and Grenet, 2015[79]). In an OECD estimate, the total cost of year repetition was equivalent to 10% or more of the annual national expenditure on primary and secondary school education for some countries. The cost per 15-year-old student can be as high as USD 11 000 or more (Figure 4.7) (OECD, 2011[80]).

Figure 4.7. Cost of grade repetition (2009/10)

Assuming that repeaters attain at most lower secondary school



Note: These estimates add up both the direct and the opportunity cost and are based on the assumption that students who repeat years attain, at most, lower secondary education. These estimates do not address either the potential benefits of year repetition or the costs if school systems do not allow for year repetition. For example, students who have repeated a year might be better prepared for the labour market than if they had not done so. Schools might also have to spend more to offer remedial classes to struggling students if those students are not permitted to repeat a year.

[1] In Estonia, Israel and Slovenia, gross annual full-time earnings are used as annual labour costs are not available in EAG 2010.

Source: OECD (2011[80]), "When Students Repeat Grades or Are Transferred Out of School: What Does it Mean for Education Systems?", PISA in Focus, No. 6, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k9h362n5z45-en, Figure 2.

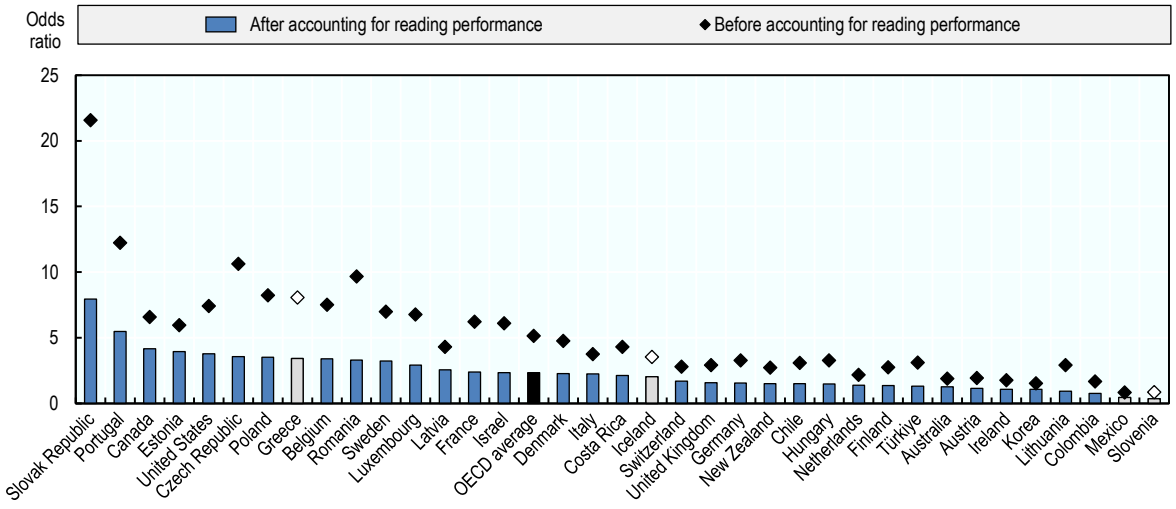
StatLink https://stat.link/po06ad

… and tends to affect disadvantaged students disproportionally

Furthermore, grade repetition raises important equity concerns as socio-economically disadvantaged students are more likely to be held back compared to their more advantaged peers**.** On average across OECD countries, a disadvantaged student is more than twice as likely to have repeated a grade at least once, as compared to an advantaged student, even if both students scored similarly in the PISA reading test (Figure 4.8). Across OECD countries, one in five students in socio-economically disadvantaged schools has repeated a grade at least once since entering primary school, compared to only 5% of students in advantaged schools (OECD, 2020[70]). Similarly, boys are more likely to repeat a grade than girls, and immigrant students compared to native-born students (OECD, 2018[63]).

Figure 4.8. Grade repetition, socio-economic status and reading performance (2018)

Increased likelihood of having repeated a grade amongst disadvantaged students, relative to advantaged students, before and after accounting for reading performance



Note: Statistically significant odds ratios are shown in darker tones (see Annex A3). Countries and other participants are ranked in descending order of the increased likelihood of having repeated a grade amongst disadvantaged students, after accounting for reading performance.
The socio-economic profile to identify disadvantaged students is measured by the PISA index of economic, social and cultural status (ESCS).
Source: OECD (2020[70]), PISA 2018 Results (Volume V): Effective Policies, Successful Schools, PISA, OECD Publishing, Paris, https://doi.org/10.1787/ca768d40-en, Figure V.2.6.

A number of countries have taken steps to change grade repetition practices through individualised support for struggling students…

Over the past years, a number of OECD countries have taken steps to reduce their reliance on grade repetition practices. According to data from PISA, the incidence of grade repetition decreased between 2003 and 2018 in 14 out of 36 countries and other participants for which there is comparable data. On average across OECD countries, the percentage of students who reported that they had repeated a grade at least once decreased by three percentage points during the period. Notably, grade repetition decreased by more than 10 percentage points in France, Mexico, the Netherlands and Türkiye, although it increased in Austria, the Czech Republic, Iceland, Korea, New Zealand and the Slovak Republic (OECD, 2020[70]).

Reducing grade repetition begins by providing intensive, individualised support to students who struggle to keep up: learning gaps between students should be targeted early with necessary support provided for students with difficulties so that they can get back on track before they fall further behind (Box 4.7).

Box 4.7. Providing individualised support to struggling students: Austria, Finland and Uruguay

In **Austria**, different measures seek to provide early support to students with learning difficulties. In primary school, the curriculum allows for one lesson of remedial teaching (*Förderunterricht*) per week for students at risk of falling behind, in particular in the core subjects. This additional instruction can be delivered as an additional class or be integrated in the regular schedule. Further, students in upper secondary education with learning difficulties can receive individual learning support (*Individuelle Lernbegleitung*). This type of support does not focus on individual subjects, but covers the entire learning process. As part of the scheme, students work together with a tutor (*Lernbegleiter*in*) with a focus on individual learning goals. An early warning system (*Frühwarnsystem*) should help identify students with learning difficulties at risk of falling behind and inform early support measures.

In the **Finnish** education system, almost all students automatically pass to the next year (none are retained prior to grade 10); every child has the right to individualised support provided by trained professionals as part of their regular schooling. A teacher who is specifically trained to work with struggling students is assigned to each school and works closely with teachers to identify students who need extra help.

In **Uruguay**, the Community Teachers Programme (*Programa Maestros Comunitarios*) allocates between one and two community teachers to disadvantaged schools, depending on school size. This programme aims to prevent students from falling behind and having to repeat a year by supporting children who perform poorly. This is coupled with the Teacher + Teacher (*Maestro más Maestro*) Programme providing either after-school or team-teaching support for students in underserved communities.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264306707-en; Eurydice (2021[81]), Support Measures for Learners in Early Childhood and School Education: Austria, https://eacea.ec.europa.eu/national-policies/eurydice/content/support-measures-learners-early-childhood-and-school-education-1_en (accessed on 31 January 2022).

Identifying the contextually specific indicators that are simultaneously highly predictive of grade repetition and easy for all stakeholders to interpret is a critical first step of early intervention (Box 4.8). This may require building data systems that can track student attendance, course marks and behaviour in an integrated fashion. Once these data systems are built, education professionals at the school level must be trained to interpret their outputs and design a standardised response protocol (OECD, 2018[63]).

Box 4.8. Using data-tracking systems to develop early warning indicators for students at risk of repeating years and/or dropping out of school

A critical factor compromising early intervention is the failure to systematically identify at risk students sufficiently early. Some profiles of students at risk of repeating a year or dropping out of school are easily discernible for school staff: students who are frequently disruptive, refuse to complete work and fail examinations. There are, however, less obvious cases such as students who attempt to avoid being noticed and students who produce the minimal required work at low levels of proficiency. Designing a comprehensive system to identify all students who are at risk requires robust data systems that are regularly used by school staff.

As a first step, ensuring that each student has a unique identifier that can be tracked across schools and networks is critical to follow highly mobile students who are at significant risk. Second, combining educator expertise with empirical analysis to identify the factors that are most predictive of students failing a course, repeating a year and dropping out of school can clarify which are the key indicators to track. In some contexts, these results can run counter to accepted wisdom. For instance, in the United States, school attendance, course marks and behavioural conduct are much stronger predictors of school completion than external test scores.

Once countries have built data infrastructure systems and agreed on which indicators to track, extensive training of school staff (teachers, counsellors and school leaders) must take place to ensure that they both understand the meaning of the early warning indicators and acknowledge their validity. For school staff to see value in gathering these data, there must exist a clear intervention plan. This might include targeted small-group teaching and counselling sessions or referral to social service providers. Thus, it is essential to set out a clear protocol of the measures taken if students are flagged as in need as well as a system to track and ensure that these interventions have, in fact, occurred.

The last step to ensure that the data-tracking system successfully addresses risk cases is to periodically review the intervention impacts at the school and system levels. This involves analysing trends in early warning indicators across types of students and schools and comparing students' outcomes on the early warning indicators before and after the interventions to track individual growth. Further, more formal evaluation studies are required to identify the causal effects of the interventions, for instance by using regression discontinuity design or matching techniques to compare treated and non-treated students with similar characteristics. These types of analyses permit review of areas in which students or schools need extra support, an assessment of the efficacy of specific interventions and an overall programme evaluation.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264306707-en.

… as well as forms of "conditional promotion" and efforts to change school cultures

School systems can also shift away from understanding grade repetition as a binary choice. Particularly in higher grades, students can be required to take a course from the year below in the specific subject in which they struggle, rather than repeating the entire previous year. With thoughtful student scheduling, this approach can be implemented at earlier year levels as well. This form of "conditional promotion" can satisfy many educators' practice-based preferences for student-level accountability and support, while avoiding system-level concerns about its associated harms (OECD, 2018[63]).

Finally, cultural shifts in the education profession and school-level incentives to avoid repetition are critical. In many countries, educators and the public see grade repetition as a valuable tool to maintain high standards. To change the narrative around grade repetition, the awareness among educators about the dangers of grade repetition must be raised, for instance through professional development and initial and ongoing teacher education. Furthermore, system leaders must take a strong public stance against the widespread practice of grade repetition and publicly present data on its effects. Such strong initiative from the top will be crucial to shift long-standing grade repetition practices over time. **France** and the **French Community of Belgium** provide examples for serious policy attention to the issue of grade repetition (Box 4.9).

Box 4.9. Systematic policy efforts to reduce grade repetition rates: lessons from France and the French Community of Belgium

France

In 2008, the Ministry of Education set ambitious objectives to reduce repetition rates. School leaders were required to explain their school level results and encouraged to decrease the number of repeaters. Students struggling in the last two years of primary school were provided with two additional hours of academic support. The rate of primary school repetition was still 14% in 2009, so the ministry set a goal of halving this rate by 2013. In 2014, Parliament passed a decree addressing school repetition [*Decree 2014-1377 of 18 November relating to the monitoring and educational support of pupils*]. The decree indicates that the repeating of a year should be considered "exceptional." It also highlights the value of dialogue between the student and the school staff prior to the decision on a student's repetition (Benhenda and Grenet, 2015[79]). While the rate of repetition has dropped significantly, it remains high, calling for further policy efforts. In 2018, the incidence of grade repetition still ranked 11th highest in the OECD, and 17% of students were retained at least once in primary school.

As the French case study shows, budget savings from grade repetition abolition appear gradually. In fact, suspending this practice can induce short-term costs related to the more rapid flow of students towards higher and more costly education levels. However, savings could occur in the medium term (after two years in the French case) and increase gradually over time. This has important implications in terms of policy: "First, the savings to be made by abolishing year repetition can only be realised and used for other education purposes gradually. Second, the reform would require several years of careful and rigorous management of the recruitment and allocation of teaching staff over the whole transition period." (Benhenda and Grenet, 2015, p. 4[79]).

French Community of Belgium

In the French Community of Belgium, grade repetition and early school leaving have been long-standing issues, resulting in significant costs for individuals and society. Some rather optimistic estimates put the cost of grade repetition at EUR 42.8 million in primary education and EUR 349.2 million in secondary education (2014 values). This is equivalent to 10% of the budget devoted to these levels of education. A number of policies and initiatives have therefore been put in place over time to change the culture of grade repetition, in particular in primary but also in secondary education. A major reform (*Pacte pour un Enseignement d'excellence*) adopted in 2015, which seeks to improve the quality of education, also aims to smooth educational pathways and to reduce educational failure and repetition.

Following legislative changes in 2015 and 2016, children can only be retained in pre-primary school (*maternelle*) under exceptional circumstances. Upon parents' request and subject to the approval of the school provider, a child can repeat the third year, but is excluded in the calculation of the operating grant in that case. As part of teachers' continuing education, third grade teachers in pre-primary can also participate in training to better understand specific learning disabilities and to adjust their pedagogy

accordingly. In general, schools – In collaboration with their psycho-medical-social support centre – must put in place individualised support and remedial measures where learning difficulties are identified and define strategies to combat school failure, early dropout and grade repetition as part of their six-year school development plans (*plan de pilotage*). In the first stage of secondary education, an individual learning plan (*Plan Individuel d'Apprentissage*) which sets personal objectives and provides multidisciplinary support to students must be put in place for students where teachers and counsellors report particular learning difficulties.

These measures build on previous initiatives, such as the *Décolâge!* project which created a community of schools with a common interest in implementing new pedagogical practices to reduce grade repetition in the transition between pre-primary and primary education as well as a reform of the first stage of secondary education (ISCED 2) seeking to strengthen the common core for all students up to the age of 14.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris; https://dx.doi.org/10.1787/9789264306707-en. Benhenda and Grenet (2015[79]), *How much does grade repetition in French Primary and Secondary Schools Cost?*, Institut des Politiques Publiques, Paris; Ministère de la Fédération Wallonie-Bruxelles (2016[82]), *Examen de l'OCDE des politiques pour un usage plus efficace des ressources scolaires RAPPORT PAYS Communauté française de Belgique*, Ministère de la Fédération Wallonie-Bruxelles, Bruxelles, http://www.oecd.org/education/school-resources-review/reports-for-participating-countries-country-background-reports.htm (accessed on 01 February 2022).

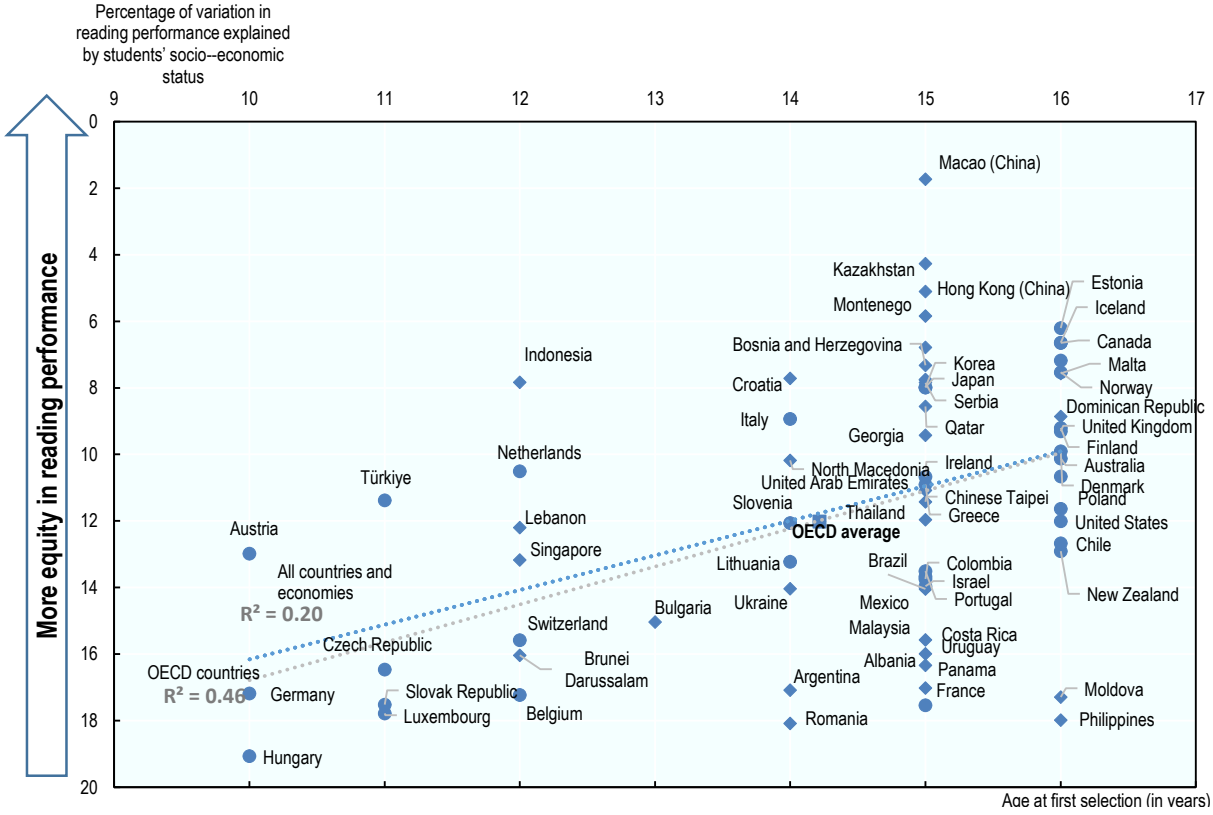
Early tracking of students into specific programmes may also limit educational efficiency and equity

In response to students' different preferences, abilities and needs, many school systems offer a variety of educational pathways and parallel programmes, often tracking students into separate learning environments. Vocational education and training (VET) programmes play a substantial role in the education of upper secondary students, and in recent years, policymakers have come to see vocational education as critical to national economic success, as employers seek a wider array of skills from secondary school graduates than those provided by the traditional academic programmes (OECD, 2018[63]).

However, despite the potential benefits of high-quality vocational programmes, concerns remain regarding the selection of students into these programmes. Particularly where tracking (i.e. the separation of students based on academic abilities) occurs at a young age, students' selection into streams tends to be strongly associated with their socio-economic background (OECD, 2018[63]): OECD countries that select students into different programmes at an earlier age showed less equitable reading performance in PISA 2018, even after accounting for per-capita GDP. Differences in the age at the first tracking accounted for 46% of the differences in equity in reading performance across OECD countries (Figure 4.9) (OECD, 2020[70]).

While proponents of early tracking argue that educating children in different learning environments allows more tailored pedagogical practices from a young age, cross-country evidence suggests that such practice yields no significant gains for students. In multiple contexts, tracking has been shown to marginally increase the educational outcomes of high achieving students, while it substantially decreases the performance of low-achievers; thus increasing educational inequality with no overall benefits to average academic performance (Hanushek and Wossmann, 2006[83]; Epple, Newlon and Romano, 2002[84]; Schütz, Ursprung and Wößmann, 2008[85]).

Figure 4.9. Age at first selection and equity in reading performance (2018)



Source: OECD (2020[70]), *PISA 2018 Results (Volume V): Effective Policies, Successful Schools*, PISA, https://doi.org/10.1787/ca768d40-en, Figure V.3.9.

… which has led some school systems to delay early tracking, and others to institute policies that attenuate its potentially negative effects on students

Some school systems have been making efforts in moving towards a more comprehensive system and delaying early tracking to reduce the impact of student background in the selection of study programmes (Box 4.10). Delaying the age of first tracking has the potential to allow students to cognitively and socio-emotionally mature and enter the most challenging pathway they can successfully complete. The effectiveness of such a policy change may however depend on complementary policies, such as flexible pathways for students that adapt to differentiated needs and the introduction of better systems to monitor the characteristics of students going into different tracks (OECD, 2018[63]).

Where delaying the age of tracking is politically infeasible, school systems can consider alternative policies to attenuate its potentially negative effects. Some education systems have been moving towards greater integration in the provision of general, accelerated, pre-vocational and vocational tracks into the same lower and upper secondary schools. Even with early selection, integrated schools providing multiple pathways may generate both better outcomes and free resources to invest in other priorities. Integrating elements of vocational and general education can create synergies and raise students' awareness of the merits of each of the tracks. Integrated school settings may also attenuate the impact of socio-economic differences as integrated schools can lead to more fluid transitions for students. An integrated approach also allows for a more modular approach to tracking where students may pursue different types of applied versus theoretical learning depending on the subject area (OECD, 2018[63]).

Such integration of services thus enables a more coherent organisation of educational planning for improved progression throughout the school system. As promising as these integrated approaches may appear, it is important to avoid creating a two-tiered school design in which some tracks are seen as less prestigious and inferior to the general programme. Counteracting this dominant perception with investments in state-of-the-art facilities and vocal leadership on the benefits of applied learning can help to mitigate these concerns (OECD, 2018[63]).

Box 4.10. Policies to delay early tracking and move towards a more comprehensive system in Austria and the Flemish Community of Belgium

Austria

School education in Austria is characterised by early selective transitions, a large vocational sector and a high degree of differentiation, particularly in upper secondary education. Upon the completion of primary school, typically at age 10, students either enter the lower level of academic secondary school (*Allgemein bildende höhere Schule – Unterstufe*, AHS-U) or general secondary school (*Mittelschule*, MS), previously known as new secondary school (*Neue Mittelschule*, NMS).

The New Secondary School (NMS) was first introduced as a pilot project in 2008, originally designed as a comprehensive school for all 10- to 14-year-old students (grades 5 to 8), delaying early tracking in the long run. While the intention was to combine the two previously available tracks in lower secondary education in this new school form, two separate tracks continued to co-exist as the result of a political compromise. Nevertheless, since its introduction, the NMS (or MS as they are called today) has become the standard lower secondary school in the country, to which students are admitted after completing their primary education without any further pre-requisites. Following a pilot project in selected schools in 2019/20, the pedagogical model of the new school form was further developed from the school year 2020/21 onwards, and as reflected in the new name (*Mittelschule*, MS). Changes were made, among others, to the grading system, remedial teaching and student grouping.

At the heart of the original reform, the NMS/MS have a similar curriculum to the alternative track (AHS-Unterstufe), but different educational goals. While students used to be separated into different ability groups in core subjects, students are assessed on differentiated grading schemes depending on their academic ability in grades 7 and 8 in the new model. The NMS/MS also introduced new pedagogical approaches, including more individualised and project-based learning, in particular in the core subjects. The introduction of the NMS/MS moreover sought to provide better chances for its students, and particularly to help them continue their education at upper secondary level and progress to an academic leaving certificate (matriculation examination, *Matura*).

The introduction of the NMS was accompanied by an evaluation programme, although this was limited to the initial stage of the reform. According to this evaluation, the reform showed weak to medium positive effects on educational quality, student support and learning climate, though not necessarily on learning outcomes. The positive effects were stronger in those schools that implemented the NMS concept more rigorously (Eder et al., 2015[86]).

Flemish Community of Belgium

The Flemish Community of Belgium used to track students relatively early, between the ages of 12 and 14. Secondary school is divided into three stages, and educational pathways are further specialised within those stages. While students can move from the vocational to the academic track, this rarely happens at the upper secondary level. Instead, students frequently transfer to less academically oriented schools or programmes (colloquially referred to as the “waterfall system”).

To delay tracking until age 14 and soften the negative effects of early tracking in the course of secondary education the Flemish Community of Belgium has introduced legislative reform for the modernisation of secondary education. The implementation of the modernisation coincides with the introduction of the new attainment targets (learning outcomes) for the first stage of secondary education, for which the Flemish Parliament developed and approved a framework in 2018. From 1 September 2019 new, concrete and clear attainment targets apply in the first stage of compulsory education.

A regulatory framework for the modernisation of the structure and organisation of secondary education was developed and approved by the Flemish Parliament. The new admission conditions, the qualifications and the study offer of the first stage are therefore fixed. By means of the correlation table and the set of new program rules, school boards can prepare for the modernisation of secondary education and profile their schools in this new framework. The implementation of the modernisation of secondary education started on 1 September 2019, giving schools sufficient time to prepare. The major reforms in compulsory education contribute to several policy aspects: rationalisation of study offer in secondary education, clearer definition of the finality of the programmes (preparing for transition to higher education or also directly preparing for the labour market), curricular reform through definition of new learning objectives, teacher training and profession. They are currently in gradual implementation. The modernisation of secondary education with new clustering of study fields, redefinition of programme finalities and new curriculum, only started in school year 2019/2020 and is due to be fully implemented in the schoolyear 2025/2026. The implementation of the new learning objectives for the first year of the second stage of secondary education (first grade of upper secondary education) only started in the school year 2021/2022.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris; https://dx.doi.org/10.1787/9789264306707-en; BMBWF (2020[87]), *Die Mittelschule. Änderungen ab dem Schuljahr 2020/21 im Überblick*, Bundesministerium für Bildung, Wissenschaft und Forschung, Vienna, https://www.bmbwf.gv.at/dam/jcr:7b6de1bc-36c1-4b54-88f0-7683120238d0/mittelschule_2020.pdf (accessed on 13 January 2022); OECD (2019[88]), *Education Policy Outlook 2019: Working Together to Help Students Achieve their Potential*, OECD Publishing, Paris, https://dx.doi.org/10.1787/2b8ad56e-en.

Adapting school networks to changing demand

Demographic trends and economic and societal transformations have required countries to adjust the way they organise their school infrastructure and education services. In rural regions, populations have been on the decline over the past 15 years in the vast majority of OECD countries, a development driven by productivity gains in agriculture, economies of agglomeration, lower fertility rates and increased rural-to-urban migration. Diverging demographic trends have meant that many school systems are simultaneously confronted with unsustainable excess capacities in rural areas and the need to expand the provision of school places in large cities. While not all rural areas are the same, and some of their challenges also apply to urban places, shrinking student numbers, teacher shortages and a relatively high proportion of disadvantaged students make the efficient provision of high-quality education a difficult undertaking in some rural contexts.

Adapting the school network (i.e. the location, size and structure of its physical infrastructure, the use of facilities and the distribution of services across school sites) in areas with falling educational demand has thus become a central issue for school systems seeking to enhance their efficiency to free up resources for the improvement of student outcomes (OECD, 2018[63]; Echazarra and Radinger, 2019[89]; OECD, 2021[90]).

Small school size, while it can have benefits, can be an obstacle for the efficient provision of education…

The structure of a school network has a significant impact on the resources required to operate and maintain its facilities. There is no agreement on what constitutes a large, medium-sized or small school in any given context. Yet, regardless of where the boundary is drawn, research from different countries indicates that significant economies of scale can be achieved when increasing school size up to a certain enrolment level before returns to scale diminish or diseconomies of scale may emerge (Andrews, Duncombe and Yinger, 2002[91]; Falch, Rønning and Strøm, 2008[92]).

Larger schools can reduce their per-student cost up to a certain point by reducing their fixed costs (e.g. related to administrative work and running and maintaining school facilities). Moreover, they are in a better position to fill classes up to the maximum permitted number of students. However, there is evidence that costs may increase once schools surpass a certain size and that very large schools bring their own challenges, such as greater organisational complexity (OECD, 2018[63]).

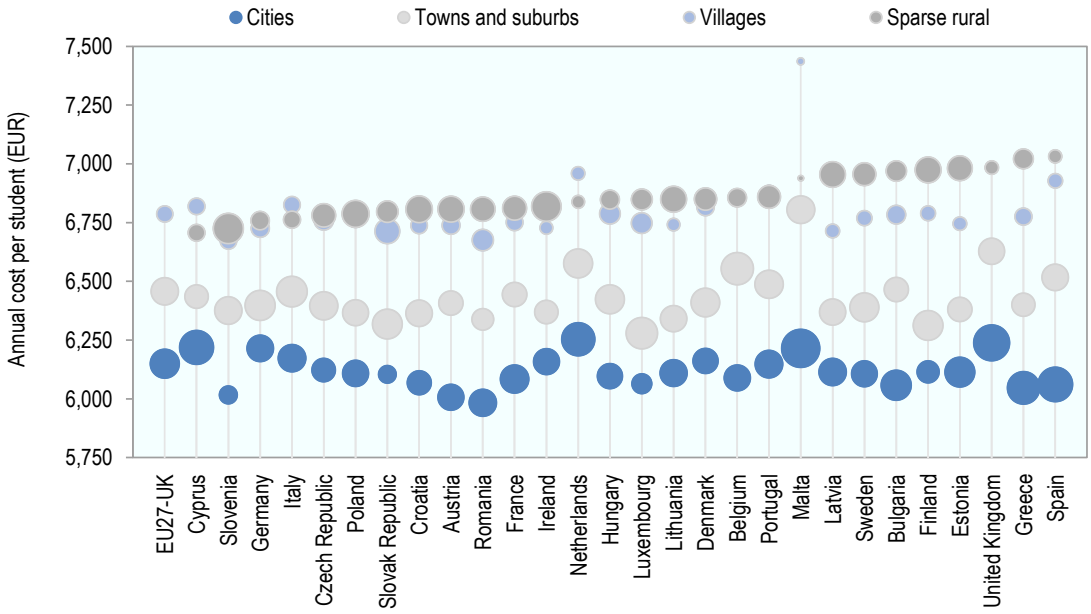
For the experience of students and teachers, the size of a school can have both advantages and drawbacks. Smaller schools often haver greater difficulties to offer their students curricular diversity, specialised teachers and quality equipment and facilities. In other respects, smaller schools may be at an advantage. They are often considered to allow for more interaction among staff, parents and students as well as foster a greater sense of belonging and facilitate the exchange between students of different ages (OECD, 2018[63]). The smaller class size found in many small schools may allow teachers to devote more attention to individual students and personalise their instruction accordingly, which has been shown to be particularly beneficial for students in early grades and those with a lower socio-economic profile (Piketty, 2004[93]).

… which raises the importance of effective school network management in rural areas

One of the biggest challenges for the efficient operation of schools in rural areas is precisely their small size and the low population density of their surrounding areas. Partly due to their small size and demographic decline, rural schools tend to have smaller classes and fewer students per teacher than their urban counterparts, which can exert considerable pressure on public resources (OECD, 2018[63]; Echazarra and Radinger, 2019[89]; OECD, 2021[90]). Based on data from PISA 2018, both student-teacher ratios and class sizes tend to be smaller in rural as compared to urban schools in secondary education across OECD countries (OECD, 2021[90]).[1] These characteristics are typically even more pronounced at the primary level (OECD, 2018[63]).

A recent OECD report providing estimates of both cost and access (distance) to education and health services in rural areas, suggests that, in Europe, the annual costs per student in sparse rural areas are 20% higher (EUR 720) compared to cities for primary schools, and 11% (EUR 681) higher for secondary schools (Figure 4.10). This cost difference can be even higher than 40% for primary schools in Estonia, Finland and Latvia, and 16% for secondary schools in Greece and Spain (OECD/EC-JRC, 2021[94]).

Figure 4.10. Annual cost per secondary school student (estimated) by country and degree of urbanisation, EU27+UK (2011)



Note: Bubble areas represent the share of national population.
Source: OECD/EC-JRC (2021[94]), *Access and Cost of Education and Health Services: Preparing Regions for Demographic Change*, https://dx.doi.org/10.1787/4ab69cf3-en, Figure 3.18.

A broad spectrum of strategies can be employed to address inefficiency in school networks, which requires carefully managing trade-offs in cost and access

Consolidation – i.e. the closing of schools and transferral of students to proximate institutions – has been the conventional response to school network inefficiency and falling student numbers. However, the repertoire of strategies to rationalise school networks has been greatly expanded beyond the merger or closure of schools and many have come to see consolidation as a last resort given its strong impact on the lives of students and communities (OECD, 2018[63]).

Developing and maintaining school infrastructures that provide all students with adequate spaces to learn is a fundamental condition for an equitable and high-quality school system. A central aspect of this is to ensure the geographic coverage of school networks and the proximity of education services to students' homes as excessive distances and/or inadequate school transport arrangements can be detrimental to both attendance and students' outcomes. Accordingly, countries can consider a broad spectrum of strategies to rationalise the organisation of the school network, which includes re-thinking how educational services are defined and distributed across school sites, fostering co-operation and resource sharing between providers, creating school clusters and engaging in consolidation (OECD, 2018[63]).

Policy simulations by the OECD for the EU27+UK countries highlight the urgency of effective school network management and the challenges involved in trading off between costs and equal access. For these countries, even after adjusting the school network to future demand by 2035, the costs per student in sparse rural areas can be expected to increase by around 3% on average, while distance to school is expected to increase everywhere outside cities, and more so in villages (OECD/EC-JRC, 2021[94]). Many school systems therefore face the challenge of reconciling incentives for a rational organisation of the

school network with the recognition that high-quality instruction in small schools is more resource intensive and should be supported accordingly, particularly where consolidation is not an option (OECD, 2018[63]).

Quality, equity and well-being need to be guiding principles for school network reforms, which may differ by level of education and require community engagement and monitoring

Regardless of the strategy used, educational quality, equity and student well-being should be the guiding principle for any school network reform. While consolidation, for example, can provide students and teachers with access to better learning and professional development opportunities in some cases, it may result in prohibitive travel distances in others. Making students' educational benefit central to network reforms thus requires countries to acknowledge the limits of consolidation and to ensure that access to schools at a reasonable distance remains a priority, particularly for younger children. At the same time, the more specialised curricula of secondary education are often impossible to provide at the scale of the average rural school. There may then be limits to the rationalisation of early childhood education and care and primary school networks while the potential for consolidation may be greater at secondary levels (OECD, 2018[63]).

As with any major reform project, the systematic consultation and engagement of all major stakeholders should precede the reorganisation of school networks (OECD, 2018[63]). This can help to resolve conflicts before they arise, yield solutions that are suitable to the local community's needs and ensure that stakeholders are willing to implement change and possess the tools to apply reforms as planned (Viennet and Pont, 2017[95]). Authorities should contribute to this process by maintaining a high level of transparency, articulating a clear educational vision for the reforms and demonstrating that it will bring about tangible improvements to students (Burns and Köster, 2016[96]). Central guidance on when and how to conduct consultations can be an effective means to support local authorities and align expectations among all actors involved (OECD, 2018[63]).

For reforms to benefit students from all backgrounds and need levels, it is also essential for authorities to identify their potential impact on equity and the well-being of specific student groups in advance, so as to take the necessary steps to address them. The continuous monitoring of equity developments should be integrated into planning and design from the outset. At the same time, representatives of vulnerable groups should be consulted and involved at key stages of the proposed reforms' design and implementation. While authorities should draw on international experiences with school network reforms, generating and sharing evaluation results at the sub-system level can also be effective in fostering system-wide learning and generating reliable insights into the effects of network adjustments on students (OECD, 2018[63]).

Sharing resources and engaging in co-operation can create economies of scale and enhance efficiencies

Co-operation and resource sharing between providers can, in many cases, allow smaller institutions to benefit from economies of scale and enhance efficiency while leaving the number, size and distribution of school facilities intact (Box 4.11). This may include jointly providing specialised services or curricula; sharing staff, facilities and back-end infrastructure; jointly purchasing materials or services; co-ordinating student transportation; and jointly offering professional development opportunities for teachers. Besides the savings generated through economies of scale, resource sharing and collaboration can also support small schools in providing a broad curriculum and high-quality instruction (OECD, 2018[63]).

The success of such collaborative practices is subject to a number of conditions. Long distances between schools and a low level of trust between school leaders and staff – especially in contexts where schools are competing for students – can constitute barriers to resource sharing. On the other hand, clearly established goals and a focus on mutual benefits can form a basis for sustained collaboration (Muijs, 2015[97]). Authorities should encourage such practices and reduce barriers or disincentives for small schools to collaborate.

Box 4.11. Addressing inefficiency in school networks: examples of co-operation and resource sharing in the Flemish Community of Belgium and Spain

In the **Flemish Community of Belgium**, the education ministry launched a policy to encourage school collaboration through the establishment of "school associations" (*scholengemeenschappen*) among secondary schools in 1999.In 2003, the programme was extended to primary schools. School associations are collaborative partnerships between schools in the same geographical area comprising between 6 and 12 schools on average. Particularly at the secondary level, a central goal was to improve the efficiency of schools' resource use and their offer through increased co-operation and co-ordination. Membership in a school association is voluntary. To incentivise collaboration in a system that is otherwise based on school choice and competition, the ministry provides additional staff and other resources whose use the association can collectively decide upon. In the most successful cases, school associations have also brought about greater effectiveness and efficiency by using shared management systems for staff recruitment and evaluation, easing their principals' managerial burden and allowing them to assume greater pedagogical leadership. Evaluations of secondary school associations also showed that many of them had developed common staffing policies that facilitate sharing staff across schools.

Spain provides another example for co-operation and resource sharing. Here, partnerships between rural schools (*Colegios Rurales Agrupados*, CRA), have served as a means to overcome the resource constraints faced by small schools since the late 1980s. Participating schools from multiple municipalities share itinerant teachers, instructional materials or extracurricular offers and organise regular co-ordination meetings among their teachers. In Catalonia, one of the country's Autonomous Communities, schools collaborate within Rural Education Zones (*Zona Escolar Rural*, ZER) around a common educational project and curriculum. Each zone is co-ordinated by a leadership team including one of the participating schools' principals, a chief of studies and a secretary, who dedicates 25 weekly hours to co-ordinating the ZER. Each ZER has a school council composed of representatives of the school management, teachers, administrative staff, parents and the municipality. The schools of each ZER share at least three itinerant teachers for instruction in a foreign language, music and sports. Larger ZERs of seven or more schools hire a fourth itinerant teacher for students with special education needs.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris; https://dx.doi.org/10.1787/9789264306707-en; Ares Abalde, M. (2014[98]), "School Size Policies: A Literature Review", *OECD Education Working Papers*, No.106, http://dx.doi.org/10.1787/5jxt472ddkjl-en.

Clustering schools under joint leadership can also help improve efficiency and quality, while maintaining a broad coverage of the school network

Co-operation between schools can take different forms with varying degrees of formality, duration and scope. If properly administered, the creation of school clusters under joint administration can also generate significant improvements in efficiency and educational quality without diminishing the geographic coverage of the school network. School clusters should be considered as an effective means to counteract some of the disadvantages of small schools without requiring their closure. However, due to their complexity, the successful introduction of a centralised leadership team and budget for multi-site schools requires careful attention to building the capacity for pedagogical and administrative leadership, and possibly the development of distributed leadership structures. **Colombia** and **Portugal** provide two examples for large-scale school network reforms that brought a number of schools under joint leadership as school clusters (Box 4.12) (OECD, 2018[63]).

Box 4.12. Addressing inefficiency in school networks: examples of school clustering in Colombia and Portugal

In **Colombia**, the education ministry has promoted the clustering of nearby schools in order to ensure all students have the opportunity to complete their education within a single school cluster. This measure should facilitate smoother transitions between levels and reduce student dropout. Since 2002, schools, and especially public schools, have been organised as school clusters with a number of sites. The main site offers all levels of compulsory education. The remaining sites offer only some levels of education. A school cluster includes one main site and a number of satellite sites. Qualitative studies suggest that the reorganisation of schools has granted small rural school sites access to school resources and infrastructure such as a library, computer lab and sports facilities, and helped ease rural students' transition between levels, although its impact on grade repetition and student dropout have been mixed.

Portugal reformed its school network to address inefficiency and drastic regional inequalities beginning from 2005. Within a decade, education authorities closed 47% of the country's public schools, most of them primary schools in rural areas, while investing in new school infrastructure, transportation and extracurricular programmes. As part of the consolidation process, nearly all public schools (98%) were re-organised into clusters under a single administration. The clusters usually include kindergartens, primary and secondary schools. While they typically group between 4 and 7 schools, clusters range in size from as few as 2 to as many as 28 schools. The organisational leadership of clusters is assigned to a principal, supported by several deputy principals, school co-ordinators and school governing councils. The governing councils include a General Board (comprised of elected representatives of teachers and parents, as well as representatives of the municipality and local partners), as well as a Pedagogical Council, which is comprised of department co-ordinators designated by the cluster Principle (e.g. the chairs of the Departments of pre-schooling, primary education, maths, languages, arts, sports, inclusive education). The introduction of clusters aimed to mitigate some of the negative consequences of school closures, allowed for a more rational use of resources and eased students' transitions across levels of compulsory education. The reorganisation of the school network is also considered to have reduced the isolation of rural teachers, improved educational opportunities for disadvantaged students in isolated areas, and fostered greater collaboration between the education ministry, municipalities, schools and other stakeholders.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*; https://dx.doi.org/10.1787/9789264306707-en.

Taking a "modular" approach to school networks constitutes a further option for the efficient organisation of school networks

Encouraging a "modular" approach to the school network and educational offer can expand the repertoire of flexible strategies to advance their efficient organisation. This entails shifting the focus away from schools as entire institutions and towards the individual services they offer as well as re-evaluating whether there is room for improving the distribution of service-delivery across schools. Allowing for some flexibility in the combination of different grade levels within the same institutions can make it easier to adapt the school network in response to changing demand, particularly where pressures differ across levels of education. Promoting these modular approaches should also involve a reflection on which levels of education can be adequately offered at the local level and which ones should rather be provided at a larger scale (OECD, 2018[63]).

Estonia, for example, opted for a more decisive separation between general upper secondary education and basic education. The aim was to consolidate upper secondary provision while leaving the network of lower secondary schools largely intact. Combined with the construction of centralised upper secondary schools, the government thereby sought to initiate a reflection among municipalities on the levels of education that they can adequately provide locally (OECD, 2018[63]).

Consolidating school networks can complement other strategies of school network reform

Despite the great potential of resource sharing and school clustering, systems with a fragmented school network should complement these approaches with incentives for the consolidation of small schools. Consolidation can yield long-term cost savings by increasing the average size of schools and lowering per-student fixed costs. However, when considering the consolidation of school networks, countries need to carefully weigh its economic benefits against the substantial transition costs generated in the process, the public and private expenditure arising from longer commuting distances, and the social and economic impact on surrounding communities (e.g. in terms of family exodus or impact on real estate prices). Adequate transportation arrangements (which typically require significant investments) need to be in place when students are reallocated to distant schools. Consolidation measures can also further reduce the diversity of schools and parents' ability to choose between multiple providers or course offers (Gronberg et al., 2015[99]).

Evidence on the negative impact of school closures suggests that, following a school closure, socio-economically disadvantaged students are more negatively affected. However, the long-term negative impact is minimised if an alternative publicly-funded schools is available at a reasonable (Humlum and Smith, 2015[100]). To attenuate any negative effects, the transition process needs to be as smooth as possible, ensuring that students are well-integrated in their new environments (OECD, 2018[63]).

Countries that decide to pursue consolidation can consider a combination of policy levers, including financial incentives and direct support in the school closure process. Incentives for consolidation, for example in the form of per-capita funding through a central formula, can constitute a powerful steering tool that discourages the maintenance of small schools due to their relatively high per-student fixed costs. These measures should be carefully targeted at the educational levels and sectors in which consolidation is expected to yield the greatest benefit and include safeguards for schools that cannot or should not be subject to closure (OECD, 2018[63]).

Consolidation can also be encouraged through other policy levers, for example by increasing the size of catchment areas. Steering tools such as minimum school and class size rules can promote the provision of education at an efficient scale. However, given the heterogeneity in local contexts, it is important to bear in mind that there is no "one-size-fits-all" solution to the size and distribution of schools. To take account of specific contexts, authorities can exempt schools from size requirements if they are identified as meriting protected status to avoid placing student in remote areas at a disadvantage. In general, countries need to be careful to provide clear incentives and use tools that reinforce, rather than undermine each other (Duncombe and Yinger, 2007[101]).

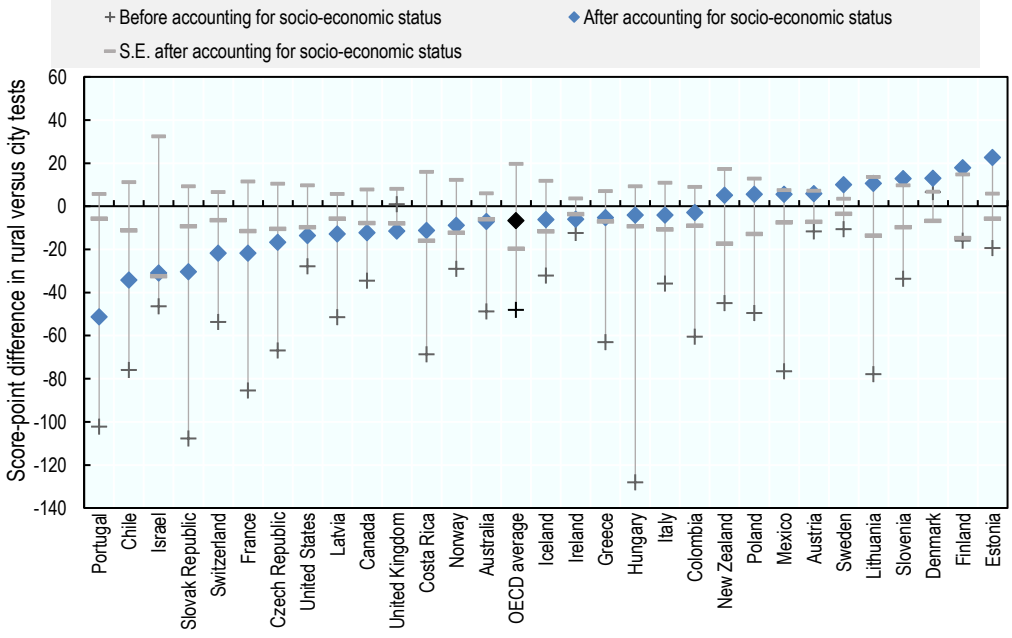
Yet, the scope for school network reform is often limited in remote areas…

The challenges associated with small school size are, in many rural areas, compounded by the schools' geographic isolation. Especially in remote areas, the scope for strategies to rationalise the school network through school co-operation, clusters, or consolidation is limited due to distance. In order to ensure that students in these areas nevertheless enjoy a high-quality education, systems can employ a range of strategies to address the challenges of remote schools while leaving the structure of the school network intact (OECD, 2018[63]; Echazarra and Radinger, 2019[89]).

The OECD's recent projections of cost and access for providing education in rural areas again highlight the need for complementary strategies to ensure equity in provision, especially for children in remote areas where some schools will need to operate below their capacity to ensure access to education. According to the report's estimates, students in sparse rural areas are estimated to travel on average four to five times further compared to students in cities (OECD/EC-JRC, 2021[94]).

Such additional strategies can be essential to help reducing performance differences between rural and urban students. Students in rural areas of most OECD countries consistently lag behind their urban peers when it comes to educational achievement and attainment (Echazarra and Radinger, 2019[89]). In PISA 2018, on average, 15-year-olds in urban schools across OECD countries scored 48 points higher in reading than their peers in rural schools. This difference is equivalent to a year of schooling, although differences in the socio-economic composition of the student populations tend to explain the rural-urban achievement gap (OECD, 2021[90]). While no evidence is available on this matter yet, the COVID-19 pandemic and efforts to provide continuity in learning through distance education likely also had a different impact on students in rural and urban areas.

Figure 4.11. The rural-city gap in reading performance of secondary school students (2018)



Note: Results based on linear regression models. S.E = Standard error.
Source: OECD (2021[90]), *Delivering Quality Education and Health Care to All: Preparing Regions for Demographic Change*, https://dx.doi.org/10.1787/83025c02-en, Figure 3.10.

… which requires complementary strategies to address inequities in learning opportunities for students in rural and remote areas

Ensuring that all schools provide high-quality teaching and learning regardless of their geographical location can be challenging. However, innovative practices exist to close the rural-urban gap in education including: the staffing of schools with teachers from the community through "Grow your own" models, professional learning networks across rural schools, or the use of new technologies for distance learning, combined with efforts to build local capacity and resources (Sipple and Brent, 2015[102]; Echazarra and Radinger, 2019[89]).

Since the provision of high-quality education in rural areas comes at a higher per-student cost, some countries provide dedicated funding to small, isolated schools. Targeted programmes have financed teacher learning and collaboration across remote schools and helped improve transport arrangements where distance constitutes a significant barrier for attendance. **Denmark**, for example, has increased its financial support for small island schools to secure the provision of a high-quality school offer in remote areas. **Chile** and **Colombia** have also dedicated resources to address challenges related to educational quality in rural areas (Box 4.13) (OECD, 2018[63]).

The transitions to secondary and post-secondary education can be a serious challenge for rural youth who often have lower expectations for their educational attainment and face considerable financial, logistical and emotional barriers as they move to higher levels of education. For PISA 2018, on average across OECD countries, students in rural schools were half as likely to expect completing a university degree as those in city schools (OECD, 2021[90]). Countries should therefore pay sufficient attention to measures, such as scholarships, allowances, socio-emotional support, career guidance, boarding and housing (OECD, 2018[63]).

Box 4.13. Examples for targeted support for rural schools: Chile and Colombia

In **Chile**, a Basic Rural Education Programme (*Programa de Mejoramiento de la Calidad y Equidad de la Educación para las Escuelas Básicas Rurales*) was created in 1992, providing technical assistance to rural schools. Originally, the programme included the provision of pedagogical materials, teacher training and professional development as well as curriculum adaptation to rural contexts. The programme also created local networks of rural schools (*microcentros rurales*) which continue to operate and provide teachers with a platform to meet regularly to collaborate in academic planning and evaluation.

Similarly in **Colombia**, a Rural Education Programme (*Programa de Educación Rural*, PER) implemented between 2002 and 2015 sought to raise access to quality education in rural areas, to prevent dropout and to make education more responsive to the needs of rural students. The programme followed a multidimensional approach that included the use of flexible pedagogical models and teaching materials designed for rural schools, teacher development and capacity building of participating sub-national education authorities. Additional strategies focused on the improvement of basic competencies in language and mathematics in basic primary education and the teaching of English. An impact evaluation found significant positive effects on efficiency (dropout, pass and failure rates) and quality (achievement in standardised language assessment) in the schools where the programme was implemented.

Source: OECD (2018[63]), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Publishing, Paris; https://dx.doi.org/10.1787/9789264306707-en; Echazarra and Radinger (2019[89]),” Learning in rural schools: Insights from PISA, TALIS and the literature”, OECD Education Working Papers No 196, https://dx.doi.org/10.1787/8b1a5cb9-en.

Key messages

The analysis in this chapter points at the possibility of jointly enhancing efficiency and equity in education systems and highlights several policy levers that allow to decrease disparities in education outcomes, increase overall performance and reduce inefficiency costs.

First, investments in ECEC are associated with high returns in terms of learning outcomes and children's socio-emotional development. Policies addressed at broadening access to ECEC – particularly for disadvantaged groups – and enhancing its quality can thus help to improve the efficiency and equity of education systems.

Second, the chapter recommends investments in high-quality teaching. In particular, policy makers are advised to increase the attractiveness of teaching careers through revising current levels of compensation, salary structures and progression policies. Special attention must be paid to guaranteeing the equitable distribution of qualified teachers across the education system through adequate incentive systems.

Third, policy makers must prevent cases of educational failure and student dropout which are a main cost factor in education systems and disproportionately affect disadvantaged students. In particular, the chapter advises against excessive grade repetition practices and recommends developing early warning systems and individual support to prevent students from falling behind. Further, policymakers should delay early tracking of students based on educational achievements to allow all students to realise their full academic potential.

Lastly, the chapter recommends reforms to school management networks in rural areas that balance concerns regarding access and efficiency. In order to create economies of scale, policy makers could facilitate resource sharing across schools, introduce joint school leadership or allow greater flexibility in combining different levels of education within one institution.

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Notes

[1] In PISA, "rural schools" refer to those in communities with fewer than 3 000 people and "urban schools" refer to those located in any city with more than 100 000 people.

5 Planning and monitoring the use of school funding to improve equity and performance

A challenge for school systems is to ensure that school funding is spent most efficiently and in accordance with policy priorities. Planning, monitoring and evaluation processes are essential to reflect upon previous expenditure in education and future resource needs in order to develop financially sustainable education budgets that support the provision of high-quality education and effectively address policy priorities. This chapter discusses how education and finance authorities can work together to ensure the alignment of budget planning procedures with strategic education priorities; and the effective use of evaluation and monitoring to inform future uses of school funding.

Introduction

Policy choices or external shocks, such as demographic changes, events like the COVID-19 crisis or the consequences of Russia's war of aggression against Ukraine, can influence the allocation of public funds across sectors. The COVID-19 pandemic has disrupted education at an unprecedented scale and maintaining learning continuity amidst school closures and teacher shortages, as well as ensuring the safe reopening of schools required unanticipated financial resources. As the sanitary crisis evolved into an economic and social crisis, governments have had to take difficult decisions regarding the allocation of funds across sectors.

As outlined in the Introduction, education appears to have maintained its priority in national budgets of OECD countries in the immediate aftermath of the crisis in 2021. Nevertheless, budget cuts to education tend to lag behind the emergence of a crisis and it remains open whether the relative budgetary stability in high-income countries can be maintained as the pandemic continues to take its economic toll (OECD, 2021, p. 28[1]). According to the 2021 Education Finance Watch (EFW) report, among low- and lower-middle-income countries with available data, two-thirds have already cut their education budgets since the onset of the COVID-19 pandemic (World Bank and UNESCO, 2021[2]).

Aligning funding strategies with policy objectives is crucial to ensure that financial resources are used effectively to drive education improvement and reforms. This requires both the formulation of clear goals and their connection to the budget planning process.

The formulation and implementation of every education budget provides an opportunity to reflect upon previous expenditure and future resource needs. Such reflection allows to develop financially sustainable resource allocations that support the provision of high-quality education and effectively address policy priorities and is ever more important in the light of the recent unforeseen circumstances. In most OECD countries, education and finance authorities share the responsibility for setting up the education budget at the central level. In 2016, nearly all of the 21 countries and other participants of the OECD School Resources Review reported that both ministries of education and finance played a role in proposing, negotiating, revising and approving budgets for education, although the order of their engagement, as well as the role of central governments varied across systems (OECD, 2017, pp. 186, Table 4.A1.2[3]). Yet, the close collaboration between ministries of education and ministries of finance matters not only during the budget's planning and formulation, but throughout the budgeting cycle, including in monitoring and evaluating the budget's successful implementation.

This chapter describes practices and procedures involved in effectively planning, monitoring and conducting the evaluation of the use of school funding, and it analyses the challenges involved in these processes. The chapter is organised around three selected key themes:

- First, the chapter reviews how budget planning procedures can be linked to education targets and priorities in order to strategically guide the planning process. It also discusses different techniques that OECD countries employ to render education budgets more flexible, responsive and efficient, for example through multi-annual approaches to budget planning.
- Second, the chapter explores the role of evaluations and how their results can be used to ensure that available resources are used more effectively and equitably. These evaluation processes can take place at different levels of the system and include internal management and control, accounting, financial reporting, external audits and evaluations, and individual performance management.

- Third, in light of a trend towards fiscal decentralisation in many OECD countries, the chapter discusses the importance of building capacity at lower levels of the system in order to enable them to assume their new responsibilities successfully.

Linking budget planning to policy objectives

Education systems pursue multiple objectives with limited resources, which makes it crucial to align funding strategies with system priorities in budget planning

OECD countries pursue a wide range of objectives for their education systems, including education quality and excellence (e.g. improving overall achievement and the share of high-performers, or upskilling their teaching workforce), equity and inclusiveness (e.g. supporting students from a low socio-economic background or integrating students with special education needs in mainstream schools) and expansion (e.g. widening access to pre-primary education).

Since school systems have limited financial resources with which to pursue these goals, it is important to ensure that funding strategies and system-wide objectives are aligned. To this end, OECD countries have, to varying extent, integrated strategic considerations into their budgeting procedures. This may involve the use of strategic documents to guide the budget planning process or the development of expenditure frameworks that connect spending decisions to education priorities. Some countries have placed particular emphasis on developing clear targets, corresponding indicator frameworks and mechanisms to report on the system's use of resources in order to achieve education goals.

This requires a shared understanding of priorities, especially in decentralised systems, and targets and standards to assess the effectiveness of budget preparation

Effectively using education objectives to inform spending decisions poses several challenges. It depends on a shared understanding of education quality and priorities to guide the budgeting process as well as the development of targets and reference standards against which its effectiveness can be assessed. The absence of such targets or their shared understanding by all relevant actors can complicate budgetary negotiations and diminish the effectiveness of the budget's preparation, particularly in systems with decentralised spending responsibilities. Likewise, not all countries set target dates for the completion of their education objectives as part of the planning process, which results in the absence of clear timeframes that could be used to subsequently evaluate spending decisions (OECD, 2017, p. 157[3]).

The challenge for policymakers is to back up policy objectives with credible and sustainable resources, while enabling flexibility to adjust to changing circumstances

Given the longer-term fiscal implications of education reform projects and the time it takes to implement them successfully, policy objectives need to be backed by credible and sustainable resource commitments. Given the changing nature of external circumstances as well as education priorities, education and finance authorities are faced with the challenge of ensuring this reliability and fiscal sustainability when formulating education budgets while at the same time allowing for sufficient flexibility and responsiveness to new developments. As discussed in the following, OECD countries have used a range of strategies, often involving multi-annual approaches to budgeting, in order to achieve this balance.

Authorities also need to determine the degree of budget flexibility they allow at the school level, for example when it comes to schools' right to carry over unused resources from one year to the next. Among the 17 systems participating in the OECD School Resources Review, four reported not to allow public schools to carry over any budget surpluses at the primary level (and three at the secondary level). By contrast, in the majority of countries, some budgetary carry-over in schools is permitted. At the primary level, this

practice is either unrestricted, allowed up to a maximum limit or for specific types of funding (e.g. in the Czech Republic, Israel and the Slovak Republic), or subject to the approval of central or local education authorities (e.g. in Denmark, Estonia, Iceland and Portugal) (OECD, 2017, pp. 189, Table 4.A1.3[3]).

In most OECD countries, the ministry of finance sets the framework and timeline for the budgeting process, but the process varies greatly across countries

Some countries develop education budget proposals within ceiling budgets while others operate bottom up with expenditure-driven budget proposals

In most OECD countries, the ministry of finance establishes the procedural framework for the budgeting process in a budget circular, which it provides to line ministries. The budget circular outlines the rules and timeline for the different budgeting procedures. In addition, it may provide guidelines for the use of fiscal projections, contain expenditure ceilings or targets and inform education ministries of specific government priorities. The budgeting process differs significantly across OECD systems – in some, the ministry of finance sets budget ceilings before line ministries draft their budget proposals while others use a bottom-up budgeting procedure in which ministerial budget proposals tend to be more expenditure-driven.

In either case, some finance ministries offer education ministries their horizontal support during the budget preparation, providing them with procedural guidance as well as relevant finance and accounting documents (Curristine, 2005[4]). Most education ministries also have a dedicated unit that is tasked with budgetary and funding matters, such as the Directorate of Financial Affairs within the Ministry of Education, Youth and Sports in France. Likewise, the Office of Information and Financial Affairs is situated in the Icelandic Department of Education or the Finance Department within the Lithuanian Ministry of Education and Science (Fakharzadeh, 2016[5]). These organisational units can play an important role in setting up budgeting and accounting systems and often take a lead in negotiating education budgets with the finance ministry (OECD, 2017, p. 168[3]).

Throughout the budgeting process, the actors involved may draw on a wide range of information, consultation procedures and planning tools to guarantee that education budgets meet future resource needs (OECD, 2017, p. 168[3]). Countries also employ different strategies to integrate education objectives into their budgeting procedures. This may involve the use of strategic documents to guide the budget planning process or the development of expenditure frameworks that connect spending decisions to education priorities.

Countries typically draw on strategic documents and multiple data sources to prepare education budgets, but analysis of impact evaluations are far less common…

As can be seen in Table 5.1, most of the countries that participated in the OECD School Resources Review's qualitative data collection[1] draw on multiple sources of data when preparing their central-level education budgets. It should be noted, however, that there may not be a systematic approach to the way it is brought to bear on the budget planning process. Likewise, the relative emphasis placed on different types of data during the formulation of initial spending ceilings, budget proposals and the subsequent negotiations varies considerably, not least in light of the often highly politicised context in which budget negotiations take place (OECD, 2017, p. 169[3]).

All 15 OECD School Resources Review countries reported to draw on administrative data during the budgeting process (e.g. the number of students, teachers and schools) and ten of them used demographic information, such as population projections. Macroeconomic and fiscal forecasts (e.g. the Gross Domestic Product (GDP) growth rate or the education expenditure's share of the national budget) were used less commonly, in 8 of the 15 systems. Most countries also reported seeking to link the budget planning process to policy objectives by considering policy priorities included in strategic documents (12 of 15) as well as

identified needs (9 of 15) when planning their education budgets. The results of programme and policy impact evaluations as well as information on performance played less of a role and were drawn on in only four of 15 systems respectively, for example in **Estonia**, where the success relative to national education targets is taken into account during the budget planning process (see Table 5.1).

Table 5.1. Information used in the preparation of the central education budget (ISCED 0-3), 2016

Country	Administrative data	Results from impact evaluations	Demographic information	Policy priorities	Identified needs	Macroeconomic and budgetary indicators	Data on student flows	Data on pedagogical orientations	Information about previous budget	Performance information
Austria	✓		✓	✓	✓			✓		
Chile	✓	✓	✓	✓	✓	✓	✓		✓	✓
Czech Republic	✓		✓		✓		✓	✓		
Denmark	✓			✓		✓	✓		✓	
Estonia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Iceland	✓		✓							
Israel	✓		✓	✓	✓			✓		
Kazakhstan	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Lithuania	✓									
Portugal	✓			✓					✓	
Slovak Republic	✓			✓	✓	✓				
Slovenia	✓		✓	✓	✓	✓			✓	✓
Spain	✓	✓	✓	✓	✓	✓			✓	✓
Sweden	✓		✓	✓						
Uruguay	✓			✓		✓		✓	✓	

Note: General note on Belgium (Fl. and Fr.): There is no central education budget and budget planning, but an annual lump sum transfer originating from central (federal) taxes to the states (Communities). Communities can use funds from the lump sum transfer for all policy domains they are responsible for at their own discretion. Budget planning happens at the state (Community) level. Therefore, this table does not provide information for Belgium (Fl. and Fr.).
The review team made every effort to ensure, in collaboration with countries, that the information collected through the qualitative survey on school funding is valid and reliable and reflects specific country contexts while being comparable across countries. However, given the qualitative nature of the survey, information should be interpreted with care. For country-specific notes to this table, see the Annex Notes on Table 4.A1.1. in OECD (2017[3]).
Source: Reproduced from OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*, http://dx.doi.org/10.1787/9789264276147-en, p. 185, Table 4.A1.1.

Strategy documents outlining policy priorities are increasingly used to connect spending with policy priorities, and this is all the more important when spending is decentralised

Particularly in school systems with decentralised resource management responsibilities, setting well-defined and prioritised goals that can be translated into concrete targets at the local and school level has been central to guiding education reforms and the preparation of budgets that are suited to fulfil these objectives. An increasing number of OECD countries make use of strategic documents to inform budget planning procedures and connect spending decisions to policy priorities. Developing these linkages between budget and strategy frameworks can provide governments with a clearer picture of where public finances are spent, facilitate the allocation of resources according to policy priorities and make it easier to track spending against the achievement of policy outcomes, particularly where targets and priorities are formulated in concrete terms (IIEP-UNESCO, 2010[6]). Box 5.1 provides an example from **Denmark**, highlighting how the formulation of policy priorities can support budgeting and reform processes in a decentralised education system.

Box 5.1. Steering education budgets through national targets in Denmark

As a school system characterised by a high degree of decentralisation in spending decisions, Denmark developed an approach to education steering that relies on the definition of clear education goals that translate into measurable targets at the local and school level. For the 2014 *Folkeskole* reform, it defined three core objectives pertaining to student achievement, equity and well-being along with a range of corresponding measurable indicators. The progress on these indicators was monitored for every school and reported to the municipalities. With the 2022/2023 school year, these reports will be replaced by annual "school development interviews" between the school principals and local authorities and intensified municipal follow-up for schools with quality challenges. Similarly, the 2012 inclusion reform was – until 2016 – guided by a clear target of an overall inclusion rate of 96%, which provided guidance to municipalities and schools and informed their local education planning. (The target was abolished in 2016).

Another noteworthy example of clearly formulated national targets is the Danish government's policy for teacher competency development and specialisation, which is part of the 2014 *Folkeskole* reform. The government had established the target that 95% of teachers should be certified in all the subjects that they teach by 2020, including the short-term objectives of reaching 85% by 2016 and 90% by 2018. (Due to the COVID-19 pandemic, this target has been suspended until 2025/26). To facilitate the achievement of these objectives, the Ministry for Children, Education and Gender Equality had provided additional funding for teacher competency development along with evidence-based recommendations on how this funding could be spent. Municipalities applying for this funding were required to develop a plan for its use and to report back on their progress.

Source: Nusche, D. et al. (2016[7]), *OECD Reviews of School Resources: Denmark 2016*, http://dx.doi.org/10.1787/9789264262430-en; Reproduced from OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*. http://dx.doi.org/10.1787/9789264276147-en, Box 4.1.

While some countries use strategy-oriented medium-term expenditure frameworks to better link resources to longer-term objectives, these often lack concrete performance targets

Integrating annual budgets into strategically oriented medium-term expenditure frameworks (MTEFs) can facilitate the link of resource allocations and longer-term objectives. Adopting a multi-annual budgeting process can provide spending agencies with a means to strategically plan their operations, take into account potential trade-offs between alternative spending options and their longer-term expenditure implications, thus giving them additional security when planning longer-term investments. Nevertheless, some MTEFs used in OECD review countries are not yet sufficiently guided by concrete targets and priorities or fail to create direct links between spending decisions, performance and policy priorities (Santiago et al., 2016[8]). Austria has taken important steps to ameliorate this shortcoming by moving towards a performance-oriented budgeting approach at the national level (see Box 5.2).

Box 5.2. Integrating performance targets into the federal budget in Austria

Building on a comprehensive reform launched in 2009, Austria introduced new budgeting principles in 2013, which led to the inclusion of performance targets in the federal budget alongside concrete actions envisaged to achieve these targets and criteria used to measure their success. The two education-related goals included in the 2015 budget are to improve gender equality in education and raise the level of education. Each goal is accompanied by three indicators whose progress is evaluated as part of the country's monitoring framework for education quality (Nusche et al., 2016[9]). The broad goals are then linked and referred back to by specific budget programmes such as the one for "compulsory schooling – primary and secondary level" (Bruneforth et al., 2016[10]).

Source: Nusche, D. et al. (2016[9]), *OECD Reviews of School Resources: Austria 2016*, http://dx.doi.org/10.1787/9789264256729-en.

Co-ordination between ministries of education and finance, within education ministries and across levels of government is essential to the success of outcome-oriented budgeting

For performance- or outcome-oriented budgeting to be successful, it requires not only the commitment of central actors and strong co-ordination between ministries. It also needs co-ordination across levels of government. To ensure that the strategic budgeting norms followed at the central level are adopted at sub-central levels of administration, some countries therefore mandate all levels of the education system from the central to the school level to develop their budgets and justify their spending decisions in light of a shared set of priorities. This may involve drafting their own medium- and short-term strategic plans and budgets in line with the central-level expenditure framework or at least actively contributing to the preparation of local expenditure frameworks prepared at the central-level. **Estonia** provides an example where co-ordination within and between ministries and different levels of administration are used to promote widespread awareness and understanding of the country's education goals and their effective integration into the budgeting process (see Box 5.3). However, in many countries, insufficient technical capacity at both the central and local levels constitutes a challenge when involving sub-central authorities in the implementation of strategic budgeting plans (OECD, 2017, p. 158[3]; IIEP-UNESCO, 2010[6]).

Box 5.3. Strategic and multi-annual education budgeting in Estonia

Estonia has taken important steps to integrate its annual budgeting processes into longer-term strategic frameworks at all levels of governance. By law, the national government, local governments and schools must have Strategic Development Plans. In the case of local and national governments, these plans must be linked to four-year medium-term expenditure frameworks (MTEF). These frameworks establish the parameters based on which annual budgets are drafted, before they are themselves adjusted in light of those budgets.

At the national level, the National Reform Programme "Estonia 2020" constitutes the most important strategic document, which was adopted in the context of the Europe 2020 strategy. It identifies 17 major challenges facing the country and divides them into 4 basic fields, one of which is education. These education priorities are further defined by the Estonian Lifelong Learning Strategy 2020, which in turn serves as the platform for financial planning in the sector between 2014 and 2020. Strategic priorities and goals are expressed in concrete financial terms by the Ministry of Education and Research's four-year MTEF and currently implemented through thirteen programmes.

This expenditure framework is subject to inter-ministerial discussion and debate before being integrated

into the government's overarching MTEF. In March of every year, the Ministry of Finance uses economic forecasts and the government's MTEF to give all line ministries a budget ceiling for the following four years. By April, line ministries must fit their priorities into these ceilings in accordance with their stated objectives and adjust their MTEFs accordingly. Negotiations between high-level civil servants result in further modifications of each ministry's budget and in September, the government submits its general budget proposal for the next fiscal year to parliament for debate. Local governments are also required to align their annual budgets with both four-year expenditure plans and longer-term Strategic Development Plans.

School directors are responsible for developing school budgets. At the national level, most local governments operate according to well-defined budget calendars and provide school directors with budget ceilings for the next fiscal year each spring. These figures are then adjusted in autumn when enrolment becomes clearer. In municipal schools, school budgets are reviewed by democratically elected boards of trustees composed of parents, teachers and students before receiving final approval by the local government. In state-run schools, budgets are also reviewed by boards of trustees or advisory bodies (in vocational schools). These boards contain not only teacher and parent representatives, but also external experts and – in the case of VET schools – industry representatives. The Ministry of Education and Research grants final approval for the budgets of state schools.

Sources: OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*. http://dx.doi.org/10.1787/9789264276147-en, Box 4.2.

Some promising strategies and lessons for policy makers include…

Strategically linking spending decisions to clearly articulated policy priorities

Aligning funding strategies with policy objectives is crucial to ensure that financial resources are used effectively to drive education improvement and reforms. This requires both the formulation of clear goals and their connection to the budget planning process. Central-level education goals should be well-defined and prioritised and – particularly in school systems with decentralised resource planning responsibilities – translatable into concrete objectives at the sub-central level. Fostering widespread awareness and a shared understanding of this strategic vision for education among different stakeholder groups and levels of authority can increase the coherence of budget planning activities across the education system. In addition, it would be beneficial for planning purposes if education objectives were accompanied by a range of targets with a defined time horizon to promote accountability, increase their value for strategic resource planning and facilitate the subsequent evaluation of spending decisions (OECD, 2017, p. 180[3]).

Countries should ensure that these targets and policy priorities are taken into consideration when planning the use of school funding by integrating them into strategic documents and the procedural mechanisms that guide the budget preparation at different levels of the education system. Particularly when combined with multi-annual budgeting procedures, strategic frameworks containing short- and medium-term objectives should be used to inform negotiations and decisions on medium-term expenditure frameworks. Information on policy objectives and expected outcomes should also be presented alongside budget allocations in order to facilitate the distribution of resources according to policy priorities, provide authorities with a clear picture of the purposes that expenditures serve and facilitate the subsequent evaluation of spending decisions against the achievement of policy outcomes. Countries should seek to establish these links between strategic objectives and education expenditure beyond the central level, for example by encouraging the alignment of spending decisions with school development plans. This may require a commitment to building technical and strategic capacity where local actors and school authorities play an active role in the budgeting process (OECD, 2017, p. 180[3]).

Adopting a multi-annual approach to budget planning

Adopting a multi-annual approach to planning education expenditure and making effective use of budgeting tools such as medium-term expenditure frameworks (MTEFs) is key to ensuring the efficiency and financial sustainability of high-performing education systems. MTEFs constitute a strong framework to combine medium-term economic and fiscal estimates with projected resource needs in order to assist spending authorities in making informed and sustainable budgeting choices. In order to achieve and maintain fiscal discipline, multi-annual expenditure plans should be adopted with a view to ensure that policy proposals and programmes are backed by a medium-term budget and that varying costs at different stages of their implementation are adequately accounted for (OECD, 2017, p. 180[3]). The development of multi-annual budgets should also be guided by high-quality forecasting mechanisms to ensure the reliability of indicative spending ceilings or create the conditions necessary to commit to longer-term allocations. In order to maximise their value for strategic planning, MTEFs should integrate budgeting processes at different levels of the education system by encouraging actors across administrative levels to align their spending proposals with central expenditure frameworks (OECD, 2017, p. 180[3]).

Finding the right degree of budget flexibility

Policy objectives can change in light of shifting priorities or unforeseen circumstances, such as the ongoing COVID-19 crisis. Budgets should allow sufficient flexibility to accommodate such shifts without compromising reliability, stability and accountability. Introducing an appropriate degree of flexibility into the budgeting process can improve its responsiveness to unforeseen circumstances and promote more efficient spending decisions at the sub-central level. Particularly in the context of multi-annual budgeting procedures, countries should seek to reconcile the importance of long-term reliability and stability in funding allocations with their responsiveness to changing conditions in the short term. Allowing for the regular adjustment of multi-annual budget ceilings to take into account changing resource forecasts and permitting funding to be shifted across budget items in response to emergencies or reassessed priorities can significantly improve the allocation of educational resources if appropriately regulated (OECD, 2017, p. 181[3]).

Schools and local authorities should also be provided with some room to carry unused appropriations forward from one budget year to the next. This can discourage inefficient expenditures towards the end of the budget cycle and provide schools and local authorities with incentives to mobilise additional revenue or improve the efficiency of their operations if they are allowed to keep some of their surplus to build reserves. Nevertheless, appropriate regulations should prevent the accumulation of excessive surpluses and spending fluctuations across years (OECD, 2017, p. 181[3]).

Evaluating the use of school funding

Evaluating the use of school funding is essential for the improvement of education quality as well as accountability purposes. Evaluation processes (encompassing a range of activities, including monitoring, reporting and auditing) provide critical information on the use of resources at different levels of the system and the education experience that the allocated resources provide to students. Well-designed evaluation systems can generate information on how school funding translates into outcomes for different groups of students and how resources could be used more efficiently and effectively to achieve the school system's goals, which can inform the planning of future budgets (OECD, 2017, p. 200[3]).

The evaluation of school funding also helps to ensure that resources are managed effectively and used for their intended purpose in line with requirements and regulations. This is becoming ever more important in education systems characterised by increasing complexity and multi-level governance structures. In practice, budgets are rarely implemented exactly as approved, which can happen for legitimate reasons,

such as policy changes and adjustments in priorities in response to emerging challenges. However, the execution of a budget may also be hindered by a lack of capacity, mismanagement, unauthorised expenditures, inefficiency or fraud. Continuously monitoring the execution and implementation of a budget can help authorities to detect these problems and address them as they arise.

In most OECD countries, evaluation and monitoring need to adapt to the increasing complexity of education systems characterised by multi-level governance

In systems with multi-level governance, central authorities with responsibility for ensuring high-quality, efficient and equitable education often use earmarked funding to steer education spending…

The complex governance arrangements of modern education systems pose new challenges for the effective evaluation of school funding. Many OECD education systems are characterised by multi-level governance arrangements with shared responsibilities between central and sub-central authorities. In such systems, the question of which actors at which levels should be held accountable for which decisions and outcomes becomes central (Burns and Köster, 2016[11]). Giving sub-central authorities the power to make funding decisions may enhance the quality of public services. At the same time, the expansion of sub-central spending, revenue collection and borrowing powers creates challenges for fiscal control and financial reporting (Schaeffer and Yilmaz, 2008[12]). It is therefore ever more important for monitoring, evaluation and reporting mechanisms to ensure that funds transferred from the central to sub-central governments are used efficiently and in line with laws and regulations and as approved by the legislative (OECD, 2017, p. 201[3]; Sevilla, 2006[13]).

Where central governments remain responsible for ensuring high-quality, efficient and equitable education at the national level while goal setting and decision making increasingly take place at the local level, central authorities need to provide a strong accountability framework for lower levels of governance (Burns and Köster, 2016[11]; Hooge, 2016[14]). In this context, some central governments take a strong role in steering and monitoring sub-national spending and performance through the use of input-related control mechanisms, such as the allocation of funds through earmarked grants (Lotz, 2006[15]).

- In **Denmark**, for example, the use of funding at a local level is generally not monitored or evaluated by central authorities, but there has been a deliberate emphasis on monitoring the use of specific grants provided to the municipalities (Nusche et al., 2016[7]).
- Similarly, in **Sweden**, the central government increasingly tries to steer municipalities by means of specially allocated subsidies (OECD, 2017, p. 202[3]).

… but sub-central authorities may perceive this central steering of education spending as interference, which calls for striking a fine balance between accountability and trust

Sub-central authorities may perceive central monitoring and controlling as interfering with their responsibilities, which can lead to tensions between different governance levels (Schaeffer and Yilmaz, 2008[12]). Accountability in multi-level governance systems thus needs to be carefully balanced with trust between actors at different levels of governance (Burns and Cerna, 2016[16]). In well-functioning sub-central government budget and managerial structures, accountability at the sub-central level is generated not only through top-down control, but through multiple, complementary types of accountability (OECD, 2017, p. 202[3]; Schaeffer and Yilmaz, 2008[12]):

- **Vertical accountability** entails rules set by higher-level governments often for the operation of local governments and requirements for financial reporting in return for the provision of financial resources through fiscal transfers.

- **Horizontal accountability** can be generated by a range of public entities responsible for checking local government abuses and inefficiency, such as local government councils, court systems or auditing agencies.
- **Bottom-up accountability** is promoted by citizens acting through the electoral process, through civil society organisations or the media. Beyond the electoral process, citizens can also hold their local authorities accountable through accessing publicly available local government financial information, involvement in the budgetary process through participatory budgeting practices, and through independent budget analysis.

The strategic use of evaluations and spending reviews can support a more efficient allocation of resources

Evaluation results can be used to inform decisions throughout the budgeting cycle and serve as a basis for professional and evidence-informed discussions among stakeholders concerning future budgets and reform initiatives. According to an OECD survey, approximately half of OECD countries reported the use of policy, programme or project evaluation results during budget negotiations between line ministries and the ministry of finance in 2005 (Curristine, 2005[4]). Many OECD countries have also seen the remit of supreme audit institutions expand beyond financial audits to include the examination of performance and the cost-effectiveness of investments.

Beyond the budget formulation process, evaluation activities can be commissioned and used internally by line ministries or national audit offices to inform their strategies, targets and funding allocations (Curristine, 2005[4]). As described in Box 5.4, some systems have established direct links between their school funding mechanisms and evaluation activities to encourage a greater focus on outcomes and outputs and direct funding towards initiatives that have demonstrated effectiveness. One challenge for policymakers seeking to strengthen the role of evidence in funding decisions is to leave sufficient room for new ideas and to create synergies between evaluation practices and innovation (Earl and Timperley, 2015[17]).

Box 5.4. Linking evaluations to school funding mechanisms in the Flemish Community of Belgium and the United States

The **Flemish Community of Belgium** provides a good example of linking school funding mechanisms to evaluations and school development. In its 2002 Decree on Equal Educational Opportunities, the Flemish Community has funding to secondary schools implementing additional education support for disadvantaged students and linked this funding to evaluation and monitoring requirements. Secondary schools have considerable flexibility as to how to use the resources, but must follow a three-year cycle consisting of policy planning in the first year, an evaluation in the second year, and an inspection in the third year.

In the **United States**, many federal grants for education programmes are awarded according to a tiered system that takes into account the available evidence of programmes' efficacy. Programmes that have not been evaluated or for which there is little supporting evidence are funded at a smaller scale while higher levels of funding are made available for programmes with stronger supporting evidence. This approach is intended to strike a balance between supporting evidence-informed policies and making room for innovation.

Sources: Nusche, D., et al. (2015[18]), *OECD Reviews of School Resources: Flemish Community of Belgium 2015*, http://dx.doi.org/10.1787/9789264247598-en; OECD (2018[19]), *Education Policy Outlook 2018: Putting Student Learning at the Centre*, http://dx.doi.org/10.1787/9789264301528-en.

However, not all evaluation activities explicitly assess the impact of programmes or policies relative to a set of previously established objectives. This can diminish their potential to help ministries in making spending decisions, prioritising among programmes and influencing their design or operation (OECD, 2017, p. 181[3]; Santiago et al., 2017[20]). One evaluation technique that explicitly aims to support effective spending decisions in the planning of educational resources are value-for-money (V4M) analyses, which may take the form of cost-benefit analyses or cost-efficiency analyses. Both weigh the expected or observed benefits of education programmes, policies or investments against their costs. The scope to perform rigorous value-for-money analyses in the education sector tends to be restricted by data limitations as well as the uncertainty and complexity inherent to the education process. Most decision makers acknowledge these limitations and underlying assumptions of V4M analyses, and therefore use them to complement, rather than substitute for other sources of information during the budgeting procedure (Münich and Psacharopoulos, 2014[21]). Nevertheless, even if the use of V4M analyses in the budgeting process is limited, elaborating frameworks for value-for-money evaluations alone can help stakeholders develop a clearer idea of the costs and benefits associated with specific proposals, which stakeholders they might accrue to over time and whether any side effects or unintended consequences should be taken into consideration (Münich and Psacharopoulos, 2014[21]).

Spending reviews are another important tool providing information to support efficient spending choices, provided that they are well co-ordinated with the budgeting process and provide concrete saving options to be considered alongside the cost of newly proposed policy initiatives. Since the financial crisis in 2008 and the increased fiscal consolidation pressures that followed, spending reviews have gained importance as tool to implement strategic savings through the budgeting process and for "developing and adopting savings measures, based on the systematic scrutiny of baseline expenditure" (Robinson, 2014[22]).

Rather than evaluating new policies and expenditure proposals, spending reviews are primarily designed to identify potential areas for savings in existing budget lines and recurrent expenditure, either through improved efficiency or reductions in services and transfer payments. Spending reviews may be conducted with a pre-defined savings target, as a means to set MTEFs or to define sectoral expenditure ceilings

during the budget preparation. The nature of the reviews varies considerably across countries with regard to their scope, frequency, and the types of saving measures they propose. Yet in 2012, half of the surveyed OECD countries reported to be engaged in a review process and most of these opted for a comprehensive format, identifying saving measures across a wide range of governmental expenditures (OECD, 2017, p. 181[3]; Robinson, 2014[22]). A recent example of an education spending review in **the Slovak Republic** is described in Box 5.5.

Box 5.5. The Slovak Republic's "Value for Money" initiative and review of education spending

The Slovak Republic's "Value for Money" initiative aims to increase the efficiency and effectiveness of public spending across all sectors. As part of the project, the Ministry of Education, Science, Research and Sport (MINEDU) and the Ministry of Finance carried out a review of education spending in 2017. At the school level, the review focused on the rationalisation of the primary and lower secondary school network, the attractiveness of the teaching profession and the remuneration of teachers.

The education spending review generated a number of recommendations including to provide additional support for teachers, especially beginner teachers, and to strengthen the link between teachers' remuneration and the quality of teaching and learning. The review calculated that measures related to the consolidation of the school network, continuous education credits and the proportion of tertiary students pursuing masters' and doctoral degrees could generate cost savings of up to EUR 88 million per year. MINEDU began implementing some of the measures recommended by the review in 2018 and 2019.

The education spending review was supported by the Slovak Republic's Educational Policy Institute (*Inštitút vzdelávacej politiky*, IVP). The IVP serves to support evidence-based policy making and to provide expert advice on strategic decisions based on analyses, forecasts and international best practices. It also aims to stimulate and inform debates on education, science and research. As of 2019, the IVP team consisted of six analysts and a director with plans to increase capacity to eight analysts in 2020.

Sources: OECD (2019[23]), *Education Policy Outlook 2019: Working Together to Help Students Achieve their Potential*, https://doi.org/10.1787/2b8ad56e-en, p. 487 ff.; Ministry of Education, Science, Research and Sport; Ministry of Finance (2017[24]), *Revízia výdavkov na vzdelávanie [Education Spending Review]*, https://bit.ly/2Tukstl.

Spending reviews in OECD countries are usually initiated and designed by the finance ministries but developing the set of savings options typically lies with ministries of education

Spending reviews in OECD countries are usually initiated and designed by the finance ministries and political leaders who decide on the review's scope, timeframe and saving targets. Depending on country-specific factors, such as the composition of review teams, education ministries often play a central role when it comes to developing the final set of savings options to be proposed for implementation (Fakharzadeh, 2016[5]). In order to identify areas for efficiency improvements, review teams rely on high-quality information generated through their own evaluation activities or drawn from existing data on education efficiency. Routinely carrying out evaluation activities can therefore make an important contribution to the quality of spending reviews if their results are relevant, reliable and effectively integrated into the process (OECD, 2017, p. 181[3]; Robinson, 2014[22]).

Spending reviews are increasingly being integrated into the budget preparation process

While spending reviews have traditionally been used by countries on an ad hoc basis, they are increasingly integrated into budget preparation processes (Fakharzadeh, 2016[5]). This implies co-ordinating the

frequency and timing of spending reviews with that of the country's ministerial budget allocations. In some cases, reviews are also timed to ensure that concrete saving options can be presented to the political leadership alongside the cost of newly proposed policy initiatives, which allows them to make a direct contribution to the budget planning process (Robinson, 2014[22]). The simultaneous consideration of spending and saving options makes it possible for governments to adopt new high-priority spending proposals without increasing aggregate expenditure by implementing corresponding saving measures identified in the review process to balance their budget. This process encourages governments to engage in a direct comparison between the merits of new spending proposals and their baseline expenditure (OECD, 2017, p. 181[3]; Robinson, 2014[22]).

Some promising strategies and lessons for policy makers include…

Evaluating the effectiveness of school funding and promoting data transparency

Countries should create the necessary conditions for their financial monitoring systems to evaluate how the use of funding translates into education processes and outcomes. Integrating the analysis of financial and education data is an important condition for identifying effective policies and programmes in order to improve decision making and make better use the available funding for teaching and learning. Achieving this goal requires the collection of comprehensive information about resource inputs, education processes and outcomes as well as long-term outcomes of education that may be more difficult to measure (OECD, 2017, p. 228[3]).

The OECD Review of Evaluation and Assessment in Education (OECD, 2013[25]) conducted an international comparative analysis of evaluation and system-level monitoring practices in education systems. Some of the key policy insights borne out by the review include:

- the importance of adopting a broad concept of education system evaluation;
- the recognition that policy making needs to be informed by high-quality data and evidence, but not driven by the availability of such information;
- creating links between the evaluation of the education system and the broader context of performance measurement frameworks for the public sector;
- the development of an education indicator framework to map available information systematically against education system goals;
- the design of a national strategy to monitor student learning standards; and
- the collection of qualitative information on the education system (OECD, 2017, p. 228[3]; OECD, 2013[25]).

Placing special attention on the impact evaluation of equity targeted funding programmes…

Many countries show considerable commitment to supporting students at risk of underperformance with targeted financial resources. In order to determine the extent to which these resources meet students' needs, they should be accompanied by a careful evaluation of their impact on relevant student groups, such as socio-economically disadvantaged students, students with a migrant background, or students with special education needs. Analysing the relationship between investments in equity and student outcomes can be a key step to understanding what works to improve equity in schooling. The success of this hinges on the formulation of clear equity targets, indicators and the collection of sufficiently disaggregated data to measure their attainment (OECD, 2017, p. 229[3]).

… and in multi-level systems, the development of integrated data systems and a culture of budget reporting and evaluation at all levels of the system

As a result of governance arrangements and split responsibilities, data on different aspects of the school system are often split across multiple levels of governance and institutions. This can obfuscate resource flows and prevent a full picture of education inputs, processes and outcomes. Countries should seek to integrate existing databases and information on resource use and education results in order to monitor resource effectiveness, facilitate better decision making and improve transparency. In decentralised school systems, integrated data systems should also make disaggregated data available to sub-central levels of governance. Common reporting standards for budgeting and accounting can ensure data comparability across the system (OECD, 2017, p. 228[3]). Particular emphasis should also be placed on developing analytical capacity, systematic and robust processes of policy and programme evaluation and a culture of using evidence as well as strategic budget planning processes that accord a central place to the use of evidence (OECD, 2017, p. 228[3]).

Promoting transparency around budgets and the use of financial resources at all relevant levels of the school system can support the evaluation process. Budgetary reporting can provide decision makers with clear information about resource use on which to base their decisions and facilitate the robust analysis of financial and non-financial data and thus enhance the quality of policy decisions. At the central level, authorities should provide information about expenditures by levels of education and different sub-sectors, different expenditure categories, localities or even individual schools, as well as information about the sources of funds for investment in the school system. This can strengthen public participation and oversight. Budgetary reporting should also be linked to evidence about the quality and equity of the school system in relation to established policy objectives and targets. This could help to communicate the goals of the investments in the school system and build social consensus about fiscal efforts for schooling. To this end, countries can develop a national reporting framework that brings together financial indicators and performance indicators, including information on the learning outcomes for students at risk of low performance (OECD, 2017, p. 231[3]).

Strategically using evaluation and research evidence in the budgeting process and the development of budget proposals

Effectively planning the use of educational resources relies on the systematic mobilisation of evidence generated through research, evaluations and monitoring activities. Evidence on the efficiency of spending choices should inform discussions among stakeholders and help the responsible authorities take informed decisions throughout the budget preparation process. To inform evidence-based budget planning effectively, the data generated by evaluation activities should explicitly assess the impact of programmes and policy initiatives, ideally relating it to previously established objectives and cost information. Systems should also consider ways to integrate evaluations into their school funding mechanisms in order to orient their approach to budgeting and financial management towards a greater focus on outcomes and outputs (see the example from the Flemish Community of Belgium in Box 5.4).

If they are well co-ordinated with the budgeting process, spending reviews can prove another important source of information to support efficient spending choices. To this end, the timing and frequency of spending reviews should be aligned with central-level budget planning procedures to ensure that concrete saving options are identified and presented to the political leadership at a time when they can be considered alongside the cost of newly proposed policy initiatives (OECD, 2017, p. 181[3]).

Establishing fora for professional discussion of evaluation and spending review results and evidence, across different ministries and agencies and across all levels of the system

The effective integration of evidence generated through research, evaluations and spending reviews into the policy making and budgeting process can be facilitated by fostering dialogue between ministries and agencies and across all levels of the system. The successful implementation of education policies requires careful policy design, effective communication and inclusive stakeholder involvement. Education ministries are uniquely positioned to address these challenges, connect resourcing strategies to education priorities and build strong partnerships to work towards them. Finance ministries, on the other hand, can play a key role in supporting education ministries with relevant expertise during the budgeting process, including to identify potential efficiency gains and work towards aggregate fiscal integrity. Fostering dialogue between ministries of finance and education can also serve to identify where horizontal support, guidance and the strategic use of tools like spending reviews can improve the budgeting process. At times of increased fiscal scrutiny, strengthening the collaboration between ministries of finance and ministries of education is therefore more important than ever.

Education systems should also create fora that foster co-operation between researchers and policy makers as well as institutions that can act as knowledge brokers and strategically consolidate, evaluate and disseminate evidence to facilitate its integration into the budgeting processes. Particularly in decentralised systems, school principals and local authorities should be encouraged and enabled to use data and research evidence for budgeting purposes through training as well as vertical and horizontal support. It is important to ensure that stakeholder groups can contribute to discussions regarding the design of evaluations, the evidence collected and the interpretation of evaluation outcomes (OECD, 2017, p. 181[3]).

Strengthening sub-central capacity for the budgeting process

Regional and local actors and even school authorities are increasingly involved in budget planning and resource allocation

Given the trend towards decentralisation in many OECD countries, the relationships between central governments, ministries, regional and local actors as well as their respective responsibilities in the education budgeting process have been subject to change (see Chapter 3). In some systems, local authorities are increasingly involved in resource planning, assuming responsibilities both for the allocation and budgeting of locally raised resources and for administering central grants. Local and regional actors may thus be responsible for developing budget proposals that outline the use of financial resources or their further distribution among sub-central levels of administration and schools (OECD, 2017, p. 169[3]). In some systems, even school-level authorities enjoy a high degree of autonomy in planning their budgets and allocating resources.

Giving local authorities and school leaders greater responsibility during the budget development and planning process can strengthen their accountability and promote their ownership of the budget. It can also enhance their ability to use their operational knowledge of the local context in order to efficiently and effectively respond to local challenges and needs. However, enabling local authorities and school leaders to perform this task adequately requires a commitment to developing capacity at both the central and local levels (OECD, 2017, p. 171[3]). While school and sub-system authorities require technical skills to prepare and monitor budget plans, the central level requires the capacity to oversee and provide effective guidance for the decentralised planning process (IIEP-UNESCO, 2010[6]). Particularly smaller communities often lack the training or resources to engage in strategic budget planning. Making budgetary autonomy work may therefore require an investment in local administrative personnel as well as effective self-evaluation and accountability mechanisms (OECD, 2017, p. 159[3]).

In decentralised systems, the roles, responsibilities and degree of autonomy of sub-central authorities over budgeting and spending vary greatly across countries

Although the trend towards fiscal decentralisation has not been universal by any means, local authorities have become increasingly involved in resource planning processes in many OECD countries. The extent of local actors' responsibilities varies greatly. In some cases, local and regional actors are responsible for developing budget proposals that outline the use of financial resources or their further distribution among sub-central levels of administration and schools, based on regulations and requirements inscribed in national legislation, Education Acts and other statutes. Other decentralised systems issue fewer prescriptions concerning the use of particular budgeting and accounting procedures at the sub-central level, leaving the process to local actors to define. In **Denmark**, for instance, each municipality is responsible for devising and implementing its own budget planning approach (Nusche et al., 2016[7]).

Likewise, the responsibility of schools in the budgeting process can take different forms, ranging from systems that give schools little to no control over the allocation of their resources to systems that give schools wide-ranging autonomy over the planning, execution and monitoring of their expenditure (OECD, 2017, p. 170[3]) (see Box 5.6).

Box 5.6. Schools' budgeting responsibilities in selected OECD countries

In **Estonia**, leaders of municipal schools submit their budget proposals to be approved by the municipal authorities, while the central education authority is responsible for approving state school budgets (Santiago et al., 2016[26]).

In **Lithuania**, as in a number of OECD systems, school boards play a more active role in the budget planning process. Typically composed of staff, parents, students and sometimes community representatives, they approve school budgets and often take part in budgeting decisions concerning the use of personal income tax revenues (Shewbridge et al., 2016[27]).

In the **Flemish Community of Belgium**, school boards, which are responsible for the governance of one or multiple schools, enjoy a high degree of autonomy concerning their use of resources and are responsible for setting up their own budgeting and accounting systems in compliance with the rules and procedures of their education network (Flemish Ministry of Education and Training, 2015[28]).

Sources: Santiago, P. et al. (2016[26]), *OECD Reviews of School Resources: Estonia 2016*, http://dx.doi.org/10.1787/9789264251731-en; Shewbridge, C. et al. (2016[27]), *OECD Reviews of School Resources: Lithuania 2016*, http://dx.doi.org/10.1787/9789264252547-en; Nusche, D., et al. (2015[18]), *OECD Reviews of School Resources: Flemish Community of Belgium 2015*, http://dx.doi.org/10.1787/9789264247598-en.

There is also variation in the extent and modalities of guidance and support received from central authorities for budget planning and management at lower levels of the system

Even in systems with extensive local budgeting autonomy, there are several ways in which the national or regional level can assist local actors in the management of financial resources. In countries like the **Czech Republic**, **Estonia** and the **Slovak Republic**, schools or school owners are provided resources to employ specialised administrative staff such as accountants and budget officers (Shewbridge et al., 2016[29]; Santiago et al., 2016[26]; Santiago et al., 2016[30]). Likewise, some countries ensure that training on financial resource management and goal-oriented budgeting is integrated into professional development strategies for local and school-level leaders (OECD, 2017, p. 159[3]).

Central education authorities can also develop guidelines to assist with school finance and management procedures, provide feedback on the progress towards education goals and co-ordinate the co-operation among actors across education levels for a whole-of-system approach to budgeting (Burns and Cerna, 2016[16]). Guidance and requirements may be communicated through different methods, such as budget circulars, budget laws, generally accepted accounting standards, charts of accounts and budget classifications. Furthermore, ministries of education and their budget planning units or ministries of finance may provide intermediate authorities with guidelines concerning financial management in education as well as budgeting and accounting practices (OECD, 2017, p. 169[3]; Fakharzadeh, 2016[5]).

In many countries where school leaders or school boards are responsible for planning their own budgets, the type of information they use in the process is at their discretion. However, to support local budgeting, several countries have developed central consulting and advisory services that act as knowledge brokers, offering their services to schools and supporting them in making strategic spending choices. Box 5.7 describes how such forms of vertical and horizontal co-operation support local actors in **Denmark** in assuming their responsibility for strategic budgeting.

Box 5.7. Supporting local budget planning in Danish schools and municipalities

Danish school leaders enjoy extensive responsibility for the development of school budget plans and a high level of autonomy in their spending decisions since the largest part of school funding is not earmarked. To support school leaders in their resource management decisions, some municipalities' education offices help school leaders with technical aspects of school budgeting such as accounting and book-keeping, which allows principals to concentrate more on the strategic and pedagogical organisation of the school. In addition, some municipalities co-operate with schools in the delivery of services and can help them achieve economies of scale, for example by buying materials and services for several schools at the same time.

School boards play a formal role in approving school budgets, adding a degree of horizontal accountability to the budgeting process. The 2014 *Folkeskole* reform has provided the national parents' association with financial support to further develop the competences and professionalism of school boards so they can exercise this role effectively. Municipalities are expected to prepare and implement development plans for under-performing schools. If there is evidence of persistent underperformance in schools, the central level can provide additional support and recommend municipalities and schools to work with central learning consultants to improve processes and outcomes.

Sources: Nusche, D. et al. (2016[7]), *OECD Reviews of School Resources: Denmark 2016*, http://dx.doi.org/10.1787/9789264262430-en; Reproduced from OECD (2017[3]), *The Funding of School Education: Connecting Resources and Learning*. http://dx.doi.org/10.1787/9789264276147-en, Box 4.3.

The centralised provision of electronic budgeting platforms or the supply of relevant data through central information management systems can be another way for the central government to support schools and local authorities in their budget planning activities (OECD, 2017, p. 160[3]; OECD, 2013[25]). Examples of such central information systems to support school-level budgeting practices include the following:

- All schools in **Iceland** have access to IT systems supporting their budgeting and accounting procedures. The systems are provided by the central government and the respective municipalities but do not comprise tools that are specifically geared towards the planning of financial resources (Icelandic Ministry of Education Science and Culture, 2014[31]).
- In **Estonia**, larger municipalities have developed remote electronic accounting systems for their schools. These systems relieve schools of the costs of keeping their own accounts while also giving them the ability to monitor their budgets on a day-to-day basis (Santiago et al., 2016[26]).

- **Lithuanian** schools are supported in their budgeting and accounting through the ministry's education management information system (EMIS) which gives them ready access to various indicators from student teacher ratios and class sizes to school buildings' surface area per student and heating costs (Fakharzadeh, 2016[5]).

Some promising strategies and lessons for policymakers include…

Strengthening local capacity and accountability for the management of financial resources

The active involvement of local actors and school authorities in the budgeting process can help leverage their operational knowledge in order to efficiently and effectively respond to local challenges and needs. However, the success of decentralised decision making requires a commitment to building technical and strategic capacity at the local level and extending central support. It also relies on governance arrangements that ensure each level of government is accountable for the specific spending decisions it takes. Oversight of the use of school funding at the local level can help ensure that decisions on the use of financial resources meet local needs and provide conditions for strong local accountability. However, sub-central authorities may have little capacity for the monitoring and evaluation of how their use of funding relates to teaching and learning. Central education authorities and central inspection services can play an important role in providing complementary expertise and in evaluating the pedagogical aspects of school operations (OECD, 2017, p. 230[3]).

Strengthening school capacity and accountability for the management of financial resources whenever schools have budgetary autonomy

In countries where schools have significant autonomy over the management of school funding, the effectiveness of its use should be an integral part of external school evaluations, school self-evaluations and school leader evaluations. This can help to promote a more effective use of resources that takes into account pedagogical considerations and the impact of resource use on teaching and learning. Evaluating the effectiveness of the use of funding at the school level should go beyond considerations of compliance. It should also assess how schools use their funding to promote the general goals of the school system, how they implement their school development plan and ultimately improve teaching and learning for all students based on a common vision of a good school. It should combine both pedagogical and financial aspects of school operation, and review how resource use affects the achievement of strategic goals and the quality of teaching and learning. The information from external and internal evaluations should result in helpful feedback to schools to inform their decision making on how to make better use of their resources and promote school development (OECD, 2017, p. 229 f.[3]).

It is important to build the evaluation and monitoring capacity of school leaders and school boards. School leaders need to be able to collect and report data on school budgets and student outcomes to their responsible authorities as well as the school community in effective ways. Central authorities could provide exemplars of good practice in data analysis, reporting and communication to make sure some minimum requirements are met. The school community, including teachers, should have a prominent role in monitoring the use of funding at a local level as part of their overall role for school development and receive training in this area. This should involve identifying key groups of stakeholders and ensuring that they all have a voice in school boards without any group dominating. Providing school boards with the tools to interpret and analyse data and other evaluation processes can be an important part of giving them the expertise they need to take part in multiple accountability systems (OECD, 2017, p. 230[3]).

Broader strategies to build local and school capacity should also pay attention to the competencies of education administrators for implementing financial monitoring and evaluation processes. This should involve training in skills to make connections between resource use decisions and the quality of teaching and learning and the ability to use the resulting data for improvement. A review of existing approaches by

different sub-central authorities can serve to identify and share examples of good practices. In decentralised systems with incipient monitoring and evaluation practices by sub-central education authorities, establishing reporting requirements may provide a stimulus to develop evaluation practices. However, it is important to bear in mind that such reporting requirements increase administrative burdens on local actors and may also encourage authorities, and thus schools, to focus on the goals that they are required to report on. Formulating competency profiles for local officials can also be one way to clarify expectations (OECD, 2017, p. 230[3]).

Key messages

Increasingly tight public budget constraints and competing financial priorities as well as complex governance structures call for well-co-ordinated, evidence-based and effective school funding. In this light, this chapter discussed practices to successfully plan, monitor and evaluate school funding policies.

Firstly, policy makers must take a forward-looking approach to budget planning which draws on a shared understanding of system-level goals: multi-annual budget plans which are aligned with national strategic documents and establish clear performance targets can provide clear directions for education policy. While medium- and long-run planning are necessary to provide a stable and reliable basis for policy making, budget plans must also maintain the flexibility needed to respond to unforeseen circumstances.

Secondly, increasingly complex education governance systems call for effective monitoring and evaluation to ensure the efficient use of resources in line with system-level goals. Conducting spending reviews and impact evaluations against concrete objectives can help to increase accountability for education spending across levels of governance and provide evidence for future policy making.

Thirdly, fiscal decentralisation trends require efforts to build capacity for monitoring and evaluation at local and school levels. Training, guidelines and advisory services could be provided to assist sub-central actors in collecting and interpreting data and using it to enhance their resource allocation.

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Notes

[1] Austria, Belgium (Fl. and Fr.), Chile, Czech Republic, Denmark, Estonia, Iceland, Israel, Kazakhstan, Lithuania, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Uruguay.

Value for Money in School Education

SMART INVESTMENTS, QUALITY OUTCOMES, EQUAL OPPORTUNITIES

Policymaking has always been a matter of making choices, managing trade-offs and balancing multiple goals and priorities to make complex budgetary decisions. Yet, the past few years have seen a rising number of priorities facing policymakers, hence mounting pressure to enhance the efficiency of public spending. There is a strong case for public investment in high-quality education as it leads to a range of economic outcomes as well as broader social outcomes for both individuals and society. But while high-quality education will continue to enable individuals and societies to thrive and recover from disruptions, education ministries will need to rethink the way they invest in education to ensure that education systems deliver greater value for money. Following an introduction laying out the context, this publication first takes stock of the wealth of economic returns and broader social outcomes derived from high-quality education, making the case for continued public investment. It then turns to the examination of smart ways of investing in education and examines key policy levers that can help enhance value for money: governing and distributing school funding to make the most of education investments; achieving educational equity alongside greater efficiency; and planning, monitoring and evaluating the efficient use of school funding.

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