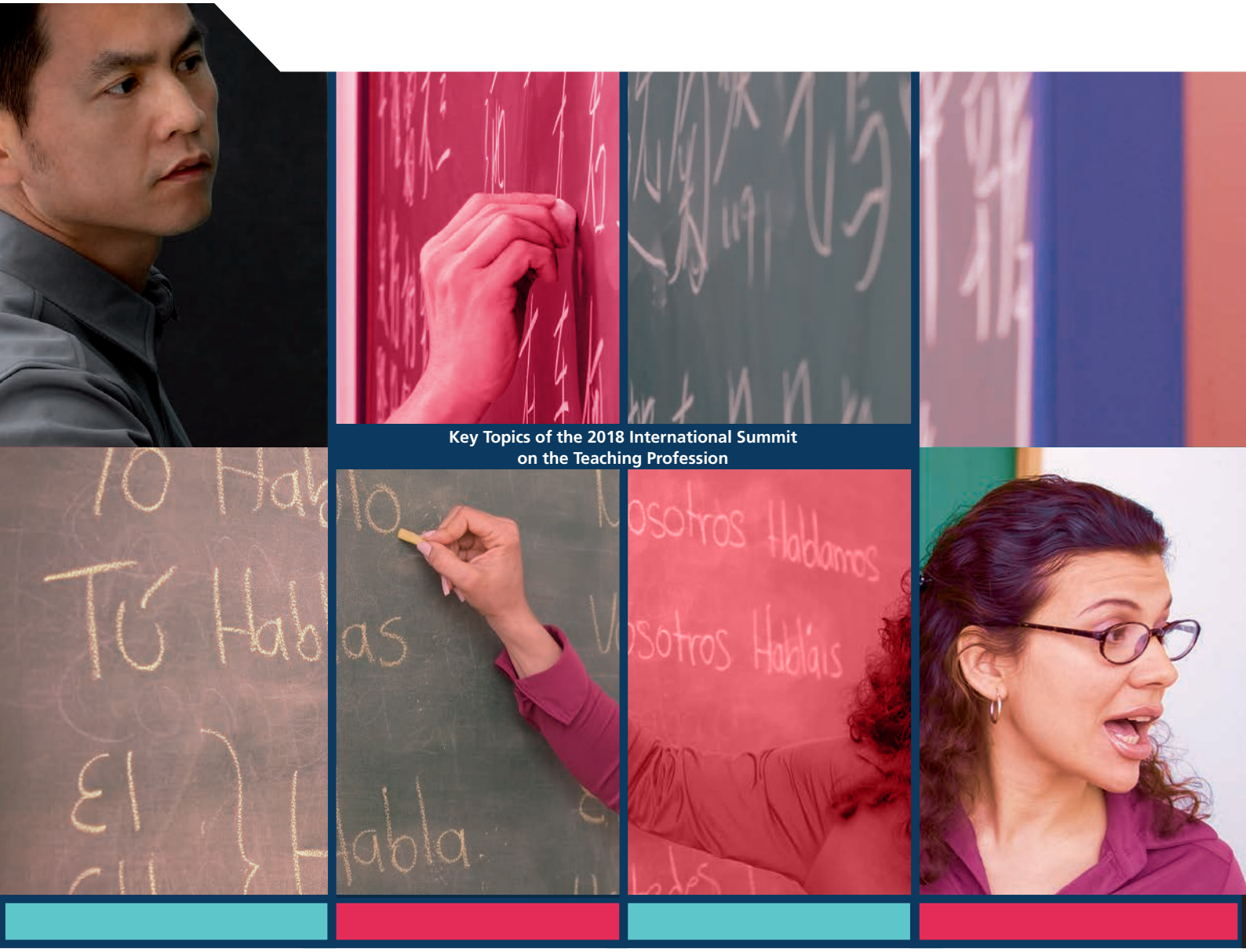
International Summit on the Teaching Profession

Valuing our Teachers and Raising their Status

HOW COMMUNITIES CAN HELP

Andreas Schleicher



Key Topics of the 2018 International Summit on the Teaching Profession

OECD

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Andreas Schleicher

OECD
BETTER POLICIES FOR BETTER LIVES

Please cite this publication as:
Andreas Schleicher (2018), *Valuing our Teachers and Raising their Status: How Communities Can Help*, International Summit on the Teaching Profession, OECD Publishing, Paris.
http://dx.doi.org/10.1787/9789264292697-en

ISBN 978-92-64-29261-1 (print)
ISBN 978-92-64-29269-7 (PDF)

Series: International Summit on the Teaching Profession
ISSN 2312-7082 (print)
ISSN 2312-7090 (online)

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Foreword

The knowledge and skills that students need to contribute effectively to society are changing constantly. The dilemma for educators is that the kinds of knowledge and skills that are easy to teach and test are exactly the skills that are also easiest to digitise, automate and outsource.

So expectations on teachers are high and growing. We expect them to have a deep and broad understanding of what they teach and the students they teach, because what teachers know and care about makes such a difference to student learning. That entails professional knowledge (i.e. about 21st century disciplines, about the curriculum of specific disciplines and about how students learn in those disciplines), as well as knowledge about professional practice that enables teachers to create effective learning environments to foster the cognitive, social and emotional aspects leading to good learning outcomes. It also entails an understanding of the research-theory-practice nexus and the inquiry and research skills that allow teachers to become lifelong learners and grow in their profession.

But we expect much more than what we put into teachers' job descriptions. We also expect teachers to be passionate, compassionate and thoughtful; to make learning central and encourage students' engagement and responsibility; to respond effectively to students of different needs, backgrounds and languages; to promote tolerance and social cohesion; to provide continual feedback and assessments of students; and to ensure that students feel valued and included and that learning is collaborative. And we expect teachers themselves to collaborate and work in teams, and with other schools and parents, to set common goals, and to plan and monitor the attainment of goals.

And there is more to this. Successful people generally had a teacher who was a mentor and took a real interest in their life and aspirations, who helped them understand who they are, discover their passions and how they can build on their strengths, teachers who taught them how to love to learn and build effective learning strategies and helped them find out how they can make a difference to social progress.

But our education systems are not keeping up. Most schools look much the same today as they did a generation ago, and teachers themselves are often not developing the practices and skills required to meet the diverse needs of today's learners.

In March 2018, with support from the OECD and Education International, the Portuguese Ministry of Education is bringing education ministers, union leaders and other teacher leaders together in Lisbon for the eighth International Summit on the Teaching Profession. Focusing on *New challenges and opportunities facing the teaching profession in public education*, the Summit will seek to identify how to better support the teaching profession to meet the formidable challenges of 21st century education.

It is clear that schools do not operate in a vacuum. Successful schools depend on the resources and support of their communities, and schools at the centre of their communities are often the most successful. In turn, schools are vital to the social health of their local communities. What can policy makers and the teaching profession do to strengthen links with communities? How can schools truly engage the local community and contribute to corporate social responsibility? These are some of the questions for the first session of the 2018 Summit.

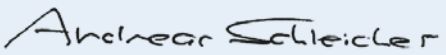
But at the heart of education is pedagogy. Many teachers have a good sense of the kind of pedagogies on which 21st century learning hinges, but there is a major gap between intended and implemented practices. How can education systems create the conditions for encouraging and supporting teachers to initiate, share and evaluate innovative pedagogies, including new technologies? What are the implications of new pedagogies for the roles of teachers and students? The 2018 Summit will address these issues in its second session.

In its third session, the Summit will turn to teachers themselves. There is a growing recognition that for teaching and learning to be most effective, teachers need to have high levels of well-being, self-efficacy and confidence. This mirrors increasing evidence that students' well-being, efficacy and confidence are vital for their learning. How can governments, in partnership with teachers' unions, create evidence-informed strategies on well-being, efficacy and effectiveness as part of their teacher policies?

One of the secrets of the success of the International Summit on the Teaching Profession is that it explores difficult and controversial issues on the basis of sound evidence, provided by the OECD, as the global leader for internationally comparative data and analysis.

This report, *Valuing our Teachers and Raising their Status: How Communities Can Help*, summarises evidence that underpins the 2018 Summit, bringing together data analysis and experience to develop better education policies for better lives.

The report was written by Andreas Schleicher, with contributions from Karine Tremblay, Pablo Fraser and Sakshi Mishra, and support from Susan Copeland. It is based on data, comparative analysis and reports from the OECD. Chapter 1 sets the scene and discusses emerging trends, challenges and opportunities in today's education systems and their implications for teachers and policy makers. Chapter 2 draws from and builds on *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools* (drafted mainly by Alfonso Echazarra and Esther Carvalhaes), *PISA 2015 Results (Volume III): Students' Well-Being* (drafted mainly by Mario Piacentini) and *Schools at the Crossroads of Innovation in Cities and Regions* (drafted mainly by Dirk van Damme). Chapter 3 builds on *TALIS 2013 Results: An International Perspective on Teaching and Learning* (drafted mainly by Michael Davidson), *Ten Questions for Mathematics Teachers… and How PISA Can Help Answer Them* (drafted mainly by Kristen Weatherby), "Do new teachers feel prepared for teaching?", *Teaching in Focus, No. 17* (drafted mainly by Yoon Young Lee), "Understanding teachers' pedagogical knowledge: report on an international pilot study", *OECD Education Working Papers*, No. 159 (drafted by Kristina Sonmark, Nora Revai, Franscesca Gottschalk, Karolina Deligiannidi and Tracey Burns) and *Innovative Learning Environments* (drafted mainly by David Istance). Chapter 4 builds on *TALIS 2013 Results: An International Perspective on Teaching and Learning* and *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*.



Andreas Schleicher

Director for Education and Skills and Special Advisor on Education Policy to the Secretary-General

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Executive Summary

EMERGING TRENDS, CHALLENGES AND OPPORTUNITIES

Digitalisation connects a majority of the world's population in ways that vastly increase our individual and collective potential. But the same forces have also made the world more volatile and more complex. However, the disruptive implications of digital technologies for our economic and social fabric should not predetermine societal outcomes. Education will play a key role in determining how the next decades will play out for individuals, nations and the planet. But this requires preparing students to look towards the future, not the past, and that is why smart educational policies are so important nowadays.

Schools need to prepare students more and more for rapid changes – to train for jobs that have not yet been created, to tackle societal challenges that have not yet transpired and to use technologies that have not yet been invented. They also need to prepare students for an interconnected world, in which students understand and appreciate different perspectives and world views, interact successfully and respectfully with others and take responsible action towards sustainability and collective well-being. Educational success is no longer primarily about reproducing content knowledge, but rather about extrapolating from what we know and applying that knowledge creatively in novel situations, creating value by making connections between different fields of knowledge and ideas that previously seemed unrelated, and collaborating with others to mobilise, share and integrate knowledge and take collective action. These evolving skills demands have elevated the role of social and emotional skills such as perseverance, empathy, understanding others' perspective, mindfulness, ethics, courage and leadership. But very few education systems have made such broader goals an integral part of what they expect from students.

Developing these types of skills requires a very different approach to learning and teaching and a different calibre of teachers. Today, the challenge is to turn teaching into a profession of advanced-knowledge workers governed by professional norms of control and benchmarks in lieu of bureaucratic and administrative oversight. It is imperative that teachers take ownership of their profession as the pace of change in 21st-century school systems requires building on their expertise to design policies and practices. Even though governments are not able to directly implement changes in the classrooms, they can help by sharing their vision for 21st century learning, building and communicating the case for change, and supporting the shift in paradigm through smart strategies to make change happen.

Many teachers and schools are ready for that. To encourage their growth, policy makers need to inspire and enable innovation, and empower change through enhanced autonomy, encouraging risk-taking, and identifying and sharing best practice. They can work towards this shift in thinking by building trust through healthy relationships with the profession and constructive transparency. Interestingly, many of the countries with the strongest student performance also have strong teachers' unions who are treated as trusted professional partners, working constructively with policy makers to facilitate a constructive dialogue based on research and evidence.

SCHOOLS AT THE CENTRE OF THEIR COMMUNITIES

Successful schools depend on the resources and support of their communities and in turn, they contribute to the social health of their local communities; schools at the centre of their communities are often the most successful. One obvious way for schools to involve their communities is through engaging parents. As families are the first social unit in which children learn and develop, it is not surprising then that interactions with parents have consistently been shown to influence students' achievement motivation, expectations, attitudes and psychological health. Parents are also key players in helping their children succeed at school. Therefore, school policies need to remove barriers that hinder parents' regular participation in school activities and foster their engagement with their children, schools and communities.

But the link with parents is just one dimension. Schools can shape their communities in many ways. They are increasingly looking outward, opening up to local communities and to learning opportunities that the local environment provides through extracurricular activities that enrich the life of the local community in sports, social care, volunteer work and culture. R&D projects can also offer innovative answers to the needs of local businesses and non-profit organisations, while providing students with real-world experiences and enhancing their entrepreneurialism.

Yet, because local communities differ in wealth and cultural capital, schools do not find themselves on a level playing field. Many OECD countries still face difficulties in equipping socio-economically disadvantaged schools to effectively address the challenges they face and offer their students a high-quality education. But policies can overcome community disadvantage by aligning resources with students' needs by sending the best teachers to work with the students who are having the greatest difficulty reaching national standards, or using formula-based school funding to advance equity objectives. Schools can also become partners in serving the needs of populations at risk in local communities. Levelling the playing field also requires policy makers to address regional discrepancies and ensure that all students can benefit from quality education. This is particularly true for rural communities facing pressure to consolidate school offer because of declining student populations, while at the same time attracting qualified teachers. This may require redesigning the school network and clustering small rural schools into larger hubs with a critical mass of students.

A wide range of indirect background factors can influence the role of schools in their communities such as: student admissions policies; parents' ability to choose schools; whether there is tracking/selection of students on grounds of ability and aptitude; system-wide forms of accountability and assessment; and forms of national curricula. Public policy can help reconcile aspirations for greater flexibility in school systems and more opportunities for parents to choose their child's school with the need to ensure quality, equity and coherence in school systems.

ENABLING PEDAGOGIES FOR THE FUTURE

New forms of pedagogy are evolving all the time and go hand in hand with teachers' professional development. Teachers' learning opportunities shape not only their knowledge of the subject(s) they teach and pedagogy in general, but also their beliefs about teaching, motivational and affective skills.

The traditional view of a classroom that has existed for generations in schools around the world consists of teacher-directed instruction characterised by lectures, lesson summaries or question-and-answer periods that are driven by the teacher. But over the past decades, education specialists have encouraged giving students more control over the time, place, path and pace of learning, and student-oriented teaching strategies are increasingly finding their way into classrooms.

However, recent research suggests that teachers need a diverse set of tools to help students advance from the most rudimentary to the most complex mathematics problems, with teacher-directed learning more likely to be successful in solving the former and student-oriented teaching strategies more successful with more complex tasks. It is also interesting that different approaches foster different cognitive skills in students: teacher-directed approaches are better predictors for cognitive learning outcomes, while student-oriented approaches are better predictors for social and emotional outcomes, including career expectations.

Innovating the pedagogical core means transforming or rethinking the organisational relationships and dynamics of most schools today to make them relevant for the 21st century:

- from the lone teacher to team teaching, collaborative planning, informal reflection and feedback, thus enabling learning and sharing good practice
- from individual classrooms to learners increasingly mixing across age and ability levels to encourage individualised education, peer support and autonomous learning
- from the familiar class schedule and bureaucratic units to fewer and longer learning periods for greater flexibility and deeper learning
- from the traditional approaches to teaching and classroom organisation to an increased focus on inquiry approaches and collaborative work, project-based learning, interdisciplinary learning, real-life problems and taking full advantage of communication technologies.

There is evidence that the way we think of schools is being reimagined in some innovation pockets, with teachers and schools adopting creative approaches. But how can public policy enable developing and implementing effective pedagogical practice at the system level? One approach to foster innovation in schooling has been to increase autonomy,

diversity and competition among educational institutions. Digitalisation is another policy avenue for enhancing innovation in education, while being mindful that if technology can amplify great teaching, it cannot replace poor teaching. But many practitioners just do not believe that the problems they face can be solved by science and research: they believe that teaching is an individual art based on inspiration and talent, not a set of skills that you can acquire throughout your career. This problem often goes back to policy, given the lack of incentives and resources to codify professional knowledge and know-how, and limited room for non-teaching working time to support a serious engagement of teachers in knowledge creation. The answer is to strengthen trust, transparency, professional autonomy and the collaborative culture of the profession, all at once.

TEACHERS' WELL-BEING, CONFIDENCE AND EFFICACY

There is growing recognition that for teaching and learning to be most effective, teachers need to have high levels of well-being, self-efficacy, and confidence. This mirrors increasing evidence that students' well-being and confidence are vital for their learning. Yet, demands on teachers are high and growing: we expect them to have a deep and broad understanding of what they teach and the students they teach as well as an understanding of the link between research, theory and practice, and the inquiry and research skills that allow teachers to become lifelong learners and grow in their profession. Moreover, teachers today are increasingly expected to perform additional tasks such as facilitating the development of students' non-cognitive skills, responding to students' individual differences and working collaboratively with other teachers and parents to ensure the holistic development of their students.

In this context, it is no surprise that teacher stress and well-being have become a prominent issue in the policy and public debate. Research suggests that stressful working environments may affect teachers' motivation, self-efficacy and job commitment, which can in turn affect the education system as a whole through frequent turnover and efficiency costs. The quality of teachers' instruction and practice is also at risk, as stressed or burnt-out teachers can hardly operate effectively in the classroom. Evidence from TALIS indicates that less than one-third of teachers believe that their profession is valued in society, while PISA shows that the most successful education systems are those where society values teachers. This raises the question of whether governments should now prioritise teachers' well-being.

It is disappointing how little systematic evidence is actually available about the well-being of teachers. The most extensive research at the international level concerns teachers' self-efficacy and it shows that this is more important for policy than a superficial reading might indicate. It is not just about making sure that teachers are happy and feel good about themselves and their teaching, although that is important as well. High levels of teacher self-efficacy influence academic outcomes of students and are also associated with student motivation and other positive teacher behaviours, such as job satisfaction and retention.

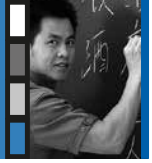
Chapter 1

EMERGING TRENDS, CHALLENGES AND OPPORTUNITIES

School systems need to adapt to economic and social changes to equip students with the relevant skills, knowledge, attitudes and values needed for success in future life and work. The expansion of technology, particularly the advent of digitalisation, presents new opportunities and challenges to prepare students to be lifelong and lifewide learners. Students now need to not only learn information but also understand how to use it, they need to interact successfully and respectfully with others, and take responsible actions and work together towards collective well-being. Equipping students with these skills requires innovation and a change in the approaches towards teaching and learning. Teachers are key actors in creating this context for learning and growth and can help establish effective learning environments. As we move into the future, new forms of educational provision will be needed that recognise the essential role that teachers play in transforming classrooms and to support them in their endeavour. This chapter explores the implications of the digital transformation on education systems and explains how teachers and policy makers can work together to harness its potential.

Note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.



PREPARING STUDENTS FOR THEIR FUTURE, NOT OUR PAST

Digitalisation is connecting people, cities, countries and continents, bringing together a majority of the world's population in ways that vastly increase our individual and collective potential. But the same forces have also made the world more volatile, more complex and more uncertain. The rolling processes of automation and hollowing out jobs, particularly for routine tasks, have radically altered the nature of work and life. For those with the right knowledge, skills and character qualities, this has been liberating and exciting. But for those who are insufficiently prepared, it can mean vulnerable and insecure work and life without prospects. As our economies shift towards regionalised hubs of production, linked by global chains of supply and information, but concentrated in locations where comparative advantage can be built and renewed, the distribution of knowledge and wealth is key, and that is closely tied to the distribution of educational opportunity.

While digital technologies can have disruptive implications for our economic and social fabric, these are not predetermined. It is the nature of our collective and systemic responses to these disruptions that will determine the outcomes, the continuous interplay between the emerging technological frontier and the range of cultural, social, institutional and economic ingredients, including education, that we combine in response. That is why smart educational policies are so important and why their design and implementation hinge on support from many stakeholders.

Education will be a key differentiator for how the next decades will play out for individuals, nations and the planet. But education needs to prepare students for their future, not our past. When it was still possible to assume that what we learn in school would last for a lifetime, teaching content knowledge and routine cognitive skills were rightly at the centre of education. Today, when we can access content on line and routine cognitive skills are being digitised and outsourced, the focus must shift to enabling people to become lifelong and lifewide learners. Schools now need to prepare students for more rapid change than ever before, to learn for jobs that have not yet been created, to tackle societal challenges that we cannot yet imagine and to use technologies that have not yet been invented. And they need to prepare students for an interconnected world, in which students understand and appreciate different perspectives and world views, interact successfully and respectfully with others and take responsible action towards sustainability and collective well-being.

Lifelong learning is about constantly learning, unlearning and relearning when the contexts change, and it entails continuous processes of reflection, anticipation and action. Reflective practice is needed to take a critical stance when deciding, choosing and acting, by stepping back from what is known or assumed and by taking different perspectives. Anticipation mobilises knowledge and cognitive skills, such as analytical or critical thinking, to foresee what might be needed in the future or how actions taken today might have consequences for the future. And both reflective practice and anticipation contribute to the willingness to take responsible actions, in the belief that we all have the power to shape and change the course of events. This is how agency is built. Through anticipation, action and reflection, we assemble the competences that enable us to engage with the world – incisively, sensitively and responsibly. So modern schools need to help students to constantly evolve and grow and to find and adjust to their right place in a changing world.

These days, we no longer know how things will unfold. Frequently, we are surprised and need to learn from the extraordinary, and sometimes we make mistakes along the way. But it will often be our mistakes and failures, when properly understood, that create the context for learning and growth. By strengthening cognitive, emotional and social resilience, education can help people, organisations and systems to persist, perhaps even thrive, amid unforeseeable disruptions. Collectively, education can provide communities and institutions with the flexibility, intelligence and responsiveness they need to thrive in social and economic change.

Of course, state-of-the-art knowledge will always remain important. Innovative or creative people generally have specialised skills in a specific field of knowledge or practice. As much as learning-to-learn skills are important, we always learn by learning something. However, educational success is no longer mainly about reproducing content knowledge, but rather about extrapolating from what we know and applying that knowledge creatively in novel situations. And epistemic knowledge[1] (e.g. thinking like a scientist, philosopher or mathematician) is taking precedence over knowing specific formulas or equations.

The conventional approach in school is often to break problems down into manageable bits and pieces and then to teach students how to solve these bits and pieces. But modern societies create value by synthesising different fields of knowledge, making connections between ideas that previously seemed unrelated. That requires being familiar with and receptive to knowledge in other fields.

In today's schools, students typically learn individually, with their individual achievements certified at the end of the school year. But the more interdependent the world becomes, the more we need great collaborators and orchestrators. Innovation is now rarely the product of individuals working in isolation, but much more an outcome of how we mobilise,

share and integrate knowledge. Also, the well-being of societies depends increasingly on their capacity to take collective action. Every day, we are seeing how the mere interaction of billions of individual humans, taking their own autonomous decisions, can combine to create systemic risks with potentially catastrophic consequences. Schools, therefore, need to become better at helping students to be aware of the pluralism of modern living and to join people from different backgrounds in life, work and citizenship. That means teaching and rewarding collaboration as well as individual academic achievement, enabling students to think for themselves and to act for and with others.

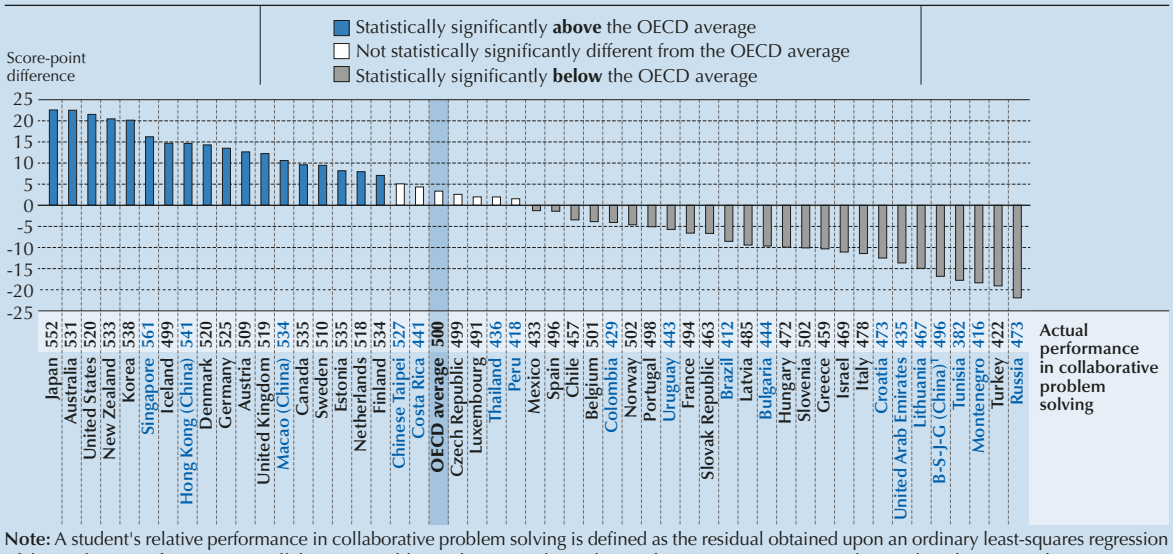
Collaborative skills have become a catchword in many education systems, but the reality is that students sit most of the time behind individual desks, with limited time for collaborative learning. In the Programme for International Student Assessment (PISA), that was also one of the biggest surprises from the first assessment of collaborative problem-solving skills in 2015 (Box 1.1). On average across OECD countries, fewer than one in ten 15-year-old students could solve problem-solving tasks with fairly high collaboration complexity, where they had to maintain awareness of group dynamics and take initiative to overcome obstacles and resolve disagreements and conflicts, even when the subject-matter content of these tasks was rather simple.

Box 1.1. How good are students in solving problems collaboratively?

Figure 1.1

Countries' and economies' relative performance in collaborative problem solving

Score-point difference between actual and expected performance in collaborative problem solving



Note: A student's relative performance in collaborative problem solving is defined as the residual obtained upon an ordinary least-squares regression of the student's performance in collaborative problem solving over his or her performance in science, reading and mathematics. The regression is performed at an international level, pooling data from all countries and economies that participated in the collaborative problem-solving assessment.

1. B-S-J-G (China) refers to the four PISA-participating provinces: Beijing, Shanghai, Jiangsu and Guangdong.

Countries and economies are ranked in descending order of the relative performance in collaborative problem solving.

Source: OECD (2017), *PISA 2015 Results (Volume V): Collaborative Problem Solving*, OECD Publishing, Paris, Tables V.3.2 and V.3.9a, http://dx.doi.org/10.1787/9789264285521-en.

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In today's schools, students typically learn individually, but tomorrow's world will rely upon collaborators and orchestrators. In 2015, to assess students' preparedness for this, PISA carried out the world's first international assessment of collaborative problem-solving skills, defined as the capacity of students to solve problems by pooling their knowledge, skills and efforts with others.

As one would expect, students who have stronger reading or mathematics skills also tend to be better at collaborative problem solving, because complex reasoning and managing and interpreting information are always required to solve problems. The same holds across countries: top-performing countries in PISA (such as Japan, Korea and Singapore in Asia, Estonia and Finland in Europe, and Canada in North America) also come out on top in the PISA assessment of collaborative problem solving.

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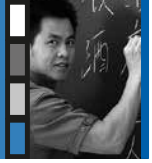


But individual cognitive skills explain less than two-thirds of the variation in student performance on the PISA collaborative problem-solving scale, and a roughly similar share of the performance differences among countries on this measure is explained by the relative standing of countries on the 2012 PISA assessment of individual, creative problem-solving skills. There are countries where students do much better in collaborative problem solving than one would predict from their performance in the PISA science, reading and mathematics assessments. For example, Japanese students do very well in those subjects, but they do even better in collaborative problem solving. The same holds for students in Australia, New Zealand and Korea. Students in the United States also do much better in collaborative problem solving than one would expect from their average performance in reading and science and their below-average performance in mathematics. By contrast, students in the four Chinese provinces that took part in PISA (Beijing, Shanghai, Jiangsu and Guangdong) did well in mathematics and science, but came out just average in collaborative problem solving. The same holds for Lithuania, Montenegro, the Russian Federation, Tunisia, Turkey and Abu Dhabi (United Arab Emirates).

The results show that some countries do much better than others in developing students' collaborative problem-solving skills, but all countries need to make headway in preparing students for a much more demanding world. An average of only 8% of students can solve problem-solving tasks with fairly high collaboration complexity. Even in top-performer Singapore, just one in five students attains this level.

Similarly, all countries need to make headway in reducing gender disparities. When PISA assessed individual problem-solving skills in 2012, boys scored higher in most countries. By contrast, in the 2015 assessment of collaborative problem solving, girls outperformed boys in every country, both before and after considering their performance in science, reading and mathematics. The relative size of the gender gap in collaborative problem-solving performance is even larger than it is in reading.

These results are mirrored in students' attitudes towards collaboration. Girls reported more positive attitudes towards relationships, meaning that they tend to be more interested in the opinions of others and want others to succeed. Boys, on the other hand, are more likely to see the instrumental benefits of teamwork and how collaboration can help them work more effectively and efficiently.

There seem to be factors in the classroom environment that relate to those attitudes. PISA asked students how often they engage in communication-intensive activities, and the results show a clear relationship between the frequency of these activities and positive attitudes towards collaboration.

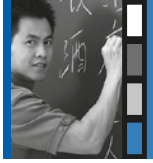
Many schools can also do better in fostering a learning climate where students develop a sense of belonging and where they are free of fear. Students who reported more positive student-student interactions score higher in collaborative problem solving, even after considering the socio-economic profile of students and schools.

It is interesting that disadvantaged students often see the value of teamwork more clearly than their advantaged peers. Schools that succeed in building on these attitudes by designing collaborative learning environments might be able to engage disadvantaged students in new ways.

Finally, when it comes to helping students develop their social skills, education does not end at the school gate. Parents need to play their part. For example, students score much higher in the collaborative problem-solving assessment when they reported that they had talked to their parents outside of school on the day prior to the PISA test, and also when their parents agreed that they are interested in their child's school activities or encourage them to be confident.

In sum, in a world that places a growing premium on social skills, a lot more needs to be done to foster those skills far more systematically across the school curriculum. Strong academic skills will not automatically also lead to strong social skills. Part of the answer might lie in giving students more ownership over the time, place, path, pace and interactions of their learning. Another part of the answer can lie in fostering more positive relationships at school and designing learning environments that benefit students' collaborative problem-solving skills and their attitudes towards collaboration. Schools can identify those students who are socially isolated, organise social activities to foster constructive relationships and school attachment, provide teacher training on classroom management and adopt a whole-of-school approach to prevent and address bullying. But part of the answer lies with parents and society at large. It takes collaboration across a community to develop better skills for better lives.

Source: OECD (2017b), *PISA 2015 Results (Volume V): Collaborative Problem Solving*, http://dx.doi.org/10.1787/9789264285521-en.



More generally, changing skill demands have elevated the role of social and emotional skills. Such skills are involved in achieving goals, living and working with others and managing emotions. They include character qualities such as perseverance, empathy or perspective, mindfulness, ethics, courage and leadership. Developing those kinds of characteristics is often what distinguishes elite schools. But for the majority of students, character formation in school remains a matter of luck, depending on whether this is a priority for their teachers, since very few education systems have made such broader goals an integral part of what they expect from students.

Social and emotional skills, in turn, intersect in important ways with diversity. They can help students live and work in a world in which most people need to appreciate a range of ideas, perspectives and values and to collaborate with people of different cultural origins, a world in which people need to decide how to trust and collaborate across such differences, often bridging space and time through technology, and a world in which their lives will be affected by issues that transcend national boundaries. Effective communication and appropriate behaviour within diverse teams are also keys to success in many jobs and will remain so as technology continues to make it easier for people to connect across the globe. Employers increasingly seek to attract learners who adapt easily and are able to apply and transfer their skills and knowledge to new contexts. Work readiness in an interconnected world requires young people to understand the complex dynamics of globalisation and be open to people from different cultural backgrounds.

Engaging with different perspectives and world views requires individuals to examine the origins and implications of their own assumptions and those of others. This implies profound respect for and interest in others and their concept of reality and perspectives. The ability to see through multiple lenses provides opportunities to deepen and question one's own perspectives and to make more mature decisions. Where we are not successful with this, we are building our education systems on sand.

WHAT THIS MEANS FOR LEARNING, TEACHING AND TEACHERS

The challenge is that developing such knowledge, skills and character qualities requires a very different approach to learning and teaching and a different calibre of teachers.

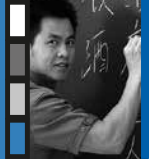
The past was divided, with teachers and content divided by subjects and students separated by expectations of their future career prospects. And the past could be isolated, with schools designed to keep students inside and the rest of the world outside, a lack of engagement with families and a reluctance to partner with other schools and community organisations. The future needs to emphasise the integration of subjects and the integration of students. It also needs to be connected, so that learning is closely related to real-world contexts and contemporary issues and open to the rich resources in the community. Powerful learning environments are constantly creating synergies and finding new ways to enhance professional, social and cultural capital with others. They do that with families and communities, with higher education, with businesses, and especially with other schools and learning environments. This is about creating innovative partnerships. Isolation in a world of complex learning systems will seriously limit potential.

Instruction in the past was subject-based. Instruction in the future needs to be more project-based, building experiences that help students think across the boundaries of subject-matter disciplines. The past was hierarchical. The future is collaborative, recognising both teachers and students as resources and co-creators.

In the past, different students were taught in similar ways. Now school systems need to embrace diversity, with differentiated approaches to learning. The goals of the past were standardisation and compliance, with students educated in age cohorts, following the same standard curriculum, all assessed at the same time. The future is about building instruction from student passions and capacities, helping students to personalise their learning and assessment in ways that foster engagement and talents, and about encouraging students to be ingenious. School systems need to better recognise that individuals learn differently, and that people learn differently at different stages of their lives. They need to foster new forms of educational provision that take learning to the learner in ways that allow people to learn in the ways that are most conducive to their progress. We need to take to heart that learning is not a place but an activity. As well as countering educational disadvantage, this will capitalise on the strengths of the most talented students.

In the past, schools were technological islands, with technology often limited to supporting existing practices, and students outpacing schools in their adoption and consumption of technology. Now schools need to use the potential of technologies to liberate learning from past conventions and connect learners in new and powerful ways, with sources of knowledge, with innovative applications and with one another.

Where teaching is about imparting prefabricated knowledge, countries can afford low teaching quality. And when teacher quality is low, governments tend to tell their teachers exactly what to do and exactly how they want it done, using an industrial organisation of work to get the results they want. Today, the challenge is to turn teaching into a profession of advanced-knowledge workers, and to do so across the board rather than in pockets of excellence.



What is clear is that such people will not work as exchangeable widgets in schools organised as Tayloristic workplaces that rely mainly on administrative forms of accountability and bureaucratic command-and-control systems to direct their work. To attract the people they need, modern school systems need to transform the organisation of work in their schools to foster professional norms of control and benchmarks, in lieu of bureaucratic and administrative oversight. The past was about received wisdom; the future is about user-generated wisdom.

In the past, the policy focus was on the provision of education. Now it needs to be on outcomes, shifting from looking upwards in the bureaucracy towards looking outwards to the next teacher, the next school and the next education system. In the past, administrations emphasised school management. Now the focus needs to be on instructional leadership, with leaders supporting, evaluating and developing teacher quality and the design of innovative learning environments. The past was about quality control. The future is about quality assurance.

The challenge is that such system transformation cannot be mandated by government, which leads to surface compliance, nor can it be built solely from the ground. Governments cannot apply the innovations in the classroom, but they can help in building and communicating the case for change and articulating a guiding vision for 21st century learning. Governments have a key role as platform and broker, as stimulator, incentiviser and enabler, and they can focus resources, set a facilitative policy climate and use accountability and reporting to encourage new practices. Governments can support the shift in paradigm by setting ambitious goals that foster innovation, providing opportunities for autonomy, choice and competition, empowering agents of change, encouraging risk-taking, and rewarding and giving exposure to success.

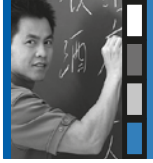
MAKING EDUCATIONAL CHANGE HAPPEN

To transform schooling at scale, it is important to establish not only a clear vision of what is possible, but also smart strategies that help make educational change happen. The good news is that our knowledge about what works in education has improved vastly. It is true that digitalisation has contributed to the rise in populism and the establishment of a post-factual world that can work against rational policy making. But the very same forces, whether in the form of more and better data or new statistical and analytical tools, have also massively expanded the scope and power of social research to create a more evidence-based environment for the development of effective policies. PISA provides a good mirror for that. The first PISA assessment in 2000 was able to explain about a third of the performance variation among schools across the participating countries, but in 2015 that figure had risen to 85%. That means that most of the performance differences among schools can now be statistically associated and explained, with data from students, parents, teachers and school principals, even if the causal nature of many of those relationships remains still insufficiently understood.

But again, knowledge is only as valuable as our capacity to act on it, and the reality is that many good ideas get stuck in the process of policy implementation. One reason for the difficulty in reforming education is simply the scale and reach of the sector. Schools are among the biggest areas of public spending. And because everyone has participated in education, everyone has an opinion about it. Everyone supports education reform – except when they fear it may adversely affect their own children. And even those who promote change and reform often alter their views when they are reminded of what change actually entails. Education is a very visible presence; almost every community has a school, and higher education and training institutions are increasingly part of the landscape. Educational reform is difficult to co-ordinate across an education system and across multiple regional and local jurisdictions.

The issue of loss of advantages or privileged positions is of particular importance in education reform, because the vast structure of established providers (usually public) means there are extensive vested interests. As a result, the status quo has many protectors, stakeholders in education who have a vested interest in preventing change. Even small reforms can involve massive reallocations of resources and touch the lives of millions. This rules out "reform by stealth" and makes it essential to have broad political support for any proposed reform. In essence, education reform will not happen unless educators implement and own it.

There is often uncertainty about who will benefit from reforms and to what extent. This uncertainty is a particularly vexed issue in education because of the range of people who have a stake in education (including students, parents, teachers, employers and trade unions). Uncertainty about costs is problematic, because education infrastructure is large and involves multiple levels of government, each often trying to minimise or shift the costs of reform. Assessing the relative costs and benefits of reform in education is also difficult, because of the large number of intervening factors that can influence the nature, size and distribution of any improvements resulting from reform. It might be an expensive long-term investment, but in the short term it is rarely possible to predict clear, identifiable results from policies, especially given the time lags that are likely to be involved.



Teachers are generally viewed positively by the public, even when there is great dissatisfaction with education systems. Teachers often also command greater public trust than politicians, so any resistance to reform on their part is likely to be effective. Even when parents have a poor opinion of the education system, they will generally have a positive view of their children's school and its teachers. The implementation of reforms is therefore often impossible without the co-operation of education staff. They can easily undermine reforms in the implementation phase, while blaming policy makers for having attempted misguided reforms in the first place. Last but not least, teachers in many countries are well organised. To be fair to them, it should be noted that many teachers have suffered from years of incoherent reforms that disrupt rather than improve educational practice, because they may prioritise volatile political interests over the needs of learners and educators and often do not draw on the expertise and experience of teachers themselves. A recent survey undertaken by the National Association of Schoolmasters Union of Women Teachers (NASUWT) in England (United Kingdom) identified constant change as the number one factor identified as a source of disempowerment by 74% of respondents (NASUWT, 2017). So teachers know that the easiest approach for them may be simply to wait reforms out.

Experience in several countries suggests that strong proactive unions that can successfully separate areas of disagreement and issues of collective bargaining to work with policy makers on professional issues and the design of reforms are essential to effective policy implementation. Interestingly, many of the countries with the strongest student performance also have strong teachers' unions working constructively with policy makers, and these countries treat their teachers as trusted professional partners, thereby facilitating a constructive dialogue based on research and evidence (Schleicher, 2011).

Timing is also relevant to education reform, in more than one sense. Most significantly, there is a substantial gap between the time at which the initial cost of reform is incurred and the time when it is evident whether the benefits of reforms will actually materialise. While timing complicates the politics of reform in many domains, it seems to have a greater impact on education reform, where the lags involved are over so many years. As a result, the political cycle may have a direct impact on the timing, scope and content of education reform. Education reform becomes a thankless task when elections take place before the benefits are realised. Policy makers may lose an election over education issues, but they rarely win an election with education. That may also contribute to the fact that, only about one in ten reforms across OECD countries are followed by any attempt to evaluate their impact (OECD, 2015).

Given that education systems involve multiple levels of government, implementation of comprehensive reform is often difficult to co-ordinate across the various levels of the administration and across multiple regional and local jurisdictions. And it is not only difficult to co-ordinate policy development across levels of governments, but it is also hard to link the perspectives of different government departments. However, if education is to be developed over a lifetime, then a broad range of policy fields need to be involved, including education, family, employment, industrial and economic development, migration and integration, social welfare and public finance. A co-ordinated approach to education policies allows policy makers to identify policy trade-offs, such as between spending on early education or investing in welfare programmes later on.

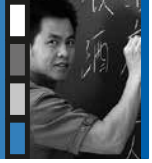
Creating linkages between different policy fields is also important for ensuring efficiency and avoiding duplication of effort. But a whole-of-government approach to education is challenging. Ministries of education will naturally focus on building strong educational foundations for life, with due emphasis on transferrable knowledge and skills. Ministries of employment, by contrast, are mainly concerned with getting unemployed workers off the street through short-term job-specific training that addresses immediate skills mismatches. Ministries of economy may have their eye on the skills needed to secure long-term competitiveness. Those differences in perspectives often play out in the institutional organisation of education.

WHAT WE SHOULD EXPECT FROM TOMORROW'S TEACHERS

Successful education systems in the 21st century will do whatever it takes to develop ownership of professional practice by the teaching profession. Some argue that one cannot give teachers and educational leaders greater autonomy because they lack the capacity and expertise to deliver on it. And that, of course, often holds some truth. But a response that simply perpetuates a prescriptive industrial model of teaching will continue to disengage teachers, just as someone trained to heat up pre-cooked hamburgers will rarely become a master chef.

In contrast, productive learning takes place when teachers feel a sense of ownership over their classrooms, and students feel a sense of ownership over their learning. So the answer is to strengthen trust, transparency, professional autonomy and the collaborative culture of the profession all at the same time.

But the most essential reason why teachers' ownership of the profession is a must-have rather than an optional extra lies in the pace of change in 21st-century school systems. Even the most effective attempts to translate a government-established curriculum into classroom practice will drag out over a decade, because it takes so much time to communicate the goals and methods through the different layers of the system and to build them into traditional methods of teacher education.



In a fast-changing world, when what and how students need to learn changes so rapidly, such a slow process is no longer good enough. It inevitably leads to a widening gap between what students need to learn and what and how teachers teach. The only way to shorten that pipeline is to professionalise teaching, that is to ensure that teachers not only have a deep understanding of the curriculum as a *product*, but equally with the *process* of curriculum and instructional design and the pedagogies to enact and enable the ideas behind the curriculum.

In short, the changes in the demands in our societies have vastly outpaced the structural capacity of our current governance systems to respond. And when fast gets really fast, being slower to adapt makes education systems really slow and disoriented. Even the best education minister can no longer do justice to the needs of millions of students, hundreds of thousands of teachers and tens of thousands of schools. The challenge is to build on the expertise of the hundreds of thousands of teachers and tens of thousands of school leaders and to enlist them in the design of superior policies and practices. Where systems fail to engage teachers in the design of change, teachers will rarely help systems in the implementation of change.

Successful policy implementation now requires the mobilisation of the knowledge and experience of teachers and school leaders who can make the practical connections between the classroom and the changes taking place in the outside world. That is the fundamental challenge of policy implementation in our times. It is not accomplished just by letting a thousand flowers bloom and asking parents to figure out what schools are best. It requires a carefully crafted set of conditions that can unleash the initiative of teachers and schools and build capacity for change.

As the prescriptive approach weakens, the position of classroom practitioners needs strengthening. While governments can establish directions and curriculum goals, the teaching profession needs to take charge of the instructional system, and governments need to find ways to enable and support professionalism. However, increased professional autonomy also implies challenging idiosyncratic practice. It means moving away from every teacher having his/her own approach towards the common use of practices agreed to be effective, making teaching not just an art but also a science.

Paradoxically, the highly standardised industrial work organisation of teaching has often left teachers alone in the classroom. Zero percent school autonomy has meant one-hundred percent teacher isolation behind closed classroom doors. But changing this is not just a matter of adding more time for professional development. Finding out what pedagogical approaches work best in what context takes time and deliberate investment in research, and it also takes collaborative practice, where good ideas spread and scale in the profession.

WHAT WE SHOULD EXPECT FROM TOMORROW'S EDUCATION POLICY MAKERS

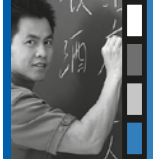
Education policy makers constantly strive to raise quality and equity in education. However, effective policy making and implementation cannot be achieved by policy makers alone. That requires collaboration and constructive dialogue between key stakeholders, including teachers, school leaders and parents.

Effective leadership is central to creating an environment for making this happen, and it is particularly important when there is little coherence and capacity in education. There are many great teachers, schools and educational programmes within every education system, but it takes effective leadership to build a great education system.

The education crisis, mirrored in flat-lining educational outcomes despite rising costs, is at least in part an education policy crisis. Finding adequate and forward-looking responses to the interrelated changes in technology, globalisation and the environment is ultimately a question of leadership. Effective leaders help people to recognise what needs to change, mobilise support and share leadership responsibilities through the system.

Leaders wanting to see forward-looking changes in their school systems have to do more than issue orders and try to impose compliance. They need to build shared understanding and collective ownership, make the case for change and offer support that will make change a reality, and remain credible without being populist. They need to focus resources, build capacity, change work organisations and create the right policy climate, with accountability measures designed to encourage innovation and development rather than compliance. And they need to go against the grain of competitive dynamics and hierarchical bureaucracies that still dominate educational institutions.

System leaders need to tackle institutional structures that are too often built around the interests and habits of educators and administrators rather than those of learners. Most of our school systems are designed to sort students and weed some of them out, not to open opportunities and address the diverse needs of learners. Sorting and weeding were very efficient and effective approaches for the industrial age, when education was about finding and training a small minority of leaders



and then giving everyone else just basic knowledge and skills. In a modern society, where we need to capitalise on all talent and ensure equitable access to learning, such approaches have become a principal barrier to success. There need to be incentives and support for schools to address the needs of all their pupils, rather than getting an advantage by shifting difficult learners elsewhere.

For schools to be entrepreneurial and able to adapt, system leaders need to be able to mobilise the human, social and financial resources needed for innovation, to work as social entrepreneurs both within and beyond their own organisations, and to build stronger linkages across sectors and countries to establish partnerships with government leaders, social entrepreneurs, business executives, researchers and civil society.

For education policy it will also be important to get beyond the unproductive wrangling between forces pushing for greater *decentralisation* and those aiming for greater *centralisation* of the school system. That debate detracts from the real question of what aspects of education are best managed at each level of the education system and the overriding of principle of subsidiarity, where every layer of the school system should continuously ask how it can best support learners and teachers at the front line.

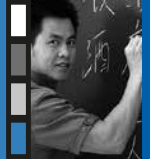
That also means that teachers, schools and local authorities recognise that certain functions, particularly those regarding the establishment of curriculum frameworks, course syllabi, examinations or teaching standards do require a critical mass of capacity and therefore tend to be best supported by some level of centralisation. The test of truth is a coherent instructional system that is available to all students, and in which world-class educational standards feed into well-thought-out curriculum frameworks that guide the work of teachers and publishers of instructional materials.

System leaders need to be strategic (i.e. aware of how organisational policies and practices can either facilitate or inhibit transformation) and be ready to confront the system where it inhibits change. They need to be design thinkers, capable of recognising emerging trends and patterns, and to see how these might benefit or obstruct the innovation they want to achieve. They need to be politically savvy, in terms of working with organisations as well as people. They need to use their knowledge about what motivates people to get them to support their plans for change, and they need to use their understanding of power and influence to build the alliances and coalitions needed to get things done.

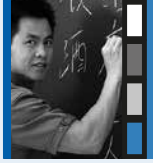
Many teachers and schools are ready for that. To encourage their growth, policy needs to shift towards inspiring and enabling innovation, identifying and sharing best practice. That shift in policy will need to be built on trust – trust in education, in educational institutions, in schools and teachers, in students and communities. In all public services, trust is an essential part of good governance and a key determinant of where great people want to work. But trust cannot be legislated and mandated, and that is why it is so hard to build into traditional administrative structures. Trust is always intentional. It can only be nurtured and inspired through healthy relationships and constructive transparency. That is the lesson we can all learn from Finland, where opinion polls consistently show high levels of public trust in education. At a time when command-and-control systems are weakening, building trust is the most promising way to advance and fuel modern education systems.

THE INTERNATIONAL SUMMIT OF THE TEACHING PROFESSION AS A PLATFORM FOR POLICY MAKERS AND TEACHERS TO FIND SOLUTIONS

So how can policy makers and the teaching profession work together to address these challenges? This is not easy, because there are naturally many difficult issues separating teachers and policy makers. There are opponents of teachers' unions who see them as interfering with promising school reform programmes by giving higher priority to their own bread-and-butter issues than to what the evidence suggests students need to succeed. But the fact is that many of the countries with the strongest student performance also have strong teachers' unions. Indeed, the higher a country is on the PISA league tables, the more likely it is that that country is working constructively with its teacher organisations and is treating its teachers as trusted professional partners. Sometimes, the nature of the relationship between governments and teachers' unions reflects the work organisation in education. A highly industrialised work organisation characterised by standardisation and compliance, where government focuses on prescribing and justifying, and where teachers are expected to do similar work for similar pay, encourages unions that focus on pay and working conditions and tends to lead to stakeholder relationships that are top-down and antagonistic. In turn, a highly professional work organisation, where the role of government is enabling and incentivising and where the teaching profession is characterised by diverse careers, ownership and innovative ways of working, is conducive to strategic, principled and professional working relationships between government and unions. In that sense, every education system gets the teachers' unions it deserves.



The International Summit of the Teaching Profession provides a platform for governments, teachers' unions and professional bodies to redefine the role of teachers and to create the support and collaborative work organisation that can help teachers grow in their careers and meet the needs of 21st century students. What makes the International Summit of the Teaching Profession unique is that ministers and union leaders are sitting next to one another and that, where they may have encountered a stalemate in their own country, they can listen to ministers and union leaders from other countries who might have successfully overcome similar challenges.



Note

1. The PISA 2015 Science Framework defines epistemic knowledge as the understanding of the rationale for the common practices of scientific enquiry, the status of the knowledge claims that are generated, and the meaning of foundational terms such as theory, hypothesis and data (OECD, 2017a).

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Chapter 2

SCHOOLS AT THE CENTRE OF THEIR COMMUNITIES

Schools do not operate in a vacuum. Successful schools depend on the resources and support of their communities and schools at the centre of their communities are often the most successful schools. In turn, schools are vital to the social health of their local communities. What can policy makers with teacher unions and the teaching profession do to strengthen links with communities? Given the importance of schools for disadvantaged communities, how can system support for teachers and education staff be strengthened in these schools to drive quality and equity? What can we learn from schools that partner with businesses, educational services and cultural bodies in their community and excel at driving business and social innovation in their communities? How can schools engage the local community and contribute to social responsibility? These are some of the questions for the first session of the 2018 International Summit on the Teaching Profession.

Note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

FROM VERTICAL TO HORIZONTAL FORMS OF GOVERNANCE

One conventional assumption is that governments set policy, which then descends in a vertical implementation line through local government together with implementation/support agencies, through to school principals and into the classroom. "Learning" and "education" are considered synonymous with formal schooling. Auxiliary organisations, such as education publishers, examination boards and teacher-training organisations are seen as extensions to arrangements set by governments. Such a framework of understanding has become increasingly inadequate. A perennial challenge for policy is that it is notoriously slow in changing behaviour in teaching and learning.

A number of factors have challenged and transformed this top-down conception of policy making, including the increasing use of digital technologies, the entry of new learning providers, the growing interest of employers in steering what students should learn and know and the expertise in learning in other sectors (e.g. in the creative sector). We need models that embrace the horizontal as well as the vertical, the non-formal as well as the formal, the unsponsored collaboration as well as the regulated. This is about seeing schools as part of more comprehensive ecosystems of learning with multiple dimensions:

- They are multilevel systems (local, regional, national and international), and aligning these levels is a major challenge, particularly in those that are most decentralised.
- Reflecting our societies, the systems are increasingly diverse, both in demographic terms (of students, teachers and communities) as well as in the values and identities communities and countries ascribe to themselves and expect their education systems to deliver.
- They contain a growing number of stakeholders who are increasingly vocal about their wants and desires, not only for themselves and their children, but for the system as a whole.

One obvious way for schools to engage with their communities is through engaging parents. This chapter begins by examining policies and practices for strengthening this link. It then looks outward, turning to how schools can contribute to the well-being of communities. It ends by looking at ways to reconcile aspirations for greater flexibility and parental choice with equity.

ENGAGING PARENTS

Few relationships in life are as significant and enduring as the relationship between children and their parents or the adults who raise them. Families are the first social unit in which children learn and develop. Good parenting can take different forms and be shaped by various social and cultural forces, but it invariably involves providing children with the support, care, love, guidance and protection that set the conditions for healthy physical, mental and social development.

It is not surprising, then, that interactions with parents have consistently been shown to influence students' achievement, expectations, attitudes and psychological health. The activities parents and children do together, parents' expectations for their children's future, and the behaviours and attitudes parents model for their children are all associated with children's psychological well-being. Parents are also key players in helping their children succeed at school. After all, they are their children's first and longest-serving teachers. As children grow, the connection with their parents also evolves. The relationship between parents and their 15-year-old children often reflects the greater autonomy and desire for independence that come with adolescence. Activities that parents and their young children once shared, such as reading together or helping with homework, often give way to adolescent children exploring their own interests by themselves and to more mature interactions with their parents, involving discussion and negotiation.

The following explores how some forms of parental involvement, such as interest in their child's life, the activities they engage in together and parents' participation in school-related activities, are associated with how well students do in school and how satisfied they are with their own life. It also looks at factors that parents regard as obstacles hindering their participation in their child's school activities. The data are based on the PISA 2015 assessment, and the figures and tables cited refer to *PISA 2015 Results (Volume III): Students' Well-Being* (OECD, 2017a).

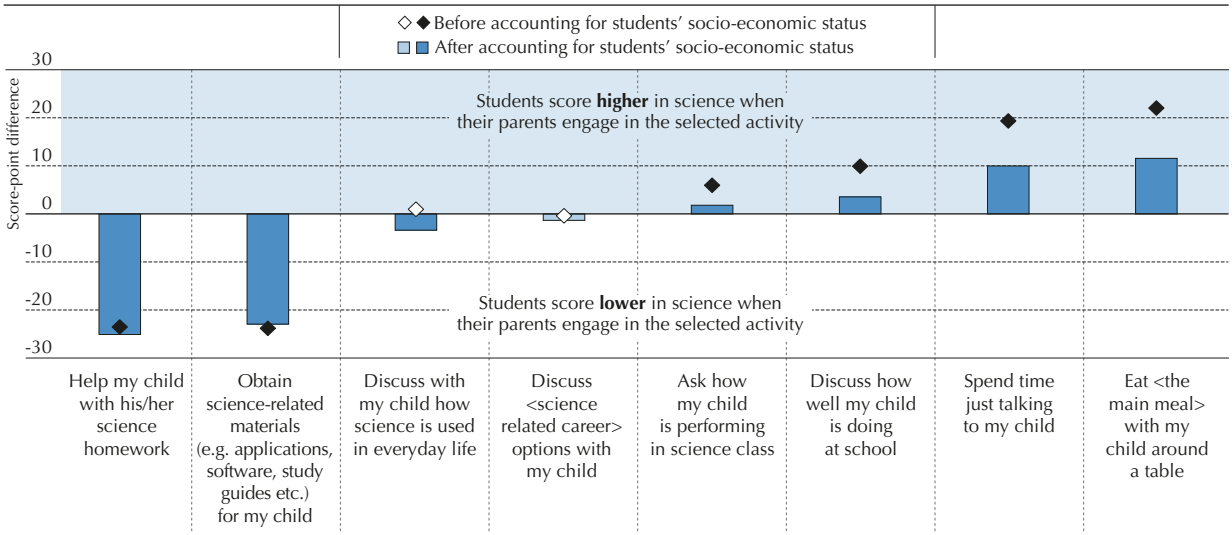
Parental involvement and student learning outcomes

The literature consistently documents positive associations between a range of home-based and school-based parental activities and children's educational achievement, measured either as school marks or standardised test scores. This positive relationship holds in various disciplines, across ethnic groups and gender and over time. Figure 2.1 shows how parental engagement in a set of selected activities is associated with differences in students' performance on the PISA science assessment.

Figure 2.1

Parents' activities and students' science performance

Difference in science performance between students whose parents engage in selected activities at least once a week and those whose parents engage in such activities less frequently (average for 18 countries/economies)



Note: Statistically significant values are marked in a darker tone.

Source: OECD (2017a), *PISA 2015 Results (Volume III): Students' Well-Being*, Figure III.9.2, http://dx.doi.org/10.1787/9789264273856-en.

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Parents' activities that typically take place at home or in the context of the family, namely "discussing how well my child is doing at school", "eating the main meal with my child around a table" and "spending time just talking to my child" are all positively related to the child's science performance in PISA 2015. An activity as simple as eating a meal together at least once a week is associated with an increase of at least 12 score points in science, on average, after accounting for students' socio-economic status. While there is no theoretical reason to expect a direct connection between students' performance in school and routinely eating a meal with their parents, the observed relationship may be capturing underlying traits of families that nurture this habit, traits that are more closely related to children's performance at school. For example, parents may use mealtime as an occasion to encourage their children, monitor their progress in school and show support. These families may also be able to maintain an orderly, structured environment for their children at home with less stress and greater stability.

Similarly, students whose parents "spend time just talking" to them at least once a week score 10 points higher, on average, than students of similar socio-economic status whose parents do so less frequently. This relationship is positive and significant in Georgia, Hong Kong (China), Korea and Portugal. Another possible explanation for the positive relationship between parent-child discussions and performance is that parents might find it easier to talk about school with children who perform relatively well and are engaged at school. Conversely, most activities that reflect parents' direct involvement in their child's science education have a negative relationship with the student's science score. Students whose parents reported that they "help my child with his/her science homework" or "obtain science-related materials (e.g. applications, software and study guides) for my child" at least once a week, score over 20 points lower in science, on average, than students whose parents engage in these activities less frequently (Figure 2.1). Poor performance in science may be the reason why parents are more directly involved in their child's school work. PISA results are also consistent with research findings showing a negative relationship between parental help with homework and student performance in early adolescence and beyond.

While help with homework might have been effective in the early years of school, during adolescence, students may respond better to other forms of parental support that respect their growing need for autonomy. This is illustrated by the positive associations found between students' performance in science and parents reporting that they "discuss how well my child is doing at school" or "spend time just talking to my child". As Figure 2.1 shows, parents' involvement in science homework or in monitoring their child's progress in science education is not strongly related to socio-economic status. This suggests that while advantaged and disadvantaged parents may differ widely in how they interact with their children at home, parents from all socio-economic groups try to help their children when they are struggling in school.

Box 2.1. Experiment to increase parent participation in Chile

An experiment in Chile offered each participating parent the chance to receive a high frequency of information via SMS messages regarding the attendance, behaviour and mathematics test scores of their children. After four months, the students involved had significantly higher math grades, improved attendance and a lower prevalence of bad behaviours, and they were less likely to fail the grade at the end of the year.

Source: Berlinski, S. et al., (2016), "Reducing parent-school information gaps and improving education outcomes: Evidence from high frequency text messaging in Chile", Working paper, December 2016, Abdul Latif Jameel Poverty Action Lab (J-PAL), Cambridge MA, www.povertyactionlab.org/sites/default/files/publications/726_%20Reducing-Parent-School-information-gap_BBDM-Dec2016.pdf.

Box 2.2. Bringing the community together: "Maker's Space" in Bulgaria

When Yordan Hodzhev began teaching, ethnic and community tensions outside the classroom strongly affected students' relationships inside the classroom. The result was an environment that was not conducive to effective learning, where students would refuse to collaborate and work together on projects. This led Mr Hodzhev to start what he calls "Maker's Space" in two primary schools in the villages of Mirkovo and Chelopech, in Bulgaria. Maker's Space sought to bring fractured communities together to find solutions to local problems, while also addressing students' low levels of interest in science and technology. Additionally, Mr Hodzhev used Maker's Space to help demystify science to girls and motivate them to pursue careers in science.

Maker's Space was designed as a workspace where parents and students could make and repair objects together. The space was equipped with tools and 3D printers and was available to everyone. There was no charge for using the space or the tools. The idea behind Maker's Space was to encourage everyone to engage in a practical way with science and exploration and to better understand how things work. An added advantage was that since all segments of the community needed to repair items, by providing everyone equal access to tools through this unique space, Mr Hodzhev succeeded in bringing together groups that were once hostile towards each other, in a creative and productive way. Because of this innovative space, community tensions have lessened, and parents have begun visiting the schools more often, becoming more involved in their children's education.

Source: OECD (2018), *Teaching for the Future: Effective Classroom Practices to Transform Education*.

Parental involvement and students' satisfaction with life

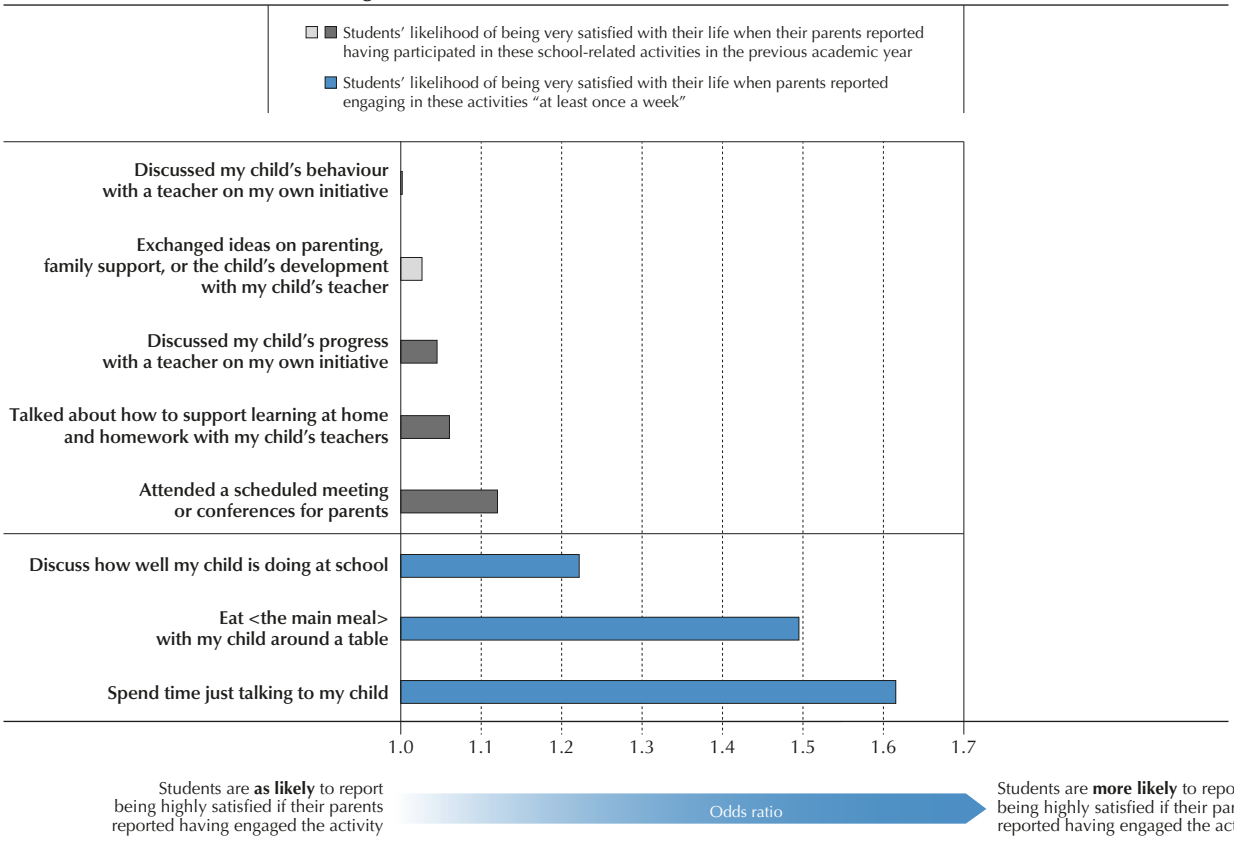
PISA data show that certain types of parental activities are positively related not only to students' performance, but also to other areas of their life, such as how satisfied students are with their own life. Students whose parents reported "spending time just talking to my child", "eating the main meal with my child around a table" or "discussing how well my child is doing at school" at least once a week were between 22% and 62% more likely to report high levels of life satisfaction (i.e. their responses put them at the equivalent of 9 or 10 on a scale of 0 to 10) than students whose parents reported engaging in these activities less frequently (Figure 2.2). Some school-related forms of parental involvement, such as having attended a school meeting or conferences for parents in the previous academic year or having interacted with their child's teacher, are also positively related to students' satisfaction with life, but the strength of these associations is considerably weaker. Parents of students who are struggling in school and perhaps less satisfied with their life may be more likely to interact more often with their child's teachers and school, which could partially explain these weaker associations.

Countries vary in which parental activities are most strongly related to students' life satisfaction, but "spending time just talking" is the parental activity most frequently and most strongly associated with students' life satisfaction across all countries with available data. It is not possible from these results to determine the direction of the relationship between communication within the family and students' life satisfaction. Parents may be more likely to engage in these activities if their children are, in general, more satisfied with their life, which makes them more open to communicating and sharing a closer interaction with their parents and others. How adolescents perceive their parents' attempts to communicate with them can also play a role.

Figure 2.2

Parents' activities and students' life satisfaction

Students' likelihood of reporting being highly satisfied[1] with their life when their parents reported having engaged in the selected activities, after accounting for students' socio-economic status (average of all countries and economies with available data)



1. A student is classified as "very satisfied" with life if he or she reported 9 or 10 on the life-satisfaction scale. The life-satisfaction scale ranges from 0 to 10.

Notes: Statistically significant values are marked in a darker tone. All values regarding activities parents reported engaging in "at least once a week" are statistically significant.

Source: OECD (2017a), *PISA 2015 Results (Volume III): Students' Well-Being*, Figure III.9.4, http://dx.doi.org/10.1787/9789264273856-en.

StatLink http://dx.doi.org/10.1787/888933472215

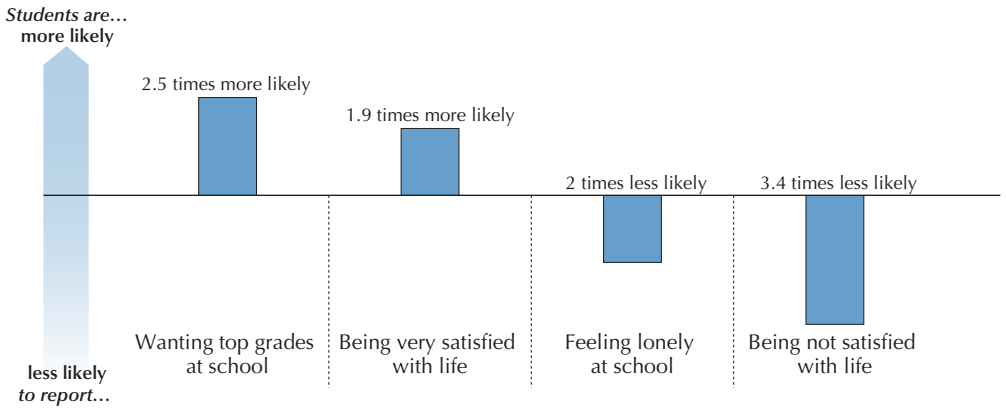
Parents' interest in school and students' performance in PISA and life satisfaction

Students' perceptions of how interested their parents are in them and in their school life can influence their own views on the value of education, the goals they set for themselves and how much effort they put into learning – all of which may affect their performance and their motivation to do well in school. These perceptions may also be related to students' feelings and beliefs about their parents' appreciation, care and love in general, which may be linked to how satisfied they are with their own life. Indeed, students who reported that their parents are interested in their school activities perform better in PISA than students who reported a lack of interest from their parents. This is true at all levels of performance in science, although this association is stronger among low-performing students. This may indicate that parental interest acts as a protective factor against low performance, without necessarily being an equally powerful catalyst for high performance. In fact, students who "agree" or "strongly agree" that their parents are interested in their school activities are also more motivated to do well in school. Across OECD countries on average, these students were 2.5 times more likely to report that they "want top grades in school" (Figure 2.3). Likewise, students who hold these perceptions of their parents' interest were almost twice as likely to report being highly satisfied with their life (reporting 9 or 10 on a scale from 0 to 10 of life satisfaction) than students who do not hold those perceptions. Students' positive views of their parents' interest in their school activities may signal some underlying protective effect in supportive parent-child relationships, as these students were also less likely to report feeling lonely at school and to report low satisfaction with life.

Figure 2.3

Parents' interest in their child's activities at school and well-being

Increased likelihood of students to report the following measures of well-being[1] if they agree or strongly agree that their parents are interested in their school activities, after accounting for students' socio-economic status (OECD average)



1. Students want top grades at school or feel lonely at school if they agree or strongly agree to related statements in the questionnaire. Students who are very (not) satisfied with life are those with self-reported values of 9 or 10 (between 0 and 4) on the life satisfaction scale, which ranges from 0 to 10 points.

Notes: The figure reports a logarithmic transformation of the odds ratios of the outcome (e.g. wanting top grades at school) related to parents' interest. The logarithm transformation makes the values of odds ratios below one and above one comparable in the graph. The label at the end of each bar displays the corresponding odds ratios (change in the likelihood of the outcome).

Source: OECD (2017a), *PISA 2015 Results (Volume III): Students' Well-Being*, Figure III.9.7, http://dx.doi.org/10.1787/9789264273856-en.

StatLink http://dx.doi.org/10.1787/888933472242

How parents engage with their children about school

PISA asked parents how often they engage in certain activities at home with their child and whether, in the previous academic year, they had interacted with their child's teacher in school (Figure 2.4). Across the 18 countries and economies that distributed the parent questionnaire, eating the main meal together is by far the most common activity reported by parents. On average, 82% of parents reported that they eat the main meal with their child around a table, followed by 70% who reported that they spend time just talking to their child and 52% who reported that they discuss how well their child is doing at school every day or almost every day. In the Flemish Community of Belgium, France, Italy, Portugal and Spain, more than 90% of parents eat a meal with their child daily or nearly every day. Spending time just talking, while relatively less frequent, is also practiced routinely by most parents in 18 countries with available data.

Overall, the share of parents who reported that they talk with their child about how he or she is doing at school is both smaller and more variable than that of parents who eat a meal with their child or spend time just talking to their child on a daily or nearly-daily basis (OECD, 2017a, Table III.9.1). Nonetheless, in Italy, Portugal and Spain, about 75% of parents reported that they discuss how well their child is doing at school almost every day.

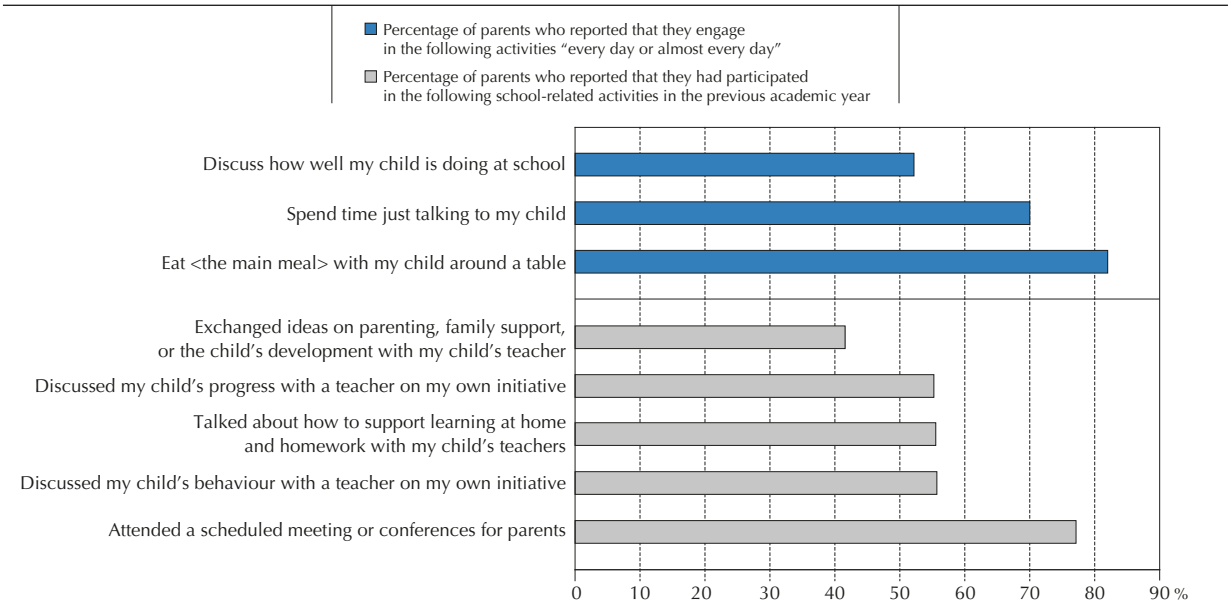
Among the school-based activities shown in Figure 2.4, the activity most frequently reported by parents is attending a scheduled meeting or conference for parents in their child's school. Some 77% of parents, on average, reported having done so during the previous academic year. Slightly more than half of the parents reported that they had "discussed my child's behaviour with a teacher on my own initiative", "discussed my child's progress with a teacher on my own initiative" or "talked about how to support learning at home and homework with my child's teachers". Compared to most other countries, smaller shares of parents (between 15% and 37%) in the Flemish Community of Belgium, Ireland, Macao (China) and Scotland (United Kingdom) reported that they had conversed with their child's teacher at their own initiative (OECD, 2017a, Table III.9.3).

On average, parents reported that they had "exchanged ideas on parenting, family support, or the child's development with my child's teacher" less often than the activities mentioned above. Around 42% of parents reported that they had done so during the previous academic year. This could reflect a perception among some parents that these topics are more private than school-related in nature. Smaller proportions of parents reported that they had engaged in other school-related activities, such as participating in local school government such as a parent council or school-management committee (19%), volunteering in physical or extracurricular activities (15%), and volunteering to support school activities (12%) (OECD, 2017a, Table III.9.1).

Figure 2.4

Parents' activities with their child and at their child's school

Percentage of parents who reported engaging in home-based activities routinely and who had participated in school-related activities during the previous academic year (average for 18 countries/economies)



Source: OECD (2017a), *PISA 2015 Results (Volume III): Students' Well-Being*, Figure III.9.1, http://dx.doi.org/10.1787/9789264273856-en.

StatLink http://dx.doi.org/10.1787/888933472181

Overall, these results are an encouraging indication that most parents in participating countries and economies have been able to find some time to be with their children and that they have cultivated the habit of routinely talking with their children, eating with them, and participating in their school life. Such simple daily or weekly family interactions can provide students with the structure, regularity and support they need to thrive on their own.

Students' reports of their parents' interest in their life at school

Through the activities they engage in at home and at school, parents manifest their values as well as the aspirations and concerns they have for their child's life, in general, and for his or her success in school, in particular. But what parents tell their children, how they show affection and interest in them and how they support their academic achievement are ultimately subject to their children's interpretation. When asked about their perceptions regarding their parents' interest in their school life, 94% of PISA-participating students across OECD countries reported that they "agree" or "strongly agree" that "my parents are interested in my school activities" (OECD, 2017a, Table III.9.18). In most countries where this proportion is above the OECD average, there is little variation in students' responses related to socio-economic status (OECD, 2017a, Table III.9.19; and Figure 2.5). However, in countries where this proportion is below the OECD average, the share of students who "agree" or "strongly agree" that their parents are interested in their school activities is significantly smaller among disadvantaged students. Cross-country comparisons of such data need to be interpreted with care, as response behaviour for these kinds of questions may vary across culture. For example, students in several of the East Asian countries that are known for their strong parental engagement in education report fairly low levels of parental interest the education of their children.

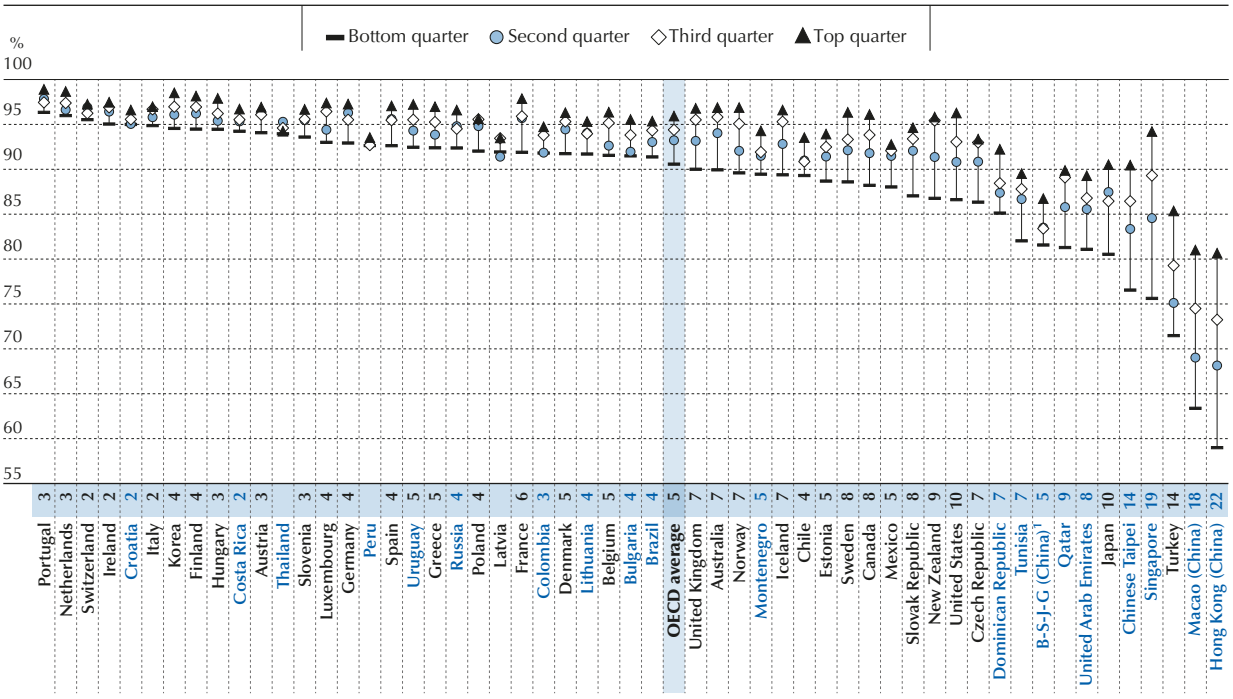
Obstacles to parents' participation in school activities

One meaningful way for school leaders to help parents engage more often and more effectively with their child's school is to help remove the barriers that hinder their regular participation in school activities. PISA asked parents what kinds of factors have hindered their participation in activities at their child's school during the previous academic year. Considering factors external to school, 36% of parents reported that "I was not able to get off from work", 33% reported that "the meeting times were inconvenient", and 13% of parents selected "I had no one to take care of my child/children", on average across 18 countries (Figure 2.6).

Figure 2.5

Parents' interest in their child's activities at school, by socio-economic status

Percentage of students who reported "agree" or "strongly agree" with the statement "My parents are interested in my school activities"



Note: Statistically significant differences in the percentage of students who reported that their parents are interested in their school activities, between students in the top and bottom quarters of the PISA index of economic, social and cultural status, are shown next to the country/economy name.

1. B-S-J-G (see Figure 1.1).

Countries and economies are ranked in descending order of the percentage of students in the bottom quarter of the ESCS index who reported that their parents are interested in their school activities.

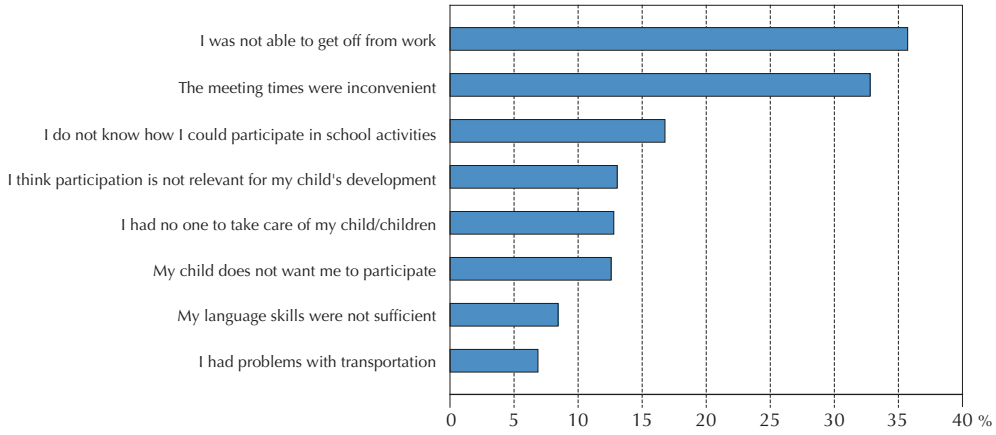
Source: OECD (2017a), *PISA 2015 Results (Volume III): Students' Well-Being*, Figure III.9.5, http://dx.doi.org/10.1787/9789264273856-en.

StatLink http://dx.doi.org/10.1787/888933472221

Figure 2.6

Obstacles to parents' participation in their child's school activities

Percentage of parents who agreed or strongly agreed that the following factors hindered their participation in their child's school activities in the previous year (average for 18 countries/economies)



Source: OECD (2017a), *PISA 2015 Results (Volume III): Students' Well-Being*, Figure III.9.8, http://dx.doi.org/10.1787/9789264273856-en.

StatLink http://dx.doi.org/10.1787/888933472257

Considering barriers related to communication, 17% reported that "I do not know how I could participate in school activities". Some 13% of parents selected the following reasons as obstacles: "I think participation is not relevant for my child's development" and "My child does not want me to participate". Some 8% of parents cited language barriers, and 7% mentioned problems with transportation. Parents often face several of these obstacles at once. These barriers can be related to the neighbourhoods in which families live, the work arrangements they may have, the infrastructure and other human and social services available in their area, and the demographics of the region.

In most countries and economies, relatively more parents reported that meeting times at school were inconvenient or that they were not able to get off from work than reported other reasons for not participating (Table III.9.26 and Figure 2.6). These two reasons can overlap, as parents may have reported that meeting times are inconvenient because they cannot get time off from work to participate. In some countries, work constraints and inflexible schedules seem to be the major barriers to participation. In Latin American countries, such as Chile, the Dominican Republic and Mexico, in addition to scheduling times and inflexible work schedules, parents frequently reported a lack of childcare services and problems with transportation. These countries also show some of the largest shares of parents who reported that they do not know how they can participate in school activities, who think that their participation is not relevant for their child's development, or who reported that their child does not want them to participate. Between 29% and 46% of parents in the Dominican Republic and Mexico reported at least one of these reasons as obstacles to participation.

The PISA question about barriers to parents' participation in their child's school activities reveals the concerns of parents whose interaction with the school is constrained in various ways. But what can one learn about parents who do participate in their child's school life? Do these parents differ in any way from those who do not participate? PISA data show that parents' or guardians' levels of education, their income level, how much they spend on education, and their gender are all significant indicators of whether or not a parent takes the initiative to speak with his or her child's teacher. In particular, parents with a tertiary education were 21% more likely to report that they had "discussed their child's progress with the teacher at their own initiative" during the previous academic year, after accounting for students' performance. High-earning parents were 14% more likely, and those who spend more on education were 33% more likely to report that they had done so. Mothers or female guardians were, on average, 13% more likely than fathers or male guardians to report that they had talked to their child's teacher about his or her progress in school (survey respondents included only one of the two parents for each child); foreign-born parents were as likely as native-born parents to report that they had done so, after accounting for their child's performance in PISA.

SCHOOLS DRIVING PROGRESS AND WELL-BEING IN LOCAL COMMUNITIES

While communities can play a crucial role to support schools, schools in turn can have a major impact on communities. In many countries, schools are important spaces in the local community. The time has long passed when schools were seen as merely secluded spaces where children and youngsters were dropped off and locked away while parents went to work. More and more schools are looking outward, opening up to local communities and to the learning opportunities that the local environment provides. At the same time, they are taking on activities and roles promoting the common good and well-being in the local community.

For example, schools offer extracurricular activities that enrich the life of the local community in sports, social care, voluntary work and culture. Research and development projects offer innovative answers to the needs of local enterprises and social-purpose organisations, while enhancing entrepreneurialism among students and providing real-world experiences. The concept of "service-learning", which expresses the learning value of students engaging in providing services to the local community, offers an appealing vision of the opportunities available to schools to drive progress and well-being in local communities.

In connecting to the local and regional environment, schools also engage many stakeholders to work together to improve the well-being of everyone involved. Schools not only engage parents and families in learning, but also draw on the various resources provided by local enterprises, community organisations, social services, and sports and cultural institutions, such as museums, theatres or libraries. Yet, because local communities differ in wealth and cultural capital, schools do not find themselves on a level playing field. Geographical segregation can lead to unequal opportunities for schools to benefit from engaging with the local community, although policy can overcome community disadvantage by providing targeted funding for schools in disadvantaged areas to offer extended services to their community (Box 2.3).

Box 2.3. Extended schools in Northern Ireland (United Kingdom)

In Northern Ireland (United Kingdom), the Department of Education launched its extended schools programme in May 2006. It aims to improve levels of educational achievement for disadvantaged children and young people by providing the additional support that they might need to help them reach their full potential. Over the following ten years, the programme has provided over GBP 100 million of funding to allow schools serving the most disadvantaged areas to offer a wide range of services or activities outside of the normal school day to help meet the learning and development needs of pupils, their families and local communities. Extended school activities are designed to support learning, raise school standards and promote healthy lifestyles, enabling schools to work closely with members of the wider community and connect local people with local services. Some examples include breakfast or homework clubs, sport activities, art, drama, information and communication technology, programmes for parents and families and community use of school premises.

A video (https://youtu.be/-aBPTt7m_78) describes the programme and the positive impact it has had on local communities.

Source: Department of Education of Northern Ireland (n.d.), Extended schools programme, Department of Education, Bangor, www.education-ni.gov.uk/articles/extended-schools-programme.

Schools can also become partners in serving the needs of local communities, especially in disadvantaged communities or through working with populations at risk of exclusion or distress (Boxes 2.4 and 2.5). In recent refugee crises in various parts of the world, there have been inspiring examples of schools playing a socially and ethically responsible role in providing help, shelter and assistance to refugees.

Box 2.4. Community schools and early childhood education in the United States

Collective impact initiatives have proliferated in the United States, premised on the idea that multifaceted problems require multifaceted responses and addressing the needs of low-income children requires schools partnering with community organisations to support them and their families in a co-ordinated fashion across education, health and social services. In these initiatives, schools are reaching out to families through community organisations, beginning in the early childhood years and then continuing with school-based social, health and even job-related services once the children are enrolled in school. Successful initiatives in Ohio and Oregon are worth highlighting in this respect.

In Cincinnati (Ohio), all schools in the Cincinnati Public Schools district are community schools, known as Community Learning Centers (CLCs). In this city district, which includes a large minority population, this strategy came in response to declining enrolment and an exodus of families in the 1990s. Most schools have full-time resource co-ordinators, and ensuring that all partner supports are targeted towards meeting each school's specific academic goals is central to the district's approach to CLCs, as is an emphasis on community engagement and input. Cincinnati's CLCs have expanded in two ways to also serve as hubs for children and their families before they enter kindergarten. First, the district has begun increasing the number of preschool programmes housed in elementary schools, giving younger children access to the same supports as K-12 students, including health clinics and vision and dental services. Second, a non-profit has begun piloting early childhood resource co-ordinators at CLCs, assigning them to reach out to families with young children and organise networks of early childhood providers that are anchored by an elementary school CLC. These networks share instructional practices and work on transitions, resource referrals and hosting joint events for children and families. Since implementing CLCs, Cincinnati has gone from being one of Ohio's worst-performing districts to becoming the state's first urban district recognised as "effective". It is now regarded as a national leader in community schooling.

In Multnomah County (Oregon), the Schools Uniting Neighborhoods (SUN) Service System supports 86 community schools in this diverse county that includes Portland and five other districts. The county is the managing partner for the system and, in that role, contracts with non-profit agencies that hire and support full-time site managers at the community schools. The site managers work with school staff and community partners to align resources,

...

including after-school programmes, with the school's academic and social-emotional goals. They support family engagement and advocacy and co-ordinate resource referral for family basic needs and other services. In recent years, Multnomah County has also extended its work to include early childhood programmes. In addition to increasing the number of preschool classrooms in its schools, the county implemented a highly regarded three-week summer early kindergarten transition class across many of the community schools, launched a vigorous kindergarten registration campaign and supported home visits by kindergarten teachers. SUN is also implementing a new pilot project in eight schools, whereby facilitators in these schools reach out to families with young children before their children start school and engage them in school activities such as play-and-learn groups in school buildings. SUN is now working with these schools on how they will begin collaborating with the family childcare providers located near each participating elementary school.

Source: Jacobson, D. (2018), "A powerful convergence: Community schools and early childhood education", *Phi Delta Kappan,* Vol. 99/5, pp. 19-24, www.kappanonline.org/david-jacobson-powerful-convergence-community-schools-early-childhood-education/.

Creating wider partnerships is also an outstanding feature of innovative schools. They have an urgent drive to avoid isolation and are aware that significant innovation cannot be achieved and sustained alone. They look to build and maintain the capital they need as organisations (social capital, intellectual capital and professional capital) through forging alliances, partnerships and networks. They extend themselves beyond given institutional and organisational boundaries and introduce their learners to a range of other possibilities and resources, with benefits for both the learners and the community.

Box 2.5. Community schools in the Flemish Community of Belgium

Inspired by community schools and extended schools in various countries and by recent developments in the Netherlands, a number of initiatives started around the turn of the century in the Flemish Community of Belgium to develop a concept of *brede* school (which could be translated as "lifewide school"). The purpose of such initiatives, mostly situated in primary schools, was to firmly integrate schooling and learning in the network of social, medical, cultural and welfare services of a local community in order to develop an integrated approach to the social conditions of effective learning. The local community is seen as an integrated resource of services that help to support the learning and development of all children, more specifically those from a disadvantaged background.

One of the pioneering schools was *De Buurt* ("The neighbourhood"), an innovative primary school in a disadvantaged area in the city of Ghent. The school itself was oriented towards experiential and child-centred pedagogy, but was also embedded in a wide network of services and initiatives with strong impact in the local community: a clubhouse, a café, local community work, an evening school, services to help parents with their children's homework, etc. The school opened up its infrastructure for local associations and initiatives.

Similar local initiatives have spread across the Flemish Community of Belgium. The public education network GO! developed a policy to support *brede scholen* and to generalise its principles in all its primary schools by 2020. A *brede* school should be a very open and transparent glass house integrated in an extended social and cultural network in the local community. The benefits of this approach are manifold: children learn effectively in interaction with their environment, not only during school hours but also in their leisure time; parents, local associations and stakeholders and ordinary citizens become active participants in creating the educational environment; and schools that adopt these principles are more positively valued and supported by their local communities.

The development of *brede scholen* has been supported both by local governments and the Flemish government. At the local level, cities and municipalities can reinforce the opportunities for *brede scholen* by supporting partnerships and synergies between various social and cultural services. Especially in the context of urban renewal initiatives, with the establishment of new infrastructure and social services, the concept has become influential in shaping an integrated and co-ordinated approach. At the Flemish level the principles of *brede* school have inspired the criteria and decisions for new school building projects. Openness, integration in the community and synergies with other social and cultural services are now seen as very favourable conditions for the approval of new school building projects.

Sources: GO! *onderwijs van de Vlaamse Gemeenschap* [GO! education of the Flemish Community] (2012), *Brede open school: Visietekst van het GO!*, GO! *onderwijs van de Vlaamse Gemeenschap,* Brussels, www.g-o.be/media/1927/go-visietekst-bos-definitief_2013.pdf and related web page www.g-o.be/brede-open-school/.

When looking at innovative schools, the range of some of their partnerships is quite impressive, as illustrated by the following examples (these case studies and those that follow are taken from OECD Reviews of Regional Innovation [OECD, 2013a]).

Jenaplan-Schule (Thuringia, Germany) co-operates with diverse institutional partners in the city and region. Prominent among the partners are Goepel Electronics, the Planwerkstatt, the Schiller House, the Romantic House, the One-World-House, the Public Radio Channel Jena, the public cinema in the Schillerhof, Kommunal Real Estate Office of the City of Jena, the Ernst-Abbe Public Library, the University of Applied Sciences Jena, the University of Jena, the Protestant Adult Education Thuringia, the Philosophia e.V., the Imaginata, the Heritage Office, the City Museum Göhre, the Diskurs e.V., Grund genug e.V., the Theater House Jena and the German National Theatre in Weimar.

The starting point of *Liikkeelle*! (On the Move!) (Finland) was an initiative of the Finnish National Board of Education, which attracted the attention of the town of Kalajoki and the Science Center Heureka. They applied for the funding together, building on existing social networks and good practices. An important further partner has been *PaikkaOppi* (Location Learning), which collaborated in developing an interactive virtual map (their primary aim is to produce an interactive map to support the teaching of geography, geographical information systems (GIS) and environmental studies in schools). The template for the map came from the National Land Survey of Finland. Other partners are the universities of Helsinki and Oulu which have helped to create new teaching methods, such as time-space-paths, and a jointly organised course for student teachers of the arts and upper secondary school students. In addition, the universities have contributed by studying *Liikkeelle*! and producing scientific knowledge and a survey report about the project. Commercial actors are also involved to further develop the virtual environment to accommodate the needs of teachers and learners.

A range of institutions collaborate with the *Centro de Educación Infantil y Primaria* (CEIP) Andalucía (Seville, Spain) in different ways: the Cajasol Foundation subsidises library activities; RENFE (the Spanish railways network) finances the travel expenses to Madrid of some students; the Universidad de Sevilla (teachers and students of the Faculty of Psychology) do some hours in the school in exchange for credits and participate in interactive groups; and the Universidad Pablo de Olavide (scholarship holders of the Flora Tristán student residence and some teachers) take part in interactive groups and in workshops, mainly on the radio.

Horizontal connectedness

As illustrated in OECD Innovative Learning Environments project, innovative schools are often characterised by a high level of horizontal connectedness to their environment. In many innovative learning environments, inquiry-based or problem-based learning is defined by real-world problems and carried out with real-world partners, such as universities and vocational training centres, the local business community, libraries, museums, theatres and sports clubs.

The early childhood development centre CENDI (Nuevo León, Mexico) draws significant content from the daily life of the community, its families, its neighbourhood stories, social and demographic developments, and traditions to enrich its educational programme.

The Culture Path programme (Kuopio, Finland) is for all elementary schools of Kuopio and involves the community in students' learning process. Students follow one "path" for each grade level, such as the library path or the music path. In so doing, students visit at least one local cultural institution or other cultural destination outside the school environment during the school year. These field trips are accompanied by various learning activities at school before and after the trip, and each path is planned according to the requirements and the curriculum for the specific grade level.

Another boundary crossed was between participating in school activities and contributing to adult activities outside of school. The students engaged much more seriously in measurements similar to those reported in the national media. For example, the students asked more insightful questions and realised that conducting the measurements and documenting the results was surprisingly hard and messy (*Liikkeelle*! [On the Move!], Finland).

In the Enrichment Programmes at Rodica Primary School (Slovenia), students participate in voluntary activities, such as helping nursery school teachers or helping in schools for children with special needs.

One of the unique features of the *Dobbantó* (Springboard) programme in Hungary is that, by design, the place of study is not just the classroom; opportunities for learning outside the school are part of the curriculum.

At the Yuille Park P-8 Community College (Victoria, Australia), the school and the community are very closely linked as part of the Community Learning Hub, which includes education, health and facilities for all members of the community. The building is designed so that the community facilities can be accessed from within or outside the school. Having access to these is particularly important for the community, as it is one of the most disadvantaged in Victoria, and many parents are unemployed.

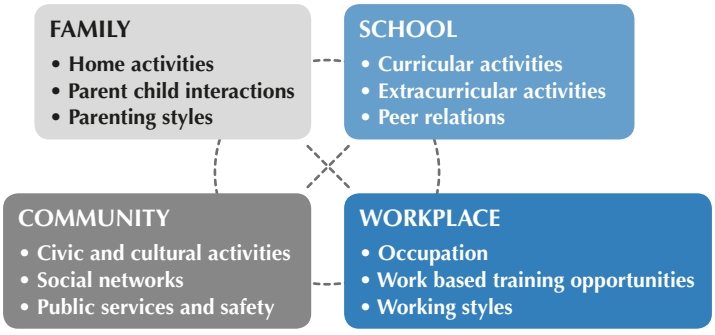
The school library at CEIP Andalucía (Seville, Spain) supports the publication of the school newspaper, *Nevipens Andalucía*. *Nevipens* means "news" in Romany. The idea of the newspaper is to get students closer to the press and make them assume the role of journalists. They prepare the different sections of a newspaper: leading articles, news stories on the school and the neighbourhood, culture (with a section on children's literature), reading and library, citizenship, puzzles, dedications, etc. The newspaper helps to open communication and participation of families and other educational agents in the neighbourhood and develops linguistic communication and social citizenship skills in learners.

Multidimensional ecosystems of learning

The diversity of social contexts in which learning takes place highlights the value of formal, non-formal and informal learning. Formal learning involves institutionalised, curriculum-based learning and teaching (such as learning that occurs within the education system) or workplace learning. Informal learning can take place within work, family or community contexts. It is often more unintentional from the learner's perspective. This type of learning happens, for instance, when children play. Non-formal learning is situated between formal and informal learning. It is structured and intentional, but it is not regulated, accredited or formally supported.

Hence, learning takes place in a variety of social settings, summarised in the current framework as the school, the family, the community and the workplace. Within each type of context we can distinguish a number of specific elements (Figure 2.7). Each context contributes to the development of cognitive, social and emotional skills, although their relative importance will change depending on an individual's stage in life. For instance, parents are clearly crucial during infancy and early childhood, but school and the community become increasingly important as a child enters formal education and interacts with diverse social networks. The workplace, in turn, is a key learning context, particularly during late adolescence and early adulthood.

Figure 2.7
A framework of learning context



Source: OECD (2015a), *Skills for Social Progress: The Power of Social and Emotional Skills*, Figure 2.7, http://dx.doi.org/10.1787/9789264226159-en.

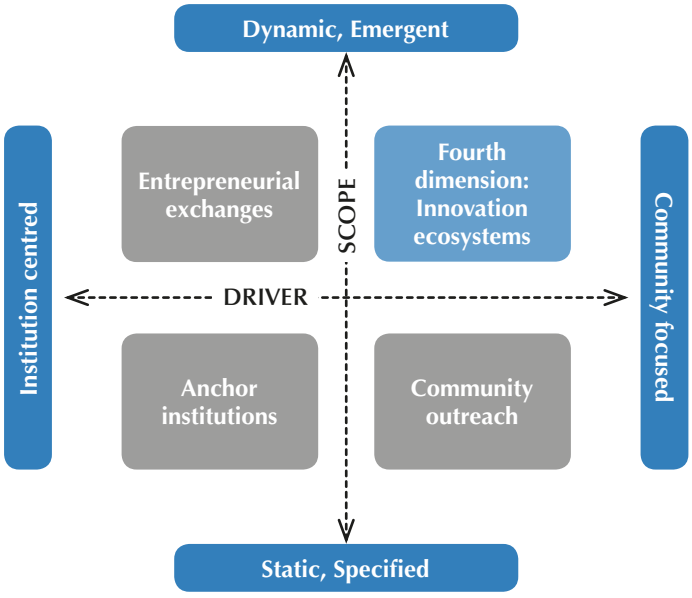
Schools can engage with their communities in different ways

Schools' engagement with their communities can take different forms:

- schools' standing as anchor institutions in their communities, with benefits arising from just being there
- schools' entrepreneurial trading relationships with different client groups, providing educational services to students and employers, and transferring knowledge-based expertise to industry, policy makers and public services
- involvement of schools in the life of the wider community through a variety of corporate social responsibility activities, ranging from outreach programmes with schools or community groups to public lectures and cultural events, and opening campus facilities to public and outside users.

Figure 2.8 illustrates schools' engagement with their external communities along two axes, from provider-centred to community-focused, and from static and specific activities to dynamic and emergent solutions. This framework captures the three domains described here, while highlighting a fourth space of open and collaborative partnerships through which schools and stakeholder communities work together to resolve shared needs and to create collective economic and social benefits. This mode of engagement goes well beyond institution-centred interactions and can help develop local or regional responses to economic and social challenges.

Figure 2.8
Dimensions of school/community engagement



Source: OECD (2017b), *Schools at the Crossroads of Innovation in Cities and Regions*, http://dx.doi.org/10.1787/9789264282766-en, adapted from Stevenson and Boxall (2015), *Communities of Talent: Universities in Local Learning and Innovation Ecosystems,* PA Consulting, London.

Serving the community through extracurricular activities

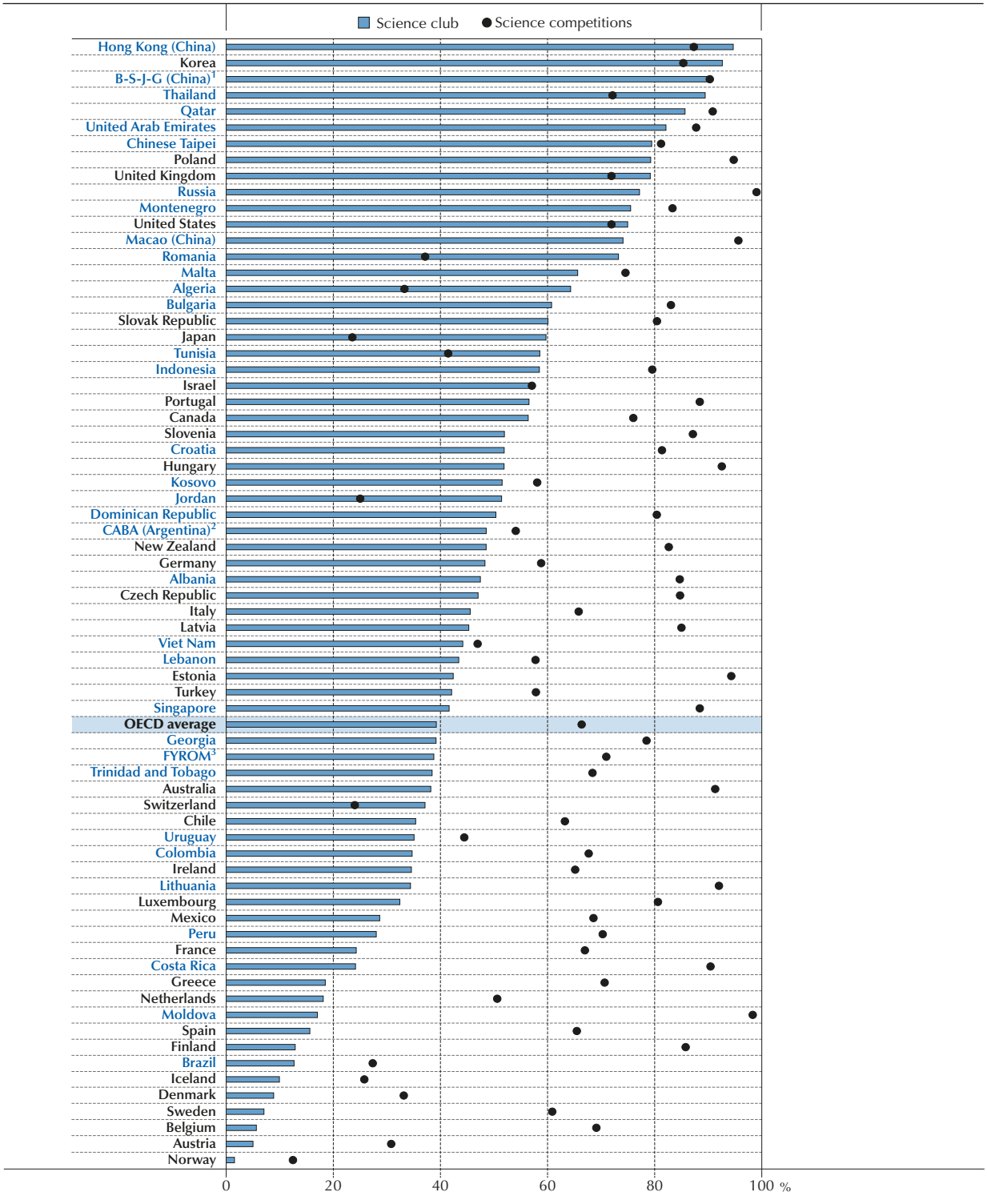
In many school systems, extracurricular activities provide opportunities for students to engage in the local community and to develop social and emotional skills, including civic engagement. Extracurricular activities refer to activities that complement academic content, such as sports, clubs, student government associations, volunteer work and school chores. These activities provide students with real-life situations outside the classroom, with the help of adult facilitators who can act as mentors.

Principals in the PISA 2015 science assessment were asked if their school offers a science club and science competitions at the school (Figure 2.9). Across OECD countries, 39% of students are enrolled in schools that offer a science club, and 66% attend schools that offer science competitions. Such offerings are beneficial to student learning: on average across OECD countries, students in schools that offer science competitions score 36 points higher in science (12 points higher after accounting for students' and schools' socio-economic profile) and 21 points higher if the school offers a science club (6 points higher after accounting for students' and schools' socio-economic profile). Across OECD countries, students who attend schools that offer science-related extracurricular activities hold stronger epistemic beliefs, such as believing that scientific ideas sometimes change or that evidence comes from experiments. However, access to these extracurricular activities is uneven, and advantaged schools offer science clubs and competitions more often than disadvantaged schools. For example, while 53% of students enrolled in disadvantaged schools are offered science competitions, 78% of students in advantaged schools are offered this activity, on average across OECD countries.

Figure 2.9

Science-related extracurricular activities offered at school

Results based on school principals' reports



1. B-S-J-G (see Figure 1.1).
2. CABA (Argentina) refers to the adjudicated region of the Ciudad Autónoma de Buenos Aires.
3. FYROM refers to the Former Yugoslav Republic of Macedonia.

Countries and economies are ranked in descending order of the percentage of schools offering a science club.

Source: OECD (2016a), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, Figure II.2.9, http://dx.doi.org/10.1787/9789264267510-en.

StatLink http://dx.doi.org/10.1787/888933435520

Countries approach the organisation of extracurricular activities in schools in different ways. In the majority of OECD countries, the organisation of extracurricular activities is not formally regulated. The implementation of these activities is often left to the discretion of local authorities or individual schools. However, in some countries, there are formal national guidelines for extracurricular activities that specify the hours and types of activities. For example, extracurricular activities are organised as an integral part of school education in Japan (Box 2.6). The Japanese curriculum (Courses of Study) for primary school students specifies minimum hours that schools should secure for four types of special activities: homeroom activities, student government, club activities and school events. For school events, the curriculum suggests organising specific activities, such as school trips, through which students can experience intensive group interactions and learn to be respectful of others. Besides these activities specified in the curriculum, most schools organise the cleaning of school facilities by students. This provides an opportunity for students to learn ways to collaborate with others and discipline themselves, while helping to maintain a clean learning environment. Korea also has similar guidelines on extracurricular activities, specifying time allocation for "creative experiential activities", including self-regulated activities, club activities, voluntary activities and career education.

Box 2.6. Collaborative development network in Japan

The Community Co-operation Network for Learning and Education (*Chiiki Gakkou Kyoudou Honbu*), launched in 2016 by Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT), is a system designed to promote collaboration between schools and local communities and encourage local residents and organisations to participate in an open network.

The network is based on a number of previous projects, including the following:

1) The School Support Regional Headquarters initiative (*Gakkou Shien Chiiki Honbu*), launched in 2008, aims to promote the participation of local volunteers to support schools. The school support activities range from relatively easy tasks, such as patrolling school routes and tending school flower beds, to more systematic tasks, such as setting up a community centre within a school.

2) The Programme to Promote After-School Classes for Children (*Houkago Kodomo Kyoushitsu*), launched in 2007, provides children with learning support and opportunities for various hands-on activities after school, with participation of community members.

3) The Saturday Educational Activities project, launched in 2014, aims to provide children with educational activities on Saturdays, in partnership with community members and organisations.

4) The Community Tutoring School for the Future project (*Chiiki Mirai Juku*), launched in 2015, is community-based learning support for junior and senior high-school students who need learning assistance.

By 2016, around 10 000 of the 29 453 public compulsory education schools in Japan (19 974 elementary schools and 9 479 junior high schools) were working with about 4 500 School Support Regional Headquarters across the country. About 16 000 After-School Classes for Children were conducted at public elementary schools. In addition, Saturday educational support activities, carried out with the help of local residents and companies or other organisations, are conducted at about 12 000 public elementary, junior high schools or high schools. The newly launched Community Co-operation Network for Learning and Education is expected to allow comprehensive co-ordination of school-support activities by local residents that have been provided independently.

Source: MEXT (2016a), *OECD-Japan Education Policy Review: Country Background Report*, MEXT, Tokyo; MEXT (2016b), *"Community School no secchi joukyou" [The status of establishment of Community Schools]*, MEXT, Tokyo, www.mext.go.jp/a_menu/shotou/community/shitei/detail/__icsFiles/afieldfile/2016/06/16/1372303_04.pdf; MEXT (2016c), *"Gakkou, katei, chiiki no renkei kyouryoku suishin jigyou oyobi chiiki no yutakana shakai shigen o katsuyou shita doyoubi no kyouiku shien taisei tou kouchiku jigyou jisshi joukyou" [Implementation status of the "Promotion of Coordination and Collaboration among Schools, Families and Communities" project and the "Development of Educational Support System for Saturdays Based on Rich Social Resources of Communities" project]*, MEXT, Tokyo, http://manabi-mirai.mext.go.jp/assets/files/H28jissijoukyou/28jissijokyo.pdf; MEXT (2016d), *"Chiiki to Gakkou no Renkei, Kyoudou no Suishin ni Muketa Sankou Jireishuu" [Collection of Reference Examples for Promotion of Coordination and Collaboration between Community and Schools]*, MEXT, Tokyo, http://manabi-mirai.mext.go.jp/assets/files/sankojirei.pdf.

Whether there are formal regulations or not, schools and local education authorities have greater autonomy to plan extracurricular activities than those included in the curriculum. Since schools are less constrained by the physical boundaries of classrooms (and, in some cases, of schools), facilitators or mentors of extracurricular activities can flexibly mobilise real-life activities and scenarios to teach life skills that typically require strong social and emotional capability. Extracurricular activities often stimulate students to actively contribute to designing their own learning experience. They can also provide opportunities for schools to strengthen linkages with the community.

School-community partnerships can also provide additional opportunities for social and emotional learning, by improving children's access to extracurricular activities, and can enhance their engagement in the community.

In Denmark, a public school reform has been in place since 2014 to enhance a school-community link that aims to improve extracurricular activities. With this reform, schools are required to collaborate with the surrounding community by involving local sports clubs, cultural centres, art and musical schools and various associations. The municipalities are required to commit to ensuring school-community co-operation.

In Portugal, PEDIME (Strategic Plan of Inter-municipal Development of Education) is an integrated and innovative plan to combat school failure based on joint work between the 13 municipalities and between the municipalities and their respective schools, valuing convergence and complementarity with strategic plans of schools.

In the United Kingdom, the Outward-Facing Schools programme at the Sinnott Foundation promotes schools' links with communities and parents by providing fellowships to education practitioners in secondary schools. Their initiatives include active collaboration by schools with local groups and businesses to create community work opportunities for students, such as volunteering at care homes and teaching at local primary schools.

Service-learning

Learning based on engaging with the local community is often referred to as service-learning. At its most basic level, academic service-learning is an experiential learning pedagogy in which education is delivered by engaging students in community service that is integrated with the learning objectives of core academic curricula. Academic service-learning is premised on providing students with contextualised learning experiences that are based on authentic, real-time situations in their communities. Using the community as a resource for learning, the primary goal of academic service-learning is to enhance students' understanding of the broader value and utility of academic lessons within the traditional disciplines (e.g. science, mathematics, social studies, language arts and fine arts), while engaging young people in social activities through which they derive and implement solutions to important community issues. Ideally, the community service the students perform helps them better understand how the academic concepts taught in the classroom can be applied to situations in their everyday lives. In this regard, academic service-learning seeks to simultaneously enhance students' academic achievement and their civic development.

The literature on service-learning reveals that the community-service activities in which students are engaged tackle a broad range of societal issues, including those concerning the environment, health, public safety, human needs, literacy and multiculturalism. In implementing service-learning activities, students can address a societal issue either through direct service (e.g. serving food at a homeless shelter) or indirect service (e.g. producing a research report that provides recommendations to the homeless shelter for improving its food distribution). Regardless of the type or focus of the service activity, academic service-learning is designed to help students apply their academic content knowledge to act on authentic and often complex societal issues.

In contrast to other forms of project-based learning, academic service-learning projects are purposefully community-focused and community-based, are usually conducted in partnership with members of the community, and, most importantly, are designed with a community need in mind. In essence, like a textbook or laboratory, the community becomes a resource for learning whereby the environs outside school offer students authentic learning opportunities to use their academic knowledge and skills to construct and implement solutions to real-life social problems in the local community or broader society.

The emphasis on community service and its use of the community as a resource for academic study intentionally shifts the role that students play in the learning process. They become producers rather than recipients of knowledge, active rather than passive learners, and providers rather than recipients of assistance. Unlike most other experiential learning approaches, academic service-learning places students in situations where they focus less on using resources

for their own gain and more on acting as a resource for the benefit of others. Service-learning creates an educational atmosphere whereby learners confront real-life issues through community-engaged experiences that call on them to develop meaningful, academically-relevant actions that have real consequences for the community and themselves. Perhaps more than any other experiential or community-engaged learning pedagogy, academic service-learning has a strong civic dimension at its core. Its emphasis on community service establishes an inherent civic dimension that promotes social responsibility and citizenship among participants.

Learning to engage

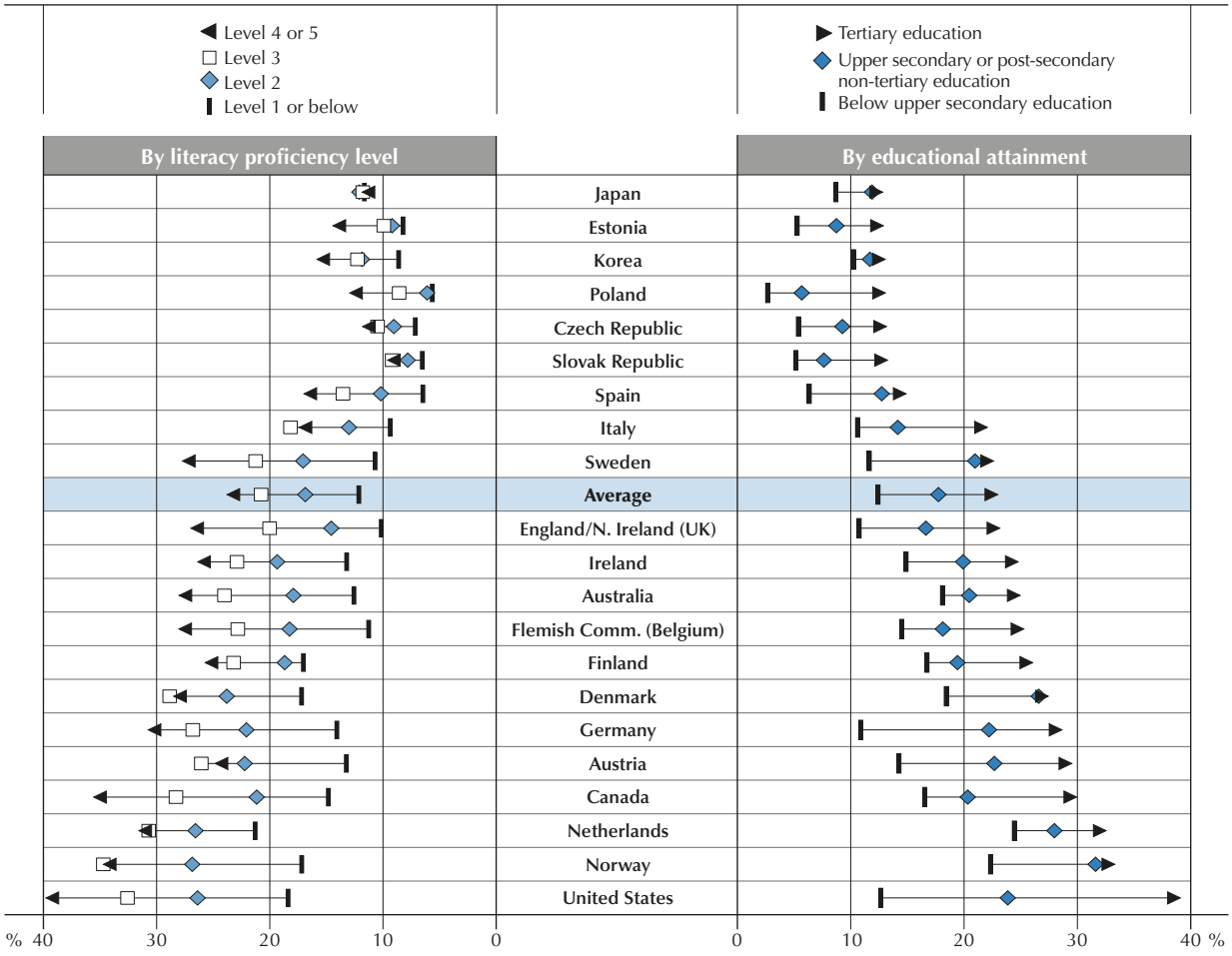
Education, whether measured in terms of educational attainment or skills acquired, seems to have a strong impact on the civic and community engagement shown later in life. Figure 2.10, based on data of the Survey of Adult Skills, a product of the Programme for the International Assessment of Adult Competencies (PIAAC) shows the strength of the relationship, but also that the strength differs from country to country.

On average, better-educated individuals are more likely to exhibit higher levels of civic and social engagement than the less educated. Also, better-educated parents are more likely to stimulate their children's civic engagement, and an educated society in turn tends to be more cohesive and have less crime. However, the precise mechanisms and pathways through which education promotes civic and social engagement remain unclear.

Figure 2.10

Percentage of adults reporting that they volunteer at least once a month, by educational attainment and literacy proficiency level (2012)

Survey of Adult Skills, 25-64 year-olds



Countries are ranked in ascending order of the proportion of people with tertiary education reporting that they volunteer at least once a month.

Source: OECD (2014), *Education at a Glance 2014: OECD Indicators*, http://dx.doi.org/10.1787/eag-2014-en.

StatLink http://dx.doi.org/10.1787/888933116680

Partnering with business and cultural bodies in the local community

Contemporary learning environments often develop strong connections with partners to extend their boundaries, resources and learning spaces.

Cultural partnerships can be very useful in extending the boundaries of the learning environment beyond formal school provision, and in offering access to arts materials and experiences directly. As in the case of the Fiskars Elementary School (Finland), artists and craftspeople become part of the educational workforce too.

> The Fiskars Elementary School (Finland) may be defined as an enlarged learning environment. The basis for the model and its central working method are the workshops that are developed, and organised in co-operation with such actors as the Artisans, Designers and Artists Cooperative of the village of Fiskars.
>
> Thanks to the cultural offer of Sant Sadurní D'Anoia and other nearby towns, all students at *Instituto Escuela Jacint Verdaguer* (Spain) annually attend a performance of each artistic discipline (music, dance and theatre), visit exhibitions and have similar cultural experiences.
>
> The Culture Path programme (Finland) has been implemented in close collaboration with local cultural institutions, schools and teachers, as well as other relevant interest groups, such as the Eastern Regional Centre for Dance, the Children's Cultural Centre Lastu, many cultural associations and private culture activists. The project aims to produce a service that is easily accessible, and which enables both students and teachers to experience culture and art as a source of learning and enjoyment. The programme has nine paths, one for each grade level: library, art, museum, media, environment, dance, music, theatre and the K-9 card. With the K-9 card, a Grade 9 student can use the city's cultural services for free, or at minimal cost, after "trekking" for eight years on the Culture Path.

These, and many other examples of partnerships with museums, galleries and theatres, and also with radio and media companies, extend the materials and the means of learning as well as the range of professionals involved.

Another channel through which schools partner with and contribute to the local economy and community is their engagement with local business and industry (Box 2.7). Some corporate partnerships may be the more conventional community links of businesses helping through taking a funding or sponsorship role, but they may also be much more oriented to the learning that takes place.

> The Lobdeburgschule (Thuringia, Germany) co-operates with many regional partners. This includes membership in *Berufsstart plus* (a project for transition into vocational training) of the Eastern Thuringian Apprenticeship Network. Other co-operation partners include a car dealer, an educational institution, an education centre in Jena, the regional office of the German Children and Youth Foundation, the University of Applied Science of Jena, a registered association, the International Academy Berlin for Innovative Pedagogy, Psychology and Economics, the University of Berlin, the University of Jena, a day-care centre, the vocational training centre for health and social issues, a theatre, the adult education centre Jena, and the vocational training centre in Jena-Göschwitz.
>
> The connection between schools and the economic activity of the surrounding community is exemplified in the *Instituto Agrícola Pascual Baburizza* (Chile). The education of these students is guided by a group of farmers from the community, who are part of the school board and make sure that what is taught at the school is linked to real needs ("learning by doing and producing"). Internships must be done in real situations to train people and professionals. The students learn about employers' demands, and it is expected that they will continue to develop throughout their professional lives. Everything that students learn in internships must have a practical application. All of this is done in the countryside, the "big classroom".

Box 2.7. School partnership with the local community in Portugal

Within the framework of experimental teaching, one school in Alcanena (Santarem region) works with a number of partners: the Alviela Science Center; Nersant (a regional business association); the *Faculdade de Ciências e Tecnologias da Universidade de Coimbra*, the *Faculdade de Ciências e Tecnologias da Universidade Nova de Lisboa* and the *Instituto Politécnico de Tomar* (higher education institutions); and the Technological Center for the Leather Industry.

...

The aim of these partnerships is to increase student exposure to the community and blend classroom learning with practical experiences. Each partnership serves a different purpose:

- Alviela Science Center: This partnership aims to improve the skills and knowledge of students through participation in workshops and interactive exhibitions.
- Nersant Business Association: This partnership aims to improve students' entrepreneurship skills and to equip them with the skills needed to design, develop and communicate a business idea for new products.
- Higher education institutions: This partnership provides students with opportunities to interact with researchers from different fields. Students can work with these researchers on projects and benefit from their expertise and guidance.
- Technological Center for the Leather Industry: This partnership familiarises students with the local leather industry and tannery procedures. Students can also make use of labs in the technological centre for their own research related to leather.

These partnerships help ground learning in real-life situations that require practical solutions. Due to this, students in Grade 10 grade were motivated to design a project using the industrial waste of the leather industry to develop an eco-friendly battery, which was both more efficient and more sustainable.

Source: Ministry of Education (2018).

LEVELLING THE PLAYING FIELD

Poverty need not be destiny

What wise parents want for their children is what communities should want for all children. But there can be tensions between innovation, flexibility and openness in an education systems, on the one hand, and coherence and equity, on the other.

There has been much discussion on the extent to which the performance of nations on tests like PISA is shaped by the socio-economic context of families, schools and communities. In all countries taking the PISA test, learning outcomes are associated with the social background of students and schools, highlighting that social background is a major challenge for teachers and schools. However, the strength of the relationship between social background and the quality of learning outcomes varies substantially across education systems, highlighting that poor results are not an inevitable outcome of social disadvantage. On the PISA 2015 assessment, the 10% most disadvantaged students in Estonia or Vietnam performed at the level of the average student in the OECD area (Figure 2.11). If the poorest students in Estonia, Shanghai (China) or Vietnam can perform at a level that would be associated in western countries with typical performance, why should not the poorest children in these other countries do as well as their counterparts in Estonia, Shanghai (China) or Vietnam?

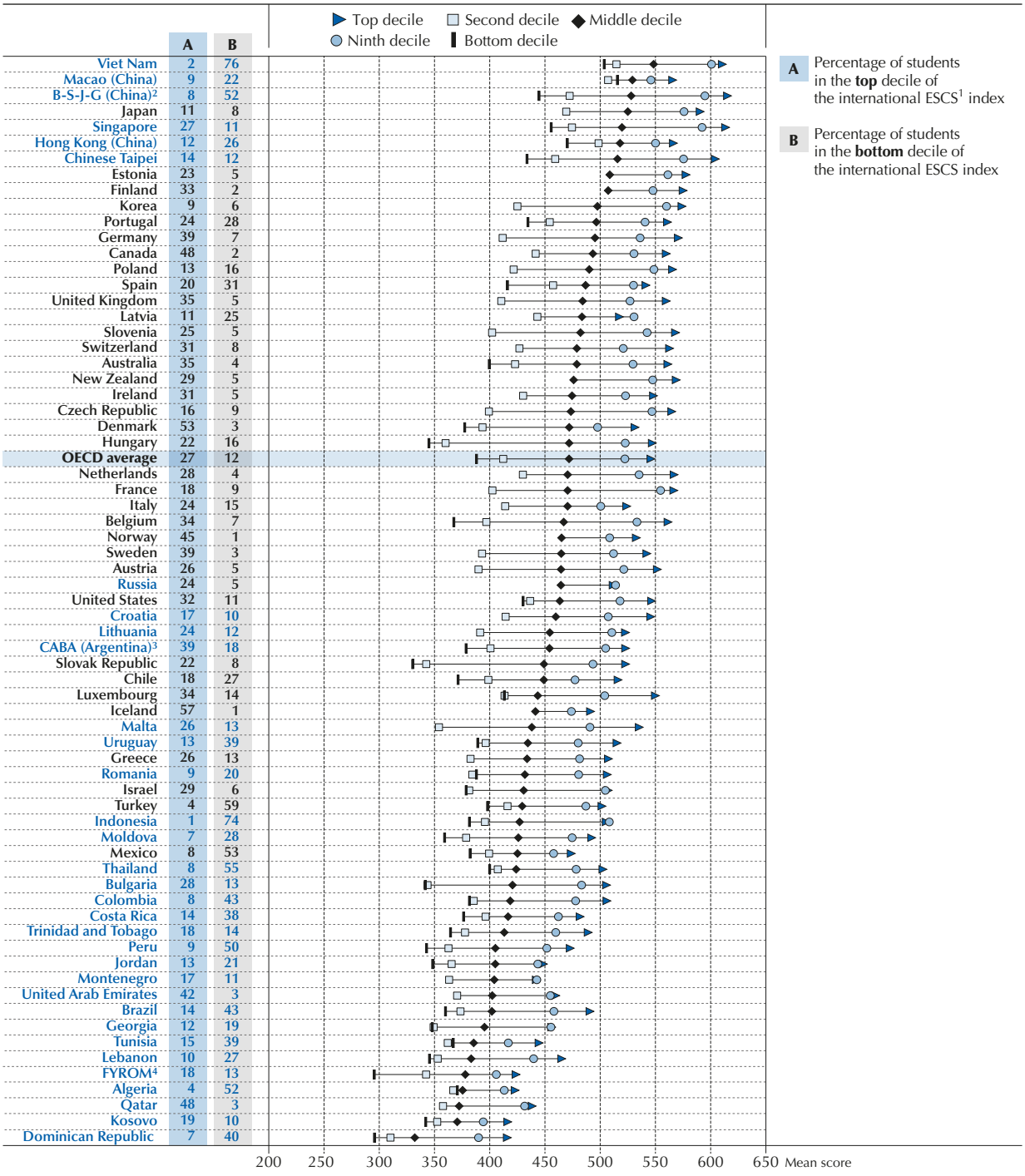
Aligning resources with needs

PISA data show that one of the most important factors that can affect a student's performance is the socio-economic background of the other students in the class. The implication is that one of the most important resources to be allocated to schools and classrooms is the students themselves. Germany failed to join the northern European nations in moving away from a tripartite secondary school organisation based on social class in the years leading up to and just following the Second World War. This has made it difficult for that country to provide its lower-income students, especially immigrant students, with the quality of education that they need to have a decent chance to get a qualification and become productive members of German society. The post-PISA move in Germany to reduce the system from three to two divisions has contributed to the improvement in student achievement in recent years. Along the same lines, Poland produced a substantial improvement in overall performance by converting a secondary school system that was mainly organised according to the social class of its 15-year-olds to one in which comprehensive schools enrol all social classes.

Many OECD countries still face difficulties in equipping socio-economically disadvantaged schools to effectively address the challenges they face and offer their students a high-quality education (Figure 2.12). Nevertheless, some education systems have taken active steps to improve the alignment of resources with students' needs.

Figure 2.11

Mean performance in science, by international decile on the PISA index of economic, social and cultural status



1. ESCS refers to the PISA index of economic, social and cultural status.
2. B-S-J-G (China) refers to the four PISA-participating provinces: Beijing, Shanghai, Jiangsu and Guangdong.
3. CABA (Argentina) refers to the adjudicated region of the Ciudad Autónoma de Buenos Aires.
4. FYROM refers to the Former Yugoslav Republic of Macedonia.

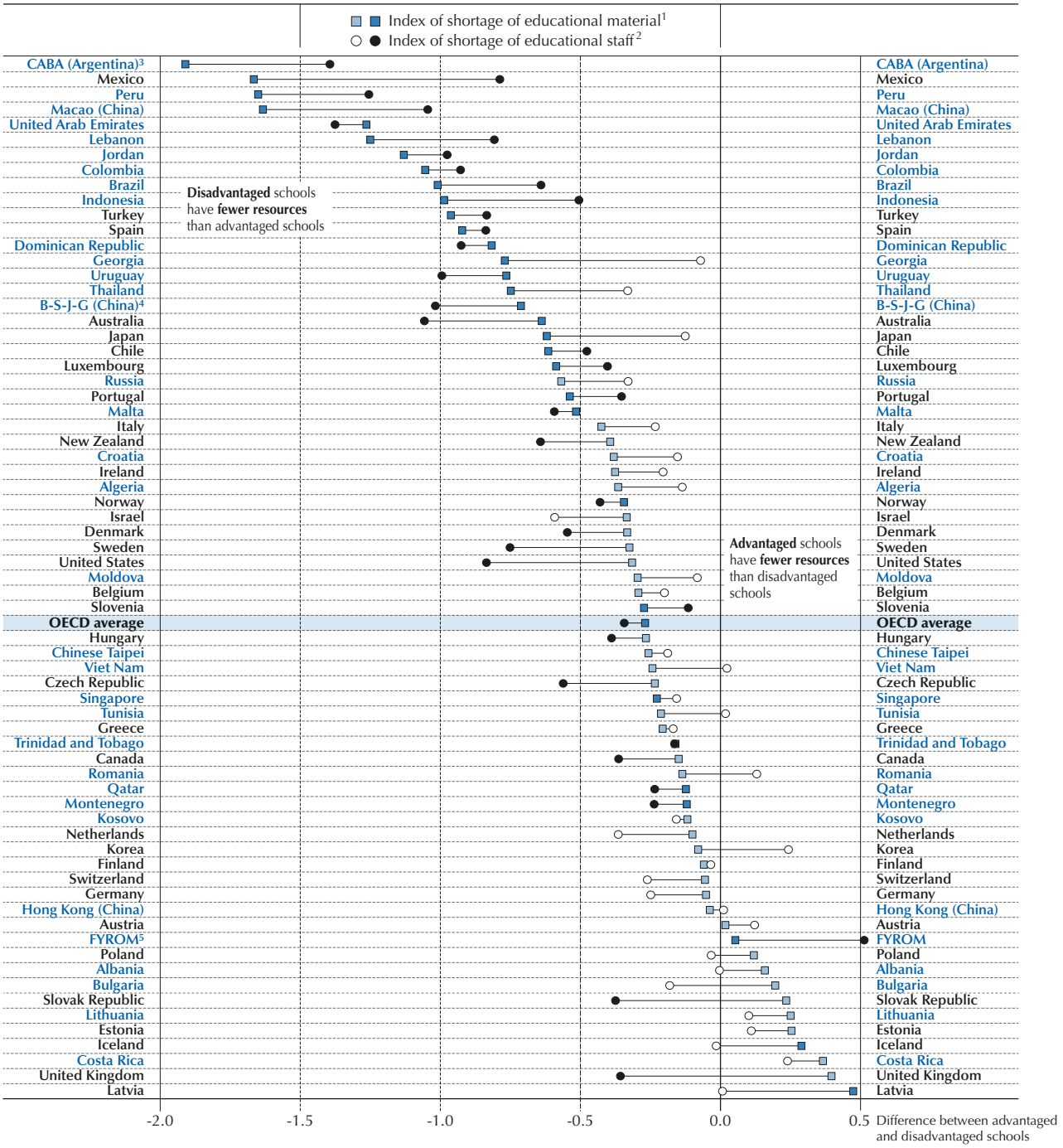
Notes: International deciles refer to the distribution of the PISA index of economic, social and cultural status across all countries and economies.
Only countries and economies with available data are shown.
Countries and economies are ranked in descending order of the mean science performance of students in the middle decile of the PISA index of economic, social and cultural status.

Source: OECD (2016b), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, Figure I.6.7, http://dx.doi.org/10.1787/9789264266490-en.

StatLink http://dx.doi.org/10.1787/888933432757

Figure 2.12

Differences in educational resources between advantaged and disadvantaged schools



1. The index of shortage of educational material is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack of and/or inadequate educational materials, including physical infrastructure.

2. The index of shortage of educational staff is measured by an index summarising school principals' agreement with four statements about whether the school's capacity to provide instruction is hindered by a lack and/or inadequate qualifications of the school staff.

3. CABA (Argentina) refers to the adjudicated region of the Ciudad Autónoma de Buenos Aires.

4. B-S-J-G (China) refers to the four PISA-participating provinces: Beijing, Shanghai, Jiangsu and Guangdong.

5. FYROM refers to the Former Yugoslav Republic of Macedonia.

Note: Statistically significant differences between advantaged and disadvantaged schools are marked in a darker tone.

Countries and economies are ranked in ascending order of the difference in index of shortage of educational material between advantaged and disadvantaged schools.

Source: OECD (2016b), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, Figure I.6.14, http://dx.doi.org/10.1787/9789264266490-en.

StatLink http://dx.doi.org/10.1787/888933432823

Singapore, for example, sends its best teachers to work with the students who are having the greatest difficulty reaching the country's high standards, and in Japan, officials in the prefectural offices transfer good teachers to schools with weak faculties to make sure that all students benefit from equally qualified teaching staff. In addition, the OECD School Resources Review notes that an increasing number of countries use formula-based school funding as a means to advance equity objectives through the distribution of financial resources (OECD, 2017b). Many of the most effective funding systems acknowledge differing needs across schools through a combination of targeted funding or the inclusion of coefficients that assign additional resources to schools with particular needs based on the students they serve, their educational offer or school characteristics, such as their size or location.

In the Flemish and French Communities of Belgium, for example, the formula used to allocate operating grants and staff resources to schools includes weights for students' socio-economic characteristics, special educational needs and school location. There is also additional targeted funding allocated as a restricted block grant to school providers for specific student groups, including students from disadvantaged backgrounds and newly arrived immigrants and refugees (Nusche et al., 2015). All of this serves to support an efficient and equitable distribution of funds to ensure that the schools with the greatest needs receive sufficient resources to adequately serve the students of their communities.

Levelling the playing field and enabling all students to succeed also requires systems to address regional discrepancies and ensure that all students can benefit from a high-quality educational offer. Educational institutions are often vital to the social health of their surrounding communities. Yet many communities, particularly those in rural areas with declining student populations, are facing pressures to consolidate their educational offer, given the high cost of operating and maintaining small schools. Small schools may also find it difficult to provide their students with a broad educational offer and also to attract qualified teachers to provide specialised courses and teach under the challenging conditions found in many rural schools (such as multigrade classes). Providing high-quality education at the heart of rural communities thus relies on the efficient use of educational resources and a careful adjustment of the school network to changing educational demand and students' needs. Countries have used a range of policy levers and steering tools to make sure that educational provisions adapt to local demand and enable teachers to meet their students' needs. Portugal, for example, has redesigned its school network and clustered small rural schools into larger hubs with a critical mass of students, to ensure that available resources are used efficiently to provide a high-quality education regardless of a school's location (Box 2.8).

Box 2.8. School clustering in Portugal

In 2005/06, Portugal, implemented an ambitious reform to consolidate its school network and address its inefficiencies and drastic regional inequalities. Between 2001 and 2016, the number of schools was reduced from 16 454 to 8 350. Prior to the reform, rural areas were dominated by small schools with poor facilities and low performance, while schools in urban areas were often overcrowded and relied on double-shift education. To address this problem, the Ministry of Education co-operated with local governments and school executive boards to close down small, underperforming schools with above-average annual repetition rates in 2005/06, while simultaneously providing the affected local governments with financial support to build and invest in new school centres and provide funding for school transport. Many small schools were thus replaced by new school centres with a minimum of 150 students at more than one level and full-day school with extracurricular activities.

Besides rationalising the administration, management and use of school resources, the introduction of school clusters also aimed to ease the transition between different levels of compulsory education. Portuguese school clusters therefore often include two or more levels of compulsory education, comprising preschool establishments and one or more education cycles within a single organisation, sharing its administration and management. This facilitates transition between different levels of education in one specific geographic area. The reorganisation of the school network is considered to have improved its efficiency, expanded educational opportunities for disadvantaged students in isolated areas, and fostered a collaborative approach between the Ministry of Education (centrally and regionally), municipalities, schools and other stakeholders.

Several features of the reform contributed to the success of the reorganisation, including that: 1) the reform was guided by a clear vision and criteria that specified which schools should close and which should replace them; 2) it was recognised that parents needed to be convinced that the clustering would have positive outcomes for them and their children, and incentives were provided (including free transportation); 3) municipalities supported cluster hubs in assuming their new leadership.

Sources: Ares Abalde, M. (2014), "School Size Policies: A Literature Review", *OECD Education Working Papers*, No. 106, http://dx.doi.org/10.1787/5jxt472ddkjl-en; OECD (forthcoming), *The Organisation of the School Offer* (working title).

The most impressive result of the performance on PISA of Shanghai (China) is not just its high average score, but the low variability in school performance that is achieved despite considerable social and economic inequalities in the population of the province. This has not come about by chance but can be seen in the context of determined efforts to improve the school system by converting so-called weaker schools to stronger schools. These efforts include:

- systematically upgrading the infrastructure of all schools to similar levels
- establishing a system of financial transfer payments to schools serving disadvantaged students and establishing career structures that incentivise high-performing teachers to teach in disadvantaged schools
- pairing high-performing districts and schools with low-performing districts and schools, where the authorities exchange and discuss their educational development plans and work together to deal with problems such as teachers' development, and where institutes for teachers' professional development affiliated with both authorities share their curricula, teaching materials and good practices
- implementing arrangements under which the government commissions "strong" public schools to take over the administration of "weak" ones, by having the "strong" school appoint its experienced leader, such as the deputy principal, to be the principal of the "weak" school and sending a team of experienced teachers to lead in teaching, in the expectation that the ethos, management style and teaching methods of the high-performing school can be transferred to the poorer-performing school.

There is nothing other than outdated regulation and a lack of imagination that would preclude other education systems from pursuing similar efforts. And in fact, there are similar examples in many education systems. In the state of Ceara in Brazil, the highest-performing schools received a significant reward in terms of additional financial resources, which allowed them to hire more specialised teachers and experts. However, they were not allowed to deploy these additional resources in their own school but were required to use them to support the schools that struggle most. So everyone won: the high-performing schools gained additional prestige and an expanded team, and the low-performing schools benefitted from the expertise of high-performing schools that may have been more valuable to them than additional money.

Of course, in the early stages of a country's economic development, the demand for highly educated people is limited, and so are the resources for developing such people. One way to meet that need is to put what money there is into children who are, by virtue of the education and income of their parents, the most advantaged students in the whole society. That is why segregating schools by social class and concentrating efforts on a small number was a very efficient strategy for providing education in the first stages of an industrial society. But when far larger proportions of highly educated people are demanded in the world's high-wage economies, it is not only socially unjust but highly inefficient to organise an education system this way.

Reconciling flexibility and equity

A wide range of indirect background factors can have an impact on the role of schools in their communities. At system level, these include: student admissions policies and whether or not parents are able to choose schools; whether there is tracking/selection of students on grounds of ability and aptitude; system-wide forms of accountability and assessment; and forms of national curricula. While these factors are outside the main focus of the International Summit of the Teaching Profession, it is worth reflecting on evidence about the relationship between school choice and equity, as the social background of students admitted to schools is affected by policies in these areas.

While enhanced school autonomy seems a common characteristic of high-performing education systems, these education systems differ substantially in how they regulate autonomy. They often pursue very different approaches when it comes to linking school autonomy with school choice, and to reconciling choice with equity. For example, England (United Kingdom) and Shanghai (China) both place considerable emphasis on market mechanisms, but while public policy in England mainly operates on the demand side of markets, seeking to drive school improvement through enhancing parental choice, the main emphasis of public policy in Shanghai lies on the supply side, aiming to provide schools in the most disadvantaged areas with the best educational resources. And while Finland and Hong Kong (China) both put considerable emphasis on local autonomy, in Finland that autonomy is exercised within a strong public school system, while most schools in Hong Kong are managed by private entities with rather loose steering mechanisms (Box 2.9).

Some countries have tried to strengthen flexibility and equity-related mechanisms at the same time. England (United Kingdom), for example, has rapidly increased the number of academies, which are autonomous state-funded schools directly funded by the Department for Education and independent of local authority control. At the same time, England has established a pupil premium that provides schools with additional resources based on the composition of their socio-economic intake. The diversity of approaches that schools in England use to allocate the pupil premium is intriguing.

Many of the schools went beyond exams and results to prioritise efforts around student well-being, with examples ranging from pastoral care, safeguarding, school uniforms or breakfast clubs to improving student attendance. Some schools focused on parents, conducting workshops for parents to understand current teaching methods or to engage parents in academic work and assessment, or introducing students to the world of work. But all of the schools own the process through which they seek to leverage the potential of disadvantaged students and are publicly accountable for it.

Some countries have also made it possible for private schools to be integrated into the public education system as government-dependent schools or as independent schools that receive a certain amount of public funding.

One of the most controversially debated levers around flexibility is school choice. Proponents of school choice defend the right of parents to send their child to the school of their preference – because of quality, pedagogical approaches, religious denomination, affordability or geographical location – regardless of legal restrictions or financial or geographical barriers. The idea is that, given students' diverse needs and interests, a larger number of options in any one school system should offer better value by reducing the cost of failure and mismatch, stimulate competition and, in doing so, prompt schools to innovate, experiment with new pedagogies, become more efficient and improve the quality of the learning experience. Proponents argue that the increasing social and cultural diversity of modern societies calls for greater diversification in the education landscape, including by allowing non-traditional providers and even commercial companies to enter the market.

Critics of school choice argue that, when presented with more choice, students from advantaged backgrounds often opt to leave the public system, leading to greater social and cultural segregation in the school system. They are also concerned with over-reliance on theoretical models of rational, price-based economic competition as the basis for efficient allocation of resources. At the macro level, such segregation can deprive children of opportunities to learn, play and communicate with children from different social, cultural and ethnic backgrounds which, in turn, threatens social cohesion. To critics, vouchers and voucher-like systems divert public resources to private and sometimes commercial providers, thereby depriving public schools, which tend to serve large populations of disadvantaged students, of the resources needed to maintain the quality of the education provided.

A closer look at the evidence shows that the case is not so clear-cut. Hong Kong (China) is a system that has a market-driven approach in virtually every field of public service, but it has been able to combine high levels of student performance with a high degree of social equity in the distribution of educational opportunities (see Box 2.9). The Netherlands provides an example of a successful choice-based system (Box 2.10). On the other hand, in Sweden, the introduction of choice-based mechanisms seems to have led to widening social disparities without overall improvements in results (Box 2.11).

Box 2.9. Hong Kong (China): Success through entrepreneurship

The backdrop for the education system in Hong Kong (China) is that schooling used to be entirely the domain of philanthropy, and it was only when the economy gathered strength in the 1960s that the government began to subsidise education.

With the majority of schools run by private entities, the government has few levers for direct intervention, and parents have a powerful influence on schools, both through their choice of schools (though still banded) and through local control.

Parents sit on school management committees, parent-teacher associations and home-school co-operation committees. According to a former Permanent Secretary for Education, parents have more influence on what happens on the ground than the Education Bureau. The vibrant cyber-community has added to the tremendous pressures on schools to maintain a high quality of education.

Most leading newspapers have education pages that deal on a daily basis with policy debates as well as disputes in schools. An inspiring principal from one of Hong Kong's elite schools explained how principals and teachers face a daily struggle to balance administrative accountability, client accountability and professional accountability while keeping their focus firmly on nurturing well-rounded children and helping parents see beyond their children's entry to university.

All that does not mean that education is not a government priority. On the contrary, Hong Kong devotes 23% of its public budget to education, more than any OECD country, realising that it is talent that transforms the lives of its citizens and drives its economy.

Source: Schleicher A. (forthcoming), *Worldclass: How to build a smart school system*.

Box 2.10. School choice in the Netherlands

The Netherlands is a high-performing school system where more than two-thirds of 15-year-old students attend publicly funded private schools. It is also a highly diversified system, with wide differences among schools in pedagogical approaches, religious denomination and socio-economic profile. However, the between-school variation in PISA science performance in 2015 was one of the largest among OECD countries (just over 65% of the performance variation is explained by between-school differences in performance).

The Netherlands has a highly decentralised school system. School autonomy is grounded in the principle of freedom of education, guaranteed by the Dutch Constitution since 1917. This allows any person to set up a school, organise teaching and determine the educational, religious or ideological principles on which teaching is based. In principle, parents can choose their child's school (although this is somewhat restricted by the school guidance given by education professionals when students complete primary school), but local authorities control enrolments to some extent in order to mitigate imbalances in school composition or weight student funding to support greater social diversity in schools.

In 2011, about one in three primary students was enrolled in public schools, one in three was enrolled in Catholic schools, one in four attended Protestant schools and the remainder was enrolled in other types of government-dependent private schools. While public schools are open to all students, government-dependent private schools may refuse students whose parents do not subscribe to the school's profile or principles.

A distinctive feature of the Dutch system is the institution of school boards. These bodies are given far more powers than the schools that are governed by these boards. The boards oversee the implementation of legislation and regulations in the school and employ teachers and other staff. In the past, public schools were governed mostly by local authorities, but governance has increasingly been devolved to independent school boards. The school governors who make up the boards may be volunteers (laypeople receiving an honorarium) or professionals (who receive a salary).

The role of the school boards is a subject of debate in the Netherlands. A recent OECD review (OECD, 2016c) calls for strengthening the governance capacity and accountability of schools boards by improving transparency and rebalancing decision-making powers between the board and school leaders.

Since the 1980s, the government has devolved additional responsibilities to schools. Private foundations have assumed responsibility for schools managed by local authorities (although the schools themselves remain public), and lump-sum financing has been introduced, which gives school boards the freedom to make their own spending decisions. Conversely, some recentralisation has taken place through the establishment of national learning objectives and examination programmes. Mergers of school boards have been promoted, as larger school boards are considered to be more professional and financially stable.

In the decentralised Dutch education system, religious organisations and associations of citizens receive public funding for the schools for which they are responsible, provided that they meet government regulations. Public and private schools receive the same amount of public funding in the form of a lump-sum allocation based on the number of students enrolled. Since the mid-1980s, additional subsidies were assigned for disadvantaged students, reflecting the higher cost of teaching them. Since 2006, these voucher weights have been based on parents' educational attainment, replacing previous criteria based on students' immigrant background.

Although publicly funded private schools are not allowed to charge mandatory tuition fees or operate for profit, state-funded schools can supplement their funding with voluntary contributions from parents or businesses. Private schools receive significantly more of such contributions than public schools. Publicly funded private schools are not allowed to engage in selective admissions, but parents of prospective students may be required to subscribe to the school's profile or principles.

The education system of the Netherlands manages to offer parents a wide choice and to fund private entities that organise schools with public resources in a way that is generally seen as fair. The overall high quality of the system can partly be attributed to its diversity, the degree of competition among schools, and the high level of autonomy enjoyed by school boards, school leaders and teachers. While the Netherlands shows large between-school variations in PISA performance, it succeeds in maintaining equity in its system. The accountability system works well; teacher professionalisation is well-developed, and the relative consistency in the quality of schools allows for examinations to be centrally designed.

Source: OECD (2017c), *School Choice and School Vouchers: An OECD Perspective*, www.oecd.org/edu/School-choice-and-school-vouchers-an-OECD-perspective.pdf.

Box 2.11. School choice in Sweden

Student performance on PISA has declined, from near the OECD average in 2000 to significantly below the OECD average in 2012. These disappointing results fuelled a national debate on the quality of school education and the consequences of the introduction of market mechanisms, leading to a broad consensus on the need for change. The recent OECD review (OECD, 2015b) highlighted a number of policy recommendations, including revising school-choice arrangements to ensure quality with equity. These include improving the access of disadvantaged families to information about schools and supporting them in making informed choices, as well as introducing controlled choice schemes that supplement parental choice, to ensure a more diverse distribution of students in schools. A major reform undertaken in Sweden in the early 1990s was the liberalisation of rules for establishing and running independent schools. Independent schools are fully funded by the public purse and have full autonomy to allocate resources as long as they conform to government regulations. School choice was introduced in parallel in 1991. As a result of these reforms, the education system changed from one where the vast majority of students attended the public school in their catchment area to one where many students opt for a school other than their default school, and where schools that are privately-run and publicly funded compete with traditional public schools. Students in Sweden are first allocated to a school based on geographical criteria. Parents and students can then opt to stay in the school to which the student has been assigned or can choose another public or independent school, if places are available. In primary and lower secondary schools, no selective criteria for admissions are applied other than first-come, first-served. The independent schools (publicly funded private schools) must follow the national curriculum and are not allowed to charge extra fees. In Sweden, 86% of students attend public schools, and 14% attend independent schools. Public funding for independent schools is provided through a voucher system. Students are allocated a certain amount, decided by municipalities. With this expansion of the education market, the number of independent schools in Sweden increased from around 60 in 1991 to 792 in 2014, with the greatest increase in upper secondary schools.

Source: OECD (2015b), *Improving Schools in Sweden: An OECD Perspective*, www.oecd.org/education/school/Improving-Schools-in-Sweden.pdf.

Evidence on school choice and competition from PISA has concluded that results indicate a weak and negative relationship between the degree of competition and equity. Among OECD countries, systems with more competition among schools tend to show a stronger impact of students' socio-economic status on their performance in mathematics. Caution is advised when interpreting this result, as the observed relationship could be affected by outliers. But this finding is consistent with research showing that school choice – and, by extension, competition – is related to greater levels of segregation in the school system, which may have adverse consequences for equity in learning opportunities and outcomes (OECD, 2013b).

The degree of choice that parents enjoy and the level of competition in school systems vary widely between countries and within countries among different social groups. Across 18 countries with comparative data in the PISA 2015 assessment, the parents of 64% of students reported that they had a choice of at least one other school available to them, but this percentage varies widely among countries (OECD, 2016a). Parents of students who attend rural and disadvantaged schools reported having less choice than parents of students in urban and advantaged schools.

Parents in PISA were also asked to report how much importance they gave to certain criteria when choosing a school for their child. These were mainly related to school quality, financial considerations, the school's philosophy or mission, and the distance between their home and the school. Across the 18 education systems with available data, parents were more likely to consider it important that the school environment is safe, that the school has a good reputation and that the school has an active and pleasant climate – even more important than the academic achievement of the students in the school (OECD, 2016a).

It is concerning that the parents of children who attend disadvantaged, rural and public schools were considerably more likely to report that the distance between their home and the school is important than the parents of children in advantaged, urban and private schools and that the children of parents who assigned more importance to distance scored considerably lower in the PISA science assessment, even after accounting for the socio-economic profile of students and schools. This was also observed among students whose parents considered low expenses to be important or very important. These students score 30 points lower in science (roughly the equivalent of a school year) than students whose

parents considered low expenses to be only somewhat important or not important. And again, the parents in disadvantaged and public schools were more likely than those in advantaged and private schools to consider low expenses important when they choose a school for their child. It seems that struggling families often have a hard time assessing differences in outcomes, even with good information systems. They may not have the time to visit different schools and may not have the transportation needed to get their children to schools of choice, or the time to get them to a distant school or pick them up at the end of the school day.

The degree of competition in a school system and the rate of enrolment in private schools can be related, but they are not the same thing. On average across OECD countries, about 84% of 15-year-old students attend public schools, about 12% attend government-dependent private schools, and slightly more than 4% attend independent private schools. Of the 12% of students enrolled in private government-dependent schools, around 38% attend schools run by a church or other religious organisation, 54% attend schools run by another non-profit organisation and 8% attend schools run by a for-profit organisation. In Ireland, all 15-year-old students in private government-dependent schools attend a religious school; in Austria, all students enrolled in private government-dependent schools attend those run by another non-profit organisation; and in Sweden, over half of students in private government-dependent schools attend one run by a for-profit organisation (OECD, 2016a).

Greater enrolment in private schools is often referred to as the privatisation of education and is regarded as a move away from the notion of education as a public good. But that is not necessarily the case. In many countries where large parts of the school system operate under private legal statutes, such schools can be seen as legally private but functionally public. This means that, as private entities, they contribute to fulfilling public missions and functions. For example, they can partly or completely follow the national curriculum and serve the public mission of education by providing quality education. There are also many cases in which private schools provide access to education for underserved communities and have equity-related missions.

As in other sectors of public policy, the distinction between public and private education is often blurred. Public-private partnerships are an accepted reality in various other public policy sectors, and there is no reason why education should be an exception. The relevant question is how public policy objectives, such as providing high-quality education for all citizens, can be achieved.

Many critics of school choice claim that the prevalence of private schools would have a negative impact on the quality of education. But PISA data show that there is no relationship between the share of private schools in a country and the performance of an education system. After accounting for social background, there is also very little difference in performance between public and private schools in most countries, and where such differences exist, they are mostly in favour of public schools.

Perhaps the most contentious issue is to what extent and how public funding should go to private schools. In Finland, the Netherlands, the Slovak Republic, Sweden and the partner economy Hong Kong (China), principals of privately managed schools reported that over 90% of school funding comes from the government, while in Belgium, Germany, Hungary, Ireland, Luxembourg and Slovenia, between 80% and 90% of funding for privately managed school does. In contrast, in Greece, Mexico, the United Kingdom and the United States, 1% or less of funding for privately managed schools comes from the government, while in New Zealand, between 1% and 10% does (OECD, 2016a). What is noteworthy is that, in those countries where privately managed schools receive larger proportions of public funding, there is less of a difference in the socio-economic profiles of publicly and privately managed schools (Figure 2.13). Across OECD countries, 45% of the variation in this difference can be explained by the level of public funding devoted to privately managed schools; across all participating countries, 35% of the variation in this difference can be accounted for in this way.

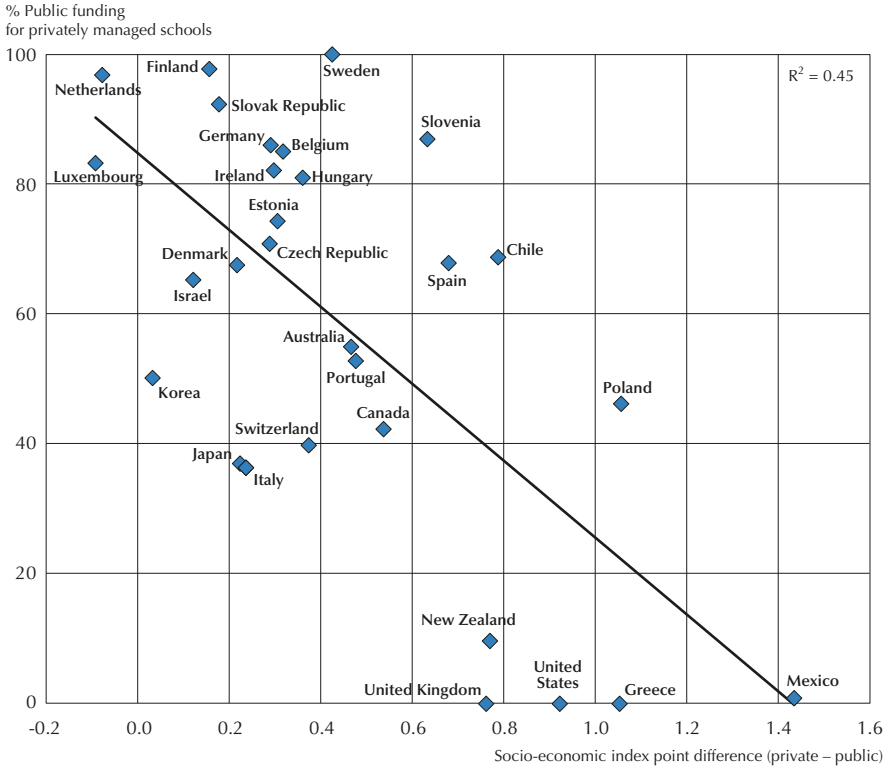
In order to mitigate possible negative effects of school choice and public funding of private schools, particularly segregation and social stratification, various governments have implemented compensatory financing mechanisms. For example, Chile, the Flemish Community of Belgium and the Netherlands have instituted weighted student funding schemes, whereby funding follows the student on a per-student basis, and the amount provided depends on the socio-economic status and educational needs of each student. These schemes target disadvantaged students and, in doing so, make these students more attractive to schools competing for enrolment.

Specific area-based support schemes, such as the "zones of educational priority" found in France[1] and Greece, are observed in school systems with large between-school variation in performance and a concentration of low-performing schools in certain locations. In Belgium, government-dependent private schools, which constitute a majority of the market, receive almost the same amount as public schools, and they are forbidden from charging tuition fees or selecting students.

Figure 2.13

Relationship between stratification and public funding for privately managed schools

Stratification: Difference in socio-economic background between students in privately and publicly managed schools, as measured by the PISA index of economic, social and cultural status (ESCS)



Source: OECD (2012), *Public and Private Schools: How Management and Funding Relate to their Socio-economic Profile,* Figure 2.3, http://dx.doi.org/10.1787/9789264175006-en.

It is also important to pay due attention to the mechanisms by which public funding is provided to private schools. One way is through vouchers, which assist parents directly, although the merits and demerits of voucher systems are highly debated among countries. As of 2009, 9 out of 22 OECD countries with available data reported that they use vouchers to facilitate enrolment in government-dependent private primary schools. In five of these countries, the voucher programme was restricted to disadvantaged students. At the lower secondary level, 11 out of 24 countries reported using voucher schemes, 7 of which targeted disadvantaged students. At the upper secondary level, 5 of 11 voucher programmes were means-tested. Of the surveyed OECD countries, seven reported that they provide vouchers from primary through upper secondary education (OECD, 2011). Tuition tax credits, which allow parents to deduct expenses for private school tuition from their tax liabilities, are used less frequently than vouchers. As of 2009, only 3 out of 26 OECD countries with available data reported using tax credits to facilitate enrolment in government-dependent private schools (OECD, 2011).

Between universal voucher systems (in which vouchers are available to all students) and targeted voucher systems (in which vouchers are provided only to disadvantaged students), there are large differences in effectiveness in mitigating the adverse effects of school choice. Vouchers available for all students can help expand the choice of schools and promote competition among schools. School vouchers that target only disadvantaged students can help improve equity in access to schools. An analysis of PISA data shows that, when comparing systems with similar levels of public funding for privately managed schools, the difference in the socio-economic profiles between publicly managed schools and privately managed schools is twice as large in education systems that use universal vouchers as in systems that use targeted vouchers. The design of voucher schemes is thus a key determinant of their success, and regulating private school pricing and admissions criteria seems to limit the social inequities associated with voucher schemes.

Beyond that, the international evidence suggests that schools that are selective in their admissions tend to attract students with greater ability and higher socio-economic status, regardless of the quality of the education the schools provide. Given that high-ability students are less costly to educate and their presence can make a school more attractive to parents, schools that can control their intake wind up with a competitive advantage. Allowing private schools to select their students thus gives these schools an incentive to compete on the basis of exclusiveness rather than on their intrinsic quality. That, in turn, can undermine the positive effects of competition. The evidence also shows that selective admissions can be a source of greater inequality and stratification within a school system. However, there are few studies investigating whether these effects vary depending on the selection criteria (e.g. interviews with parents compared to results of aptitude tests). It is also important to keep in mind that students are selected not only based on explicit admissions criteria but also because of parents' self-selection, selective expulsion and more subtle barriers to entry. Policies that aim to reduce segregation should therefore also identify and address overly complex application procedures, expulsion practices, lack of information and other factors that prevent some students and parents from exercising their school choice.

Critics argue that allowing publicly funded private schools to charge tuition fees gives these schools an unfair advantage over public schools and undermines the principle of free school choice. Like selective admissions, imposing substantial add-on fees tends to skim the top students from the public sector and increase inequalities in education. Some policy interventions that limited fees for low-income families were effective in reducing segregation, but there have been few empirical studies in developed countries that have determined the effect of fees as distinct from that of selective admissions and other confounding factors.

Relatively little is known about whether there is a threshold of household contributions beyond which lower-income families will be deterred from choosing subsidised private schools. However, both simulations and empirical evidence confirm that public funding may fail to widen access to private schools unless it is accompanied by restrictions on tuition fees. If private schools invest public resources to improve their quality rather than to broaden access, subsidies can exacerbate inequities across school sectors. This is one of the reasons why abolishing substantial add-on fees, along with offering targeted vouchers, can help reduce disparities in achievement between advantaged and disadvantaged students.

POLICY IMPLICATIONS

Successful schools depend on the resources and support of their communities. In turn, schools are vital to the social health of their local communities. In recent years, the top-down conception of traditional education has been turned upside down and stretched sideways by a number of factors, including the penetration of digital technologies, the entry of new learning providers, the interest of employers in the outcomes of schooling and the expertise in learning in other sectors (e.g. in the creative sector).

Parents are a central actor in these ecosystems, and there is much that schools and school policy can do to foster parental engagement with their children and with schools and communities. Parents can be encouraged to adopt simple and healthy routines, such as eating meals together and talking together, that bring them closer to their child.

Schools can identify those parents who may be unable to participate in school activities for reasons other than a lack of interest. Building some flexibility in the ways in which parents can communicate with the school may encourage greater parental involvement. Scheduled phone or video calls may be as effective as some face-to-face meetings and may better fit the busy schedule of some parents.

Teachers can be encouraged to welcome all parents as partners in education, particularly those from disadvantaged backgrounds whose children most need their support to do well in school and in life. Through their engagement in their child's education, parents can help build a learning environment that encourages both high academic performance and the well-being of all students.

Removing language barriers to parents' participation in school activities may require partnerships beyond the school. In countries with large immigrant populations, including many European countries, schools may need to seek collaboration with immigration and social service agencies, as these might offer useful services, including interpreters, that can help facilitate communication between the school and immigrant families.

Finally, governments can provide incentives to employers who adopt work-life balance policies so that parents have adequate time to attend to their children's needs. Healthy young people are more engaged and productive participants in society, so advancing policies that support parents' involvement in their children's lives is one way for governments to build more inclusive societies

But the link with parents is just one dimension. Schools can shape their communities in many ways, and often schools are seen as important spaces in the local community. In connecting to the local and regional environment, schools can engage many stakeholders to work together to improve the well-being of communities.

Schools can become critically important partners in serving the needs of local communities, especially in disadvantaged communities or through working with populations at risk of exclusion or distress. In recent refugee crises in various parts of the world, there have been inspiring examples of schools playing a socially and ethically responsible role in providing help, shelter and assistance to refugees.

Schools can also create wider connections with their communities through various alliances, partnerships and networks that allow them to introduce their learners to a range of other possibilities and resources, with benefits for both the learners and the community.

But perhaps the most important role that public policy can play is to help reconcile aspirations for greater flexibility in school systems and more opportunities for parents to choose their child's school with the need to ensure quality, equity and coherence in school systems.

In and of themselves, school autonomy and school choice neither assure nor undermine the quality of education. What matters are smart policies that maximise the benefits of autonomy or choice while minimising the risks and establishing a level playing field for all providers to contribute to the school system. Well-crafted policies can help school systems deliver education tailored to a diverse student population while limiting the risk of social segregation. When market mechanisms are introduced or expanded in education systems, the role of public policy needs to shift from overseeing the quality and efficiency of public schools to ensuring that oversight and governance arrangements are in place to guarantee that every child benefits from accessible, high-quality education.

It is clear that school choice will only generate the anticipated benefits when the choice is real, relevant and meaningful (i.e. when parents can choose an important aspect of their child's education, such as the pedagogical approaches used to teach them). If schools are not allowed to respond to diverse student populations and to distinguish themselves from one another, choice is meaningless.

In turn, private schools may need to accept the public steering and accountability mechanisms that ensure the attainment of public policy objectives in exchange for the funding they receive from the public purse. All parents must be able to exercise their right to choose the school of their preference. That means that governments and schools need to invest in developing their relationships with parents and local communities and help parents make informed decisions. Successful choice-based systems have carefully designed checks and balances that prevent choice from leading to inequity and segregation.

Last but not least, the more flexibility there is in the school system, the stronger public policy needs to be. While greater school autonomy, decentralisation and a more demand-driven school system seek to devolve decision-making to the frontline, government authorities need to maintain a strategic vision and clear guidelines for education and offer meaningful feedback to local school networks and individual schools.

Note

1. In France, this scheme has since been revised to form "Priority Education Networks".

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Chapter 3

ENABLING PEDAGOGIES FOR THE FUTURE

At the heart of education is pedagogy. Many teachers have a good sense of the kind of pedagogies on which 21st century learning hinges, but there is a major gap between intended and implemented practices. How can education systems create the conditions for encouraging and supporting teachers to initiate, share, and evaluate innovative pedagogies and curricula, including new technologies? What are the implications of new pedagogies for the roles of teachers and students? What are the implications of pedagogical innovation and innovative learning environments for the roles of governments and the profession/unions? What are the implications of new pedagogies and curricula for school and system evaluation? These are important issues that the 2018 International Summit on the Teaching Profession seeks to tackle in its second session.

Note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

TEACHER PROFESSIONAL COMPETENCE

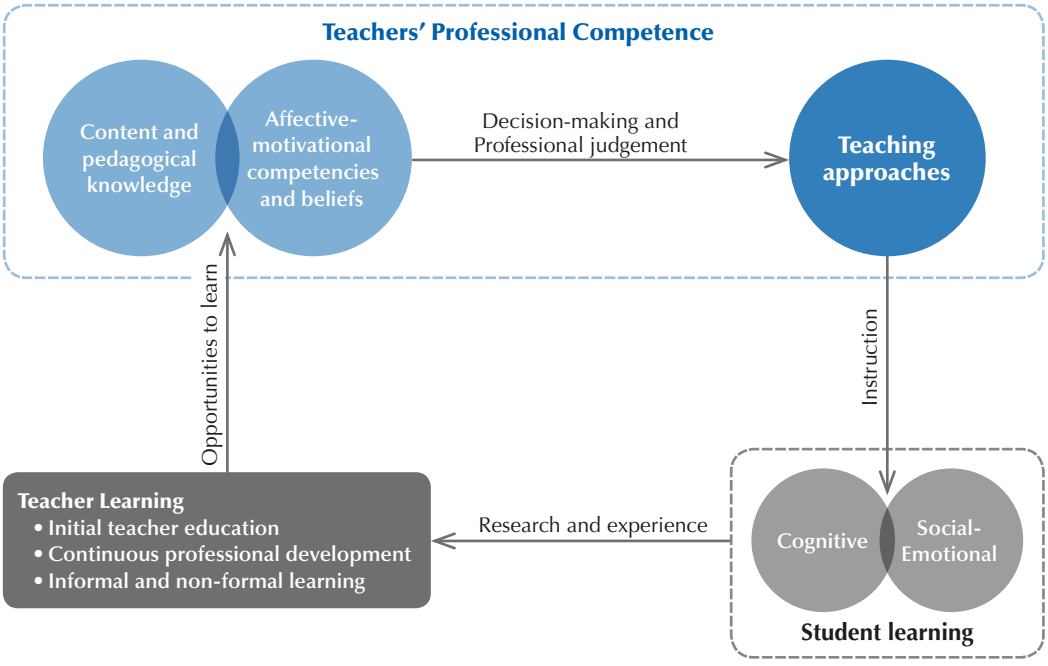
Enhancing what and how students learn requires enhancing pedagogy, and enhancing pedagogy is ultimately about developing teachers' professional competence. It can be defined as "the ability of teachers to meet complex demands in a given context by mobilising various psychosocial (cognitive, functional, personal and ethical) resources." Teachers' professional competence shapes instructional processes and is, in turn, shaped by the opportunities and incentives teachers have to learn (Figure 3.1).

Research and experience of teachers continuously feed into the knowledge base that is transferred to and also co-constructed by teachers, through individual and collective learning. Teachers' learning opportunities shape not only their knowledge of the subject(s) they teach and pedagogy in general, but also their beliefs about teaching and other motivational and affective competences. Teachers draw on such knowledge and competences to make decisions in the classroom.

Professional judgement guides the subsequent teaching approaches, which include curriculum and lesson planning, selecting and applying sets of teaching methods, classroom management and student assessment. Instruction is, in turn, the implementation of teaching approaches, as manifested in interactions with students, teacher behaviour and the tools and materials used in the classroom. This then influences both cognitive and socio-emotional aspects of student learning.

Figure 3.1

Conceptual framework of teachers' professional competence



Source: Guerriero, S. and N. Révai (2017), "Knowledge-based teaching and the evolution of a profession", in *Pedagogical Knowledge and the Changing Nature of the Teaching Profession*, http://dx.doi.org/10.1787/9789264270695-13-en.

This chapter examines some of these dimensions more closely, to identify policy levers through which effective pedagogies for 21st century learning can be enabled and supported. It starts with a look at how well-prepared incoming teachers feel and then reviews some data from PISA on teacher-directed and student-oriented learning, as well as gaps between intended and implemented pedagogical practice. After that, it presents initial findings from a first assessment of teachers' general pedagogical knowledge and then concludes with some policy levers to shape innovative learning environments.

HOW WELL DO NEW TEACHERS FEEL PREPARED FOR TEACHING?

Examining to what extent new teachers feel prepared for their job provides a starting point for reviewing teachers' professional competence.

When new teachers start teaching, they often bring energy and enthusiasm into their classrooms. However, the first phase of their careers can be strenuous and stressful, as they have limited experience for coping with many new and challenging situations. It is not surprising, then, that new teachers in most countries report lower levels of confidence than their more experienced peers. Some even experience burn-out early in their careers and, in some countries, more than a third of new teachers leave the profession within the first five years.

On average, new teachers with a maximum of three years' work experience comprise about 10% of the total teacher population across the countries and economies that participated in the 2013 OECD Teaching and Learning International Survey (TALIS). Italy (3%), Portugal (1%) and Spain (3%) have the smallest proportion of new teachers across participating countries and economies. Singapore (30%) has the biggest proportion of new teachers, followed by England (United Kingdom) (16%).

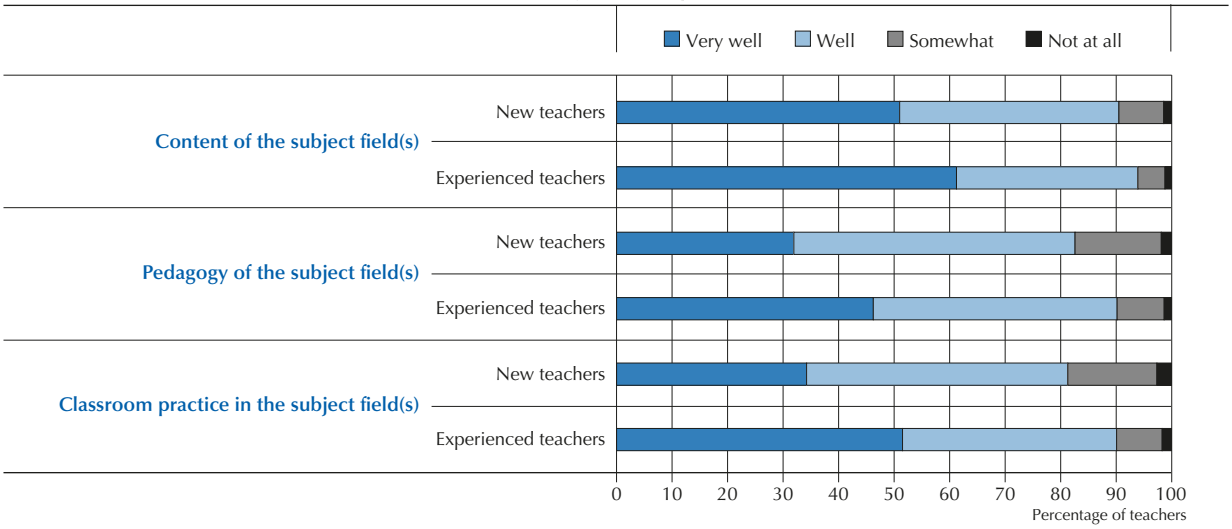
Feelings of preparedness of new versus experienced teachers

Teachers were asked to rate their feelings of preparedness ("not at all", "somewhat", "well" and "very well") in three domains: content, pedagogy and classroom practice of the subject field(s) they teach. Figure 3.2 compares the responses of new and experienced teachers in each domain. Overall, most teachers seem fairly confident. More than 80% of new teachers report that they feel "well" or "very well" prepared in all three domains, and over 90% of experienced teachers do so. It is not surprising that experienced teachers report significantly higher levels of preparedness than new teachers, but differences in reported levels of preparedness between new and experienced teachers display some interesting patterns across domains. New teachers are more likely to feel prepared in the content of the subject field(s) compared to the pedagogy or classroom practice of the subject field(s).

Figure 3.2

Feelings of preparedness of new versus experienced teachers

Percentage of new and experienced teachers reporting preparedness in content, pedagogy and classroom practices of the subject(s) they teach



Source: OECD (2017a), "Do new teachers feel prepared for teaching?", *Teaching in Focus*, No. 17, http://dx.doi.org/10.1787/980bf07d-en.

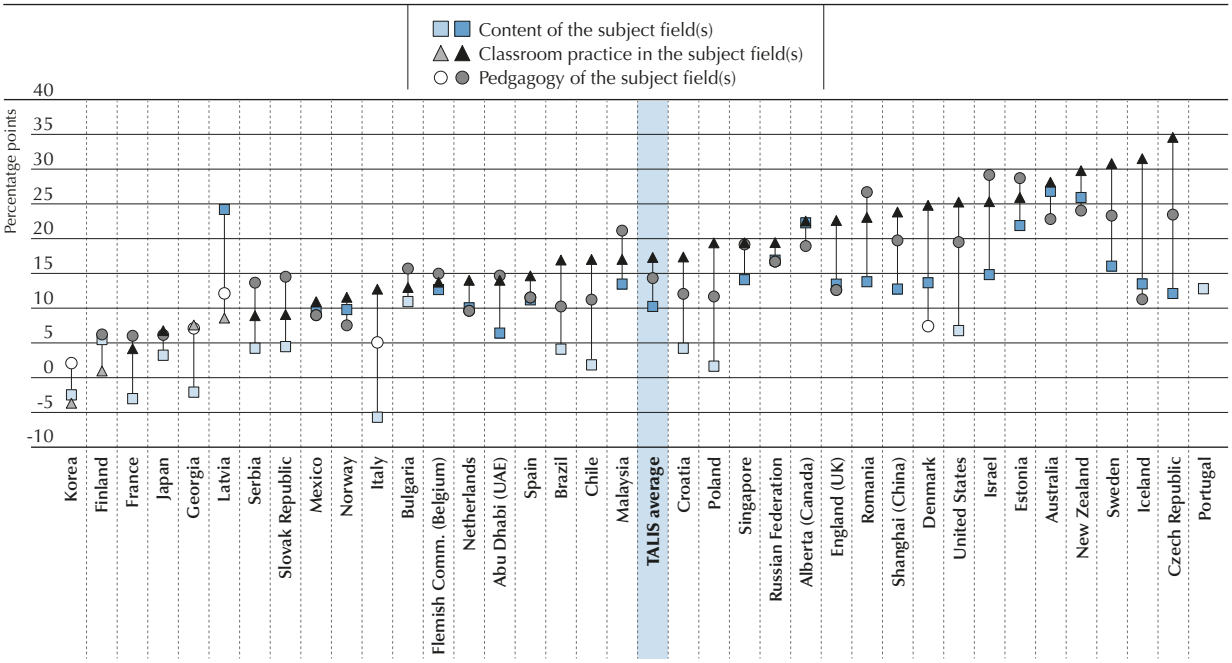
Preparedness in content of the subject field(s)

Both new and experienced teachers report better preparedness in the content rather than the pedagogy and classroom practice of the subject field(s) they teach. More than 90% of both new and experienced teachers report feeling "well" or "very well" prepared in the content of their subject field(s). As shown in Figure 3.3, significant differences in feelings of preparedness for the content knowledge domain between the two groups of teachers are found in only 22 of the 37 TALIS 2013 countries and economies, whereas there are significant differences in more than 32 countries and economies in the other two domains: pedagogical and practical knowledge to teach subjects.

Figure 3.3

Gaps in feelings of preparedness between new and experienced teachers

Differences in percentage points between the proportion of new and experienced teachers who reported feeling "very well" prepared in content, pedagogy and classroom practices of the subject(s) they teach



Notes: Items for which the gaps are not statistically significant at 5% are presented in a darker tone in this figure.
This figure does not present the results when sampling variability of the estimate was too high for reporting with greater than 33.3% of coefficient of variation.
Data are ranked in ascending order according to the differences in proportion of new and experienced teachers who reported feeling "very well" prepared in classroom practice in the subject field(s).
Source: OECD (2017a), "Do new teachers feel prepared for teaching?", *Teaching in Focus,* No. 17, http://dx.doi.org/10.1787/980bf07d-en.

Preparedness in pedagogy of the subject field(s)

In many participating countries and economies, the largest difference in reported preparedness between new and experienced teachers is in the pedagogy of the subject field(s) they teach. Differences, for this domain between new and experienced teachers are largest in Israel (30 percentage points), Estonia (29 percentage points), Romania (27 percentage points) and Malaysia (21 percentage points). In contrast, differences between new and experienced teachers are only 6 percentage points in Finland, France and Japan. In Italy and Korea, no statistically significant differences are found. The magnitude of some of these differences suggests that new teachers may require more support to develop effective pedagogical strategies for teaching content in some countries than in others, possibly due to limited pre-service or in-service training.

Preparedness in classroom practice of the subject field(s)

In more than half of TALIS 2013 countries and economies, the largest difference in reported preparedness between new and experienced teachers is in classroom practice of the subject field(s) they teach. In countries such as the Czech Republic, Iceland and Sweden, the gaps between the proportion of new and experienced teachers feeling "very well" prepared in classroom practice in the subject field(s) are greater than 30 percentage points. However, in France (4 percentage points) and Japan (7 percentage points), the differences between the groups are much smaller, and there are no statistical significant differences in Finland and Korea. These results may reflect prospective teachers' exposure to teaching as part of pre-service education and/or different levels of support provided to new teachers as part of in-service training.

TEACHER-DIRECTED AND STUDENT-ORIENTED LEARNING

The preceding analysis suggests that teacher education institutions in many countries and economies may give insufficient attention to pedagogical content knowledge, general pedagogical knowledge or new knowledge emerging from educational science. But the data reflect only teachers' feelings of preparedness. It is much harder to find systematic evidence on the actual prevalence of pedagogies in classrooms.

The traditional view of a classroom that has existed for generations in schools around the world consists of students sitting at desks, listening as the teacher stands in the front of the class and lectures or demonstrates something on a board or screen. The teacher has planned the lesson, knows the content he or she needs to cover and delivers it to the students, who are expected to master that content and apply it to their homework or a test. This kind of teacher-directed instruction might also include things like lectures, lesson summaries or question-and-answer periods that are driven by the teacher.

But for decades now, educationalists have encouraged giving students more control over the time, place, path and pace of learning. Thus student-oriented teaching strategies are increasingly finding their way into classrooms of all subjects.

What types of teaching strategies are being used to teach mathematics in schools around the world? And which one should teachers be using for what purpose? Data from the PISA 2012 assessment indicate a prevalence of teacher-directed methods, but deciding how to teach mathematics is not as simple as choosing between one strategy and another. Teachers need to consider both the content and the students to be taught when choosing the best teaching strategy for their mathematics lessons.

Where does mathematics teaching fall in the debate on teacher-directed versus student-oriented learning?

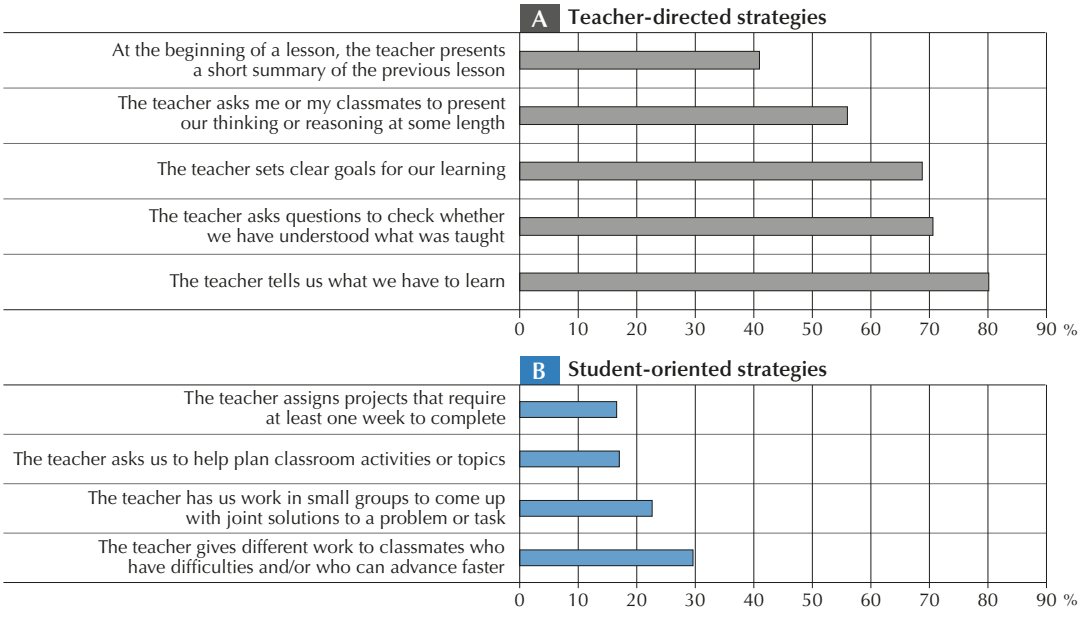
In PISA, students were asked about the frequency with which their teachers use student-oriented or teacher-directed strategies in their lessons. The results indicate that, teacher-directed practices are used widely. For instance, across OECD countries, eight out of ten students report that their teachers tell them what they have to learn in every lesson, and seven out of ten students have teachers who ask questions in every lesson to check that students understand what they are learning.

On the other hand, the student-oriented practice that teachers most commonly use is assigning students different work based on their ability, commonly called differentiated instruction. However, according to students, this practice is used only occasionally, as fewer than one in three students in OECD countries report that their teachers use this practice frequently in their lessons. Figure 3.4 shows the reported frequency of both teacher-directed and student-oriented instructional strategies for mathematics.

Figure 3.4

Teacher-directed and student-oriented instruction

Percentage of students who responded "in every lesson" or "in most lessons", OECD average



Note: The OECD average includes all member countries of the OECD except Latvia.

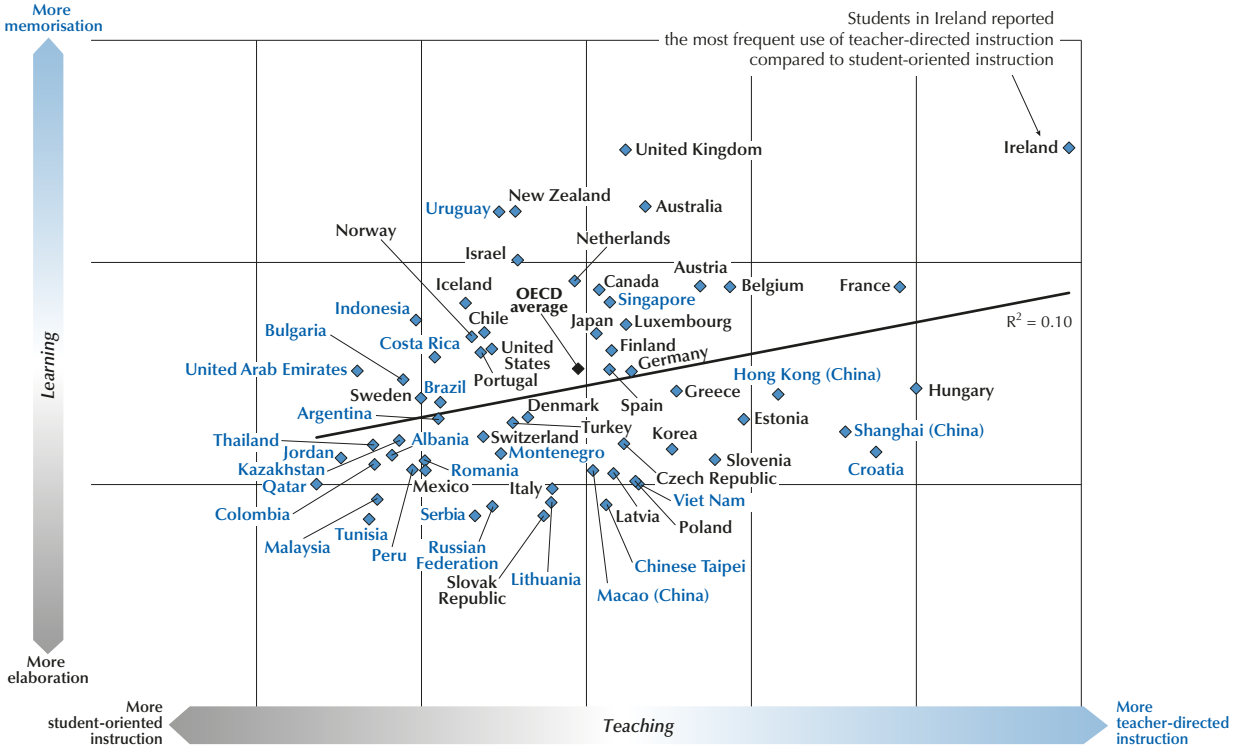
Source: OECD (2012), PISA 2012 Database, adapted from Echazarra, A. et al. (2016), "How teachers teach and students learn: Successful strategies for school", *OECD Education Working Papers,* No. 130, http://dx.doi.org/10.1787/5jm29kpt0xxx-en.

The PISA survey also indicates that students may be exposed to different teaching strategies based on their socio-economic status or gender. For example, girls report being less frequently exposed to student-oriented instruction in mathematics class than boys do. Conversely, disadvantaged students, who are from the bottom quarter of the socio-economic distribution in their countries, report more frequent exposure to these strategies than advantaged students do. Teachers might have reasons for teaching specific classes in the ways they do, and other factors, such as student motivation or disruptive behaviour, might be at play too. Ideally, however, all students should have the opportunity to be exposed to some student-oriented strategies, regardless of their gender or social status. Also, when considering an entire country, the more frequently teacher-directed instruction is used compared with student-oriented instruction, the more frequently students learn using memorisation strategies (Figure 3.5).

Figure 3.5

How teachers teach and students learn

Results based on students' reports



Note: The OECD average includes all member countries of the OECD except Latvia.

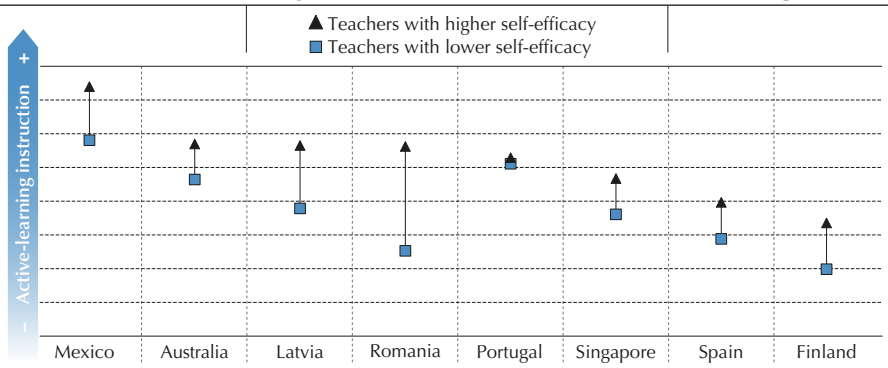
Source: OECD (2016), *Ten Questions for Mathematics Teachers ... and How PISA Can Help Answer Them,* Figure 1.2, http://dx.doi.org/10.1787/9789264265387-en.

Which teachers use active-learning teaching practices in mathematics?

The TALIS study asked mathematics teachers in eight countries about their regular teaching practices (Figure 3.6). The study included four active-learning teaching practices that overlap in large part with student-oriented practices: placing students in small groups, encouraging students to evaluate their own progress, assigning students long projects, and using information and communication technology (ICT) for class work. These practices have been shown by many research studies to have positive effects on student learning and motivation. TALIS data show that teachers who are confident in their own abilities are more likely to engage in active-teaching practices. This is a somewhat logical finding, as active practices could be thought of as more risky than direct-teaching methods. It can be challenging to use ICT in your teaching or have students work in groups if you are not confident that you have the skills needed in pedagogy, content or classroom management.

Figure 3.6

How teachers' self-efficacy is related to the use of active-learning instruction



Notes: All differences are statistically significant, except in Portugal and Singapore.

Teachers with higher/lower self-efficacy are those with values above/below the country median.

The *index of active-learning instruction* measures the extent to which teachers use "information and communication technologies in the classroom", let "students evaluate their own progress", work with "students in small groups to come up with a joint solution to a problem" or encourage students to work on long projects.

The *index of self-efficacy* measures the extent to which teachers believe in their own ability to control disruptive behaviour, provide instruction and foster student engagement.

Countries are ranked in descending order of the frequency with which teachers with higher self-efficacy use active-learning instruction.

Source: OECD (2016), *Ten Questions for Mathematics Teachers… and How PISA Can Help Answer Them*, Figure 1.3, http://dx.doi.org/10.1787/9789264265387-en.

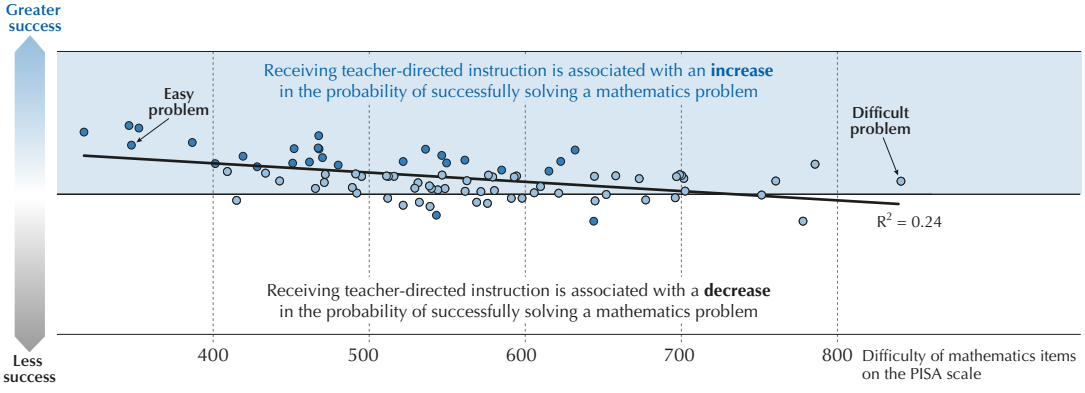
How can a variety of teaching strategies benefit student achievement?

When looking at students' mean mathematics scores on the PISA assessment, along with their exposure to the teaching strategies discussed in this chapter, another reason for using a variety of teaching strategies emerges. The data indicate that when teachers direct student learning, students are slightly more likely to be successful in solving the easiest mathematics problems in PISA. Yet as the problems become more difficult, students with more exposure to direct instruction no longer have a better chance of success. Figure 3.7 shows the relationship between the use of teacher-directed strategies and students' success on mathematics problems of varying difficulty. Therefore, just as one teaching method is not sufficient for teaching a class of students with varying levels of ability, a single teaching strategy will not work for all mathematics problems either. Past research into the teaching of mathematics supports this claim too, suggesting that teaching complex mathematics skills might require different instructional strategies than those used to teach basic mathematics skills. Some recent evidence suggests that more modern teaching methods, such as student-oriented teaching strategies, encourage different cognitive skills in students.

Figure 3.7

Teacher-directed instruction and item difficulty

Odds ratio, after accounting for other teaching strategies, OECD average



Note: Statistically significant odds ratios are marked in a darker tone. Chile, Latvia and Mexico are not included in the OECD average.

Source: OECD (2012), PISA 2012 Database, adapted from Echazarra, A. et al. (2016), "How teachers teach and students learn: Successful strategies for school", *OECD Education Working Papers*, No. 130, http://dx.doi.org/10.1787/5jm29kpt0xxx-en.

Some countries, such as Singapore, are taking this research to heart and are designing mathematics curricula that require teachers to use a variety of teaching strategies (Box 3.1). Yet rather than doing away with more traditional, teacher-directed teaching methods altogether, these methods should be used in tandem. In other words, teachers need a diverse set of tools to teach the breadth of their mathematics curriculum and to help students advance from the most rudimentary to the most complex mathematics problems.

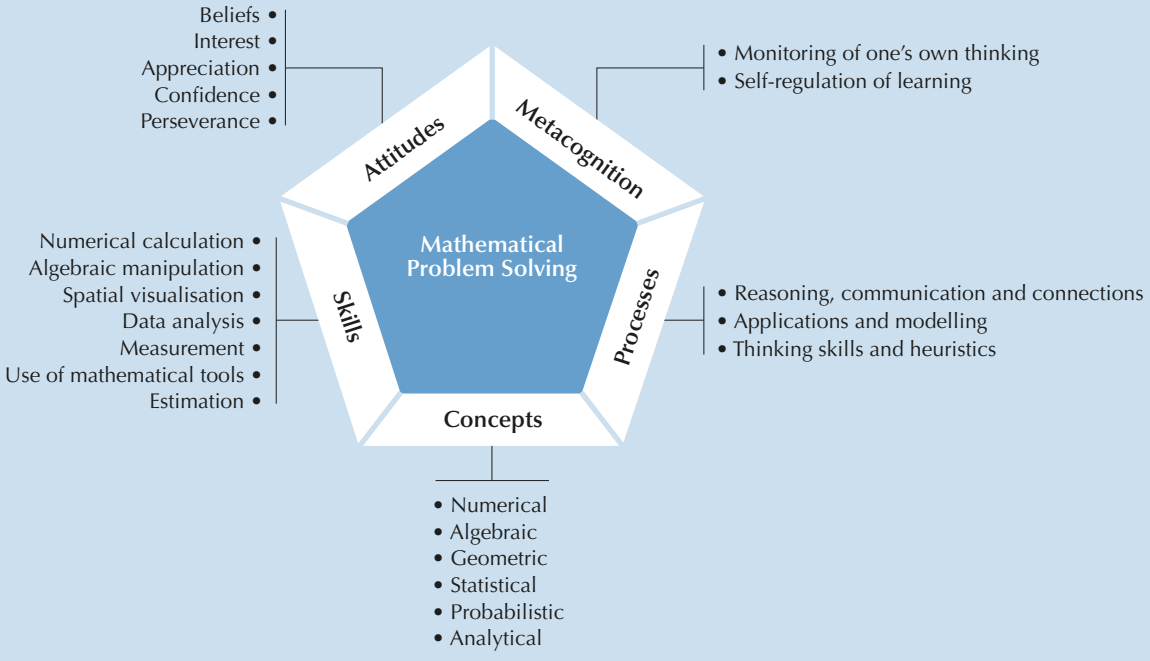
It is interesting that teacher-directed approaches are better predictors for cognitive learning outcomes, while student-oriented approaches are better predictors for important social and emotional outcomes, including career expectations.

Box 3.1 Teaching and learning strategies for mathematics in Singapore

The objective of the mathematics curriculum in Singapore is to develop students' ability to apply mathematics to solve problems, by developing their mathematical skills, helping them acquire key mathematics concepts, fostering positive attitudes towards mathematics and encouraging them to think about the way they learn. To accomplish this objective, teachers use a variety of teaching strategies in their approach to mathematics. Teachers typically provide a real-world context that demonstrates the importance of mathematical concepts to students (thereby answering the all-too-common question: "Why do I have to learn this?"). Teachers then explain the concepts, demonstrate problem-solving approaches and facilitate activities in class. They use various assessment practices to provide students with individualised feedback on their learning.

Students are also exposed to a wide range of problems to solve during their study of mathematics. In this way, students learn to apply mathematics to solve problems, appreciate the value of mathematics and develop important skills that will support their future learning and their ability to deal with new problems.

Singapore mathematics curriculum framework



Source: OECD (2016), *Ten Questions for Mathematics Teachers… and How PISA Can Help Answer Them*, http://dx.doi.org/10.1787/9789264265387-en.

THE GAP BETWEEN INTENDED AND IMPLEMENTED LEARNING STRATEGIES

The dilemma for educators is that routine cognitive skills (the skills that are easiest to teach and easiest to test) are exactly the skills that are also easiest to digitise, automate and outsource. There is no question that state-of-the-art knowledge and skills in a discipline will always remain important. Innovative or creative people generally have specialised skills in a field of knowledge or a practice. And as much as learning-to-learn skills are important, we always learn by learning something.

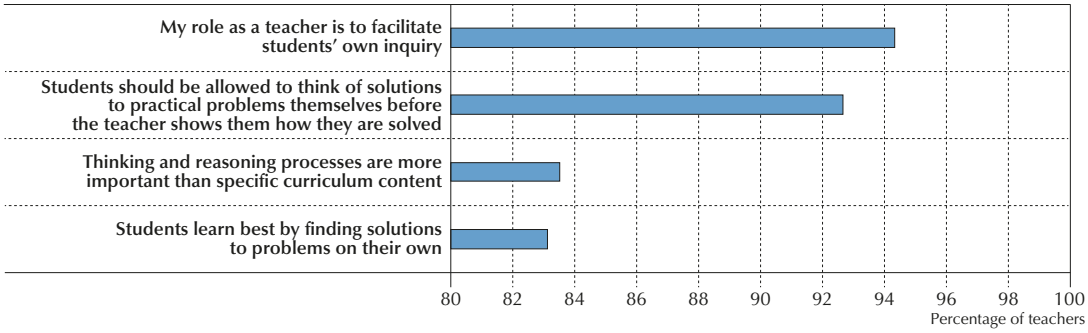
However, educational success is no longer about reproducing content knowledge, but about extrapolating from what we know and applying that knowledge creatively in novel situations, and about thinking across the boundaries of subject-matter disciplines. If everyone can search for information on the Internet, the rewards now come from what people do with that knowledge.

Teachers seem to have internalised that and report that they predominantly believe in constructivist approaches to learning. As shown in Figure 3.8, overall, there is strong agreement among teachers that it is their role to facilitate inquiry in the student (94% on average). Also, a majority of teachers believe that students should be allowed to think of solutions themselves before teachers show them (93%). The rate of agreement was mixed across the other variables, but it was generally above 80% across countries for beliefs related to students being able to find their own solutions and that thinking and reasoning skills are more important than content.

Figure 3.8

Teachers' beliefs about teaching and learning

Percentage of lower secondary education teachers who "agree" or "strongly agree" with the following statements



Items are ranked in descending order, based on the percentage of teachers who "agree" or "strongly agree" with the statement.

Source: OECD (2014a), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 6.8, http://dx.doi.org/10.1787/9789264196261-en.

StatLink http://dx.doi.org/10.1787/888933042048

So far so good, but when PISA asked students to report on the prevalence of different approaches to what actually happens in the classroom, the picture was often at odds with what teachers reported to be desirable learning strategies. For example, teachers in England (United Kingdom) reported a strongly constructivist view of teaching, but England was among the countries where students reported the highest prevalence of memorisation strategies (Figure 3.9). The pattern is similar for many other English-speaking countries.

In short, in some countries there is a significant gap between what teachers report to be desirable pedagogies and what actually happens in classrooms.

Who uses memorisation the most?

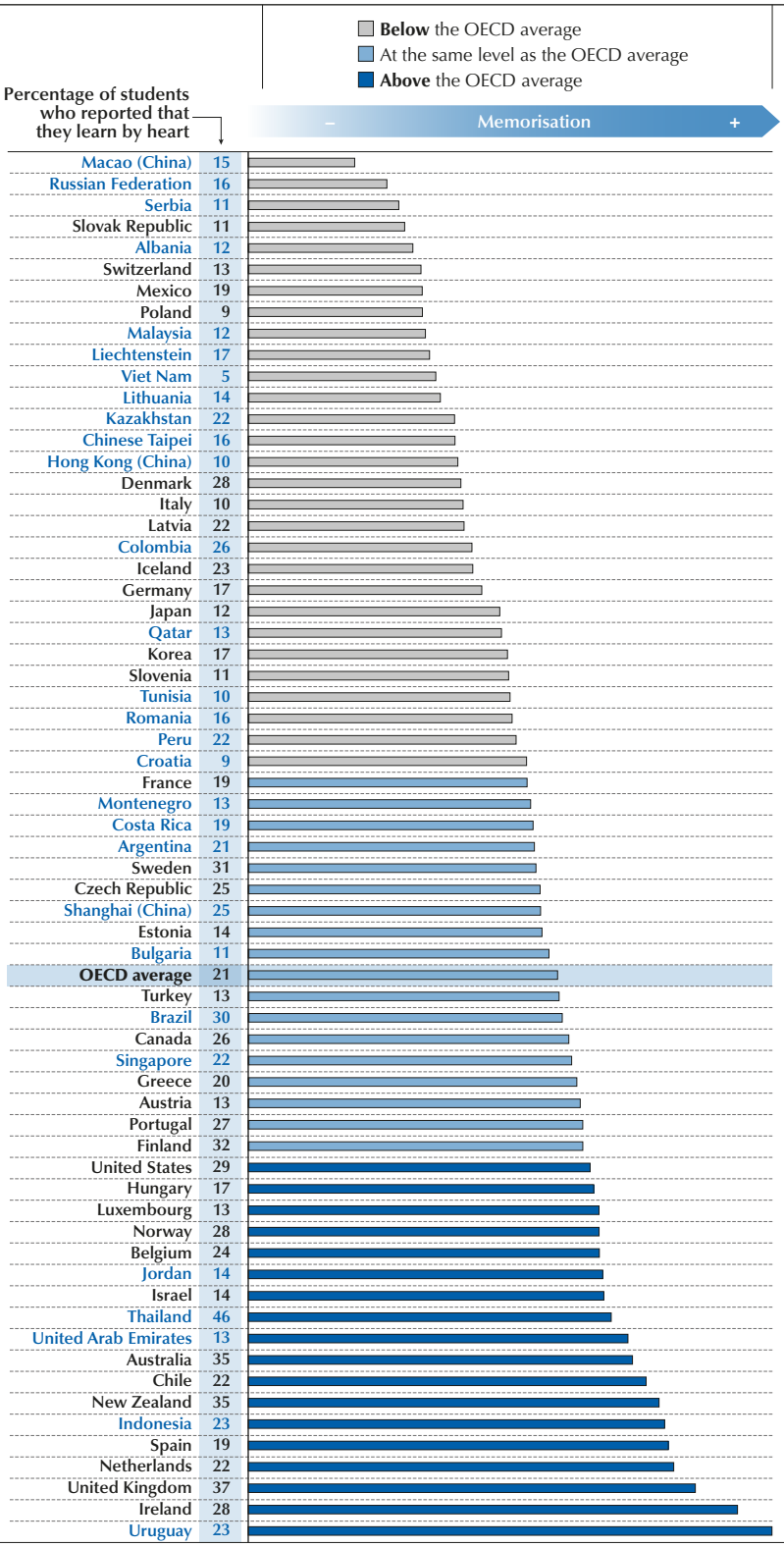
There are many reasons why students use particular learning strategies, or a combination of them, when learning mathematics. Among students who mainly use memorisation, drilling or repetitive learning, some may do so to avoid intense mental effort, particularly if they are not naturally drawn to mathematics, are not familiar with more advanced problems or do not feel especially confident in their own abilities in the subject. To some extent, PISA results support this hypothesis. They indicate that, across OECD countries, persevering students, students with positive attitudes, motivation or interest in problem solving and mathematics, students who are more confident in their mathematics abilities and students who have little or no anxiety towards mathematics are somewhat less likely to use memorisation strategies. Boys, too, are less likely than girls to use these strategies; in fact, in no education system did boys report more intensive use of memorisation when learning mathematics than girls (Figure 3.10).

When looking at students' self-reported use of memorisation strategies across countries, the data also show that many countries that are among the highest performers in the PISA mathematics exam are not those where memorisation strategies are the most dominant. For example, fewer students in East Asian countries reported that they use memorisation as a learning strategy than did 15-year-olds in some of the English-speaking countries to which they are often compared.

Figure 3.9

Students' use of memorisation strategies

Based on students' self-reports

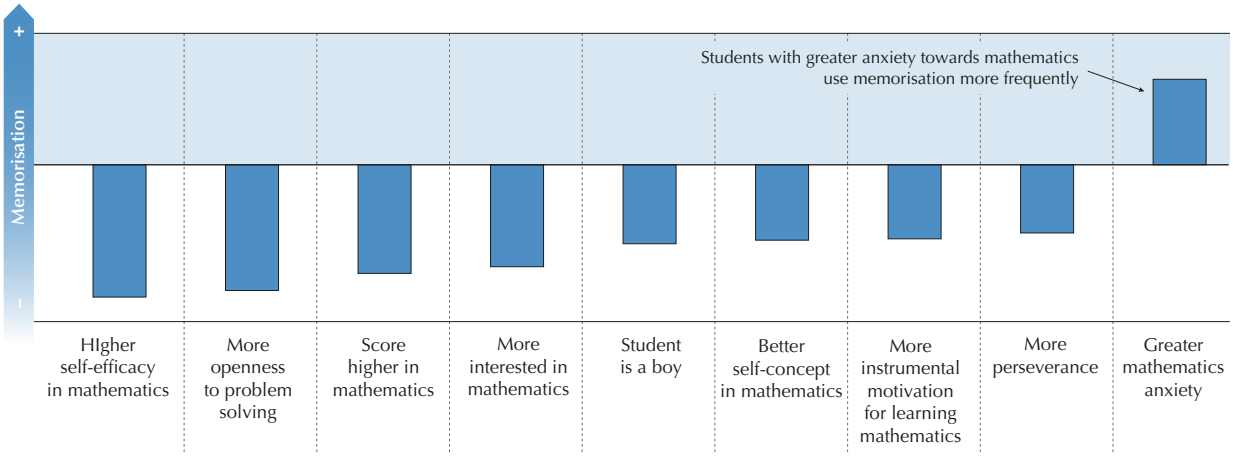


Source: OECD (2016), *Ten Questions for Mathematics Teachers… and How PISA Can Help Answer Them*, Figure 4.1, http://dx.doi.org/10.1787/9789264265387-en.

Figure 3.10

Who is using memorisation?

Correlation with the index of memorisation, OECD average



Source: OECD (2016), *Ten Questions for Mathematics Teachers… and How PISA Can Help Answer Them,* Figure 4.2, http://dx.doi.org/10.1787/9789264265387-en.

These findings may run counter to conventional wisdom, but mathematics instruction has changed considerably in many East Asian countries, such as Japan (Box 3.2).

Box 3.2. Mathematics teaching in Japan

Mathematics teaching in Asian countries has historically been regarded as highly traditional, particularly by many western observers. Whether accurate or not, the typical image of Japanese education often includes highly competitive entrance exams, cram schools and rote memorisation. However, Japanese education has gradually evolved into a system that promotes the acquisition of foundational knowledge and skills and encourages students to learn and think independently, which is one of the ideas behind the "Zest for Living" reform. In Japanese education today, academic and social skills refer to: the acquisition of basic and foundational knowledge and skills; the ability to think, make decisions and express oneself to solve problems; and being motivated to learn. For example, the Period for Integrated Studies policy, which asks teachers and schools to develop their own cross-curricular study programmes, encourages students to participate in a range of activities (including volunteer activities, study tours, experiments, investigations, and presentations or discussions) with the aim of developing students' ability to recognise problems, learn and think independently and improve their problem-solving skills.

Source: Schleicher A. (forthcoming), *Worldclass: How to build a smart school system*.

Will memorisation help or hinder student learning?

Some experts in mathematics education consider memorisation to be an elementary strategy that is better suited to solving routine problems that require only a shallow understanding of mathematics concepts. PISA results reinforce this view. They show that students who report using memorisation strategies are indeed successful on easier mathematics tasks. For example, one of the easiest mathematics problems in the PISA 2012 assessment was a multiple-choice question involving a simple bar chart. Some 87% of students across the education systems participating in PISA answered this question correctly. Students who report that they use memorisation strategies to learn mathematics have about the same success rate on this easy item as students who report using other learning strategies.

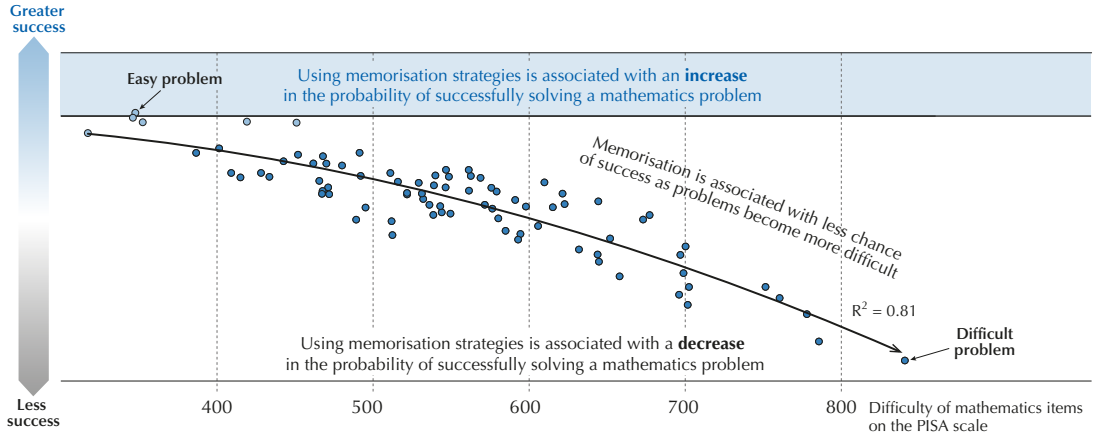
Although memorisation seems to work for the easiest mathematics problems, its success as a learning strategy does not extend much beyond that. According to the data, as problems become more challenging, students who use memorisation are less likely to be able to solve them correctly. Results are even worse for the most challenging mathematics problems.

Only 3% of students correctly answered the most difficult question on the 2012 PISA test. Solving this problem required multiple steps and involved substantial geometric reasoning and creativity. An analysis of PISA results shows that students who reported using memorisation the most when they study mathematics (those who chose the memorisation-related statement for all four questions) were four times less likely to solve this difficult problem correctly than students who reported using memorisation the least (Figure 3.11).

Figure 3.11

Memorisation strategies and task difficulty

Odds ratio across 48 education system



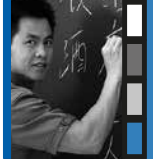
Source: OECD (2016), *Ten Questions for Mathematics Teachers… and How PISA Can Help Answer Them*, Figure 4.2, http://dx.doi.org/10.1787/9789264265387-en.

Indeed, PISA results indicate that no matter the level of difficulty of a mathematics problem, students who rely on memorisation alone are never more successful in solving mathematics problems. This would suggest that, in general, teachers should encourage students to go beyond rote memorisation, to think more deeply about what they have learned and to make connections with real-world problems.

But PISA results also show a difference in students' performance based on the types of memorisation activities used. Students who practice repetitive learning (drilling) are more successful in solving difficult problems than those who simply learn something by heart (rote memorisation). Repetitive learning can ease students' anxiety towards mathematics by reducing the subject to a set of simple facts, rules and procedures that might seem less challenging for the least-confident students to master. Drilling can also free up time for more advanced mathematics by gradually reducing the mental effort needed to complete simple tasks.

PISA 2015 looked at this from another angle. It made epistemic beliefs, knowledge and understanding a focus of the PISA science assessment, assessing not just what students knew, for example in the field of science, but also whether they could think like a scientist and how they valued scientific thinking. The rationale behind this was that the more rapidly content knowledge evolves in a subject, the more important it is for students to understand the structural and conceptual foundations of a discipline (know that) rather than just master its content with a limited shelf life or related contextual knowledge (know-how). In the field of mathematics, for example, students need to know how and why we study mathematics (epistemic beliefs), be able to think like a mathematician (epistemic understanding) and grasp the practices associated with mathematics (methodological knowledge).

The results varied strikingly across countries, even within regions. For example, students in Chinese Taipei were among the highest performers on the 2015 science assessment, but in relative terms, they were significantly stronger in reproducing scientific content than in demonstrating scientific thinking. Students in Singapore were stronger than their peers in Chinese Taipei in content knowledge, but they were even better on tasks requiring them to think like a scientist than on content knowledge. Students in Austria were stronger in the knowledge of scientific facts than in understanding scientific concepts, while their French peers were stronger in conceptual knowledge. Such variations even among otherwise similar countries suggest that education policy and practice can make a difference, and it should encourage policy makers and educators to reframe curricula and instructional systems to place greater emphasis on deep conceptual and epistemic understanding.



WHAT DO WE ACTUALLY KNOW ABOUT TEACHERS' PEDAGOGICAL KNOWLEDGE?

The preceding sections provide some indirect reflections of the type of learning going on in classrooms. It is much more difficult to look at teachers' pedagogical knowledge more systematically.

Teachers' specialised knowledge encompasses a range of different fields and types of knowledge. Some of these are common to all teachers (e.g. knowledge of child development or forms of evaluation), while some differ based on the teacher's subject (e.g. knowledge of mathematical concepts, language or history), the age group taught, or the educational context (e.g. knowledge of curriculum). Three categories of teachers' knowledge are often seen as particularly important:

- general pedagogical knowledge (knowledge in creating and facilitating effective teaching and learning environments for all students, independent of subject matter)
- content knowledge (knowledge of subject matter or content area)
- pedagogical content knowledge (knowledge about the teaching and learning of a content area).

A framework for measuring teachers' general pedagogical knowledge

While there are well-established theoretical frameworks on teachers' knowledge, it is surprising how little is actually known about what teachers know and can do. That is true for the OECD as well. Only recently has the OECD begun to develop instruments to assess teachers' knowledge as part of its Innovative Teaching for Effective Learning project, starting with the first of the three above categories, general pedagogical knowledge. A review of empirical evidence on teachers' general pedagogical knowledge identified three components around which the assessment was developed. Each of these dimensions is further specified into two sub-dimensions, as set out in Table 3.1.

Table 3.1

Framework for assessing general pedagogical knowledge of teachers

Dimension	Sub-dimension	Description
Instructional process	Teaching methods and lesson planning	Productively utilising instructional time through use of various teaching methods (e.g. direct instruction, discovery learning), knowing when and how to apply each method to promote students' conceptual understanding of learning tasks and structuring learning objectives, lessons, curricular units and assessment
	Classroom management	Maximising instructional time through awareness of all classroom activity, handling multiple classroom events concurrently, pacing lessons appropriately to maintain momentum, providing clear directions and maintaining student attention
Learning process	Learning and development	Fostering individual learning through knowledge of various cognitive learning processes, including learning strategies, impact of prior knowledge, memory and information processing, causal attributions, effects and quality characteristics of praise, and opportunities for increasing student engagement
	Affective-motivational dispositions	Knowledge of motivational learning processes (e.g. achievement motivation) and strategies to motivate a single student or whole group
Assessment	Evaluation and diagnosis procedures	Knowledge of different forms and purposes of formative and summative classroom assessments, and how various frames of reference (e.g. social, individual, criterion-based) impact student motivation and quality of assessment
	Data and research literacy	Knowledge of interpreting, evaluating, and using research and data to inform the teaching and learning process (e.g. relevance, validity, reliability)

Source: Sonmark, K. et al. (2017), "Understanding teachers' pedagogical knowledge: Report on an international pilot study", *OECD Education Working Papers*, No. 159, http://dx.doi.org/10.1787/43332ebd-en.

A first pilot of this assessment has been completed, which involves judgement samples composed of 943 in-service teachers and 644 pre-service teachers from 5 countries: Estonia, Greece, Hungary, Israel and the Slovak Republic (Sonmark et al, 2017). It is important to acknowledge the pilot nature of the exercise, which still needs to be replicated with representative samples before it can be used for policy decisions.

Profiles of teachers' general pedagogical knowledge

The Teacher Knowledge Survey pilot provides some interesting initial insights on the pedagogical knowledge base of teachers, teacher candidates and teacher educators. It does this by visualising the relative strengths and weaknesses of the pedagogical knowledge base as a series of profiles. These visualisations are based on the three dimensions and sub-dimensions of the Assessment Framework set out in Table 3.1.

Teachers, teacher candidates and teacher educators might be expected to possess a strong and balanced knowledge base across these three dimensions, although it is possible that priorities in teacher education systems might skew the profiles in a particular direction. If a balanced knowledge base is expected but the profile shows that there is a particular strength in one dimension, this would give an indication of what elements the system could usefully aim to strengthen. Across the participating countries, the pilot survey identified three distinct types of profiles:

- ***Strength in instruction***

The knowledge base in this profile is strongest on items relating to teaching methods, lesson planning and classroom management. This could be due both to teacher education and practical experience. While teacher candidates with this profile would be expected to possess a more theoretical knowledge of best practices for instruction, in some countries there has been a move towards more practice-oriented teacher education. Teacher education that is driven by a know-how approach is more likely to equip teacher candidates with a strong knowledge of instruction processes. Systems that place an emphasis on mentoring and induction may also tend to prioritise this element. Teacher educators with strength in instruction could benefit from both theoretical and practical knowledge, as well as from their own meta-knowledge and experience of how teachers and teacher candidates develop in their classes and throughout their careers.

- ***Strength in learning***

In this profile, the knowledge base is strongest on items relating to the cognitive, motivational and emotional dispositions of students and their learning processes and development. Strength in this dimension could come from a primarily theory-based teacher education system in which the disciplines of classical developmental psychology (e.g. from Piaget, Vygotsky, etc.) and more recent cognitive sciences (e.g. the brain sciences) dominate.

Teacher candidates from those programmes would have a stronger knowledge base on students' cognitive and emotional development. For teachers, this profile could reflect ongoing professional development that is continuously updated with new evidence from the learning and brain sciences, and/or continuing PhD studies in these areas. It could also reflect informal processes of learning, such as reading specialised magazines. For teacher educators, this profile might reflect those who are actively producing, using and disseminating research in the learning and brain sciences.

- ***Strength in assessment***

In this profile the knowledge base is strongest on items relating to evaluation and diagnostic procedures, as well as data use and research literacy. This could reflect the rise in accountability in education and the increasing emphasis placed on standardised student assessments and various forms of national or regional examinations in many systems.

The survey also asked respondents about their initial training and professional development, as well as their self-reported self-efficacy and instructional quality. Despite reporting similar opportunities to learn about classroom management in initial teacher education and professional development, in-service teachers reported higher levels of self-efficacy than pre-service teachers in all aspects of self-efficacy in classroom management, which is perhaps due to the influence of years of experience (Figure 3.12). This may imply that teachers do not feel fully confident until they gain substantial experience in the profession. The pilot results also show that for pre-service teachers, a practicum in initial teacher education predicts how confident they will be and obtaining early classroom experience may be of particular importance in order for new teachers to be prepared for the job as soon as possible.

The pilot results also suggest a link between confidence and teaching quality among in-service teachers. The more confident they feel about their classroom management skills, the less likely they are to report lots of disruptive noise in the classroom. In-service teachers who feel more confident about teaching are also more likely to report that they know what is happening in the classroom, that they make the rules for classroom behaviour explicit for their students and that their students try to create a pleasant learning environment.

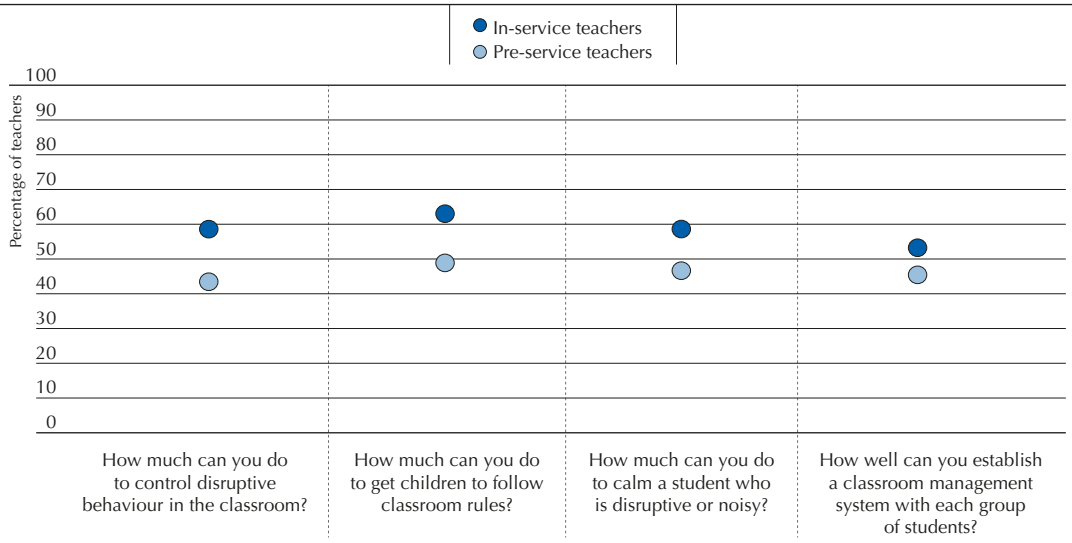
As shown in Figure 3.13, both *teacher candidates* and *teachers* exhibit the most strength in data use and research literacy. These items measured knowledge of statistical concepts, as well as knowledge of interpreting and applying research evidence. Strength in this sub-dimension can partly be related to the specificities of the teacher sample, namely that one-quarter of respondents were mathematics teachers, and approximately one-third science were teachers, while only 19% were mother-tongue language teachers.

Teacher candidates' second strongest area is classroom management.

Teachers' second strongest knowledge domain is evaluation and diagnosis procedures, which, in the assessment, pertained to knowledge of the forms and quality of assessment, assessing collaborative skills, transfer of learning and learning gain, and giving feedback.

Figure 3.12

In-service and pre-service teachers' self-efficacy in classroom management

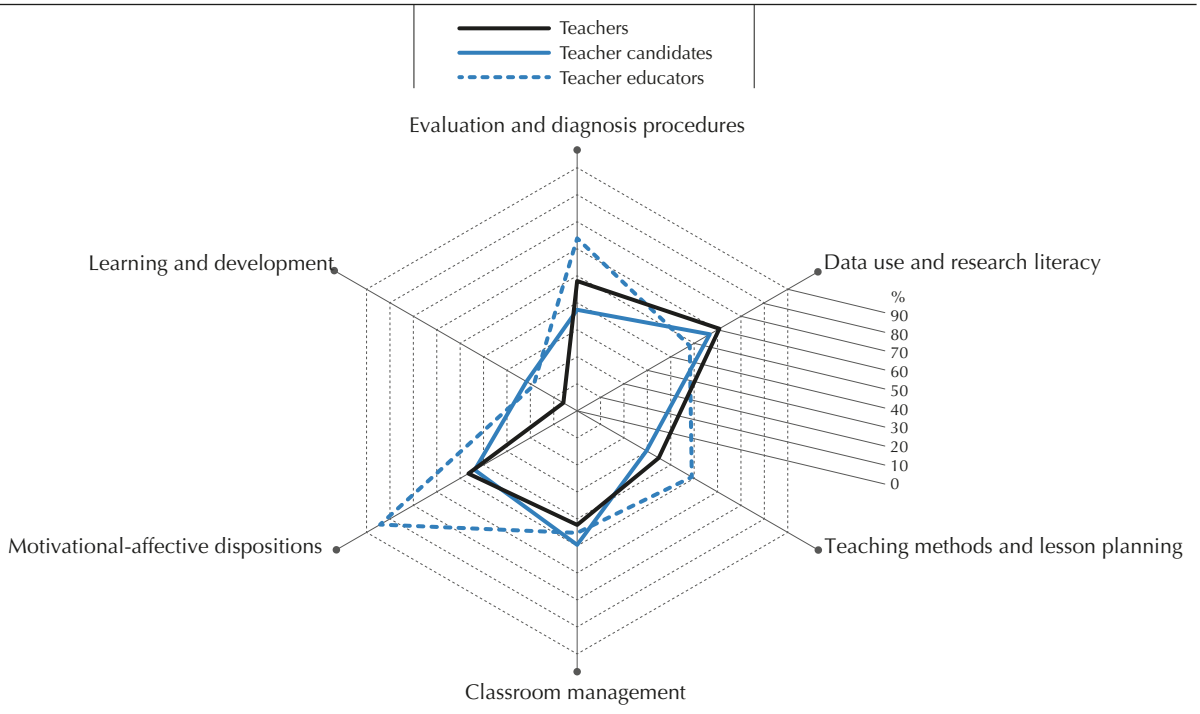


Note: The pilot data are based on judgment samples and show the analytical potential of the instrument. They do not reflect the actual population of countries or sampled groups.

Source: Sonmark, K. et al. (2017), "Understanding teachers' pedagogical knowledge: Report on an international pilot study", *OECD Education Working Papers,* No. 159, http://dx.doi.org/10.1787/43332ebd-en.

Figure 3.13

Profile of teacher candidates, teachers and teacher educators per sub-dimension



Note: The pilot data are based on judgment samples and show the analytical potential of the instrument. They do not reflect the actual population of countries or sampled groups.

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Teacher educators' profile is strongly skewed towards motivational-affective dispositions, reflecting knowledge pertaining to types of student motivation, goal orientations, mastery and performance. Perhaps surprisingly, data use and research literacy is a relatively weak area of the teacher knowledge base as measured in this assessment.

SHAPING LEARNING ENVIRONMENTS

The previous analysis raises the question of how policy and practice can shape learning environments and pedagogy. OECD Centre for Educational Research and Innovation ran an Innovative Learning Environments project from 2008 to 2017. Part of that work consisted of an in-depth study of some 40 learning environments that have taken the innovation journey (OECD, 2013).

Prior work on the learning sciences (Dumont, Istance and Benavides, 2010) led to seven learning principles that define 21st century effectiveness and together function as an analytical framework for examining innovative learning environments (Box 3.3).

Box 3.3. The learning principles of the Innovative Learning Environments project

1. The learning environment recognises the learners as its core participants, encourages their active engagement and develops in them an understanding of their own activity as learners.
2. The learning environment is founded on the social nature of learning and actively encourages well-organised co-operative learning.
3. The learning professionals within the learning environment are highly attuned to the learners' motivations and the key role of emotions in achievement.
4. The learning environment is acutely sensitive to the individual differences among the learners in it, including their prior knowledge.
5. The learning environment devises programmes that demand hard work and challenge from all without excessive overload.
6. The learning environment operates with clarity of expectations and deploys assessment strategies consistent with these expectations; there is strong emphasis on formative feedback to support learning.
7. The learning environment strongly promotes "horizontal connectedness" across areas of knowledge and subjects as well as to the community and the wider world.

Source: OECD (2017b), *The OECD Handbook for Innovative Learning Environments*, http://dx.doi.org/10.1787/9789264277274-en.

The Innovative Learning Environments project added three more dimensions to the framework:

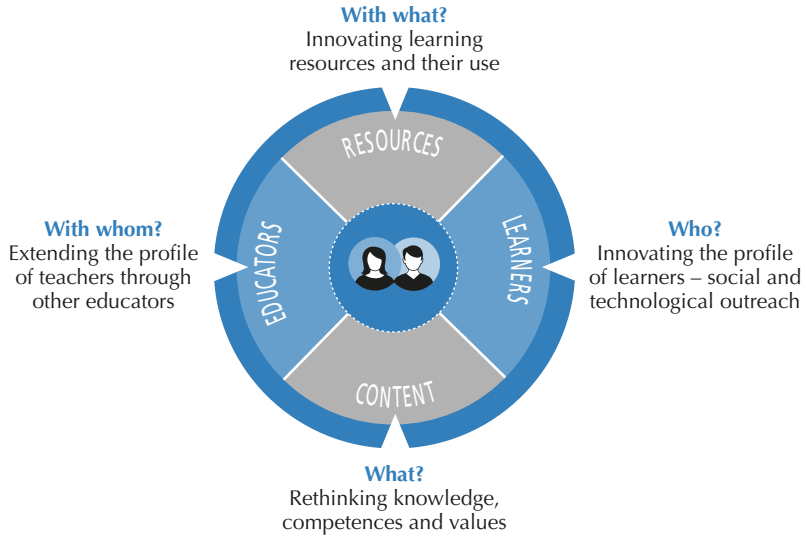
1. Innovate the "pedagogical core" of the learning environment, whether the core elements (learners, educators, content and learning resources), the dynamics which connect them (pedagogy and formative evaluation, use of time and the organisation of educators and learners) or combinations of both.
2. Become formative organisations with strong learning leadership constantly informed by evidence about the learning achieved through different strategies and innovations.
3. Open up to partnerships by working with families and communities, higher education, cultural institutions, media and businesses, and especially with other schools and learning environments, in ways that directly shape the pedagogical core and the learning leadership.

Four main elements comprise the pedagogical core: learners (who?), educators (with whom?), content (what?) and resources (with what?). To rethink and then innovate these core elements – each individually and especially all four together – is to change the heart of any learning environment (Figure 3.14).

Innovating the pedagogical core at the heart of schools means transforming organisational relationships and dynamics to make them relevant for the 21st century. In many cases, this means rethinking the kinds of organisational patterns that are the backbone of most schools today: the lone teacher; the classroom separated from other classrooms, each with its own teacher; the familiar class schedule and bureaucratic units; and the traditional approaches to teaching and classroom organisation.

The case studies described below have systematically rethought many of these practices and have created new learning environments by regrouping teachers, regrouping learners, rescheduling learning, and/or changing pedagogical approaches and the mix of those approaches.

Figure 3.14
Innovating the elements of the pedagogical core



Source: OECD (2017b), *The OECD Handbook for Innovative Learning Environments*, http://dx.doi.org/10.1787/9789264277274-en.

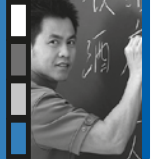
Regrouping educators and teachers

The following case studies highlight three main arguments for abandoning the conventional format of one teacher per group of learners. First, teachers benefit from collaborative planning, working together and shared professional development strategies (i.e. teamwork as an organisational norm). Second, team teaching allows for a wider variety of teaching options. Third, teamwork can benefit certain groups of learners who might otherwise not get the attention they need when only one teacher is in charge.

In some of the cases, collaboration might be described as part of the general culture of the learning organisation:

> Teaching teams are cross-curricular and complementary at Lakes South Morang P-9 School (Victoria, Australia), with team members planning and teaching together, as well as coaching one another. To support this, a collaborative data-storage system is available for sharing documentation, assessments, etc. Experienced team teachers also engage in coaching other teachers on various teaching approaches that cater to different learning styles.
>
> Lobdeburgschule, Jena (Thuringia, Germany): Twenty years ago, teachers introduced teamwork as a structural element. Organisational and pedagogical themes, as well as learning and working practices, are discussed in the teams. In the early 1990s, they established the "morning circle", when all students gather to discuss different aspects of school life.
>
> Teachers in the Quality Learning Center and Enquiry Zone, Mordialloc College (Victoria, Australia) used to "teach to the text", according to the assistant principal, within single, closed-door classrooms. This has changed. Now teachers open up their classrooms and work in teams to model and share good practice – not only with their colleagues, but also with students and the broader community.

The collaborative process of team teaching encourages informal reflection and feedback. When teachers work together regularly, collaboration becomes a tool for recording, learning and sharing good practice. This is in line with the development of professional learning communities for teachers, which collaboratively analyse pedagogy and lesson content in order to continually refine practice.



Professional learning is a priority in the Community Learning Campus, Olds High School (Alberta, Canada). Much of the professional learning is embedded in daily activities, such as team teaching, curriculum building (multidisciplinary teams of teachers working collaboratively to design an integrated, multidisciplinary programme of study), collaborative lesson planning and team meetings. Teachers also attend professional learning days scheduled by the school or the district.

An important aspect in CEIP Andalucía (Seville, Spain) is the collaborative work of both teachers and students. Adults in the school (teachers, families and volunteers) are organised into working groups, commissions, meetings, the Teachers' Assembly, etc. This teamwork culture is also present inside the classroom, where several adults often work together in the same class.

At *Jenaplan-Schule* (Thuringia, Germany), teachers collaborate in regular meetings, such as team conferences with teachers from all classes/grades. In the weekly team meetings, teachers discuss important topics for the forthcoming week and develop the subject matter, materials and methods to be used.

Several of the case studies refer to team teaching, which allows for different approaches by two or more educators working together with a large group of learners. It is worth noting that, in education, small is not always preferable to large. Large groups of students may sometimes be taught together in lecture mode and then broken down into smaller groups for other styles of teaching.

Instead of deploying one teacher in a 30-student classroom, in certain subjects, the Cramlington Learning Village (England, United Kingdom) features 2 teachers for a 60-student class. This adds flexibility to the class schedule and allows teachers to split students into groups in any way that suits their needs, such as for parallel or differentiated instruction. It also allows them to run cross-disciplinary sessions, such as an enquiry facilitated by a science teacher and a media teacher. The result is that teachers across many disciplines can build flexibility at no extra cost. The process of team teaching can also help to model and release the creative energies of collaboration, resulting in new and novel ways of orchestrating learning that are engaging to learners.

In CEIP Andalucía (Seville, Spain), the entire class of students is regularly divided into groups of four or five. The lesson comprises activities that each last 15 or 20 minutes and are accompanied by a teacher or another adult. Once the time devoted to one activity has finished, the adults rotate to another group, so that they spend some time with all the groups at every lesson. Each group carries out a different activity, but the general subject matter of all activities is the same.

Team teaching is used in almost all lessons at *Europäische Volksschule Dr. Leopold Zechner* (Vienna, Austria). Many of these teachers speak the same language as the immigrant students in the classes.

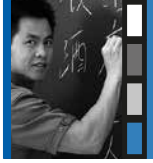
Specific groups of learners who might not get the attention they need in large classes often benefit from team teaching.

Having two teachers in the classroom in *Europaschule* (Linz, Austria) allows for a more personal level of attention. For example, one teacher concentrates on the subject matter and explains tasks, while the special-needs teacher primarily focuses on social issues, supports group-building processes and attends to those who need special attention.

Similarly, in the *Hauptschule* (St. Marein bei Graz, Austria), students are taught in mixed-age classes, including some students with special needs. Instead of streaming students into ability groups, teacher teams apply within-class differentiation, alternating between basic teaching for the whole class and add-on content for highly motivated students or extra support for less-motivated students.

Three to five teachers work with *Dobbantó* (Springboard) students (Hungary) on an ongoing basis; two of them are present together in the classroom 40% of the time. Generally, there are three teachers working with the group in the humanities, natural sciences and a vocational field, with at least one of the three having experience in teaching students with special education needs.

Instead of taking low-achieving students out of the classroom in CEIP Andalucía (Seville, Spain), another teacher joins the class during the two hours each day when flexible groups are organised. As a result, there is less misconduct in classes, and low achievers have improved their academic performance.



When teachers work together in teams, they all learn from each other's techniques and practices because they can finally see those practices (enhanced visibility) – they are no longer hidden behind a closed classroom door. The visibility is enhanced even further when this becomes organisation-wide rather than just individual collaboration among colleagues. While this practice might be unnerving to teachers at first, it is inherent in the nature of innovation to disrupt established habits before the innovation is integrated and becomes accepted in organisational practice.

Teachers at the John Monash Science School (Victoria, Australia) identified the benefits of "knowing what others are doing", and therefore learning from one another, as well as "having a stronger sense of what the students are learning" and the ways in which richer connections could be made between different areas of learning. This was a new way of working for teachers, who are traditionally used to closed-off private areas and personal desks.

The Distance Learning Classroom in Lok Sin Tong Leung Wong Wai Fong Memorial School (Hong Kong, China) gives students the opportunity to learn from their counterparts in different schools and enables teachers to observe lessons and exchange information with their peers who are not physically on site. The Smart Classroom is an advanced technological classroom that allows teachers to use a wide variety of media in their teaching. It also serves as a live link with other partner schools.

Regrouping learners

One of the most common ways in which the innovative learning environments discussed here regroup learners is by mixing older and younger learners together.

There is a variety of reasons offered by the case-study schools for grouping together learners of different ages: as a stimulus to learning, as a way of encouraging diversity and contacts that would otherwise be unlikely to develop, to enable peer teaching, and as a way of reducing bullying and fostering good social relations.

In the Lisbjerg School (Aarhus, Denmark), there are two large groups composed of students whose ages span three years (6-9 year-olds and 10-13 year-olds). The students are also organised into smaller groups of 12, which are also mixed in terms of age. Teaching is differentiated and alternates between working within the bigger and the smaller groups. All students follow an individualised learning path (called "the child's storyline"), and document their work in different portfolios.

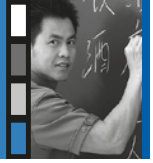
In the Community of Learners Network (British Columbia, Canada), teachers work within the walls of the traditional school structures to create innovative approaches to teaching and learning. For example, in elementary (K-7) classrooms, where students are placed in cohorts based on age, teachers collaborate across grades. They have shifted both the physical structures and the learning structures to enhance collaboration among students of different ages, and they have shifted the power structures to include students as key resources in the education of their peers – and their teachers.

In the Presteheia school (Kristianssand, Norway), learner groups vary in age and size but tend to be between 33 and 54 students. Time in the large mixed groups is used to build relationships among children who would otherwise not socialise. This reduces the incidence of bullying at school and increases feelings of security and confidence. It also makes it easier for students to find someone with whom they can have a trusting relationship, because they can choose among more students. Teachers and other staff are deployed flexibly.

Some of the case studies are very small schools with mixed-grade classes. They intentionally use the heterogeneity of their students as the basis for an individualised education, to encourage integration and autonomous learning.

Gesamtschule Schupberg (Boll, Switzerland) is a small school with a multigrade classroom composed of students of varying cognitive and physical abilities. The school emphasises the heterogeneity of the student group, and regards the heterogeneous student body as a stimulating and motivating influence on the children's social and cognitive development. All 20 students, from Grades 1 to 9 are placed in one mixed-age class. Although students are assigned to a certain grade, learning activities are adapted to their current level of development, allowing for gifted students to be challenged and for weaker students to develop greater self-confidence as learners.

Several of the innovation sites operate with a "house" system that offers a more manageable organisational unit and stimulates more "family-oriented" engagement among students.



Subscribing to the principle that learning is a social endeavour, the Community Learning Campus, Olds High School (Alberta, Canada) is both physically and programmatically organised into four learning communities, called quads. The quads provide a range of learning settings for a wide variety of groupings and configurations of students. The quads bear the names of colours: Red, Green, Blue and Gold. The Red Quad is composed of Grade 9 students. It is the only quad that contains a single grade. The other three quads include a mix of Grade 10, 11 and 12 students. Students remain in the same quad, with the same group of teachers, throughout these three years in high school.

A key part of the collaborative environment in the Australian Science and Mathematics School (South Australia, Australia) is the Tutor Group Programme. Each student is a member of the same multi-year group for the duration of his or her time at the school. The Tutor Group meets daily for 40 minutes. Key roles of the Tutor Group are to "ensure that students feel a sense of belonging within the school" and to "provide care and guidance through strong student-teacher relationships".

At Colegio Karol Cardenal de Cracovia (Santiago, Chile), the unit is not the "house" or "family" or "quad", but the "ministry", as in a national or regional government. In each ministry, there is a student minister, counsellor teacher, parent minister, chiefs of communal departments, mayor of the class and deputy secretary. The "president" is elected during political campaigns that involve voting boxes and election monitors. The student who wins the largest share of votes becomes president of the school government, and the student who wins the next highest number votes becomes the secretary-general to the president.

Co-operative learning is a prominent feature in many of the innovative sites. In some cases, it is more formalised through the establishment of learner groups that are considerably smaller than the houses or tutor groups described above.

In the case of a school in Hong Kong (China), there is a deliberate strategy of mixing abilities in small working groups.

Lok Sin Tong Leung Wong Wai Fong Memorial School (Hong Kong, China) has restructured all classes in primary Grades 1 to 6, dividing students into small groups, normally of around three or four pupils. These heterogeneous groups are formed according to students' academic performance. Each group is made up of both more able and less able students. The heterogeneity of the groups enhances co-operative learning, in which students work together to maximise their own and each other's learning.

Mevo'ot HaNegev Kibbutz Shoval (Israel) operates with a project-based pedagogy, with projects taking place around a specific problem or question that can be theoretical, practical or both. The learners divide into workgroups of three or four students and then examine a topic or a sub-topic from the wider subject.

Rescheduling learning: Innovating how time is used

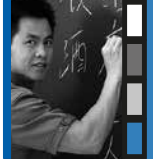
Schedules structure the school day, week or cycle; the school timetable provides a central organising tool in schools the world over. Many educators still see time primarily in quantitative terms (i.e. as something one has more or less of), with the effectiveness of teaching directly related to it. But with innovative approaches, time is regarded in more qualitative terms.

The distribution and planning of activities over time is a familiar part of school life. A number of the innovative learning environments described here have moved in the direction of organising learning into fewer, longer periods, partly for greater flexibility, but particularly in order to enhance the opportunities for deeper learning.

Mevo`ot HaNegev Kibbutz Shoval (Israel) has a shorter school week (five days) and longer lessons (60 minutes) than are customary in Israel, to allow students to engage more deeply in their lessons. The number of subjects covered per week was reduced from eight to four or five; the relationship between teachers and learners has become more personal; learning has been oriented towards understanding; studying has become more individual and autonomous; and teachers mentor and support the learners.

Every day except Wednesday at John Monash Science School (Victoria, Australia) begins with a 15-minute tutorial group meeting. The timetable of the school operates on a four-period day, and a ten-day cycle. Each period is 75 minutes long to provide, as described by the principal, "opportunities for deep learning".

The timetable at the Community Learning Campus, Olds High School (Alberta, Canada) consists of five 70-minute blocks with 10 minutes between classes. One of the five blocks of time is known as Flex Period (flexible period). Students explained that they have time to eat and also enough time to work on homework or anything else they might wish to work on. They also have access to a teacher during this time.



As some of the schools in the case studies move away from the standard subject-based curriculum, it is not surprising to find that this is reflected in their timetables.

> In Spanish schools, time is organised according to subjects. But in the *Instituto Escuela Jacint Verdaguer*, the timetable is based on methodology instead. The three areas into which the curriculum is organised are reflected in students' timetables and the "learning pyramid": 25% of the time is devoted to instrumental areas, 25% to personal work and autonomy, 40% to co-operative work and the remaining 10% to intrapersonal work.
>
> The academic year lasts 36 weeks in *Dobbantó* (Springboard) (Hungary), as in any other Hungarian vocational school, but the daily and weekly schedules are quite different. Approximately 60% of study time is devoted to general education, and 40% is devoted to developing work-related competencies.

Many of the cases that were studied use time more flexibly than traditional schools. Flexibility goes hand in hand with individualised learning plans and with education philosophies that aim to make schooling less bureaucratic.

> The *Europaschule* (Linz, Austria) has no school bell, since many believe the sound interrupts learning. Teachers start and end their lessons or break a double period when they consider it appropriate.
>
> Instead of the 45-minute rhythm and subject-oriented instruction normally found in the German school system, an open, adaptive form of instruction is applied in the *Jenaplan-Schule* (Thuringia, Germany). Individual students have enough flexibility in their schedules and free time to work and learn at their own pace during the day and to pursue their other interests, apply their creativity and develop their social skills. The goal is to have students understand themselves as active and independent learners who can enjoy the fruits of their efforts.

Some of the innovative learning environments studied provide their students with the opportunity to accelerate their learning. There is international evidence that this leads to improved results.

> At the Australian Science and Mathematics School (South Australia, Australia), Year 10 students may study subjects at Year 11 or Year 12 level, while Year 12 students have the opportunity to take first-year courses at Flinders University as part of their Year 12 studies. The school responds to the learning needs of its most motivated and gifted students by allowing them to self-pace their learning and do away with the confines of the traditional school-year cycle.

Rituals can help to structure the school day and make it meaningful, creating routines of reflection or planning. Several of the innovation sites studied begin and conclude the school day or week with such a special moment. For example:

> In the *Projektschule Impuls*, Rorschach (Bern, Switzerland) the day begins with a "morning circle" when a "speakerstone" is passed around and the children can talk about their feelings or thoughts. There is a regular structure to the day. Classes start with a foreign-language session, followed by group work based on learning plans. Afterwards there is a period of absolute quietness, timed by a sandglass that runs for 25 minutes, while the students remain at their place and do not speak or walk around.
>
> The Multimedia Programme, including "The Morning Show", the CGPS Radio Show and Film-Making project, has become central to the Courtenay Gardens Primary School (Victoria, Australia). The show is run each morning by a group of senior school learners who apply to do so and undertake appropriate training. It provides the school community with information about their day ahead, transmitted throughout the school at 9:00 a.m. on the television in each classroom, in the staffroom and at the entrance to the school, from a dedicated multimedia classroom. The show follows a structured storyboard that includes an overview of news around the school, including student and staff birthdays, teachers on yard duty, weather, a "maths minute", phone-ins from classrooms and a film made by students.

A number of the case-study learning environments systematically structure learning and support for their learners outside regular school hours. There are many more examples than those cited below, as all of the sites using virtual e-classrooms, for instance, have removed the close connection between face-to-face contact and organised learning.

> The *Entre Amigos* association in the Polígono Sur (Seville, Spain) is responsible for organising extracurricular activities through an official tender process of the City Council of Seville. From 8:00 a.m., the selected organisations are in charge of the "Morning Classroom", developed to assist those whose parents go to work early in the morning, most of them at street markets. Evening extracurricular activities start at 3:00 p.m. and finish at 5:00 p.m., although CEIP (Spain) is normally open later.

The Lok Sin Tong Leung Wong Wai Fong Memorial School (Hong Kong, China) has launched a number of activities for students before, during and after school. Those who need to be at school early can join the "Reading is Fun" programme, from 7:15 a.m. through most of the following hour. Students can choose different kinds of books to read and share afterwards. In addition to lunchtime activities, students can join the Student Gardener Team to look after the plants in the school garden and the community garden during recess. Every afternoon, students have 40 minutes of self-study to work on their homework. There is also a two-hour period at the end of the school day for tutorial classes on academic and creative subjects.

The Enrichment Programmes, Rodica Primary School (Slovenia) offers an array of artistic, research, international, linguistic and social activities that encourage creative thinking, constructivist education and diverse paths to knowledge. These complement the regular programme and are offered mostly outside of regular lesson time, in the afternoon or on Saturdays.

Widening pedagogical repertoires

Innovative learning environments also work with different pedagogical approaches to expand teaching and learning. Many focus on inquiry approaches and collaborative work, both of which are critical for preparing students for future learning and for equipping students with 21st century skills. These sites also take full advantage of the possibilities afforded by communication technologies. What is important are the mixes of pedagogical approaches. Innovation is not about using a single new teaching method or one kind of technology; it is about employing a combination of tools and approaches, including direct teaching.

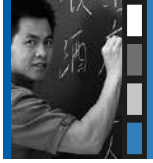
In many of the innovative cases studied, students engage in project-based learning. They are encouraged to acquire knowledge while practising skills, like hypothesis generation, scientific inquiry, self-monitoring and (sometimes on line) literary analysis. Some sites have shifted from subject-specific teaching towards more interdisciplinary learning that links knowledge and skills from several subject areas.

The *Jenaplan-Schule* (Thuringia, Germany) distinguishes among learner group instruction (music, arts, sports, handicrafts/woodworking, etc., and social studies), learner group work, and learner group projects in nature, geography/history, German and ethics/religion. In all learner groups, the project work, scheduled for 100 minutes three times a week, is the central working form.

"Problem-Based Learning" is an important part of students' work in natural sciences, social sciences and technology at *Instituto Escuela Jacint Verdaguer* (Spain). All such work is planned as a team and carried out either co-operatively or individually. Understanding a problem is considered to be the first step on the path to finding a solution to the problem. The organisation of learning spaces, the timetable, activities, trips and workshops are based on this methodology.

At Matthew Moss High School, Innovation Unit (England, United Kingdom), student teams work one day per week on a research project. The teachers first introduce a challenge, which can vary from launching an egg as high as possible and returning it to earth without breaking to responding to a natural disaster or investigating family histories of migration. The students then gather information about the topic and write a research proposal which they submit to their teachers for approval. After the proposal is approved, they conduct research throughout the school year. In the process, they are free to organise their own research, while the teachers act as facilitators who present in-time lessons or suggest additional sources of knowledge.

In the Community of Learners Network (British Columbia, Canada), educators design broad inquiry questions that encompass a range of learning intentions. Background knowledge is developed through direct instruction and a series of information-gathering collaborative processes, such as research, "jigsaw puzzles", literature circles, information circles, field experiences and guest presentations. A prominent feature of this phase is a series of "circle meetings" where students' learning is co-constructed and facilitated in small groups. Reflective writing and representations of evolving understanding (using mind maps) follow the small-group meetings. After this phase, the students are coached to articulate their own inquiry questions that fit within the larger inquiry question. As they pursue their individual inquiries, they often facilitate learning experiences for their classmates. Ongoing progress is supported through multilevel feedback circles that rely on self, peer and teacher support. The inquiry process is followed by a celebration of learning, called a Learning Showcase, where families, fellow students and community members are invited to share in the learning experience. Once the inquiry circle is completed, a new one begins, following the same sequencing of activities. This allows the students to become more autonomous in their learning and gradually take on more challenging inquiry projects as they progress.



It is a common feature of many innovative learning environments to make the learning experience authentic and meaningful by engaging students with real-life problems, offering hands-on experiences, and incorporating the students' historical, natural and cultural environment into learning activities. Central to authentic teaching are real-life problems, which are interesting to students because they are more relevant, complex and challenging than simplified problems designed by educators, and because they are more closely linked to the development of 21st-century skills.

> In the Centre for Studies on Design at Monterrey, the Atelier of Ideas, Monterrey (Nuevo León, Mexico), the college co-operates with enterprises and institutions, which submit real-world projects that student teams complete, from brainstorming to final evaluation, with instructors acting as counsellors in this process. There are three major steps: project design (coming up with a plan to bring the project to fruition); collaborative work (working together to optimise the process and the outcomes); and evaluation (by the teacher, peers, the individual student and the external agency that came up with the project proposal).
>
> The three-year practical building and living project at Breidablikk Lower Secondary School (Norway) involves students building houses on a 1:20 scale. Students get to play the role of builder, gardener, electrician, bank employee, real estate agent and others. To this end, the school co-operates with representatives of different businesses. Students use the same digital tools that architects use, and houses are furnished with electricity and handmade furniture. All designs must be environmentally sustainable.

Work on real-life problems often goes together with hands-on experience. At a few sites, hands-on learning involves inviting native speakers of the languages students are learning into the classroom (or through videoconferencing) for face-to-face conversations, or letting students participate in international events where they can hear and speak the languages they are studying.

Hands-on experience may also entail running a small business, such as producing and selling homemade products or working on problems posed by external customers. The students naturally gain experience in such activities as marketing, accounting and customer service, but also in organisation, co-ordination and team work.

> The Mypolonga Primary School (South Australia, Australia) has a student-organised shop in which the students sell homemade products and products commissioned from the local community to visitors and tourists. All classes are involved in business, craft and tourism, and senior students operate the shop one day per week, along with a junior trainee. Students rotate through a series of tasks in the shop, acquiring language, mathematics, art, craft and hospitality skills along the way.

Authentic learning activities often involve aspects of the students' immediate environment. These allow students to explore the world around them and learn about the cultural and historical heritage of the place where they live.

> *Liikkeelle*! (On the Move!), Heureka, Finnish Science Centre (Finland) encourages students to examine everyday settings from the perspective of natural sciences. Activities include investigating air quality and noise levels with the guidance of relevant experts and authorities. Students place a measuring device near their school, work with a centre for natural-science teaching for analysis, process the data and publish results in an interactive map on an online learning platform. They then discuss the results with students from other schools and with a wide network of experts.

Authentic learning often involves several rounds of review and revision towards a polished result, which may be an exhibition, a stage performance or a portfolio. When students can present their work to a real audience, it becomes a source of public learning and celebration. Working towards a final performance also motivates students to achieve genuine mastery, because real audiences demand coherent presentations and a high level of understanding. Presentations are also learning events in themselves: setting them up involves skills like organising group efforts and communicating effectively with an audience.

> In the Centre for Studies on Design at Monterrey, the Atelier of Ideas, Monterrey (Nuevo León, Mexico), students present the projects they have been working on – all of which respond to real enterprise and community demands – in front of local enterprises and public and/or private institutions. Doing so makes the assessment of their work much more authentic and meaningful to students.
>
> In the Community of Learners Network (British Columbia, Canada), the Showcase is a celebration that completes each inquiry cycle and has come to be seen as an essential element of the learning process. Classmates, school administrators, families and community members are all invited to view the products that the students have created and to discuss their learning experiences with them.

Europäische Volksschule Dr. Leopold Zechner (Austria) practices a special performance assessment called "commented performance portfolio" up to Grade 3. Twice a year students present their achievements to parents and teachers in a detailed conversation that lasts around 30 minutes. Students present work they have done and answer teachers' questions or demonstrate learning by solving problems they feel confident they can tackle in front of their parents.

The orchestration of learning within the environment is complex, involving many decisions, often taken by teachers working collaboratively or with others in the learning leadership, about when and where and with whom particular pedagogies are appropriate, and how these should be modulated over time. In all of the examples below, part of the day involves whole-group, teacher-led activities, mixed in with other types of teaching and learning.

In the Lobdeburgschule (Thuringia, Germany), a typical week for a Grade 1 student starts with the Monday "morning circle", where various topics are discussed. Then, learners work on their individual plans with partners, sometimes with the help of the teacher and using a range of different worksheets and prepared materials for support ("free work"). Then, it is the "epochal projects" session, which is project-based. Students work for about a week on a single theme that includes different subjects and topics of the Thuringian curriculum. At the beginning of the project, the teacher provides core information, questions about the theme are developed, and sometimes small working groups are formed. The results are presented at the end of the week. Subject-oriented lessons follow, but students have more freedom to direct their learning in these lessons. The school week ends with the group "final circle" on Friday afternoon.

At the Mordialloc College (Victoria, Australia), the daily expedition time (11:00 a.m.-1:00 p.m.) provides opportunities for workshops and student conferences related to the substantive curriculum content, as well as embedded aspects of literacy and numeracy. Guides also hold workshops on areas that address the specific needs of students. These are the key points of direct instruction for students and are generally held for groups of 15 or more students.

Coursework at *Jenaplan-Schule* (Thuringia, Germany) includes mandatory subjects, but it also demands a high degree of development and discovery by individual students.

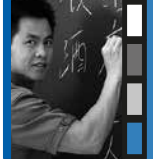
Traditional methods of teaching can be complemented by e-classrooms for acquiring and strengthening knowledge, as well as for assessment (Internet Classroom, Kkofja Loka Primary School, Slovenia). Teachers' learning materials, prepared in advance, are collected in one place within the e-classroom, where they may be used directly without downloading. Instruction via e-classroom takes place through an interactive whiteboard and portable tablets. E-classrooms allow for individual feedback after completed work or activity, with messages or a grade or a knowledge test given before progression to the next level.

Even in learning environments that have deliberately sought to move away from conventional forms of teaching and organisation, there are particular subjects for which those more conventional approaches are judged to be the most suitable even if, in these cases, teachers are always looking to encourage more active engagement among their students. The mix of pedagogies may be realised through the different media and settings used, as when e-classroom work is integrated into the larger menu of teaching and learning options. It may also stem from teachers' preferences and choices as part of the wider orchestration of learning. Again, these innovative learning environments have not simply replaced one approach or methodology with another, but rather use a wide array of approaches, all of which are aligned with the broader learning strategy.

POLICY IMPLICATIONS

When other sectors see flat-lining productivity, they look to innovation. That is happening in education too. Comparisons point to levels of innovation in education that are pretty much in line with those in other sectors. But the central question is perhaps not the volume of innovation, but its relevance and quality and the speed from idea to impact. Innovation is happening, but too little of it is focused at the heart of learning; and when it does focus there, it spreads too slowly.

In many countries, there seems to be a significant gap between what teachers report to be desirable pedagogies and what actually happens in classrooms. Particularly in the English-speaking world, teachers report a preference for constructivist pedagogies, but the results from PISA show learning strategies dominated by memorisation. This is a problem, since memorisation helps students less and less as the tasks on this test become more complex and involve more non-routine analytic skills – which is exactly where digitalisation is driving real-life tasks for humans. In turn, learning strategies framed



around elaboration, the capacity of students to connect new knowledge to familiar knowledge, to think divergently and creatively about novel solutions or how knowledge can be transferred are highly predictive for success in the more demanding PISA tasks, but often rare in classroom practice.

However, the significant variation in pedagogical practice across countries suggests that there is considerable scope for policy and practice to shape instructional systems, pedagogical practice and pedagogical beliefs. That variation is also mirrored in initial direct measures on teachers' general pedagogical knowledge that emerge from OECD's first pilot study.

This chapter has made the case for changing the heart of learning environments and has illustrated ways to do so by reshaping the roles of learners, educators, content and resources. Many of these examples provide evidence that the way we think of schools is being reimagined. Teachers and schools are innovating and adopting creative approaches. They are pushing the boundaries of the school out and bringing the community in and rethinking the traditional organisational pattern – where teachers worked alone, each with their own class following a one-size-fits-all schedule and bureaucratic content units.

However, a key question remains. At the system level, how can public policy enable the development and implementation of effective pedagogical practice?

Governance is an obvious lever. Innovative change can be more difficult in hierarchical and bureaucratic power structures that are geared towards rewarding compliance with rules and regulations. One policy approach to foster innovation in schooling has been to increase autonomy, diversity and competition among educational institutions. Questions around autonomy and choice therefore feature high on the policy agenda of many countries. As discussed in the preceding chapter, what seems clear is that choice will only generate the anticipated benefits when the choice is real, relevant and meaningful (i.e. when parents can choose an important aspect of their child's education, such as the pedagogical approaches used to teach them). In the high-performing choice-based systems, private schools also seem to accept public steering and accountability mechanisms that ensure the attainment of public policy objectives in exchange for the funding they receive from the public purse. To reconcile flexibility and innovation with equity, school systems need to carefully devise checks and balances that prevent flexibility from leading to inequity and segregation.

Digitalisation is another policy avenue for enhancing innovation in education. People have quite different views on the role that digital technology can and should play in schools. But we just cannot ignore how digital tools have so fundamentally transformed the world around schools. However, when it comes to technology, education still seems stuck in the age of chalkboards. At the time of the 2012 PISA survey, only around 37% of schools in Europe had high-end equipment and high-speed Internet connectivity, a figure which ranged from 5% in Poland to virtually 100% in Norway. But when asked, between 80% and 90% of school principals said that their schools were adequately equipped when it comes to computers and Internet connectivity, even principals in the many countries where the equipment is clearly substandard. So is technology not that important? Or were school leaders not aware of the potential of ICT to transform learning?

Where digital technologies are used in the classroom, their impact on student performance seems mixed, at best. PISA measured students' digital literacy and the frequency and intensity with which students used computers at school. Students who use computers moderately at school tend to have somewhat better learning outcomes than students who use computers rarely. But students who use computers very frequently at school do a lot worse in most learning outcomes, even after accounting for social background and student demographics (Figure 3.15). Those findings hold for digital literacy skills as well as disciplinary knowledge and skills like mathematics or science.

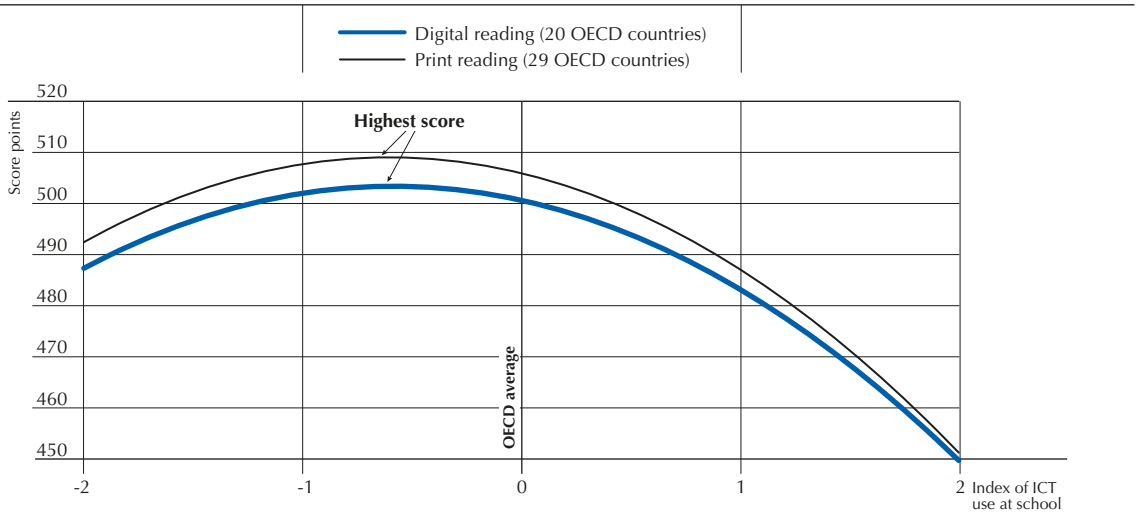
PISA results also show no appreciable improvements in student achievement in the countries that had invested heavily in digital technology for education. And perhaps the most disappointing finding is that technology has been of little help in bridging the knowledge and skills divide between advantaged and disadvantaged students. Put simply, ensuring that every child attains a baseline level of proficiency in reading and mathematics seems to do more to create equal opportunities in a digital world than is currently achieved by expanding or subsidising access to high-tech devices.

One interpretation of all this is that building deep, conceptual understanding and higher-order thinking requires intensive teacher-student interactions, and technology sometimes distracts from such human engagement. Another is that schools have not yet become good enough at the kind of pedagogies that make the most of technology and adding 21st century technologies to 20th century teaching practices in a 19th century learning environment will just dilute the effectiveness of teaching. Technology can amplify great teaching, but great technology cannot replace poor teaching.

Figure 3.15

Students' skills in reading, by intensity of computer use in school (2012)

OECD average relationship, after accounting for the social background of students and schools



Note: The lines represent the predicted values of the respective outcome variable, at varying levels of the PISA index of ICT use at school.
Source: OECD (2015), *Students, Computers and Learning: Making the Connection*, Figure 6.5, http://dx.doi.org/10.1787/9789264239555-en.
StatLink http://dx.doi.org/10.1787/888933253280

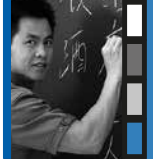
It is unclear why education has not advanced further with making education fit for the digital age. Perhaps it is just that this would disrupt the current business model of governments, academia and textbook publishers. It may also be that the educational industry is too weak and fragmented to take this on. Governments in OECD countries spend more than 9% of health spending on health-related research, while they spend less than 2% of educational spending on educational research. To put it differently, health research budgets in OECD countries are 17 times larger than educational research budgets, and in countries like the United Kingdom or the United States, they are over 70 times larger than educational research budgets. That reveals a lot about the role that we expect knowledge to play in advancing practice.

An even bigger issue is that, even where good educational research and knowledge exists, many educational practitioners just do not believe that the problems they face can be solved by science and research. Too many teachers believe that good teaching is an individual art based on inspiration and talent, not a set of competences you can acquire during your career. Yet, it would be a mistake to just blame teachers for that. This problem goes often back to policy, because there is a real lack of incentives and resources to codify professional knowledge and know-how, and in many countries the room for non-teaching working time is far too limited to support a serious engagement of teachers in knowledge creation. Because education has not been able to build a professional body of practice or even a common scientific language in ways other professions have, practice remains tacit, not articulated, invisible, isolated and difficult to transfer. Investing in better knowledge must become a priority (Box 3.4).

It is also important to create a more level playing field for educational innovation. Without knowing more about the size, market and innovation intensity of the education industry, it will be hard to build a business sector that can generate and disseminate innovation.

Governments can help to put ideas into practice, to strengthen professional autonomy and a collaborative culture where great ideas are refined and shared. Governments can also help with funding and build incentives and signals that strengthen the visibility and demand for what works (Box 3.5).

But governments alone can only do so much. Silicon Valley works because governments created the conditions for innovation, not because governments do the innovation. Similarly, governments cannot do the innovations in the classroom. However, they can help by opening up systems so that there is an innovation-friendly climate where transformative ideas can bloom and they can actively disseminate promising ideas and practice. That means encouraging innovation from teachers within the system and making it open to creative ideas from outside. More of that needs to be happening. Teachers' unions and organisations can play an important role in fostering innovation in practice (Box 3.6).



Box 3.4. Strengthening teacher professionalism and school leadership in Portugal

Portugal has implemented several promising initiatives aimed at strengthening the teaching profession, including the following:

1. implementing more stringent admission conditions for teachers' education programmes (2014)
2. reinforcing scientific curricula in teachers' education programmes (2014)
3. introducing a lifelong training framework for teachers that links continuing professional development to career progression and aims to improve the quality of teaching
4. school clustering and closing small isolated schools to foster greater collaboration among teachers and improve work organisation

In addition, Portugal implemented a reform of its school leadership in 2008, modifying selection processes and responsibilities for principals from first among equals (teachers elected to the position by their peers, functioning mainly as administrators) to professionally selected and accountable school leaders, with clearly identified authority and responsibilities. In 2012, specialised mandatory training for school leaders was also reinforced.

Source: OECD (2014b), *Education Policy Outlook: Portugal*, www.oecd.org/edu/EDUCATION%20POLICY%20OUTLOOK_PORTUGAL_EN.pdf.

Box 3.5. Innovative schools project in Portugal

In 2017, Portugal adopted a national programme for innovation in learning, enabling initiatives, and mobilising schools. This policy, Innovative Schools Project (Escolas Inovadoras), is oriented towards models of enhanced autonomy and combines the goal of Retention 0 (zero) with flexible management instruments (curriculum, spaces, organisation of classes and school calendar). Future Classroom Labs, also known as Innovative Learning Environments, were created as a result of the Innovative Schools Project (with new technology, including computer, tables, interactive white boards and tables, sensors, and graphing calculators to facilitate student learning and teacher training). Teachers are encouraged to apply new teaching methods, project-based and inquire-based learning using these spaces. This project is part of a broader policy approach adopted by Portugal, which includes a new framework of competences for the whole education system (Students' Profile at the End of Compulsory Education), the National Plan for School Success (in place in the majority of public schools and municipalities), specific tutoring to all students who repeat two grades, and the Curriculum Flexibility and Autonomy Programme (currently, in place in 235 schools).

Source: OECD (forthcoming), *Education Policy Outlook 2018: Putting Student Learning at the Centre* [working title], Country Snapshot of Portugal.

Box 3.6. Computing At School

Computing at School (CAS) is a grassroots organisation that supports computer-science teaching in primary and secondary schools, primarily in England but also across the United Kingdom. It offers a good example of the way teachers can organise themselves around innovation and teaching practices. CAS was born out of a serious concern that many students are being turned off computing by the perception that it is dull and pedestrian, so the goal is to put excitement into computing at school. Much of the support provided through CAS focuses on computer-science subject knowledge, but pedagogy also plays a part and arises out of the activity or learning tool being used by the teacher. Main projects include Teach London Computing, and physical computing and programming, using such tools as Scratch and Python. Membership is very broad, including teachers, parents, governors, examination boards, industry, professional societies and universities.

CAS is organised around local hubs, which provide training for other teachers in a given area. The core of the organisation is composed of a strategic alliance with the British Computer Society (The Chartered Institute for IT) and the CAS board. All schools in England are welcome to join the Network of Excellence in computer teaching, which is led by CAS lead schools. These lead schools, along with CAS Regional Centres and CAS Master Teachers, support the implementation of development plans and computing curriculum, provide good practice (such as lesson observations), and run computing-focused transition days. Of special interest are the classroom resources and diverse toolkits and self-assessment frameworks available for teachers.

Source: Computing At School, www.computingatschool.org.uk/.

Policy makers often view education industries as providers of goods and services to schools. They tend to underappreciate that innovation in education is also changing the very environment in which schools operate. In particular, technology-based innovations open up schools to the outside world, both the digital world and the social environment. They also bring new actors into the system, including the education industry, with its own ideas, views and dreams about what a brighter future for education could hold.

Convincing education systems to treat industry as a valuable partner is still a sensitive issue. Fears of a perceived marketisation of education or the displacement of teachers by computers often endanger what could be a fruitful dialogue. It is equally important that governments better understand the education industry.

At the same time, education systems should also be more demanding of the education industry. Most of our children would not voluntarily play with software of the quality that companies are selling to schools. Is innovation in the education industry as dynamic as it should be? Our data about the value of intangibles suggest that less than 10% of the total assets held by the large media groups relate to some form of research and development. Can we break the cartel of a few large suppliers of educational resources who use an army of salespeople to sell their services to a fragmented market? Entrepreneurs cannot afford to play this game. Can we overcome the slow sales cycles, where buyers have to deal with layers and layers of people, all theoretically in charge?

Can we create a business culture for managing innovation in school systems? Currently it is much easier for administrators to buy new tools and systems and use existing staff, because this costs them nothing. The treatment of teacher time as a sunk cost means that people see no benefit to saving this time. It is important to explore how the industry can help the education sector to close the productivity gap, with new tools and new practices, organisations and technology.

To deliver on the promises offered by technology, countries will need much more convincing strategies to build teachers' capacity to use these tools, and policy makers will need to become better at building support for this agenda. Given the uncertainties that accompany all change, educators will often opt to maintain the status quo. To mobilise support for more technology-rich schools, education systems need to become better at communicating the need and building support for change. Investing in capacity development and change-management skills will be critical, and it is vital that teachers become active agents for change, not just in implementing technological innovations, but also in designing them.

Perhaps the most distinguishing feature of technology is not only that it serves individual learners and educators, but also that it can build an ecosystem around learning that is predicated on collaboration. Technology can build communities of learners that make learning more social and more fun, recognising that collaborative learning is a powerful tool to enhance goal orientation, motivation, persistence and the development of effective learning strategies. Similarly, technology can build communities of teachers to share and enrich teaching resources and practices, and also to collaborate on professional growth and the institutionalisation of professional practice. And technology can help system leaders and governments to develop and share best practice around curriculum design, policy and practice.

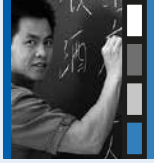
But the heart of great teaching is not technology, it is ownership. Successful education systems in the 21st century will do whatever it takes to develop ownership of professional practice by the teaching profession.

Productive learning takes place when teachers feel a sense of ownership over their classrooms and when students feel a sense of ownership over their learning. So the answer is to strengthen trust, transparency, professional autonomy and the collaborative culture of the profession, all at the same time.

But the most essential reason why teachers' ownership of the profession is a must-have rather than an optional extra lies in the pace of change in 21st century school systems. Even the most effective attempts to translate a government-established curriculum into classroom practice will drag out over a decade, because it takes so much time to communicate the goals and methods through the different layers of the system and to build them into traditional methods of teacher education. In a fast-changing world, when what and how students need to learn changes so rapidly, such a slow process is no longer good enough. It inevitably leads to a widening gap between what students need to learn and what and how teachers teach.

As the prescriptive approach weakens, the position of classroom practitioners needs strengthening. Governments steer overall directions and curriculum goals, but the teaching profession needs to take greater responsibility for the instructional system, and governments need to find ways to enable and support professionalism.

What this implies, however, is to turn away from idiosyncratic practice (where every teacher has his/her own approach on the grounds of autonomy) towards the common use of practices agreed as effective – in effect, making teaching not just an art but also a science. Finding out what pedagogical approaches work best in what context takes time, deliberate investments in research, and collaborative practice, where good ideas spread and scale in the profession. Achieving that will require a major shift, from an industrial work organisation to a truly professional work organisation for teachers and school leaders. Supporting such a shift is what we should expect from 21st century education policy.



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Chapter 4

TEACHERS' WELL-BEING, CONFIDENCE AND EFFICACY

The Summit now focuses on teachers themselves. There is a growing recognition that for teaching and learning to be at its most effective, teachers should have high levels of well-being, self-efficacy, and confidence. This mirrors increasing evidence that students' well-being, efficacy, and confidence are vital for their learning. How does teacher well-being relate to teacher effectiveness and student well-being? How should teacher well-being feature in priorities for public policy? How can governments, in partnership with teacher unions, create evidence-informed strategies on well-being, efficacy, and effectiveness as part of their teacher policies? This is the theme of the third session of the 2018 International Summit on the Teaching Profession.

Note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

HIGH AND RISING EXPECTATIONS OF TEACHERS

Demands on teachers are high and growing. We expect them to have a deep and broad understanding of what they teach and the students they teach, because what teachers know and care about makes such a difference to student learning. That entails professional knowledge (i.e. knowledge about specific disciplines, the related curriculum and how students learn in that field) as well as knowledge about professional practice that enables teachers to create effective learning environments and foster good learning outcomes. It also requires an understanding of the research-theory-practice nexus and the inquiry and research skills that allow them to become lifelong learners and grow in their profession.

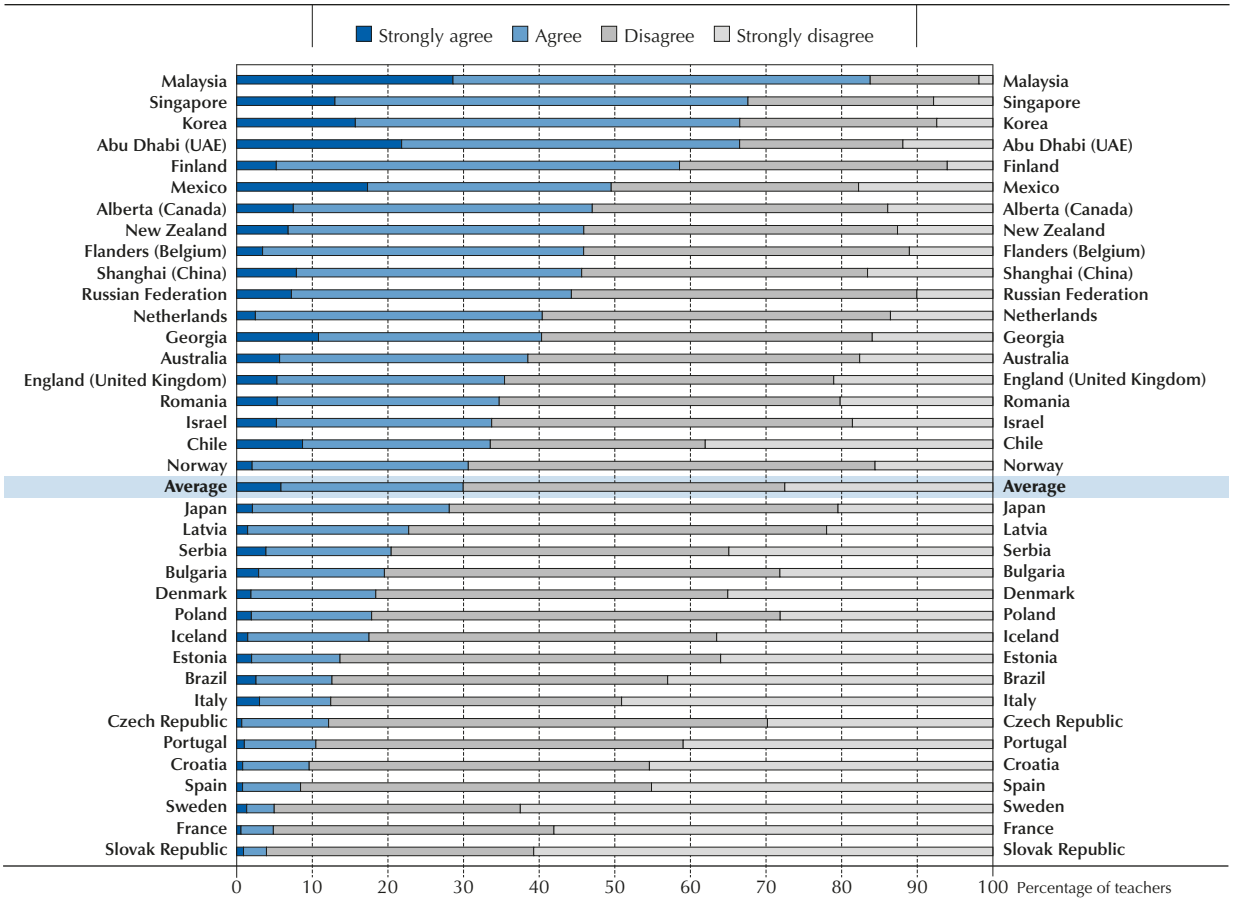
But teachers today are increasingly expected to perform tasks that fall beyond their job description. They are counted on to equip students with cognitive skills and to facilitate development of non-cognitive skills, such as student engagement, self-confidence and collaborative skills – to name just a few. Teachers are also increasingly expected to respond effectively to students' individual differences and to work collaboratively with other teachers and parents to ensure the holistic development of their students.

There are also aspects of the way of working that make the job of teachers particularly demanding. Teachers do their job in real time, with a classroom dynamic that is always unpredictable and leaves teachers no second chance to think about how to react. And whatever a teacher does, even with just a single student, will be witnessed by all classmates and can frame the way the teacher is perceived in the school from that day forward.

Figure 4.1

Teachers' view of the way society values the teaching profession

Percentage of lower secondary education teachers who "strongly disagree", "disagree", "agree" or "strongly agree" with the following statement: I think that the teaching profession is valued in society



Countries are ranked in descending order, based on the percentage of teachers who "strongly agree" or "agree" that they think that the teaching profession is valued in society.

Source: Based on OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.3, http://dx.doi.org/10.1787/9789264196261-en.

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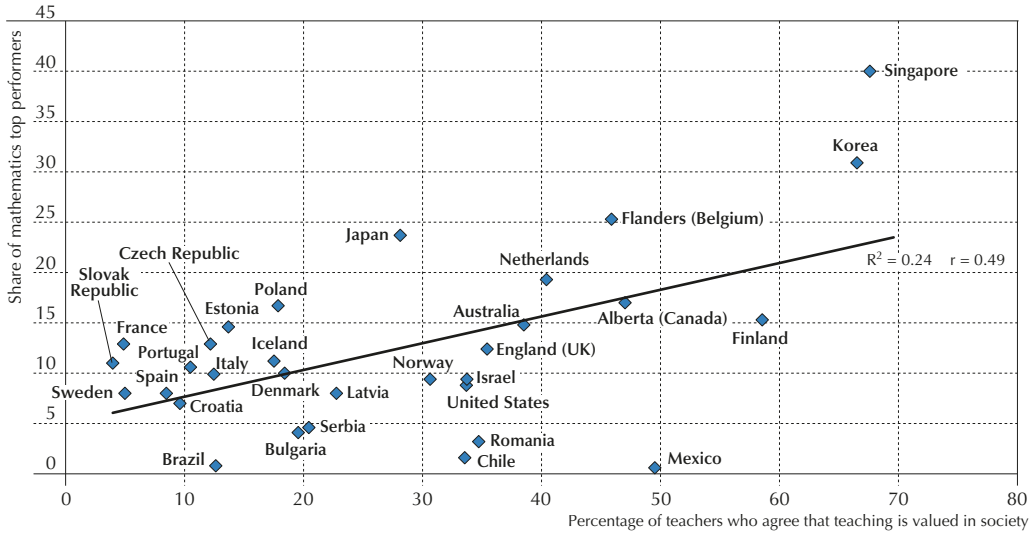
While teachers play a crucial role in a student's life, the OECD 2013 Teaching and Learning International Survey (TALIS) found that less than one-third of teachers believe that their profession is valued in society (Figure 4.1). In all but one of the countries and economies that participated in TALIS, the extent to which teachers can participate in decision-making has a strong, positive association with the likelihood of reporting that teaching is valued by society.

Importantly, evidence from the OECD Programme for International Student Assessment (PISA) and TALIS suggests that the most successful education systems are those in countries/economies where society values the teaching profession, whatever the causal nature of this relationship (Figure 4.2).

Figure 4.2

Relationship between the value of the teaching profession and the share of top mathematics performers

Relationship between lower secondary education teachers' view on the value of their profession in society and the share of top mathematics performers in PISA 2012



Source: Schleicher, A. (2015), *Schools for 21st-Century Learners: Strong Leaders, Confident Teachers, Innovative Approaches,* Figure 3.1, http://dx.doi.org/10.1787/9789264231191-en.

StatLink http://dx.doi.org/10.1787/888933199422

Put all of this together and it is no surprise that teacher stress and well-being have become a prominent issue in the policy and public debate. Given the pressure teachers face to perform at high levels and due to the potential lack of support they feel (real or perceived), teachers' well-being is an issue of concern. Job satisfaction surveys applied in different countries have shown that teachers' stress resulting from their professional activities is a phenomenon to be taken seriously. For instance, a recent study reported that 41% of teachers in Australia report a high level of stress, and 46% do so in the United States, while 81% of teachers in the United Kingdom report having experienced anxiety, depression and stress (Cross, 2014). When asked what their key concerns were, 84% of teachers in England (United Kingdom) identified workload as a major issue (NASUWT, 2017). This issue is also considered seriously by policy makers in the country (Box 4.1).

Box 4.1. The Workload Challenge: Understanding teacher workload in England (United Kingdom)

According to a 2017 Labour Force Survey of Work-related Stress, Anxiety and Depression Statistics in Great Britain, 53% of education professionals have considered leaving education over the past two years. Most say that their reasons include the volume of workload and seeking a better work–life balance. Launched in 2014, the Workload Challenge invited suggestions for tackling workload in the education sector. Three major issues were identified in the consultation: ineffective marking, use of planning and resources, and data management.

…

Three independent review groups were then set up to address these issues. Each group set out clear principles and made recommendations to be taken at every level in the school system. As part of the Workload Challenge, a commitment was made to undertake biennial Teacher Workload Surveys, with the first conducted in 2016 to provide additional information about how to reduce workload, for example by offering schools targeted support to help them remove unnecessary practice which does not improve pupils' life chances. Follow up research has also been undertaken as part of the ongoing work to act on emerging drivers and solutions. In addition, 11 projects received funding of up to GBP 30 000 to carry out collaborative research projects into efficient and effective approaches which remove unnecessary workload.

Source: HSE (Health and Safety Executive) (2017), *Work-related Stress, Depression or Anxiety Statistics in Great Britain 2017,* HSE, Merseyside, www.hse.gov.uk/statistics/causdis/stress/stress.pdf; www.gov.uk/government/publications/reducing-teachers-workload.

Stressful working environments may affect teachers' motivation, self-efficacy and job commitment, which can in turn affect the educational system as a whole. Indeed, the well-being of teachers can have direct implications on education providers through efficiency costs, since high levels of burn-out and stress can lead to frequent turnover and necessitate the training of new teaching professionals. In Sweden, one in four teachers report feeling stressed out at school and have seriously considered changing profession and/or workplace (Box 4.2). Likewise, the 2017 NASUWT Big Question survey in England (United Kingdom) revealed that 61% of teachers are thinking of quitting the profession altogether (NASUWT, 2017). Evidence from the United States is equally worrying. A recent study shows that teacher stress is linked to high turnover, which can result in lower achievement for students and higher costs for school districts (Robert Wood Johnson Foundation and Pennsylvania State University, 2016).

Box 4.2. National Gathering for the Teaching Profession: A bill to attract teachers in Sweden

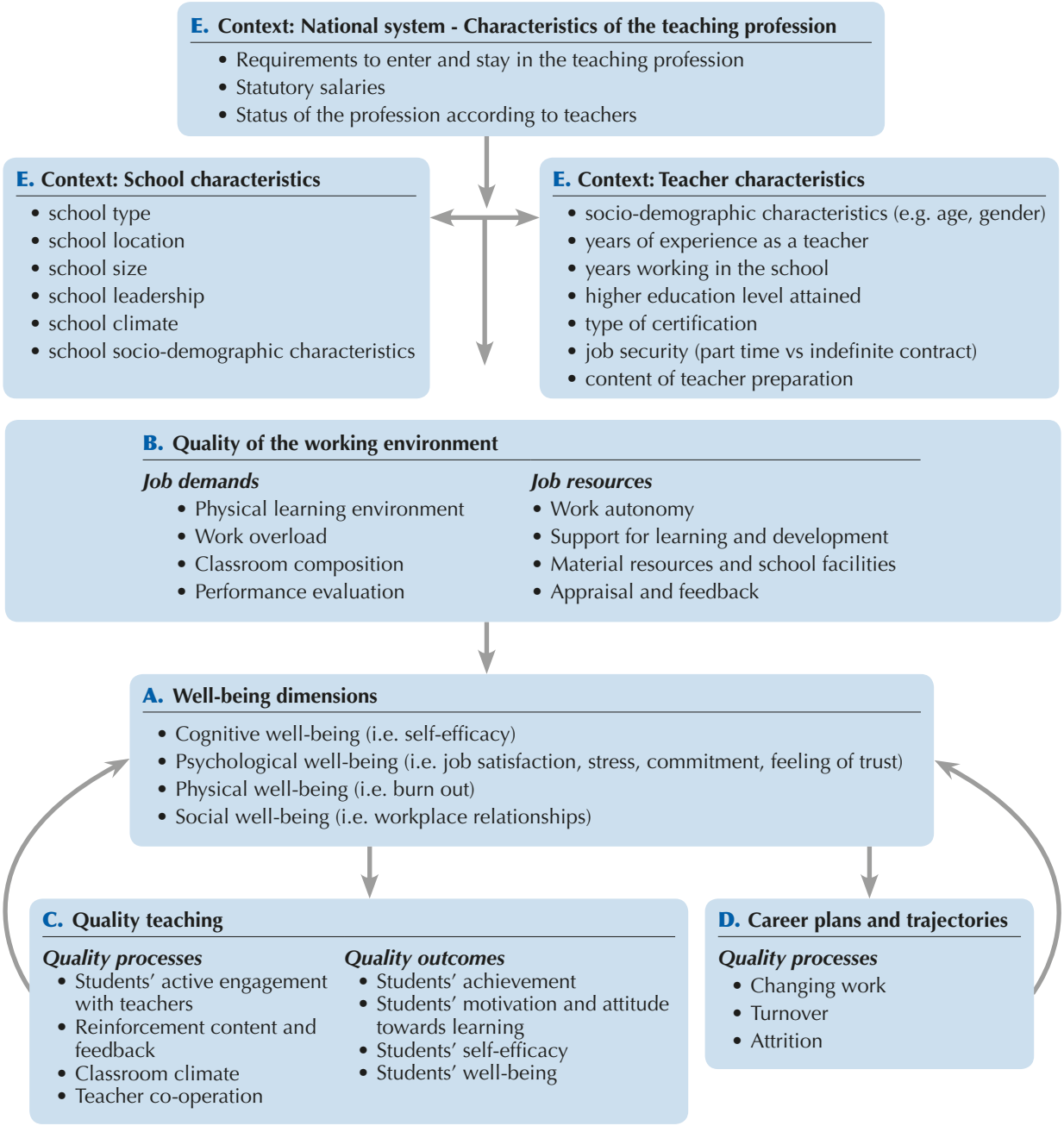
According to the Swedish National Agency for Education (Skolverket), 227 000 teachers must be trained and certified between 2017 and 2031 to meet recruitment needs. But only 145 000 teachers are expected to be certified, leading to a shortage of some 80 000 teachers in 2031. Moreover, according to an Attitudes' Survey conducted by the Swedish National Agency for Education every three years, one in four teachers in Sweden have seriously considered changing profession and/or workplace, and feel stressed at school, and one in five teachers have been subjected to violence or threats in their workplace during the last year. To address these issues, the government introduced the National Gathering for the Teaching Profession (Government Bill 2014/15:1), which proposed:

- a government programme to improve schools through a more attractive teaching profession, which provides suggestions on how to improve the working conditions of teachers and school leaders (e.g. removing administrative burdens)
- national certification for teachers
- government grants to improve career possibilities for teachers and to improve teachers' salaries
- alternative pathways to teaching, such as further training for people who work as teachers but do not have a teacher certificate, shortening initial teacher education and providing pedagogical training and financial support for people with a PhD in mathematics and science
- an information campaign called "Pass it on" to attract more people to the teaching profession and boost the status of the profession.

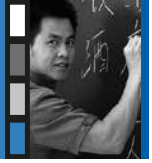
Sources: Skolverket (Swedish National Agency for Education) (2016a), *"Redovisning av uppdrag att ta fram återkommande prognoser över behovet av förskollärare och olika lärarkategorier"* [Reporting assignments to produce recurring forecasts about the need for preschool teachers and different teacher categories], Skolverket, Stockholm, www.skolverket.se/om-skolverket/publikationer/visa-enskild-publikation?_xurl_=http%3A%2F%2Fwww5.skolverket.se%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftrycksak%2FBlob%2Fpdf3876.pdf%3Fk%3D3876; Skolverket (2016b), *"Attityder till skolan 2015"* [Attitudes towards school 2015], Skolverket, Stockholm www.skolverket.se/om-skolverket/publikationer/visa-enskild-publikation?_xurl_=http%3A%2F%2Fwww5.skolverket.se%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftrycksak%2FBlob%2Fpdf3654.pdf%3Fk%3D3654; Ministry of Finance (2015), *"Budgetpropositionen för 2015"* [Budget bill for 2015], Ministry of Finance, Stockholm, www.regeringen.se/rattsdokument/proposition/2014/10/prop.-2014151/.

The quality of teachers' instruction and practice is also at risk, as stressed or burnt-out teachers can hardly operate effectively in the classroom. While evidence is more limited on this aspect, a small-scale study undertaken 2015 in the United States suggests that teacher stress and depression symptoms are linked to lower gains in student achievement in third-grade maths (McLean and Connor, 2015). Thus, in examining the quality of teaching, it is necessary to explore how the quality of teachers' working conditions can affect their performance. The OECD is currently developing a conceptualisation of those relationships as part of a new project on supporting teachers' professional learning and well-being for quality teaching (Figure 4.3).

Figure 4.3
Teachers' well-being and quality teaching



Note: Work in progress.
Source: Upcoming OECD project on Supporting Teachers' Professional Learning and Well-being for Quality Teaching.



Teacher well-being is connected in many different ways with educational processes and outcomes and is in itself a complex construct with multiple dimensions. It includes cognitive well-being, which refers to the set of skills and abilities teachers need to have to tackle their work effectively. This can be mirrored in teachers' self-efficacy (i.e. teachers' beliefs in their abilities to perform). Another aspect is psychological well-being, which relates to teachers' emotions regarding their work. A third aspect is physical well-being, which includes levels of health associated with teachers' working conditions. A key concept for health issues is burn-out, which can be understood as physical exhaustion of teachers caused by their job demands. Finally, social well-being is important, and the level of collaboration and support from colleagues has been shown to be associated with teachers' overall job satisfaction and the quality of their instruction.

HOW CONFIDENT ARE TEACHERS IN THEIR ABILITIES AS TEACHERS, AND HOW DOES THIS RELATE TO THEIR JOB SATISFACTION?

Given the importance of teacher well-being, it is surprising how limited the evidence-base on this remains. While TALIS 2018 will shed some light on issues of teacher stress, it will not be until 2021 that the OECD will be able to provide a comprehensive empirical foundation for how working conditions and teacher-related characteristics are related to teachers' well-being and how teachers' well-being may be associated with the quality of teaching and student outcomes.[1]

The importance of teacher self-efficacy

The part of teacher well-being that has been most extensively studied at the international level concerns teacher self-efficacy. According to Bandura's social cognitive theory, self-efficacy refers to individuals' beliefs about their capabilities to successfully accomplish a particular course of action. The remainder of this chapter focuses on this aspect.

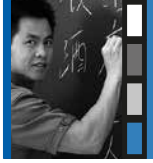
In education, research has shown that students' self-efficacy has an important influence on their academic achievement and behaviour. There is increasing evidence that teachers' sense of self-efficacy (efficacy in instruction, student engagement and classroom management) is also an important factor in influencing academic outcomes of students, and that it simultaneously enhances teachers' job satisfaction. Research shows that while teachers are generally satisfied with the aspects of their jobs that relate to their teaching work (such as work tasks and professional growth), they tend to be more dissatisfied with other aspects surrounding the performance of their job, such as working conditions, interpersonal relations and salary.

A number of studies have demonstrated positive associations between teachers' self-efficacy and higher levels of student achievement and motivation, as well as positive associations between teachers' self-efficacy and teachers' instructional practices, enthusiasm, commitment, job satisfaction and teaching behaviour (Skaalvik and Skaalvik, 2007; Tschannen-Moran and Woolfolk Hoy, 2001; Tschannen-Moran and Barr, 2004). Lower levels of teachers' self-efficacy, on the other hand, have been linked to teachers experiencing more difficulties with student misbehaviour, being more pessimistic about student learning and experiencing higher levels of job-related stress and lower levels of job satisfaction (Caprara et al., 2006; Klassen and Chiu, 2010; Collie, Shapka and Perry, 2012). Furthermore, teachers' self-efficacy appears to be a valid construct across countries differing in language and culture, and there is evidence that teachers' self-efficacy shows a similar positive relationship with teachers' job satisfaction across cultural settings (Klassen et al., 2009; OECD, 2009).

This positive relationship between teachers' self-efficacy and job satisfaction is particularly important because there is empirical evidence supporting the positive association between job satisfaction and job performance across a wide range of work settings (Judge et al., 2001). Job commitment has been found to have an important role in this relationship, as job satisfaction leads to enhanced commitment, which in turns leads to better job performance. Moreover, job satisfaction plays a key role in teachers' attitudes and efforts in their daily work with children. Exploring the relationship between teachers' self-efficacy and job satisfaction may therefore have implications for retention of teachers and their commitment to the school, job performance and, by extension, the academic achievement of students.

The TALIS 2013 survey measured three aspects of teacher self-efficacy and related aspects of job satisfaction (Box 4.3).

The individual items that make up the indices discussed in Box 4.3 are interesting in and of themselves. Table 4.1 shows that, in the majority of the countries and economies that participated in TALIS, most teachers reported holding beliefs that suggest high levels of self-efficacy. On average across countries, between 80% and 92% of teachers reported that they can often get students to believe they can do well in school, help students value learning, craft good questions for students, control disruptive behaviour in the classroom, make clear their expectations for student behaviour, help students think critically, get students to follow classroom rules, calm a student who is disruptive, use a variety of assessment strategies, and provide alternative explanations when students are confused.[2] In comparison, motivating students who show low interest in school work (70%) and implementing alternative instructional strategies (77%) both seem relatively more difficult for teachers across the countries/economies participating in TALIS to achieve.



Box 4.3. Teacher self-efficacy and job satisfaction indices

TALIS measures three aspects of teacher self-efficacy (classroom management, instruction and student engagement) and two aspects of teachers' job satisfaction (satisfaction with the profession and satisfaction with the current work environment).

To measure efficacy, teachers were asked "In your teaching, to what extent can you do the following? Not at all/To some extent/Quite a bit/A lot". Scales were then constructed by grouping questions as follows:

Efficacy in classroom management

- Control disruptive behaviour in the classroom.
- Make their expectations about student behaviour clear.
- Get students to follow classroom rules.
- Calm a student who is disruptive or noisy.

Efficacy in instruction

- Craft good questions for my students.
- Use a variety of assessment strategies.
- Provide an alternative explanation, for example, when students are confused.
- Implement alternative instructional strategies in my classroom.

Efficacy in student engagement

- Get students to believe they can do well in school work.
- Help their students value learning.
- Motivate students who show low interest in school work.
- Help students think critically.

To measure satisfaction, teachers were asked: "How strongly do you agree or disagree with the following statements? Strongly disagree/Disagree/Agree/Strongly agree". Scales were then constructed by grouping questions as follows:

Satisfaction with current work environment

- I would like to change to another school if that were possible.
- I enjoy working at this school.
- I would recommend my school as a good place to work.
- All in all, I am satisfied with my job.

Satisfaction with profession

- The advantages of being a teacher clearly outweigh the disadvantages.
- If I could decide again, I would still choose to work as a teacher.
- I regret that I decided to become a teacher.
- I wonder whether it would have been better to choose another profession.

Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, http://dx.doi.org/10.1787/9789264196261-en.

Yet in some countries, teachers seem to believe significantly and consistently less in their abilities in these domains, compared to the TALIS average. Notably, teachers in Japan reported lower levels of confidence in their ability across domains than the TALIS average. The averages range from a low of only 16% of teachers in Japan who believe that they can often help students to think critically to a high of 54% who think that they can provide alternative explanations when students are confused. Teachers in the Czech Republic also reported less confidence in their abilities in some areas. For example, only 30% of teachers in the Czech Republic believe that they can motivate students who show low interest in school work, while 39% think that they can help students value learning. The patterns are less consistent among teachers in Croatia, Norway and Spain, but in each of these countries, 53% of teachers or less responded positively to one or more of the statements used to measure self-efficacy.

Table 4.1

Teachers' self-efficacy

Percentage of lower secondary education teachers who feel they can do the following "quite a bit" or "a lot"

	Get students to believe they can do well in school work	Help my students value learning	Craft good questions for my students	Control disruptive behaviour in the classroom	Motivate students who show low interest in school work	Make my expectations about student behaviour clear	Help students think critically	Get students to follow classroom rules	Calm a student who is disruptive or noisy	Use a variety of assessment strategies	Provide an alternative explanation for an example when students are confused	Implement alternative instructional strategies in my classroom
	%	%	%	%	%	%	%	%	%	%	%	%
Australia	86.9	81.3	86.0	86.7	65.8	93.4	78.4	89.4	83.6	86.3	94.0	82.7
Brazil	96.5	94.8	97.5	89.7	87.6	96.8	95.1	91.7	90.2	91.3	97.7	87.9
Bulgaria	91.7	94.9	82.3	86.4	67.8	97.1	82.5	96.1	87.9	87.8	95.9	69.6
Chile	90.6	91.0	91.3	90.7	82.9	93.3	90.2	92.8	89.2	89.3	95.3	88.9
Croatia	68.6	52.1	90.3	83.0	50.7	93.6	77.9	83.1	81.2	84.6	96.4	92.3
Czech Republic	50.5	39.0	70.9	77.1	30.0	71.9	51.8	76.4	77.1	72.0	85.2	52.2
Denmark	99.0	96.6	96.3	96.3	82.5	98.8	92.8	94.9	94.3	79.5	98.0	86.6
Estonia	81.3	86.0	74.4	76.7	75.0	86.9	74.8	83.5	73.9	72.3	78.6	59.8
Finland	83.9	77.3	90.1	86.3	60.4	92.7	72.8	86.6	77.1	64.2	76.9	68.2
France	95.2	87.1	93.8	94.6	76.6	97.7	88.7	98.2	94.9	88.3	98.5	82.2
Georgia	84.8	86.0	88.6	82.4	66.6	90.5	86.3	90.9	84.0	86.4	85.8	83.7
Iceland	88.6	82.5	96.1	89.9	72.1	91.2	74.6	92.1	88.2	85.7	91.8	77.4
Israel	92.1	85.4	89.8	85.0	74.9	94.1	77.6	86.6	81.0	75.0	92.5	77.8
Italy	98.0	95.6	93.8	93.5	87.3	93.4	94.9	96.7	89.7	90.9	98.3	91.3
Japan	17.6	26.0	42.8	52.7	21.9	53.0	15.6	48.8	49.9	26.7	54.2	43.6
Korea	78.7	78.3	77.4	76.3	59.9	70.5	63.6	80.5	73.1	66.6	81.4	62.5
Latvia	91.0	78.6	93.5	85.2	64.8	94.3	83.0	92.0	81.2	90.1	91.4	62.1
Malaysia	95.9	98.0	95.8	96.3	95.2	92.2	91.9	98.0	96.8	88.6	95.8	89.5
Mexico	87.8	91.0	85.2	86.0	79.1	87.4	88.8	85.0	78.0	83.9	93.7	87.5
Netherlands	90.0	70.2	88.2	89.2	62.5	95.3	77.8	90.6	86.7	66.7	93.0	62.2
New Zealand	90.5	86.1	85.1	86.9	70.2	94.3	83.4	90.3	85.2	81.3	96.0	82.3
Norway	79.9	60.9	79.0	83.8	38.8	89.7	66.6	85.6	84.3	73.4	87.8	66.0
Poland	80.7	67.7	79.4	88.3	59.8	94.6	77.5	91.3	87.2	86.7	87.4	66.0
Portugal	98.9	99.0	98.2	96.1	93.8	96.9	97.5	97.5	95.2	98.3	99.2	95.9
Romania	97.9	95.1	98.9	97.8	88.7	98.5	93.4	97.7	97.7	98.0	99.4	93.2
Russian Federation	97.4	93.7	95.2	92.4	90.1	94.1	90.6	96.6	95.3	96.7	97.3	92.2
Serbia	84.9	76.1	90.0	86.1	63.4	91.9	84.3	91.1	85.6	86.3	95.3	74.1
Singapore	83.9	81.5	81.2	79.5	72.1	89.0	74.9	83.5	75.3	71.6	88.5	72.8
Slovak Republic	92.5	88.5	94.5	91.1	84.9	96.9	90.2	95.3	92.2	92.0	95.1	80.6
Spain	71.1	74.1	86.3	81.5	53.4	90.1	78.9	83.8	73.7	87.0	96.5	83.2
Sweden	93.9	76.6	82.0	84.9	64.1	90.6	75.1	86.5	82.7	81.4	95.1	71.7
Sub-national entities												
Abu Dhabi (UAE)	96.3	95.4	94.8	94.4	94.9	96.7	93.1	96.5	93.4	93.2	96.6	95.1
Alberta (Canada)	87.0	79.2	84.1	86.9	60.6	95.4	82.2	91.1	84.7	86.1	94.3	84.0
England (UK)	93.0	87.0	89.8	88.7	75.7	95.6	81.4	93.3	86.3	90.2	96.7	84.6
Flanders (Belgium)	93.1	81.6	95.1	96.4	77.7	97.2	87.4	96.6	95.4	80.7	97.7	73.2
Shanghai (China)	80.6	79.3	87.2	89.6	79.6	92.4	79.6	93.0	92.1	80.8	91.6	89.2
Average	**86.4**	**83.7**	**88.1**	**87.0**	**74.8**	**90.6**	**82.4**	**89.3**	**85.7**	**84.6**	**92.8**	**82.0**
United States	83.7	74.9	88.0	86.2	61.9	94.9	83.0	89.3	81.6	82.6	92.9	82.5

Notes: The data from the United States are located below the line and are not included in the calculations for the international average. This is because the United States did not meet the international standards for participation rates.

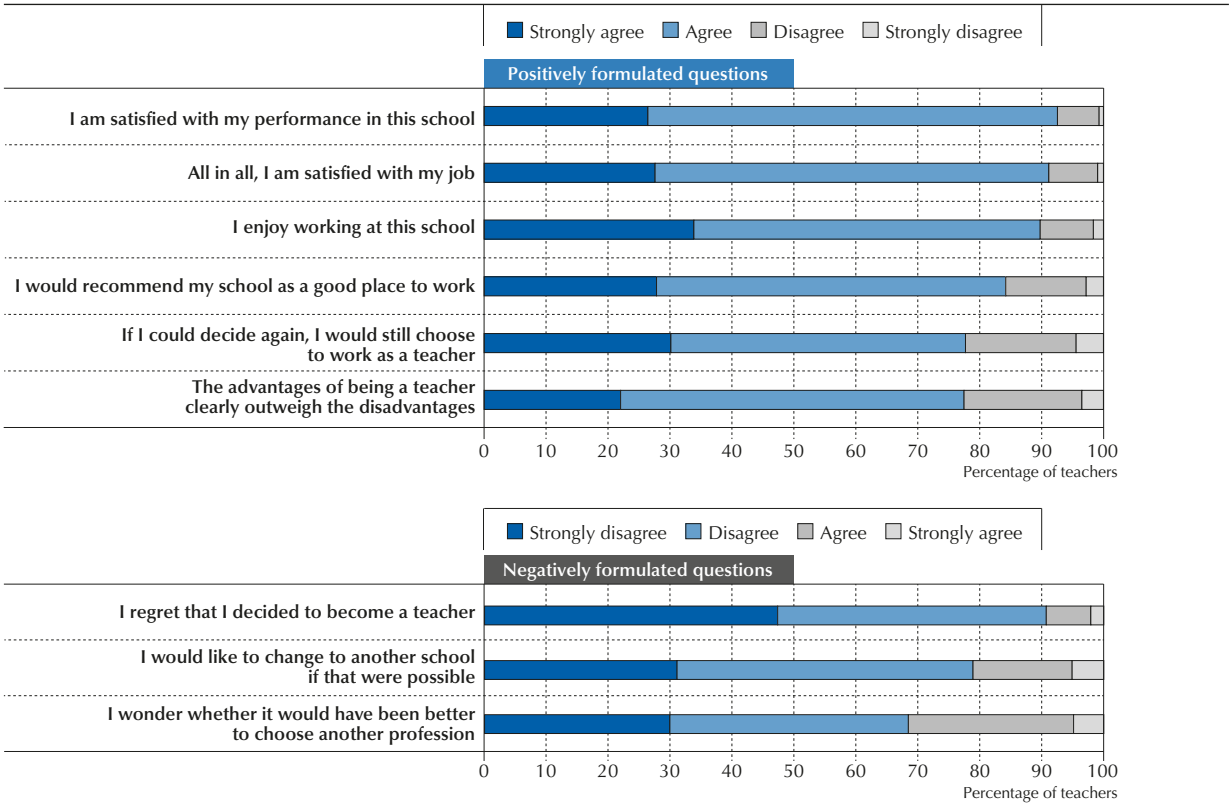
Source: Based on OECD (2014), *TALIS 2013 Result: An International Perspective on Teaching and Learning*, Table 7.1, http://dx.doi.org/10.1787/9789264196261-en.

StatLink http://dx.doi.org/10.1787/888933047463

Figure 4.4

Teachers' job satisfaction

Percentage of lower secondary education teachers who "strongly disagree", "disagree", "agree" or "strongly agree" with the following statements



Items are ranked in descending order, based on the percentage of teachers who "strongly agree" or "agree" with the statement for positively formulated questions. For negatively formulated questions the order is reversed, meaning it is in descending order based on the percentage of teachers who "strongly disagree" or "disagree" with the statement.

Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.2, http://dx.doi.org/10.1787/9789264196261-en.

StatLink http://dx.doi.org/10.1787/888933042200

The extent to which teachers across countries hold beliefs that are related to job satisfaction is shown in Figure 4.4. On average, 91% of teachers across countries reported overall satisfaction with their job; 93% of all teachers reported being satisfied with their performance in their current school; 84% would recommend their school as a good place to work; and 90% reported that they enjoy working at their current school. However, consistent with the findings for elements measuring self-efficacy, only 50% of teachers in Japan reported being satisfied with their performance in their current school, and 62% would recommend their school as a good place to work. Nevertheless, 78% of teachers in Japan reported that they enjoy working in their current school. While an average of around 77% of teachers in all countries/economies that participated in TALIS reported that the advantages of being a teacher clearly outweigh the disadvantages, in Brazil, the Czech Republic, France and the Slovak Republic, only 60% of teachers or less reported that they believe this.

Yet these results did not dissuade teachers in these four countries from reporting that they would choose to become a teacher if they had to make the decision again. Some 70% of teachers or more in these countries reported that if they had to decide again, they would still choose to work as a teacher (the TALIS average is 78%).

As noted above, fewer than one in three teachers, on average across countries/economies, believe that teaching is a valued profession in society (Figure 4.1). This is a significant finding on its own, since even the perception of whether a profession is valued can affect the recruitment and retention of candidates in the profession. However, large variations are observed among the countries and economies participating in TALIS. This perception is particularly pervasive among teachers in Croatia, France, the Slovak Republic, Spain and Sweden, where less than 10% of teachers believe

that teaching is valued. In Korea, Malaysia, Singapore and Abu Dhabi (United Arab Emirates), however, the majority of teachers feel differently: at least two out of three teachers in these countries/economies reported that their society values teaching as a profession.

Additional analyses shed more light on the factors that might influence teachers' perceptions in this area.[3] The association with gender appears to be weak, as male teachers are more likely than female teachers to perceive teaching as a valued profession in only nine countries. Experience may play a role in shaping this belief: in 13 countries, teachers with more than five years of teaching experience perceive their profession to be less valued than do their less-experienced colleagues (OECD, 2014, Table 7.3).

Interestingly, in 28 of the countries and economies that participated in TALIS, the extent to which teachers can participate in decision-making has a strong association with the likelihood of teachers reporting that they believe teaching is valued by society. In Bulgaria, Croatia and Latvia, when teachers are part of decision-making processes in their school, they were three times more likely to report that teaching is a valued profession in society, while teachers in Chile were more than five times more likely to do so.

Many countries have enacted policies to increase the prestige of the teaching profession in order to avoid the deleterious effects of negative perceptions about teaching. Countries may want to conduct further analyses to look at the origins of these negative perceptions, to identify what it is specifically about the teaching profession that engenders them.

Teachers' self-efficacy and job satisfaction as related to classroom environment

Certain classroom characteristics can make a teacher's work more challenging. Teaching classes in which a large proportion of students have different achievement levels, special needs or behavioural problems can affect a teacher's self-efficacy and job satisfaction, especially if the teacher is not properly prepared or supported (Major, 2012). Most of the empirical evidence in this area comes from studies focused on teachers of students with special needs. TALIS finds that teaching special-needs students is one of the areas in which teachers reported that they need professional development the most. Other studies have shown that teachers of special-needs students tend to report less job satisfaction and poor self-efficacy and have a greater chance of leaving their schools than do their colleagues who teach classes without such students. This is especially the case if they teach students with behavioural and emotional problems (Emery and Vandenberg, 2010; Katsiyannis, Zhang and Conroy, 2003). In addition, many of those who teach emotionally challenged children must also handle some degree of stress due to a lack of the specific skills and/or experience needed to teach children with these problems (Henderson et al., 2005).

This section investigates the associations between both teacher self-efficacy and job satisfaction, and class size and challenging classroom characteristics. Classrooms are considered to be challenging if more than 10% of students in the class are low achievers or more than 10% of students have behavioural problems.[4] Classrooms in which 10% or more of the students are academically gifted are also included in this category, as teaching to a wide range of student abilities in one class can also be a challenge (Major, 2012).

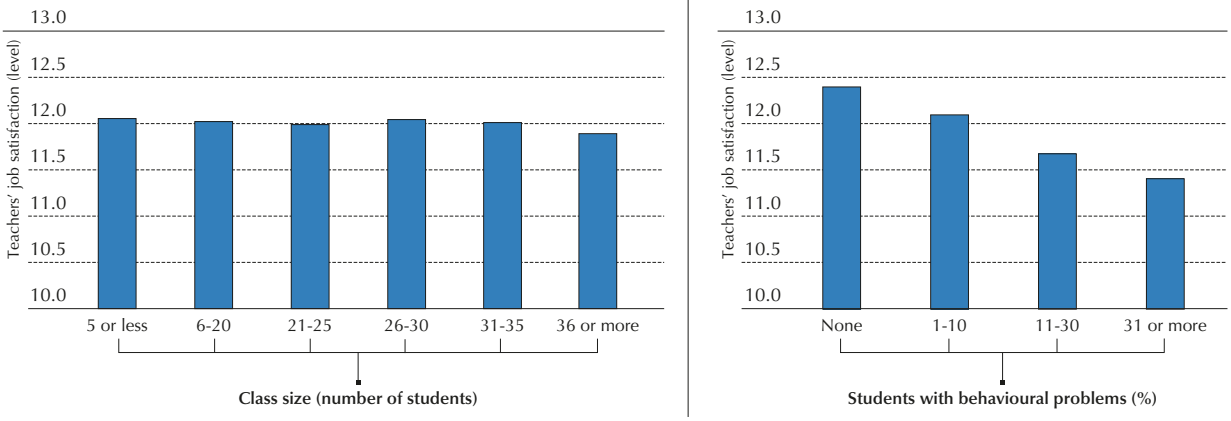
Perhaps surprisingly, class size seems to have only a minimal effect on either teaching efficacy or job satisfaction, and in just a few countries (OECD, 2014, Tables 7.6 and 7.7). Other TALIS data indicate that it is not the number of students in a class but the type of students that has the largest association with the teacher's self-efficacy and job satisfaction. An example of this is provided in Figure 4.5, where the minimal effect of class size on teachers' job satisfaction is contrasted with the stronger influence of teaching students with behavioural problems.

The associations between challenging classroom characteristics and teachers' self-efficacy and job satisfaction tell an interesting story across the countries and economies that participated in TALIS. In many countries/economies, teachers who teach classes where more than one in ten students are low achievers or have behavioural problems reported significantly lower self-efficacy and less job satisfaction (OECD, 2014, Tables 7.6 and 7.7). The negative association between teaching more low achievers and self-efficacy is observed in only 9 countries, but the negative association between teaching these types of students and job satisfaction is observed in 24 countries. Teaching classes composed of more students with behavioural problems is associated with lower self-efficacy in 16 countries and with less job satisfaction in 29 countries. These associations with self-efficacy are at least moderately strong in 7 countries, while the associations with job satisfaction are at least moderately strong in 24 countries (OECD, 2014, Tables 7.6.Web and 7.7.Web). In contrast, teaching in classrooms where more than one in ten students are academically gifted is related to greater teacher self-efficacy in 17 countries and greater job satisfaction in 23 countries.

Figure 4.5

Teachers' job satisfaction and class composition

Teachers' job satisfaction level in lower secondary education according to the number of students in the classroom and according to the percentage of students with behavioural problems[1]



1. Data on class size and students with behavioural problems are reported by teachers and refer to a randomly chosen class they currently teach from their weekly timetable.

Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.6, http://dx.doi.org/10.1787/9789264196261-en.

StatLink http://dx.doi.org/10.1787/888933042276

Teachers' self-efficacy and their relations with colleagues and students

Teachers' perceptions of school climate, the collaborative culture in school, and school leadership greatly affect their levels of stress, self-efficacy and job satisfaction (Collie, Shapka and Perry, 2012; Demir, 2008). For example, stress due to students' behaviour has been found to be negatively related to teachers' self-efficacy, and stress related to workload and teachers' self-efficacy appears to be directly related to teachers' job satisfaction (Collie, Shapka and Perry, 2012; Klassen and Chiu, 2010; Taylor and Tashakkori, 1994). These relationships are further reinforced by instructional leadership and by distributed leadership, which also serve to reduce teachers' sense of isolation and increase their commitment to the common good (Wahlstrom and Louis, 2008; Pounder, 1999).

Yet, even more important than principal leadership styles are the relationships teachers have with other teachers (in the TALIS questionnaire, this is measured by different ways of co-operating), their school leaders and their students (Louis, 2006). Next to teachers' sense of self-efficacy in their ability to manage their class, having good relations with their colleagues and students seems to be the most crucial factor affecting teachers' job satisfaction and self-efficacy (Holzberger, Philipp and Kunter, 2013; Caprara et al., 2006; Klassen and Chiu, 2010).

In this section, teacher-leader relations are examined separately from teacher-teacher and teacher-student relations. Two aspects of the teacher-leader relationship are studied: the extent to which teachers are given opportunities to participate in decision-making in their schools and the instructional leadership that school principals provide. The impact that these relationships can have on the associations between challenging classrooms and self-efficacy and job satisfaction is also discussed (OECD, 2014, Tables 7.6 and 7.7).

In all countries, when teachers reported more positive relationships with students and collaborative relationships with other teachers, they also reported significantly higher levels of self-efficacy (OECD, 2014, Table 7.8). The association appears to be stronger for teacher-teacher relations than for teacher-student relations in many countries.

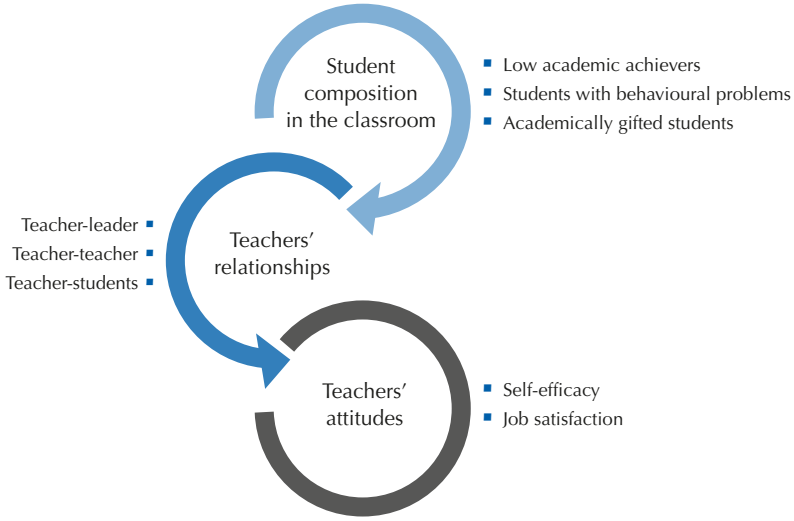
Teacher-teacher collaborative relationships are also weakly-to-moderately associated with greater job satisfaction (OECD, 2014, Table 7.9), while teacher-student relations are strongly related to greater job satisfaction. In fact, in many cases, the teacher-student association is two to three times more strongly related to job satisfaction than the teacher-teacher relationship. In general, then, teachers' positive relationships with other teachers in the school seem to be particularly important for improving teachers' feelings of self-efficacy, while teachers' positive relationships with their students appear to have the greatest impact on their satisfaction with their job.

In 20 countries, teachers who agreed that the staff members at their school are given opportunities to participate in decision-making reported greater self-efficacy (OECD, 2014, Table 7.8). An even more consistent and stronger relationship is observed between decision-making at school and teachers' job satisfaction. The ability to participate in decision-making at school is significantly related to a strong increase in teachers' job satisfaction across all countries (OECD, 2014, Table 7.9). Surprisingly, in contrast to the literature reviewed in this section, instructional leadership, as measured in TALIS, appears to be weakly associated with teachers' self-efficacy and job satisfaction.

Good relations between teachers and their colleagues and between teachers and their students can mitigate the negative effects of challenging classrooms on teachers' self-efficacy and job satisfaction (OECD, 2014, Tables 7.6 and 7.7). Figure 4.6 illustrates the relationships that are discussed below.

Figure 4.6

The influence of class composition on teachers' attitudes and relationships



Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.7, http://dx.doi.org/10.1787/9789264196261-en.

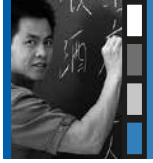
The finding that teachers who work in classrooms where at least 10% of students are low achievers tended to report lower self-efficacy and less job satisfaction still holds after accounting for these in-school relationships. But in many countries, the association is weakened (OECD, 2014, Tables 7.8.Web.1 and 7.9.Web.1 for teacher-student and teacher-teacher relationships, and OECD, 2014, Tables 7.8.Web.2 and 7.9.Web.2 for teacher-leader relationships [columns highlighted in light blue]).

When it comes to job satisfaction, the strength of the association is reduced in nearly all countries. In these cases, the relationships teachers have with their principal, their colleagues and their students can help to mitigate the adverse effects on self-efficacy and job satisfaction associated with working in classrooms with larger proportions of low-achieving students.

In general, teachers' in-school relationships do not seem to affect the strength of the associations between teaching classes with a large proportion of students with behavioural problems and teachers' self-efficacy. But in nearly all countries where teaching classes with a large proportion of students who misbehave was significantly associated with less job satisfaction, positive in-school relationships seem to reduce the strength of this association (OECD, 2014, Tables 7.8.Web.1, 7.8.Web.2, 7.9.Web.1 and 7.9.Web.2).

Teachers' self-efficacy and their professional development

In summarising research on effective teacher professional development, Darling-Hammond and Richardson (2009) contend that successful programmes are sustained over time, are collaborative and focused on the content to be taught, and provide multiple opportunities for classroom application. Since teachers' beliefs, such as self-efficacy, are an important factor in facilitating student learning, they have recently become the target of professional development activities. Studies have shown that professional development activities that are focused on the three components of teachers' self-efficacy,



classroom management, instruction and student engagement, strengthen teachers' beliefs in those areas as well as teachers' beliefs about student learning (Rosenfeld and Rosenfeld, 2008; Ross and Bruce, 2007; Powell-Moman and Brown-Schild, 2011; Karimi, 2011).

Studies remain equivocal as to whether the duration of the professional development programme or teachers' years of work experience contribute to any impact that a professional development programme might have on teachers' self-efficacy and students' achievement (Lumpe et al., 2012; Wayne et al., 2008; Powell-Moman and Brown-Schild, 2011; Rosenfeld and Rosenfeld, 2008). When mentoring is considered, however, it seems that, especially for new teachers, time spent with a mentor, participation in mentor-facilitated professional development activities and the quality of mentors' interactions are significantly related to teachers' self-efficacy and to the development of effective collaborative relationships (LoCasale-Crouch et al., 2012).

There are several types of professional development activities. Formally organised professional development activities could include induction programmes, mentoring programmes, classroom observations, workshops and conferences. More informally organised activities could also include a mentoring relationship in which a teacher can be either the mentor or the mentee in the relationship (Boxes 4.4 and 4.5). This section examines the relationship between teachers' participation in different types and aspects of professional development, and their self-efficacy and job satisfaction.

Box 4.4. Teacher Professional Development Law: Linking teacher well-being with teacher professionalism in Chile

In 2014, *Plan Maestro* was developed by civil society (teachers' unions, parents, students, research institutes and NGOs) to inform the development of the Teacher Professional Development Law (2016). The issues addressed in the 12 proposals of *Plan Maestro* included: better working conditions and remuneration for teachers, especially in disadvantaged areas; more professional development opportunities; and quality initial teacher education. The new law raised the requirements for entry into initial teacher education (ITE), introduced quality assurance mechanisms into ITE programmes (compulsory accreditation and a diagnostic external exam one year prior to graduation), and established induction programmes for new teachers, specific preparation for mentors and free professional development opportunities. The new law also brought teachers' salaries in line with similar professions, introduced salary increments every two years and improved the ratio of teaching/non-teaching time. It also introduced performance assessments based on content and pedagogical knowledge and portfolios, with evidence of school work, collaboration with colleagues and parents, innovative work and professional development.

Source: MINEDUC (Ministry of Education of Chile) (2017), "*Sistema de desarrollo profesional docente*" [Teacher Professional Development System], MINEDUC, Santiago, www.ayudamineduc.cl/ficha/sistema-de-desarrollo-profesional-docente.

Box 4.5. Teacher development in Finland

In Finland, professional development for teachers is seen as a comprehensive process which begins with initial teacher education. Teacher education has been available in universities since 1971, and a master's degree is a requirement, including a master's thesis. With this kind of research-based initial teacher education teacher, teachers become reflective professionals who actively develop their own work and professional skills and methods.

Finland does not have a nationally organised induction system. Education providers and individual schools have autonomy over arranging support for new teachers, which leads to notable differences between schools in how they implement induction. However, there is awareness of the increasing need for support for new teachers, and many different applications of mentoring practices are already in place. A specific model of peer-group mentoring has been developed and is being disseminated by the Finnish Network for Teacher Induction (*Osaava Verme*), which is part of a seven-year national Osaava programme (2010-16), funded by the Ministry of Education and Culture. The objective of the programme is to motivate education providers and individual institutions to take greater responsibility and a proactive approach to their own staff development activities with the help of networking activities and mutual co-operation.

Source: Ministry of Education and Culture of Finland (2014).

In around one of four countries, teachers who reported that they have participated in mentoring activities also reported greater job satisfaction. In seven countries, teachers who reported that they were mentees reported greater job satisfaction, while in eight countries, being a mentor was related to greater job satisfaction (OECD, 2014, Table 7.11). The strength of the association between being a mentor and greater job satisfaction is moderate in six of these countries and strong in Sweden.

In 14 countries/economies, participating in mentoring, observation or coaching programmes as part of a formal school arrangement is positively associated with self-efficacy. In seven countries, there is only a weak, albeit positive, relationship between this form of professional development and job satisfaction.

These findings suggest that being either a mentor or a mentee is associated with an improvement in teachers' job satisfaction, while these activities do not show a consistent association with teachers' self-efficacy across countries. Professional development activities that are part of a formal school arrangement are positively related to job satisfaction in only a few countries, although they relate positively to teachers' self-efficacy in twice as many countries.[5]

Teachers' self-efficacy and the appraisal and feedback they receive

Teacher appraisal and feedback can be used to recognise and celebrate teachers' strengths while simultaneously challenging teachers to address weaknesses in their pedagogical practices. Appraisal and feedback can have a significant impact on classroom instruction, teacher motivation and attitudes, as well as on student outcomes. Specifically, appraisal and feedback can play an important role in teachers' job satisfaction and self-efficacy. Although no research has directly investigated this yet, the impact of feedback and appraisal is expected to vary greatly, depending on the source. For example, while teachers say they derive little value from student ratings, teacher-solicited feedback is generally regarded as the most useful for improving teaching practices (Wininger and Birkholz, 2013; Ross and Bruce, 2007; Michaelowa, 2002).

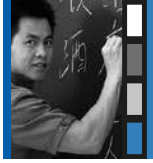
There are many methods and approaches that can be used to appraise and provide feedback to teachers. It is important to look at the types of feedback teachers receive, such as results from student surveys or students' test scores, or feedback on classroom management and whether the feedback comes from more than one appraiser. Teachers' perceptions of the impact of the appraisal are also relevant. For example, do teachers regard appraisals as having a concrete impact on their teaching or as simply an administrative exercise (Boxes 4.6 and 4.7).

Box 4.6. The power of an authentic observation with specific recommendations

For Souad Belcaid, an elementary teacher in United States, the feedback that has had the greatest impact on her teaching was that received from the head of her school, who was also her supervisor at the time. According to Ms Belcaid, the method of evaluation her supervisor used was particularly beneficial. Her supervisor would observe her class three times a year and take copious and detailed notes. After the observation, her supervisor would go over the notes with Ms Belcaid to explain her each observation and why it mattered. She would pinpoint Ms Belcaid's areas of strength and mention some areas for improvement. Such an approach was extremely helpful. However, in order for this type of detailed feedback to have real meaning, there needs to be a strong level of trust between the teacher and the evaluator. Ms Belcaid noted that while this type of formative feedback helped her become a more powerful and effective teacher, her evaluator's method was unfortunately quite rare. Once her school's administration changed, feedback was reduced to being a checklist that was used in a punitive rather than helpful way.

Source: OECD (2018), *Teaching for the Future*.

In 13 of the countries/economies that participated in TALIS, teachers who reported having at least two evaluators also reported greater self-efficacy (OECD, 2014, Table 7.12). In 23 countries, teachers who reported having at least two evaluators also reported greater job satisfaction (OECD, 2014, Table 7.13). The association is weak-to-moderate in most cases. Receiving feedback from student surveys is associated with greater self-efficacy in almost all countries and economies participating in TALIS, and with job satisfaction in 20 countries. These findings could be interpreted in two ways. Teachers might receive feedback from student surveys that helps them to feel more confident in their abilities and more satisfied with their jobs. Alternatively, it might be that the teachers who are more confident and content with their roles are those who conduct student surveys in the first place.



Box 4.7. The use of teacher and student feedback in Norway

Following several years of collaboration, the Norwegian Student Organisation and the Union of Education Norway have developed a number of recommendations for teacher appraisal. The purpose of their collaboration was to develop a set of agreed principles that can form the basis for a student survey on teaching in particular classes, with the possibility of adapting it locally. Their recommendations suggest that the survey should:

- focus on teaching practice rather than the teacher as an individual
- include the students' own self-assessment and assessment of peers to enable analysis of how student effort and motivation influence the learning environment;
- feature questions on teaching approaches that are relevant for student learning (such as adapted education and feedback to students) as well as questions on the general framework for teaching (such as materials and physical conditions)
- be carried out anonymously to ensure that students give honest answers
- be analysed by the teacher and students together with a view to improving the classroom environment and learning outcomes.

This should be followed up with a joint report by the teacher and student group on their analysis of results and agreed future changes. This report, together with relevant data, should be submitted to the teachers' closest supervisor.

Source: Norwegian Directorate for Education and Training (2011), cited in Nusche, D. et al. (2011), *OECD Reviews of Evaluation and Assessment in Education: Norway 2011*, http://dx.doi.org/10.1787/9789264117006-en.

In 24 countries, teachers who receive feedback from student test scores reported greater self-efficacy (OECD, 2014, Table 7.12). This type of feedback is also related to greater job satisfaction in 17 participating countries/economies (OECD, 2014, Table 7.13). Receiving feedback on classroom management is positively related to self-efficacy in 17 participating countries. In 23 countries, teachers who receive feedback on classroom management also reported greater job satisfaction, and the association is strong in half of these countries.

In ten participating countries and economies, teachers who reported that feedback affects their teaching also reported greater self-efficacy (OECD, 2014, Table 7.12). The perception that appraisal and feedback influence teaching practices is also positively related to job satisfaction in nearly all countries and economies surveyed (OECD, 2014, Table 7.13). In contrast, in 14 countries/economies, when teachers regarded their appraisal and feedback as only an administrative exercise, they tended to report lower self-efficacy; in all participating countries/economies, teachers who regarded appraisal and feedback in this way reported less job satisfaction. This negative association with job satisfaction is strong in most countries; only in Brazil is it weak.

Teachers' self-efficacy and their beliefs and practices

To equip students with the skills and competencies needed in the 21st century, teachers around the world are being encouraged to use a variety of teaching practices, ranging from more traditional practices (such as direct transmission of information) to more recently conceived, constructivist practices. The latter forms of teaching and learning help to develop students' skills to manage complex situations and learn both independently and continuously. It has also been argued that these practices enhance students' motivation and achievement (Nie and Lau, 2010; Guthrie, Wigfield and VonSecker, 2000; Hacker and Tenent, 2002; Nie et al., 2013). Research advocating constructivist approaches also suggests that teachers' self-efficacy is greater among those teachers who use constructivist instruction techniques than among those who use reception or direct transmission instruction techniques (Luke et al., 2005; Nie et al., 2013). Using TALIS 2008 data, Vieluf et al. (2012) reported that the impact of direct transmission versus constructivist approaches depends on different factors, such as the subjects taught and classroom variables. In fact, it was not the use of one kind of practice rather than another per se, but the variety of practices employed that was found to be related to greater teacher self-efficacy, among other things.

TALIS data indicate that, in most countries, constructivist beliefs are positively related to greater self-efficacy and job satisfaction among teachers (OECD, 2014, Tables 7.14 and 7.15). Teachers who reported more highly constructivist beliefs also reported greater self-efficacy and slightly more job satisfaction.

The number of hours spent teaching in a typical work week is more strongly associated with teachers' self-efficacy than with job satisfaction, although in opposite ways. All of these associations are weak (OECD, 2014, Tables 7.14.Web.2 and 7.15.Web.2).

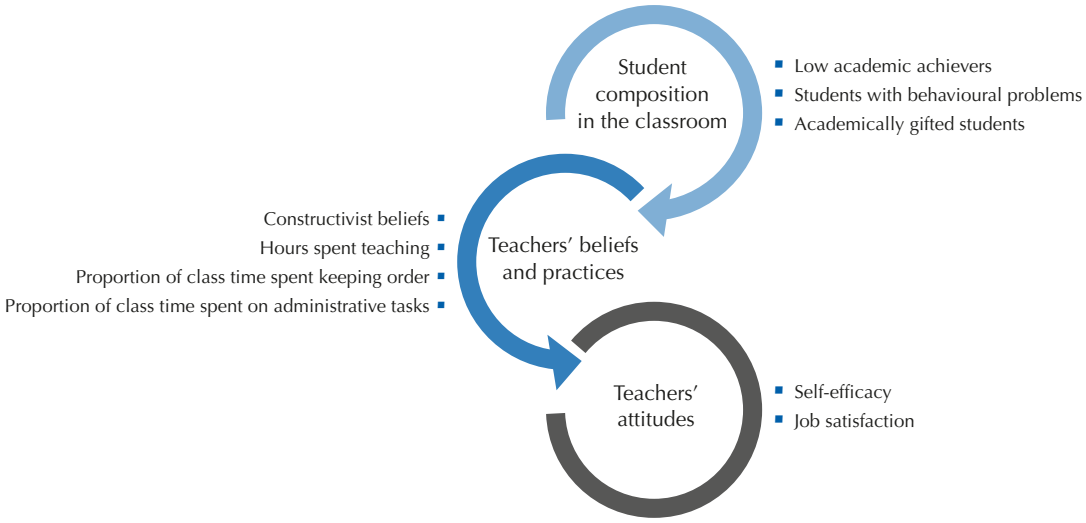
In almost all countries/economies, the more time teachers spend on keeping order in the classroom, the less self-efficacy and less job satisfaction they reported. Meanwhile, the proportion of time spent on administrative tasks in the classroom seems to be weakly and negatively associated with job satisfaction in about half of the countries surveyed, while it relates negatively to self-efficacy in 12 countries (OECD, 2014, Tables 7.14.Web.4 and 7.15.Web.4).

How teachers' beliefs and practices mediate the impact of classroom composition on their sense of self-efficacy and job satisfaction

The proportion of time spent keeping order in the classroom plays the most crucial role in the relationships between classroom composition and teachers' self-efficacy and job satisfaction (OECD, 2014, Table 7.14.Web.3). Among teachers who teach larger proportions of low achievers and who reported less self-efficacy, the proportion of time these teachers reported spending on keeping order in the classroom accounts fully for that negative association in Italy, Serbia, Spain and Sweden, and it reduces the strength of that association in Brazil, France, Mexico, Portugal and Romania. In other words, it is not that these teachers teach in classrooms with more low achievers that is related to their lower levels of self-efficacy; rather, it is the larger proportion of time that they spend on keeping order in the classroom that undermines their feelings of self-efficacy.

Figure 4.7

The influence of class composition on teachers' attitudes, beliefs and practices



Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.8, http://dx.doi.org/10.1787/9789264196261-en.

A similar finding emerges among teachers who work in classrooms with larger proportions of students with behavioural problems and who reported lower levels of self-efficacy. The proportion of time these teachers spend keeping order in the classroom accounts fully for this negative association in ten countries. In Poland, Romania and Abu Dhabi (United Arab Emirates), the association is weakened after considering the proportion of time spent keeping order in class. What this means is that, in many countries, the relationship between teaching in challenging classrooms (i.e. classrooms containing more low achievers or students with behavioural problems) and teacher self-efficacy can be explained by the amount of time that a teacher spends keeping order in the class (OECD, 2014, Table 7.15.Web.3).

Teachers' self-efficacy and their professional collaborative practices

Formal collaborative learning generally entails teachers meeting regularly to share responsibility for their students' success at school (Chong and Kong, 2012). Although an increasing number of professional development activities for teachers are structured around collaboration, evidence on conditions for successful collaboration and positive outcomes related

to collaborative practices remains relatively scarce and inconclusive (Nelson et al., 2008). Yet researchers have described a myriad of different structures and processes to create a collaborative culture among teachers in schools (Erickson et al., 2005; Nelson et al., 2008).

Empirical evidence shows that collaboration among teachers may enhance their efficacy, which, in turn, may improve student achievement and sustain positive teacher behaviours (Liaw, 2009; Puchner and Taylor, 2006). In a meta-review of empirical studies, Cordingley et al. (2003) reported that collaborative professional development is related to a positive impact on teachers' range of teaching practices and instructional strategies, to their ability to match these to their students' needs, and to their self-esteem and self-efficacy. There is also evidence that such collaborative professional development activities are linked to a positive influence on student learning processes, motivation and outcomes.

TALIS examines the associations between several collaborative practices and teacher self-efficacy and job satisfaction. Specifically, the following indicators for collaborative practices were used: teaching jointly in the same class; observing and providing feedback on other teachers' classes; engaging in joint activities across different classes and age groups; and taking part in collaborative professional learning. Teachers who reported that they engage in these kinds of activities five times a year or more are compared with those who reported engaging in them less frequently.

In almost all countries, teachers who reported that they engage in these kinds of collaborative activities five times a year or more also reported greater self-efficacy. In half of the countries, this relationship is moderately strong (OECD, 2014, Table 7.16). Particularly strong associations are observed in Bulgaria, Chile, Estonia, Finland, Israel and Korea.

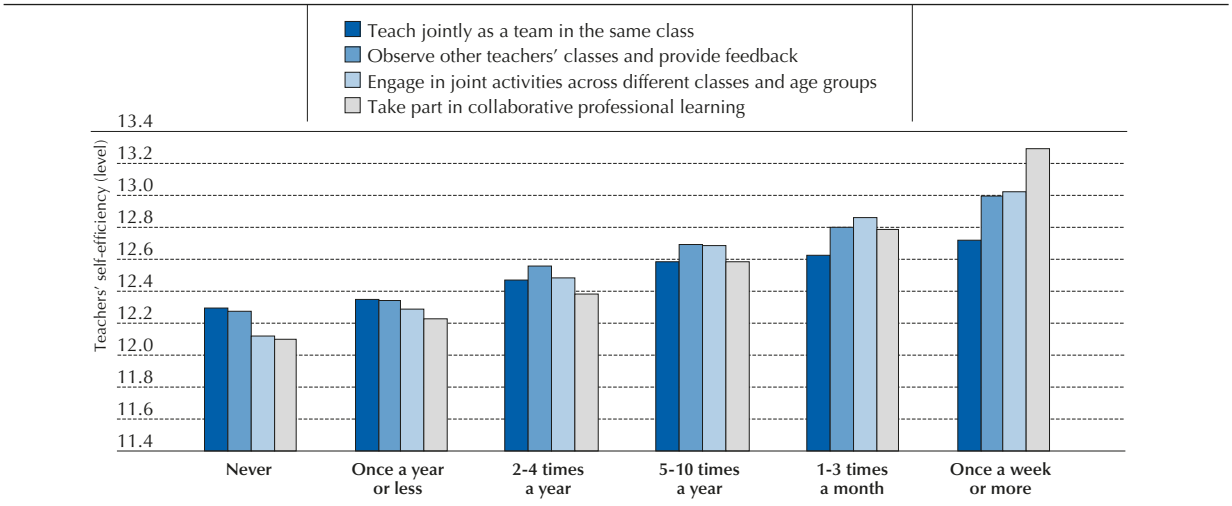
Similar to the results for teacher self-efficacy, almost all countries showed a positive relationship between teacher collaboration and job satisfaction (OECD, 2014, Table 7.17). Some relationships are particularly strong. For example, teachers in Chile and Estonia who jointly teach classes with other teachers reported greater job satisfaction (OECD, 2014, Table 7.17). In eight countries, teachers who observe other teachers' classes also reported greater job satisfaction. This association is moderately strong in these countries. The strongest association with teachers' job satisfaction appears to be participating in collaborative professional learning activities five times a year or more. In two-thirds of the countries/economies surveyed, such participation is related to significantly greater job satisfaction. Of these, 12 countries show moderately strong associations, and exceptionally strong associations are observed in Brazil and Chile. This means that teachers who take part in collaborative learning activities more frequently also reported much greater job satisfaction than those who do not.

The relationships between collaborative practices and teachers' self-efficacy and job satisfaction, on average across countries, are illustrated in Figures 4.8 and 4.9. When looking at all TALIS countries and economies, the more frequent the participation in collaborative practices, the greater the teachers' sense of self-efficacy.

Figure 4.8

Teachers' self-efficacy and professional collaboration

Teachers' self-efficacy level according to the frequency of teacher professional collaboration for the following items for lower secondary education teachers



Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.9, http://dx.doi.org/10.1787/9789264196261-en.

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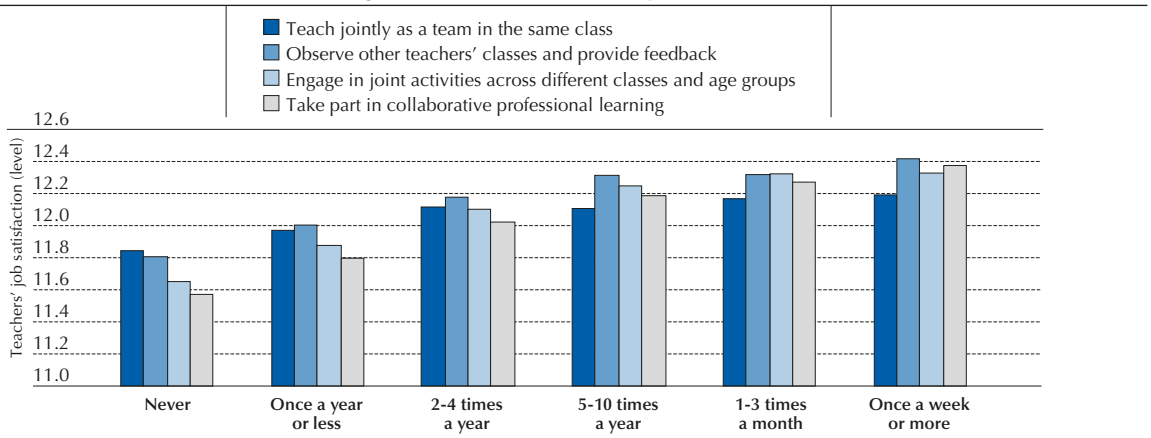
Figure 4.9

Teachers' job satisfaction and professional collaboration

Teachers' job satisfaction level according to the frequency of teacher professional collaboration for the following items for lower secondary education teachers



Source: OECD (2014), *TALIS 2013 Results: An International Perspective on Teaching and Learning*, Figure 7.10, http://dx.doi.org/10.1787/9789264196261-en.
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The strength of the association with job satisfaction appears to level off as teachers participate more frequently in collaborative activities. In general, however, more frequent engagement in collaborative practices seems to be associated with greater self-efficacy and job satisfaction among teachers across all the countries and economies that participated in TALIS.

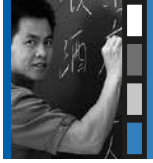
In light of these positive effects of collaboration, a number of countries have adopted initiatives to promote teacher collaboration within schools and with local stakeholders, although the specific approaches followed vary to a large extent (Boxes 4.8, 4.9 and 4.10).

Box 4.8. Collaborative evaluation in Denmark

In Denmark, teacher appraisal is not regulated by law, and no national requirements exist to evaluate the performance of teachers. Actual teacher-appraisal practices are determined locally with the possible influence of municipal requirements or guidelines. According to the *Folkeskole* (primary schools) Act, the school principal is responsible for the quality of teaching at the school as well as the overall administrative and pedagogical management of the school, including professional development of teachers. As a result, the main responsibility for designing, introducing and organising teacher-appraisal procedures within the school lies with the school principal. Actual teacher-appraisal practices in Danish schools seem to be based on a culture where school leaders show confidence in their teachers, appraisal is conducted as a school-teacher or teacher-teacher dialogue and procedures are defined in collaboration with the teachers.

Work in Danish schools is increasingly organised in a way that encourages teamwork. Schools often structure work around teams of teachers (e.g. class team, form team, section team, subject team) that share responsibility for organising their work. This development has led to growing co-operation among teachers and a more formal dialogue between school leaders and teams of teachers. This also provides a context in which some schools organise teacher appraisal mostly within teams. In this situation, teachers co-operate on promoting the quality of the teaching in the school. It is a widespread practice in the *Folkeskole* that planning, learning and knowledge sharing take place in teacher teams. Other typical activities among teachers include supervising one another within a team and jointly discussing the progress and development of an individual student. According to the *Folkeskole* Act, the school leader is responsible for the quality in his/her school within the limits imposed by the decisions of the city council and the school board.

Source: Shewbridge, C. et al. (2011), *OECD Reviews of Evaluation and Assessment in Education: Denmark 2011*, http://dx.doi.org/10.1787/9789264116597-en.



Box 4.9. Unions as agents of change to foster teachers' well-being and school improvement in the United States

For nearly 20 years, the Center for School Improvement (CSI) of the American Federation of Teachers (AFT) has led the way in creating a forum for the union and school administrators to work together in innovative ways to improve teaching quality and student performance. Case studies of a number of participating districts reveal that these partnerships create a culture of inclusion and involvement; respect for teachers; collaborative planning, problem solving and decision-making at the school level; mentoring programmes that involve teacher leaders; and opportunities for joint learning and building the professional capacity of administrators and teachers.

Collaboration does not eliminate all of a district's problems, but it enables everyone connected to a school to develop processes that lead to joint solutions to problems, creating a sense of shared responsibility and agency. The CSI facilitates building this kind of relationship by providing technical assistance and professional development. It is precisely this type of purposeful and solution-driven approach to promoting a positive school climate that helps educators improve student success, while minimising the inevitable stresses associated with the profession and their negative impact on the well-being of educators themselves.

The 2017 Educator Quality of Work Life Survey carried out by the AFT and the Badass Teachers Association (BAT) suggests that unions can play a role in mitigating stress and fostering teachers' well-being. Indeed, the survey was administered not only to a random sample of AFT members throughout the United States, but also to all teachers and staff in the public schools of two New York school districts (Solvay and North Syracuse), which have participated for many years in the CSI programme and where local unions and districts have forged strong collaborative partnerships. The survey results show that educators in these two districts were less likely to find work "always" stressful, felt more respected by their supervisors, slept about 15 minutes more each night, felt better about their work-life balance and were less likely to say they planned to leave the profession, especially among young teachers, compared to respondents to the general survey.

Source: AFT (American Federation of Teachers) and BAT (Badass Teachers Association) (2017), *2017 Educator Quality of Work Life Survey*, AFT, Washington, DC, www.aft.org/sites/default/files/2017_eqwl_survey_web.pdf.

Box 4.10. Preparing teachers to lead improvement in Japan

The Japanese tradition of lesson study, in which groups of teachers review their lessons and how to improve them (in part by analysing student errors) is one of the most effective mechanisms for teachers' self-reflection, as well as a tool for continuous improvement. Observers of Japanese elementary school classrooms have long noted the consistency and thoroughness with which maths concepts are taught and the way teachers lead discussions of mathematical ideas – both correct and incorrect – so that students gain a firm grasp on the concept. This school-by-school lesson study often culminates in large public research lessons. For example, when a new subject is added to the national curriculum, groups of teachers and researchers review research and curriculum materials and refine their ideas in pilot classrooms over a year before holding a public research lesson, which can be viewed electronically by hundreds of teachers, researchers and policy makers.

The tradition of lesson study in Japan also means that Japanese teachers are not alone. They work together in a disciplined way to improve the quality of the lessons they teach. That means that teachers whose practice lags behind that of the leaders can see what good practice is. Because their colleagues know who the poor performers are and discuss them, poor performers have both the incentive and the means to improve their performance. Since the structure of the East Asian teaching workforce includes opportunities to become a master teacher and move up a ladder of increasing prestige and responsibility, it also pays for a good teacher to become even better.

Source: OECD (2011), *Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States*, http://dx.doi.org/10.1787/9789264096660-en.

POLICY IMPLICATIONS

It is disappointing how little systematic evidence is actually available about the well-being of teachers, beyond the aspects of self-efficacy explored in this chapter. Nevertheless, the concept of teacher self-efficacy seems more important for policy than a superficial reading might indicate. It is not just about making sure that teachers are happy and feel good about themselves and their teaching, although, of course, that is important as well. There seem to be positive associations between both self-efficacy and job satisfaction and student achievement, whatever the causal nature of these relationships. High levels of teacher self-efficacy are also associated with student motivation and other positive teacher behaviours. Conversely, low levels of self-efficacy can be linked to greater stress and problems dealing with students who misbehave. TALIS data also demonstrate that, in most countries, improving teachers' sense of self-efficacy is slightly more likely to result in greater job satisfaction than the other way around. Job satisfaction is important in itself, as it relates to teachers' level of commitment to the profession and, in turn, to schools' ability to retain the best teachers.

As reported above, nine out of ten teachers are satisfied with their job, and 70% to 92% of teachers are confident in their abilities in the areas measured. The biggest differences come at the country level. Differences in reported levels of efficacy and job satisfaction come from a variety of sources, depending on the country, but across countries/economies, challenging classrooms play a large role. This is hardly a surprise, given the amount of time teachers spend in their classrooms and the importance of the work that is done – or should be done – there. If a teacher spends an inordinate amount of time keeping order, or if a large proportion of the students misbehave, it is natural to think that this teacher might feel less confident in his or her abilities or feel less positive about his or her job. The TALIS data support this.

Fortunately, TALIS data also identify the positive influences on teachers' sense of self-efficacy and job satisfaction that can aid in policy or programme development in these areas.

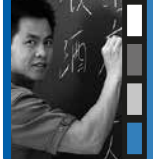
Empower teachers to play a role in decision-making at the school level

Teacher leadership is important for many reasons. Teachers who report that they are provided with opportunities to participate in decision-making at the school level have higher reported levels of job satisfaction in all TALIS countries and higher feelings of self-efficacy in most countries. In addition, in almost all TALIS countries, the extent to which teachers can participate in decision-making has a strong positive association with the likelihood of reporting that teaching is a valued profession in society. The concept of distributed leadership is not only important for helping to alleviate some of the burden school leaders face, but it can be beneficial to teachers as well. Furthermore, teachers are uniquely placed to aid in school-level decision-making because they might be closer to students and parents, more familiar with how curriculum is implemented and more able to discuss student assessments and results than their school principals. Thus, it is not only worth school principals devolving some of the responsibility for school-level decisions to teachers, but policy makers should consider providing guidance on distributed leadership and distributed decision-making at the system level.

Build teachers' capacity to handle misbehaving students

TALIS data indicate that as the proportion of students with behavioural problems grows, teachers report less job satisfaction. In addition, in most countries/economies, teachers who spend more time keeping order in the classroom reported lower levels of self-efficacy and job satisfaction. When these relationships are examined further, the analyses find that these negative relationships between both self-efficacy and job satisfaction and specific classroom factors can also be elucidated by a teacher's reports of how much time he or she spends keeping order in class. In other words, it is not the proportion of students with behavioural problems or low achievers in a class that is the most important influence on a teacher's self-efficacy or job satisfaction. Rather, it is the time the teacher spends dealing with the classroom-management issues related to these or other students.

Though it is impossible to identify cause and effect, the analyses reported here make a case for building teacher capacity, so that the impact of students' behavioural problems on teaching and learning can be mitigated. This could benefit not only the teacher, but also all of the students in the class. Professional development activities that focus on classroom management or instruction strategies might be useful, particularly for newer teachers, as they would be providing additional classroom or pedagogical support for teachers who teach particularly challenging classes. It is equally important to be sure that, teachers have several sufficiently long periods of teaching practice in a variety of schools during initial teacher education, to ensure that beginning teachers do not enter the profession until they have developed adequate classroom competencies. More flexible classroom situations, such as team teaching, might also allow teachers to share the tasks of teaching and disciplining students.



Support the development of interpersonal relationships within the school

TALIS shows that the interpersonal relationships in a school have powerful mediating effects on some of the challenging classroom circumstances that teachers might face. In addition, the relationships that teachers have with their students have a strong association with teachers' job satisfaction.

School leaders need to provide opportunities and support for building these relationships at school. The support could be in the form of resources, such as a physical space in which teachers can meet with one another, or time away from class or other administrative work to allow teachers to meet and develop relationships with students and colleagues. The leadership team needs to make itself available to its teaching staff as well. Government policies can also offer school leaders the organisational freedom to develop strategies in these areas and to make changes in the school day or school building to help. Perhaps most important, teachers need to be open and willing to engage with their colleagues, their administration and their students.

Institute meaningful systems of appraisal and feedback that have connections with teachers' practice

In all countries and economies participating in TALIS, teachers' perception that appraisal and feedback lead to changes in their teaching practice is related to greater job satisfaction, while their perception that appraisal and feedback are only administrative exercises is related to less job satisfaction.

Policy makers and schools should thus support the development of teacher appraisal and feedback systems that are actually linked to improving teaching.

Encourage collaboration among teachers, either through professional development activities or classroom practices

Collaboration among teachers is important not just for building the interpersonal relationships among staff that are shown have an impact on teachers' self-efficacy and job satisfaction, but because collaboration is valuable in and of itself. It is clear from the TALIS data that teachers benefit from even minimal amounts of collaboration with colleagues. The data show that participating in collaborative professional development activities or engaging in collaborative practices five times a year or more has a positive relationship with both teacher self-efficacy and job satisfaction. Many of the collaborative practices mentioned in TALIS, such as observing other teachers' classes and providing feedback, or teaching as a team in the same class, could – and should – be introduced at school. School leaders could make schedules more flexible to allow for team teaching, for example. These activities serve a variety of purposes, including providing professional development for teachers where they work and offering teachers another source of feedback on their work.

Notes

1. Upcoming OECD project on Supporting Teachers' Professional Learning and Well-being for Quality Teaching.

2. Teachers responded that they could perform these actions "quite a bit" or "a lot", which has here been summarised as "often".

3. These analyses were made up of binary logistic regressions conducted for each country separately. The combined Strongly Disagree-Disagree group was chosen as a reference category for the analysis examining the extent to which teachers feel that teaching is a valued profession in society

4. Similarly, the cut-off points were determined by reviewing the distribution of responses and selecting a point where both representation of the responses and sufficient variability to be meaningful were maintained.

5. In supplementary analyses (not discussed here), there do not appear to be consistent or significant changes in classroom composition correlations with self-efficacy or job satisfaction after accounting for professional development.

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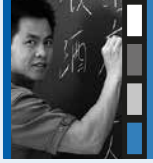

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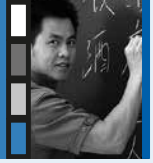

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(91 2018 02 1P) ISBN 978-92-64-29261-1 – 2018

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There is increasing recognition that teachers will play a key role in preparing students for the challenges of the future. We expect teachers to equip students with the skill set and knowledge required for success in an increasingly global, digital, complex, uncertain and volatile world. This will involve teachers and schools forging stronger links with parents and local communities, building a sense of social responsibility and problem solving skills among their students. It also means that teachers need to adopt effective and individualised pedagogies that foster student learning and nurture their social and emotional skills. How can education systems help them engage in continuous innovation and professional development to enhance their own practice?

This report shows how education systems can support teachers to meet these new demands and encourage a paradigm shift on what teaching and learning are about and how they should happen. Education systems need to create the conditions that encourage and enable innovation. They need to promote best practice through policies focused on professionalism, efficacy and effectiveness in order to help build teachers' capacity for adopting new pedagogies. Due attention should also be paid to teachers' sense of well-being so that classroom learning environments remain conducive to students' own well-being and development.

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ISBN 978-92-64-29261-1
91 2018 02 1P

9 789264 292611