TALIS

Results from the Teacher Knowledge Survey

What Teachers Know About General Pedagogy

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WHAT TEACHERS KNOW ABOUT GENERAL PEDAGOGY

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Foreword

In education, we often argue about what matters most: content or pedagogy, subject mastery or the craft of teaching. It's a bit like asking whether a great chef succeeds because of the ingredients or because of the recipe - and, more importantly, the skill to bring both together under pressure, in real time, for a room full of hungry guests. Different countries answer that question differently. Some build teacher education on a deep foundation of pedagogical knowledge; others treat it more like an add-on to deep subject expertise.

While almost everyone agrees that the quality of an education system cannot rise above the quality of its teachers, we have been far less clear—sometimes surprisingly so—about what actually makes teachers great. That's where the OECD's first-ever Teacher Knowledge Survey could change the conversation.

For the first time, we have a global yardstick for teachers' general pedagogical knowledge - the invisible engine that powers what happens inside classrooms every day. And what the data show is revealing: Across countries, when you plot student performance on PISA against teachers' pedagogical knowledge as measured by the Teacher Knowledge Survey, you don't get a cloud of scattered dots - you get something close to a straight line. In a world of messy educational debates, that kind of clarity is rare. It tells us that pedagogical knowledge is not just helpful; it is one of the most powerful system-level predictors of student learning outcomes we have.

And the story doesn't stop at correlations. Because behind the numbers lies something even more compelling: a picture of teaching as a deeply intellectual, adaptive, and highly skilled profession.

Teachers with strong pedagogical knowledge don't just deliver lessons—they design learning. They read the room. They adjust in real time. They know when to push, when to pause, when to challenge, and when to support. They are more likely to foster deeper understanding, not just surface recall; critical thinking, not just compliance. They spend less time managing chaos and more time cultivating curiosity. Excellence in teaching, it turns out, is not an accident. It is the product of knowledge—applied with judgment, refined through practice, and sustained by purpose.

And that has consequences. Students learn more in systems where teachers understand pedagogy deeply. But just as importantly, teachers themselves thrive more in those systems. The Teacher Knowledge Survey shows that teachers with stronger knowledge bases are less likely to experience work-related stress across a wide range of tasks. When you know what you are doing - and why you are doing it - you don't just perform better; you endure better. So perhaps it's time to retire an old misconception: that teaching is primarily about talent, instinct, or personality. Teaching is a knowledge profession.

And like any knowledge profession, it demands that we take seriously the preparation, development, and continuous learning of teachers - not as an afterthought, but as the core strategy for improving education systems. It demands that we recognise, reward, and elevate pedagogical expertise with the same respect we afford other high-skill professions.

Because in the end, the future of education will not be written by curricula alone, or by technology, or by policy frameworks. It will be written in classrooms - by teachers who know not just their subjects, but how to make those subjects come alive.

Acknowledgements

The development of this report was guided by Andreas Schleicher and Yuri Belfali. Marco Paccagnella led the development of the report and authored Chapters 1 and 2. Heewoon Bae authored Chapters 2 and 3. Jason McGrath contributed insights and analysis to Chapter 1. Rodolfo Ilizaliturri developed the processes for all statistical analyses in the report and led the production of the participant notes. Leonard Najman and Qi Kuang provided assistance with statistical analyses and outputs. Gabor Fülop gave advice on various technical and analytical issues and supported the alignment of TKS with the core TALIS survey. Emily Groves co-ordinated report preparation and production. Ruochen Li led and supported the team and provided valuable feedback on everything.

The project grew from the pilot study undertaken as part of the Innovative Teaching for Effective Learning (ITEL) study on teachers' pedagogical knowledge by the OECD Centre for Educational Research and Innovation (CERI) – the authors would especially like to thank Nóra Révai and Hannah Ulferts, who provided their insights from earlier work on TKS. The report also relied on support from Eda Cabbar, Duncan Crawford, Kevin Gillespie, Sophie Limoges and Della Shin for report production and communications. Editing was conducted by Samantha Fields.

The OECD Teacher Knowledge Survey (TKS) 2024 was made possible thanks to the collaboration between participating countries of the TALIS Governing Board (TGB), the OECD Secretariat and the International Association for the Evaluation of Educational Achievement (IEA) with its international consortium partners cApStAn and the Australian Council for Educational Research (ACER). The Secretariat is grateful to the TGB members from participating countries for steering the project, and the national project managers (NPMs) for turning plans into actions. Special thanks are also extended to Steffen Knoll and Anja Waschk for directing the international consortium, and Ralph Carstens for senior counsel. Conceptual and technical development relied heavily on the work of John Ainley, Jonathan Heard, Kamil Kowolik, Karsten Penon, Mojca Rožman, Pina Tarricone, Wolfram Schulz, and Adriana Viteri. The Teacher Knowledge Expert Group and Technical Advisory Group also provided direction, advice and feedback during the data analysis and report production. Mira Bocti, Eleonora Kolomiets, Huyen Nguyen, Megan Sim and Toby Simmer provided valuable support. Annex F of this volume lists the members of various TALIS bodies, as well as the experts who have contributed to TKS.

Of course, TKS could not have taken place without the support of its participating teachers, who gave their precious time to help us understand more about what they already know. Our deepest thanks are due to these professionals. For all the times you sat through training sessions, wondering how the theory would look in practice. For all the hours you spent designing activities based on what you'd learned might work. For all the time you spent reflecting on why some lessons didn't meet your expectations, but others exceeded them. Thank you for all the effort you have made to learn about how to teach, so that our young people can learn too.

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Reader's guide

How was the Teacher Knowledge Survey implemented?

The Teacher Knowledge Survey (TKS) is a module within the Teaching and Learning International Survey (TALIS). The TALIS Governing Board (TGB) leads TALIS. It is composed of a representative from each country and territory that participates in the survey. The TGB oversees the OECD Secretariat, which in turn manages a consortium of international actors that together develop and implement TALIS (and TKS).

A diverse group of education experts, under the coordination of the consortium and the OECD Secretariat and the oversight of the TGB, drafted the questions that appeared in TALIS and TKS. All questions were reviewed and approved by the TGB. Each question was translated into the national languages of every participating country and territory. The questions were tested twice to verify their translations and their functioning.

TKS was administered to lower secondary education teachers (ISCED level 2).

Which countries and territories participated in TKS?

Eight countries participated in TKS 2024: Chile, Croatia, Morocco, Poland, Portugal, Saudi Arabia, South Africa and the United States.

Low participation rates

Caution is advised when interpreting estimates for countries that did not meet the TALIS technical standards with respect to participation rates due to higher risk of non-response bias. See Annex C for more details.

Reporting conventions

Teachers

This report uses "teachers" as shorthand for the TKS target population of lower secondary (ISCED level 2) teachers.

This report refers to findings that are based on responses of teachers as a "share of teachers", "percentage of teachers", etc. For example, 35% of teachers in an education system attended a regular teacher education or training programme.

Principals

Because TKS was implemented in the same schools sampled for the Core TALIS 2024 survey (OECD, 2025[1]), this report uses sometimes information from the answers given by school principals about their schools. This report uses "principals" as shorthand for the TALIS target population of lower secondary

(ISCED level 2) principals. Principals provided information on their schools' characteristics and their own work and working conditions by completing a principal questionnaire. Responses from principals are usually treated in this publication as attributes of the teachers' personal factors, working conditions, practices, etc. In which case, principals' answers are analysed at the teacher level and weighted by teacher weights.

Where a principal provided data linked to the teachers at that school (i.e. data provided by one principal applies to several teachers, such as the size of the school), this report refers to findings as a "share of teachers in schools", a "percentage of teachers in schools", etc. For example, 35% of teachers in privately managed schools in an education system enjoy teaching.

Self-reported data

TKS included an assessment of teachers' general pedagogical knowledge (GPK) and an accompanying contextual questionnaire. While GPK scores can be considered an "objective" measure of teachers' proficiency in GPK, all other variables analysed in this report are based on self-reports from teachers and principals. They often represent their opinions, perceptions, beliefs and accounts of their activities. As with any self-reported data, this information is subjective and may, therefore, differ from data collected through other means (e.g. administrative data or video observations). The same is true of principals' reports about school characteristics and practices, which may differ from descriptions provided by administrative data at a national or local government level.

While self-reported data allow respondents to share their beliefs and perceptions, there are also limitations when interpreting findings based on self-reported information.

- **Cultural response patterns**: Social and cultural backgrounds might systematically affect how individuals respond to questions (e.g. tending to respond in moderate or extreme ways) (van de Vijver and Leung, 1997[2]).
- **Social desirability bias**: Individuals respond in ways that they think are viewed favourably but do not represent their true beliefs or actions (Krumpal, 2011[3]).
- **Validity concerns**: Respondents might have to remember something that occurred a long time in the past, or their interpretation of a question is not consistent (e.g. what one person believes to be "critical thinking" could be different from another person's opinion).

As a result, direct comparisons across countries using self-reported measures warrant caution as they can be misleading.

Cultural or contextual factors can in principle also influence answers to the GPK assessment question. The answers to the GPK assessment items were thoroughly analysed to ensure comparability across countries. More details on this analysis can be found in Annex A and in OECD (forthcoming[4]).

International averages

The OECD and TKS averages correspond to the arithmetic mean of the respective country estimates. They are calculated for most indicators presented in this report. Four countries participating in TKS are included in the OECD average: Chile, Poland, Portugal and the United States. The TKS average includes all eight participating countries.

Throughout the report, "on average" is often used as a shorthand for "on average across OECD countries participating in TKS". In each chapter, this is normally clarified at the first occurrence. For example: "On average among the four OECD countries participating in TKS (henceforth, "on average")"

In figures and tables, the number of education systems included in an international average is indicated next to that average:

- **OECD average-4**: arithmetic average based on ISCED level 2 teacher or principal data across the four OECD countries participating in TKS.
- **TKS average-8**: arithmetic average based on ISCED level 2 teacher data across the eight countries participating in TKS.

Glossary

- **Novice teacher**: Teacher with up to five years of teaching experience.
- **Experienced teacher**: Teacher with more than ten years of teaching experience.
- **Second-career teacher**: Teacher with at least ten years of work experience in non-education roles for whom teaching was not a first career choice.
- **Advantaged school**: School with 10% or fewer students from socio-economically disadvantaged homes (those that lack the basic necessities or advantages of life, such as adequate housing, nutrition or medical care).
- **Disadvantaged school**: School with more than 30% of students from socio-economically disadvantaged homes (those that lack the basic necessities or advantages of life, such as adequate housing, nutrition or medical care).
- **Urban school**: School located in a community with a population of over 100 000 people.
- **Rural school**: School located in rural area or village (with a population of up to 3 000 people). To note, in some countries and territories, schools labelled as rural may actually be located in urbanised villages.
- **Publicly managed (or public) school**: School whose principal reported that it is managed by a public education authority, government agency, municipality or governing board appointed by government or elected by public franchise. To note, a publicly managed school may not necessarily be publicly funded.
- **Privately managed (or private) school**: School whose principal reported that it is managed by a non-governmental organisation (e.g. a church, trade union, business or other private institution). To note, a privately managed school may not necessarily be privately funded.
- **Students with special education needs**: Students for whom a special education need has been formally identified.
- **Target class**: Lessons taught over the week preceding the survey to a class randomly selected from teachers' current weekly timetables.

Abbreviations

Dif.	Difference
DIF	Differential Item Functioning
GPK	General pedagogical knowledge
ICT	Information and communication technology
IRT	Item Response Theory
ISCED	International Standard Classification of Education
ITE	Initial teacher education
OTL	Opportunities to learn
PISA	Programme for International Student Assessment
S.D.	Standard deviation
S.E.	Standard error
%pt. dif.	Percentage point difference

Technical information

Causality

The design of TKS does not allow to establish causal relationships between two variables. All analysis presented in this report should be interpreted as uncovering the presence (or absence) of statistical association, i.e. whether or not variations in one variable (for instance, teachers' participation in professional development) is systematically associated to variation in another variable (for instance, self-efficacy in teaching). It is not possible, however, to assess causality between two variables, i.e. whether making teachers participate in professional development, all other things being kept equal, would cause a change in self-efficacy.

Data underlying the figures

In the tables containing the data reported in figures, four symbols are used to denote non-reported estimates:

- **a**: The category does not apply to the country/territory concerned, data were not collected by the country/territory, or there was no observation in the sample.
- **c**: There are too few observations to provide reliable estimates and/or to ensure the confidentiality of respondents (i.e. there are fewer than 30 teachers or 10 schools/principals with valid data; and/or the item non-response rate [i.e. ratio of missing or invalid responses to the number of participants for whom the question was applicable] is above 50%).
- **w**: Data were withdrawn or were not collected at the request of the country/territory concerned.

Rounding figures

Because of rounding, some figures in tables may not add up exactly to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

All standard errors in this publication have been rounded to one, two or three decimal places. Where the value 0.0, 0.00 or 0.000 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05, 0.005 or 0.0005 respectively.

Focusing on statistically significant differences

For all results presented and commented in this report (statistics, differences between countries or groups of teachers, regression coefficients), statistical tests were conducted to assess whether the results are statistically different from zero at the α=0.05 significance level. Statistically significant results are denoted by using bold font in tables and filled shapes in figures. In figures where multiple analysis are presented, normally only the name of countries for which the results are statistically significant are displayed. See Annex D for further information.

Further technical documentation

For further information on TKS and TALIS documentation, instruments and methodology, see the TALIS 2024 Technical Report (OECD, forthcoming[4]), the TALIS initial report (OECD, 2025[1]) and the TALIS 2024 User Guide (OECD, forthcoming[5]).

This report uses the OECD StatLinks service. All tables and charts are assigned a URL leading to a corresponding Excel™ workbook containing the underlying data. These URLs are stable and will remain unchanged over time. In addition, readers of the e-books will be able to click directly on these links and the workbook will open in a separate window if their Internet browser is open and running.

Content of this report

This report is organised in the following way:

- **Introduction** provides an overview of the Teacher Knowledge Survey and how it assessed teachers' General Pedagogical Knowledge (GPK).
- **Chapter 1** describes the performance of teachers in the GPK assessment, shows how GPK is related to students' and teachers' outcomes, and how teachers with different levels of GPK are allocated across schools.
- **Chapter 2** describes how GPK differs according to teachers' socio-demographic characteristics, as well as according to their beliefs about their efficacy (self-efficacy) and their opinions about whether their initial teacher education and further professional learning (Opportunities to Learn) have prepared them on various dimension of general pedagogical knowledge.
- **Chapter 3** looks at the ways in which teachers may develop their GPK through a variety of system- and school-level resources, including initial teacher education (ITE) and continuing professional learning opportunities.
- **Annex A** provides an overview of the development of TKS and its conceptual underpinnings.
- **Annex B** present summary results a survey on pathways into teaching and teachers' professional development in TKS participating countries, conducted by the OECD Secretariat to support the analysis of the results from TKS.
- **Annex C** contains information about the TKS target population, the TKS samples and a summary of the adjudication outcomes.
- **Annex D** contains information about complex variables derived from the teacher and principal questionnaires analysed in the volume, and statistical methods used to analyse TALIS data.
- **Annex E** contains the full list of result tables available online.
- **Annex F** lists the representatives of TKS countries in the TALIS Governing Board, managers in the TKS national centres, members of the OECD Secretariat, members of the TALIS Consortium and members of TALIS and TKS expert groups that contributed to TKS 2024.

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Executive summary

The OECD Teacher Knowledge Survey (TKS) was administered as part of the Teaching and Learning International Survey (TALIS) for the first time in 2024, with eight participating countries: Chile, Croatia, Morocco, Poland, Portugal, Saudi Arabia, South Africa and the United States. It is the first large-scale international assessment of general pedagogical knowledge (GPK) administered to nationally representative samples of teachers. The collection of data on an objective measure of (one element of) teachers' professional competencies marks a significant step for TALIS, complementing the historic focus on self-reported data.

Results from TKS 2024 shed some much-needed light on the nature of teachers' knowledge base and how it can be developed. Crucially, TKS highlights the value of GPK for both teacher and student outcomes. The findings have important implications for teacher education, professional development, and allocation. These results emphasize that teachers are trained professionals who have specific knowledge that others do not.

Supporting student learning

There is a strong, positive correlation between countries' average GPK scores in TKS 2024 and average 15-year-old students' performance in the PISA 2022 mathematics and reading assessment. Certainly, this finding is only based on results from the seven countries who participated in both studies, and correlation does not imply causation. However, the results suggest that teachers' knowledge of pedagogy may be associated with more effective teaching and observable differences in students' outcomes.

TKS shows that teachers with more GPK spend more time on actual teaching and learning and less time on classroom discipline, which might partly explain the link between GPK and student outcomes. In Morocco and Saudi Arabia, increases of one standard deviation in GPK are associated with 16 and 22 percent increases in the share of class time spent on teaching and learning. Meanwhile, more knowledgeable teachers spend less time on keeping order in all countries except Poland and South Africa.

Tailoring teaching practices

GPK is linked to teachers' choice of relevant teaching approaches that are adapted to students' needs. Teachers with more GPK are more likely to "always" consider students' prior knowledge and needs in lesson-planning in most countries. They are also more likely to "always" change their way of explaining topics and tasks when a student does not understand them in half of the participating countries. Meanwhile, GPK is often negatively associated with "always" pointing students to different learning materials depending on their needs. This suggests that other forms of differentiation might be preferred for use on a frequent basis, perhaps for reasons of efficiency.

GPK may also guide teachers in how to consolidate learning and support cognitive activation, for deep conceptual understanding and problem-solving skills. With more GPK, teachers are less likely to "always"

let students practise similar tasks (in four countries) and more likely to "always" select tasks that gradually increase in difficulty (in three countries). In most participating countries, teachers with more GPK are less likely to "always" focus on cognitive activation, for example by presenting tasks for which there is no obvious solution. These findings suggest that teachers with more GPK might be more discerning in planning and pacing tasks to provide an increasing level of challenge in students' learning.

Protecting teachers from stress

TKS demonstrates that GPK can be a powerful resource for teachers in navigating the demands of their profession. By supporting teachers in a range of tasks, GPK could help them manage potentially stressful aspects of their work, such as workload, student behaviour, accountability, diverse learning needs, keeping up with reforms, and professional growth. Each source of stress was less likely to be reported by teachers with more GPK in at least half of participating countries. Given the negative impact of stress on well-being and job satisfaction, these results have important implications for policymakers looking to retain teachers and help them thrive.

Variation in knowledge is substantial but not always systematic

Teachers' GPK varies substantially between and within countries. Average scores range from 274 points in Portugal to 218 points in Saudi Arabia, based on a scale centred around an international average of 250 points and an international standard deviation of 50 points (pooling teachers from all participating countries and adjusting sampling weights so that each country contribute equally irrespective of their size). But differences between teachers within the same country are often larger than cross-country ones. Performance gaps between high-performing and low-performing teachers are widest in the United States, where 175 points separate teachers at the top and bottom 10 per cent of the GPK distribution. This gap is lowest in Morocco, at 51 points.

The highest-scoring teachers in each country appear to be clustered in certain schools, which implies that students may not have equal access to the most knowledgeable teachers. Clustering seems to be most prevalent in South Africa, where 24% of teachers would need to move schools for the highest-scoring teachers to be evenly distributed.

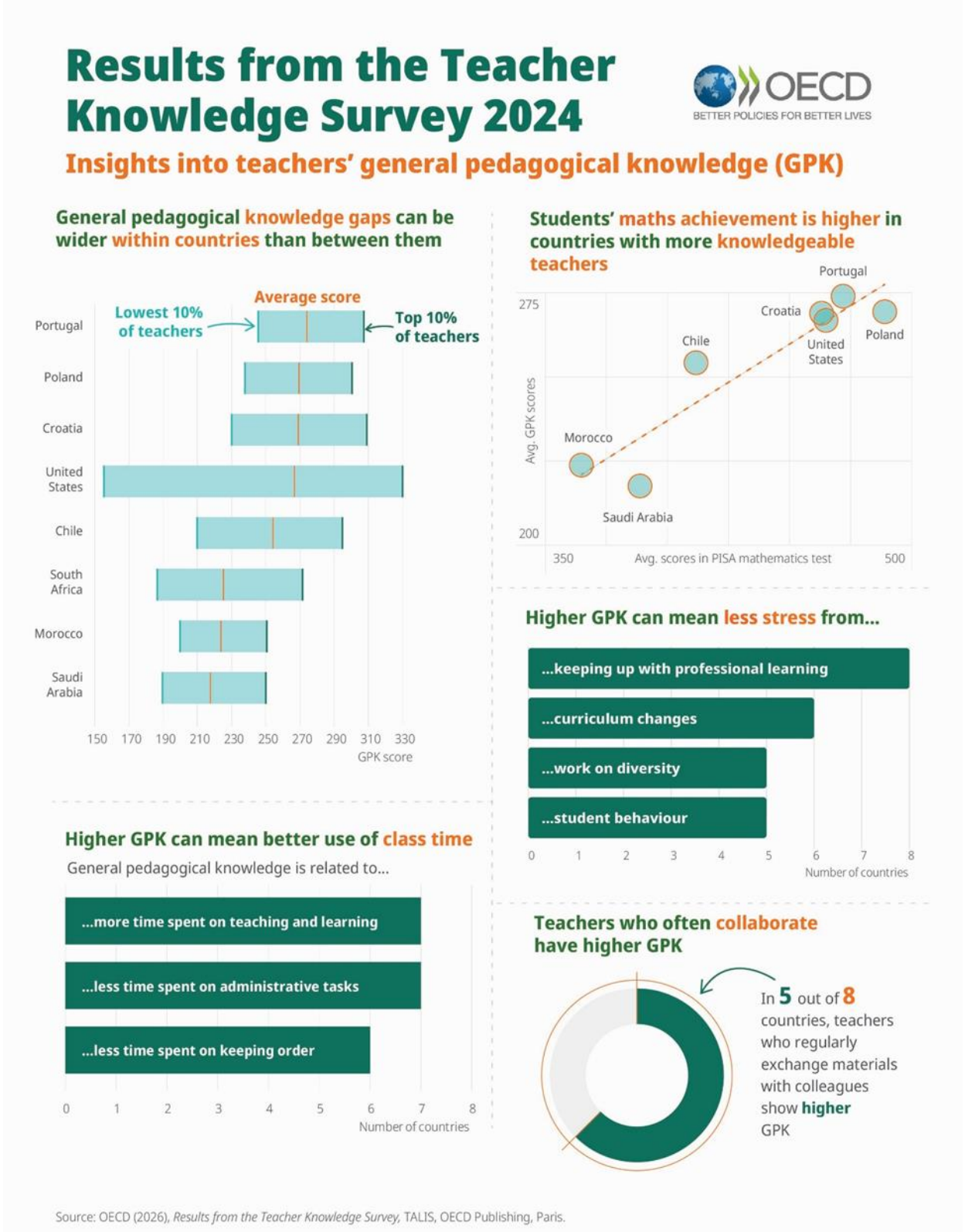
At the same time, GPK varies more within schools than between them, implying that students in different schools are exposed to teachers with similar average levels of GPK. Furthermore, teachers' GPK does not appear to be systematically associated with schools' location, governance type, or composition of the student body. Only in South Africa do systematic differences emerge, where teachers in urban schools, private schools, and schools with a lower intake of disadvantaged students tend to have more GPK.

Supporting knowledge development

For many teachers, initial teacher education (ITE) is when they first start to build their GPK. TKS shows that GPK is often related to teachers' level of education and the type of ITE they attended. Teachers with a bachelor's degree, for example, consistently have more GPK than teachers with a lower level of qualification. Meanwhile, teachers who completed a regular ITE programme often tend to perform better on the GPK assessment than those who completed programmes focusing on subject-specific content only.

Teachers' knowledge of general pedagogy continues to develop throughout their careers. TKS suggests that teacher collaboration is one resource that could support teachers' GPK once they start working. For example, teachers are likely to have more GPK when they regularly exchange teaching materials with their colleagues in most countries, which could reflect GPK gained from shared discussions and resources.

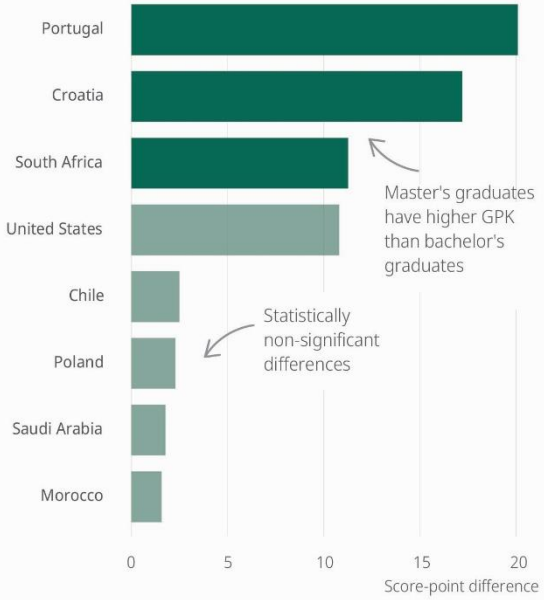
Infographic 1. TALIS TKS 2024 key results 1/2



Source: OECD (2026), *Results from the Teacher Knowledge Survey*, TALIS, OECD Publishing, Paris.

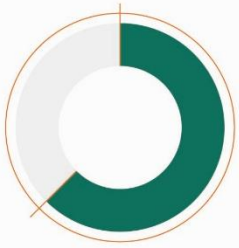
Infographic 2. TALIS TKS 2024 key results 2/2

In some countries, teachers have higher GPK when they have a master's degree



Teachers with a bachelor's degree have higher GPK than those without one, in all countries where comparisons can be drawn

Teachers with higher GPK often adapt their teaching to different learners' needs

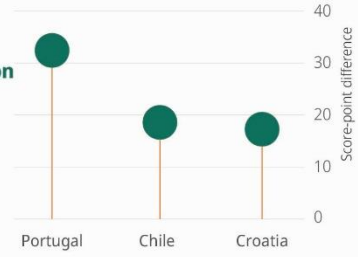


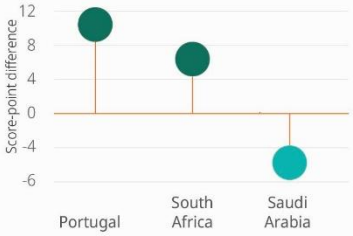
In **5** out of **8** countries, they are more likely to "**always**" consider students' prior knowledge and needs in lesson-planning

In **4** out of **8** countries, they are more likely to "**always**" adapt their explanations when students don't understand

Teachers' initial education pathways matter

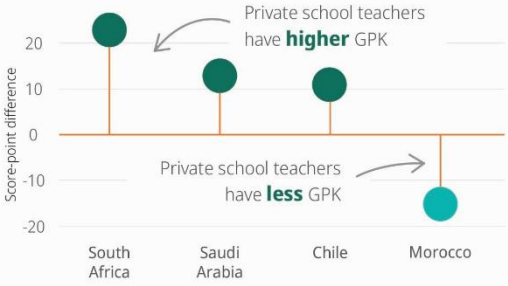
Graduates from **regular teacher education** programmes sometimes have higher GPK than those with subject-specific qualifications





Fast-track training is linked to higher GPK than regular pedagogical training in **2 countries**, but lower GPK in **1 country**

Private school teachers sometimes have higher GPK than public school teachers



But GPK is **not** generally **related to school location** or intake of **disadvantaged** students

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Source: OECD (2026), *Results from the Teacher Knowledge Survey*, TALIS, OECD Publishing, Paris.

What is the Teacher Knowledge Survey?

This chapter introduces the concept of General Pedagogical Knowledge (GPK), as defined and assessed in the TALIS Teacher Knowledge Survey. It outlines why assessing teachers' GPK matters, provides sample assessment items and guides readers in interpreting the results.

Introduction

The quality of an education system cannot exceed that of its teachers (Barber and Mourshed, 2007[1]). Teachers play a key role in shaping their students' learning experiences and outcomes (Rivkin, Hanushek and Kain, 2005[2]), from early childhood (Araujo et al., 2016[3]) to tertiary education (Carrell and West, 2010[4]). Teachers matter for both cognitive and social and emotional skills (Jackson, 2018[5]), and their impact is long-lasting (Chetty, Friedman and Rockoff, 2014[6]).

Nevertheless, the literature has traditionally struggled to identify observable teachers' characteristics and practices that are demonstrably related to teaching effectiveness (Hanushek, 1971[7]; Chingos and Peterson, 2011[8]; Jackson, Rockoff and Staiger, 2014[9]). A better understanding of what makes teachers effective is crucial to designing targeted policies that raise the quality of education.

In a seminal paper on education reforms and improving teaching, Shulman (1987[10]) focused on knowledge as the basis of teacher expertise. Several different types of knowledge were identified as relevant for teachers in their work, including:

- Content knowledge
- Pedagogical content knowledge
- Curriculum knowledge
- Knowledge of learners and their characteristics
- Knowledge of educational contexts
- Knowledge of educational purposes
- General pedagogical knowledge (GPK)

The Teacher Knowledge Survey (TKS) focuses on general pedagogical knowledge, defined as:

> *(…) the specialised knowledge of teachers for creating effective teaching and learning environments for all students, independent of subject matter (OECD, 2025[11]).*

Previous studies have found that GPK is positively correlated with quality teaching (Ulferts, 2019[12]) and with teacher well-being and job satisfaction (Voss et al., 2015[13]). Moreover, it can be argued that GPK is what distinguishes teachers from other content specialists. Being the shared knowledge base of teachers across different subjects, GPK provides teachers with a common ground for reflection. It also offers a shared language that teachers can use to discuss their students' learning progress and well-being, and ways to improve teaching and learning support across subjects (Ulferts, 2021[14]). In this sense, it is one of the main pillars of teacher professionalism, and a distinctive element that makes teachers knowledge professionals.

In the early 2010s, the OECD launched the Innovative Teaching for Effective Learning (ITEL) project to investigate the role teachers' knowledge and competence play in effective teaching and learning. That conceptualisation (Guerriero and Révai, 2017[15]) suggests that teachers draw upon their pedagogical and content knowledge, as well as their affective-motivational competencies and beliefs about teaching to inform the decisions and judgements they make in their teaching approaches. These approaches are put into practice when teachers implement them in the classroom, facilitating student cognitive and socio-emotional learning. Knowledge gained about student learning informs educational research and teachers' own experience, updating the knowledge base acquired or transferred to pre- and in-service teachers through opportunities to learn, such as initial teacher education, professional learning and informal learning.

Despite its importance, one should not forget that GPK is only one element of teachers' professional knowledge, which, in turn, is only one element of the broader conceptual framework of teachers' professional competence developed in Guerriero and Révai (2017[15]). Neither GPK nor teachers'

knowledge in general is expected to account for all variation observed in student outcomes, teaching effectiveness or other outcomes such as job satisfaction or well-being.

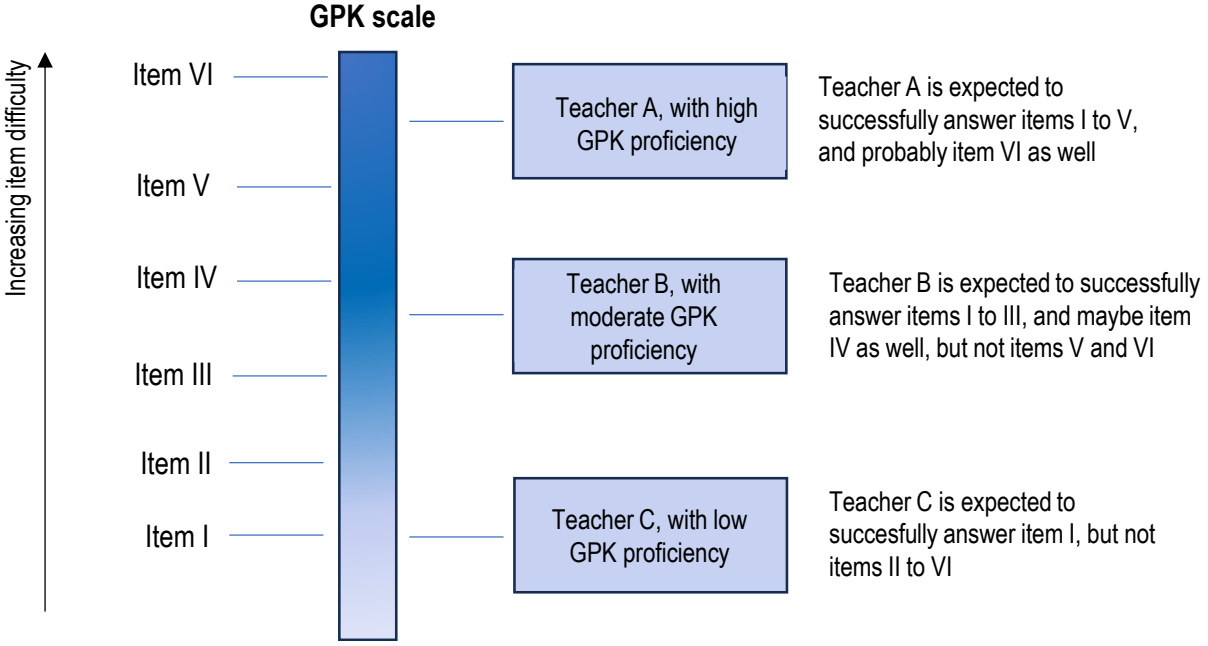
Following a successful pilot study that has shown the feasibility of assessing teachers' GPK with relatively simple instruments (Sonmark et al., 2017[16]), TKS is the first large-scale study providing internationally comparable measures of general pedagogical knowledge for representative samples of teachers across participating countries. About 20 000 teachers from more than 2 000 lower secondary schools from the eight participating countries responded to a battery of multiple-choice questions about various aspects of general pedagogical knowledge.[1] More detailed information on the conceptual framework underpinning the development of TKS and its GPK assessment component is provided in Annex A and in OECD (2025[11]).

Reporting and interpreting the results of the Teacher Knowledge Survey

The answers teachers gave to the items comprising the GPK assessment component of the Teacher Knowledge Survey were used to estimate the level of GPK proficiency in the population of teachers across the participating education systems. These estimates are expressed as scores on a (continuous and theoretically unbounded) scale, constructed by setting the average score across the eight participating education systems to 250 and the standard deviation to 50. Senate weights were used to set these values, so that each country would contribute equally, irrespective of size.[2]

On the same scale, one can assign each assessment item a "difficulty score" and rank it by difficulty. In other words, teachers' GPK and item difficulty are linked: in particular, teachers with a given GPK score have a 67% chance of correctly answering an item with the same difficulty score. Their chances decrease for more difficult items and increase for easier items, as illustrated in Figure 1.

Figure 1. The relationship between assessment items and teachers' general pedagogical knowledge



The link between respondents' demonstrated proficiency and assessment items allows us to divide the scale into "proficiency levels" and, importantly, to describe the knowledge teachers demonstrate at each

level based on item characteristics. Item developers drafted descriptors for each assessment item, summarising the knowledge assessed. These descriptors helped identify meaningful cut points on the scale, where noticeable shifts in cognitive demand or conceptual complexity of the items could be observed. Two cut points were then identified, creating three proficiency levels. The item descriptors were then aggregated at each level producing the descriptors presented in Table 1. The level descriptors characterise teachers' knowledge according to the three basic dimensions of GPK – instruction, assessment and learning (OECD, 2025[11]). Since the underlying scale reflects probabilistic tendencies, the descriptors should be seen as indicative profiles, useful for understanding the general nature of teachers' knowledge at different scale points, but not as definitive statements about any individual teacher.

Table 1. Teachers' knowledge at the three proficiency levels of the GPK scale

Level	Score range	Knowledge demonstrated by teachers at this level
Level 3 – Advanced	Equal to or above 287 score points	Level 3 teachers demonstrate advanced pedagogical knowledge reflecting conceptual depth and an awareness of current educational discourse. They can distinguish between nuanced instructional, learning and assessment practices, drawing on a well-developed understanding of established learning theories and psychometric principles, as well as contemporary approaches to teaching and learning. Their knowledge enables them to evaluate and differentiate among strategies and to draw valid inferences from learning and assessment data to inform pedagogical decision-making. **Instruction**: Teachers at Level 3 can distinguish between effective and ineffective strategies for a range of purposes, including supporting students to transfer learning across contexts, accommodating students with dyslexia and encouraging positive behaviour in classrooms. These teachers understand the defining features and purposes of instructional approaches designed to enhance student engagement and interaction, like flipped classrooms and online discussion boards. They recognise the conditions that define collaborative learning and can evaluate classroom management strategies in terms of their impact on teacher-student relationships. **Learning**: Teachers at Level 3 demonstrate knowledge of formal learning theories and can distinguish behaviourist principles from other theoretical perspectives. They can distinguish accurate information from misconceptions about learning difficulties such as dyslexia and understand concepts like adolescent cognitive development, metacognition and self-regulated learning. They can evaluate motivational and affective factors in student behaviour and can clearly distinguish between intrinsic and extrinsic motivation. They have a nuanced understanding of the concept of growth mindset and how it may be encouraged in classroom contexts. **Assessment**: Teachers at this level have a clear understanding of the distinction between formative and summative assessment purposes and between appropriate and inappropriate uses of assessment tools and data, including rubrics, raw scores and pre/post-testing. They understand psychometric concepts such as criterion-referenced assessment and can identify issues in classroom assessment related to construct validity. Their knowledge includes strategies for identifying student misconceptions and making valid interpretations of learning data.
Level 2 – Established	Between 240 and 286 score points	Level 2 teachers possess established knowledge of pedagogical concepts that support instructional adaptability, student motivation and informed assessment practices. They are familiar with a range of instructional strategies and learning principles and recognise their relevance to classroom scenarios. Their knowledge includes established theories related to student motivation, cognitive and metacognitive processes and instructional planning. They are aware of ways to adapt teaching to support diverse learners. They can recognise key psychological and developmental factors in learning and interpret assessment information to inform teaching decisions. **Instruction**: Teachers at Level 2 know a wide range of instructional tools and strategies, such as differentiated instruction, adaptive teaching and questioning techniques that support student thinking and engagement and accommodate for specific student learning needs. They recognise approaches to teaching that assist students to transfer knowledge and develop metacognitive strategies. They understand the benefits of spaced practice, and the purpose of strategies such as the "think aloud" method. They recognise strategies that maintain student attention and reduce conflict and show some awareness of key features of flipped classrooms. **Learning**: Teachers at Level 2 recognise general psychological characteristics of learners, including those related to early adolescence, motivation and self-concept. They can identify teacher responses that support growth mindset and self-efficacy and recognise learning behaviours associated with mastery goals. They know how executive functions and stress-reduction strategies relate to learning, and the qualities of feedback that

		support student learning. **Assessment**: Teachers at this level can identify formative and summative uses of assessment and know the purposes of diagnostic assessment. They can make some valid interpretations of student learning data and recognise appropriate follow-up questions to probe student thinking. They can identify suitable intentions for pre- and post-testing, the limitations of using correlational data for causal inference and appropriate strategies for diagnosing student misconceptions or forming instructional groups.
Level 1 – Foundational	Below 240 score points	Level 1 teachers demonstrate basic practical knowledge of pedagogical strategies fundamental to fostering a productive learning environment. This knowledge reflects common understandings about positive teacher-student interactions and strategies for engaging and motivating students. Teachers at this level demonstrate some practical knowledge related to the provision of feedback as well as to assessment consistency and fairness. **Instruction**: Teachers at Level 1 can identify some behaviour support and classroom management strategies that foster positive teacher-student relationships and minimise conflict. They know some teaching strategies designed to increase engagement. **Learning**: Level 1 teachers can recognise factors of teacher feedback that may influence student motivation, particularly for low-achieving students. **Assessment**: Teachers at this level are aware of basic accommodations to support assessment of students with learning needs and recognise collaborative practices that support consistent grading and assessment.

Note: The GPK scale is centred around an average score of 250 points across the eight participating countries (adjusting sample weights so that each country contributes equally, irrespective of the underlying population), and a standard deviation of 50 points.

Some examples of items used to assess general pedagogical knowledge

To give readers a better understanding of the kinds of questions used to assess teachers' general pedagogical knowledge, this section presents three sample items from the GPK assessment. All three sample items are in the form of "complex multiple-choice", demanding teachers to provide more than one response. This allowed for partial scoring: full credit was given only to teachers who answered all parts of the question correctly, and partial credit was awarded if only some answers were correct. The assessment also included simple multiple-choice items, in which teachers had to select one of four options to answer a question.

A consequence of the possibility of giving partial credit is that the item can be assigned to two different levels of difficulty on the GPK scale and potentially to different proficiency levels (Table 1). This holds for all three questions presented below. If a question is at both Levels 2 and 3, it means that a teacher at Level 2 is likely to receive partial credit (answering only some parts correctly) and unlikely to receive full credit. A teacher at Level 3, on the other hand, will likely get full credit, while a teacher at Level 1 will likely fail all parts of the question.

The three questions presented below (Figure 2, Figure 3 and Figure 4) span all three proficiency levels on the GPK scale. Each targets a specific dimension of the GPK construct (instruction, learning and assessment). Information is also provided on the transversal subdimensions along which all GPK questions were classified, depending on whether they elicited practice-based or theoretical knowledge, and on whether they focused on core knowledge or on emergent priorities for teacher knowledge (OECD, 2025[11]).

Figure 2. Sample item: Positive behaviour support strategies

POSITIVE BEHAVIOUR SUPPORT STRATEGIES

Classroom management can include the use of positive behaviour support strategies.

Decide whether each of the following strategies is an example of a strategy that supports positive behaviour in the classroom.

Select one option in each row.

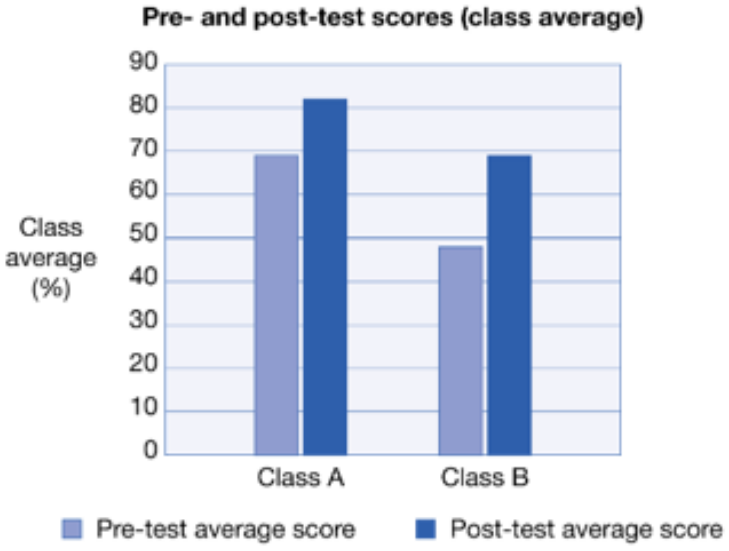
Strategy	Example	Not an example	
Teaching students routines for how to collaborate during group work.	☐ 1	☐ 2	*KTFPBS1A*
Highlighting incidents of unacceptable behaviour that arise in the classroom.	☐ 1	☐ 2	*KTFPBS1B*
Prompting students by reminding them about appropriate behaviour before they begin tasks.	☐ 1	☐ 2	*KTFPBS1C*
Facilitating the <class> to collaboratively build a list of classroom expectations and behaviours.	☐ 1	☐ 2	*KTFPBS1D*
TKS_General_PQ_Positive_Behaviour_Support			

Positive Behaviour Support Strategies: Item Characteristics	
Domain	Instruction
Scoring key	E; N; E; E
Scoring rule	4 correct: Full Credit (2); 3 correct: Partial Credit (1); Less than 3 correct: No credit (0)
Item difficulty	206 points (Partial Credit); 308 points (Full Credit)
Item level	Level 1 (Partial Credit); Level 3 (Full Credit)
Type of knowledge	Practice-based
Theme	Core knowledge

Figure 3. Sample item: Pre- and post-test scores

PRE- AND POST-TEST SCORES

This graph compares average results from pre- and post-test scores for two <classes> of <Year 8> students.



The teacher used the same tests for the two <classes>. The tests were written to assess knowledge and skills for a topic that the students have been learning.

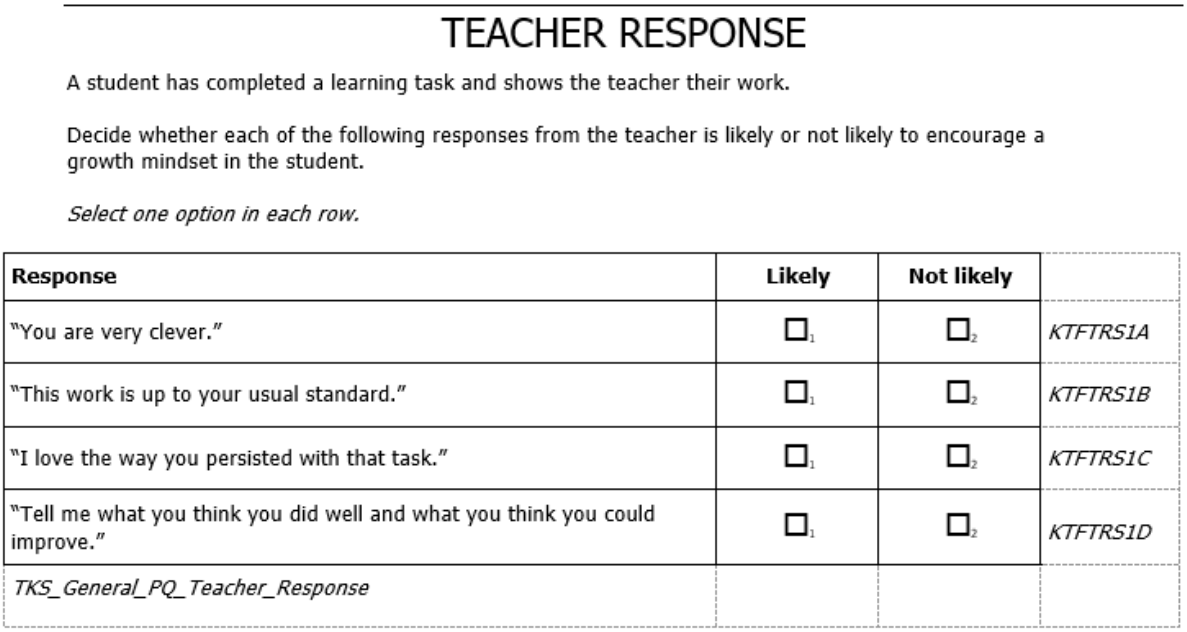
Decide whether each of the following statements is a valid interpretation of this data.

Select one option in each row.

Statement	Valid	Not valid	
<Class> A showed more improvement than <Class> B.	☐1	☐2	*KTFPPS1A*
<Class> B is operating one year level below <Class> A.	☐1	☐2	*KTFPPS1B*
<Class> A is more proficient in this topic than <Class> B.	☐1	☐2	*KTFPPS1C*
<Class> B needed a modified version of the test, but not <Class> A.	☐1	☐2	*KTFPPS1D*
TKS_General_PQ_Pre-and_Post-Test_Scores			

Pre- and Post-Test Scores: Item Characteristics	
Domain	Assessment
Scoring key	NV; NV; V; NV
Scoring rule	4 correct: Full Credit (2); 3 correct: Partial Credit (1); Less than 3 correct: No credit (0)
Item difficulty	263 points (Partial Credit); 315 points (Full Credit)
Item level	Level 2 (Partial Credit); Level 3 (Full Credit)
Type of knowledge	Practice-based
Theme	Core knowledge

Figure 4. Sample item: Teacher response



TEACHER RESPONSE

A student has completed a learning task and shows the teacher their work.

Decide whether each of the following responses from the teacher is likely or not likely to encourage a growth mindset in the student.

Select one option in each row.

Response	Likely	Not likely	
"You are very clever."	☐ 1	☐ 2	*KTFTRS1A*
"This work is up to your usual standard."	☐ 1	☐ 2	*KTFTRS1B*
"I love the way you persisted with that task."	☐ 1	☐ 2	*KTFTRS1C*
"Tell me what you think you did well and what you think you could improve."	☐ 1	☐ 2	*KTFTRS1D*
TKS_General_PQ_Teacher_Response			

Teacher Response: Item Characteristics	
Domain	Learning
Scoring key	N; N; L; L
Scoring rule	4 correct: Full Credit (2); 3 correct: Partial Credit (1); Less than 3 correct: No credit (0)
Item difficulty	258 points (Partial Credit); 311 points (Full Credit)
Item level	Level 2 (Partial Credit); Level 3 (Full Credit)
Type of knowledge	Theoretical
Theme	Emergent priorities for teacher knowledge

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Notes

[1] The number of participating teachers ranges from 1 362 in the United States (from 145 schools) to 4 584 in Morocco (from 398 schools). See Table A C.4 in Annex C.

[2] More details about the underlying methodology for the construction of the GPK scale can be found in OECD (forthcoming[17]).

1 The importance of general pedagogical knowledge

This chapter presents teachers' results on the general pedagogical knowledge assessment and how teachers with different levels of general pedagogical knowledge are distributed within countries and across schools. The chapter also explores how general pedagogical knowledge relates to a range of teachers' professional outcomes.

Highlights

- Results from the Teacher Knowledge Survey (TKS) provide evidence that **general pedagogical knowledge (GPK) may contribute to improving both students' and teachers' outcomes.** In countries **where teachers scored higher on GPK,** 15-year-old **students** tend to **perform better in mathematics and reading as assessed by the Programme for International Student Assessment (PISA)**. At the individual level, **teachers with higher GPK report lower levels of work-related stress**, suggesting that they can better cope with a wide range of job demands**.** Possibly thanks to better classroom management practices, **they spend** less time keeping order in the classroom and **more time on actual teaching and learning.**
- **Teachers with more general pedagogical knowledge** are selective with their teaching practices. They **are more likely to consider the specific contexts in which they are teaching** and adapt their practices, for example, by adjusting the difficulty of practice tasks to support student learning.
- **Teachers in Portugal achieved the highest scores in the GPK assessment**: 274 score points on average, compared to 266 across the four OECD countries participating in the survey (Chile, Poland, Portugal and the United States). Teachers in Poland, Croatia and the United States scored slightly below 270 points, while teachers in Chile achieved 254 score points on average. Average scores in the other participating countries were lower: 225 score points in South Africa, 224 in Morocco and 218 in Saudi Arabia.
- **Teachers in the United States show considerable variation in GPK,** with 175 score points separating the top and bottom 10% of teachers. In the other participating countries, this same gap ranges between 50 points in Morocco and 86 points in South Africa.
- Variation in GPK within schools is larger than variation in GPK across schools. As a result, **students across different schools tend to have access to teachers with similar GPK, on average**. However, **teachers with the highest GPK scores are not evenly distributed across schools.** This unevenness is largest in South Africa and smallest in Portugal. In most countries, no systematic differences in teachers' GPK are observed according to school characteristics. **In South Africa, teachers in schools with a higher intake of disadvantaged students tend to have lower GPK**. The opposite is true in Morocco.

Teachers' general pedagogical knowledge base

The Teacher Knowledge Survey shows that assessing teachers' general pedagogical knowledge is feasible and meaningful. These results provide the first international benchmark of teachers' knowledge base in general pedagogy and highlight the need for policy interventions to strengthen this important component of teachers' professional competencies.

Teachers in Portugal achieved the highest results (274 score points, on a scale where the average score across the eight participating countries equals 250 score points and the standard deviation equals 50 score points). Average scores of teachers in Portugal are eight points above the average across the four OECD countries that participated in the Teacher Knowledge Survey (Chile, Poland, Portugal and the United States – henceforth referred to as "the average" or "the international average"; Table 1.1 and Table E.1.1).

In Poland, Croatia and the United States, average scores are also above the average of the four participating OECD countries, although only in Poland is this difference statistically significant (Table 1.1).

Demonstrated GPK is lower than the OECD average in Chile (254 score points) and, by a larger amount, in South Africa, Morocco and Saudi Arabia (225, 224 and 218 score points, respectively).

While average scores are a useful metric for international benchmarking, they do not describe the extent to which teachers within a given country differ in GPK proficiency. Ultimately, students may be confronted with actual teachers who are very different from the "average" teacher. It is therefore important to look at the entire distribution of GPK scores.

Table 1.1. Comparison of countries based on average general pedagogical knowledge scores

Statistically significantly above the OECD average

Not statistically significantly different from the OECD average

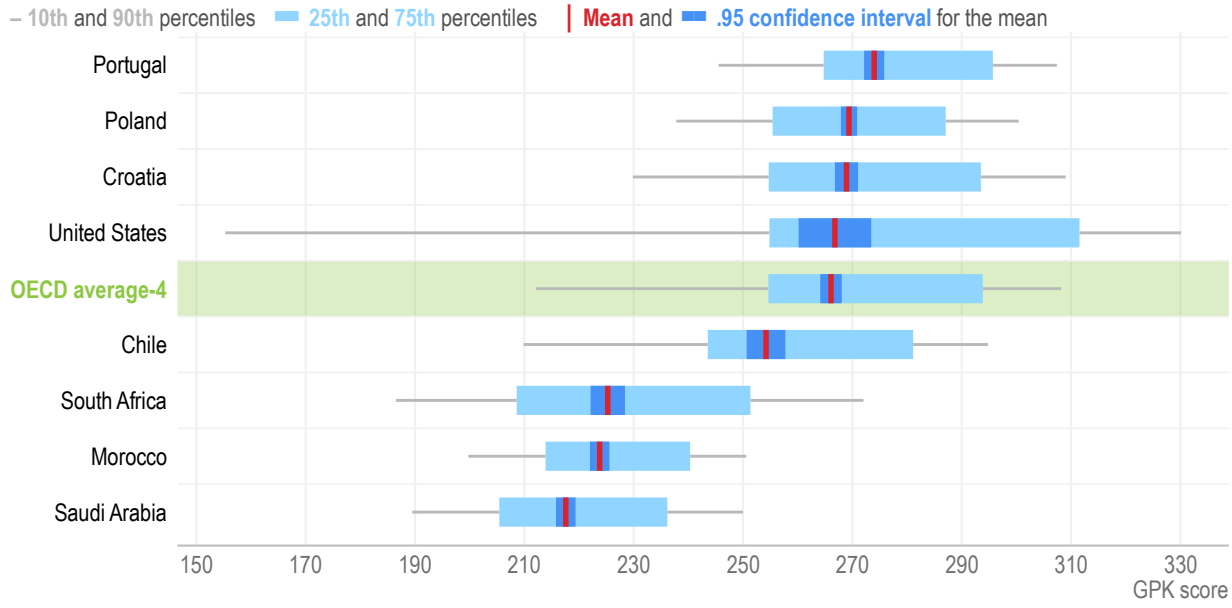
Statistically significantly below the OECD average

Mean score	Country	Mean scores in the country are not statistically different from mean scores in…
274	Portugal	
269	Poland	Croatia, United States
269	Croatia	Poland, United States, OECD average-4
267	United States	Croatia, Poland, OECD average-4
266	**OECD average-4**	**Croatia, United States**
254	Chile	
225	South Africa	Morocco
224	Morocco	South Africa
218	Saudi Arabia	

Source: OECD, *TALIS TKS 2024 Database*, Table E.1.1.

Figure 1.1 shows that countries with similar average scores can be characterised internally by very different distributions. Compare, for example, Poland and the United States. The average score on the GPK assessment is similar in the two countries, but while in Poland most teachers score close to the national average, in the United States, a large number of teachers achieve either very high or very low scores. The top quarter of teachers in the United States score above 312 points, much higher than the cut point above which the top quarter of teachers in Poland sit.[1] At the other end of the distribution, however, the cut point below which the bottom quarter of teachers sit is 255 points in both countries. The bottom 10% of teachers in the United States score below 155 points, while the bottom 10% of teachers in Poland score below 237 points (Table E.1.1).

Figure 1.1. The distribution of general pedagogical knowledge



Note: Countries are sorted according to the mean GPK scores of their teachers.
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.1.

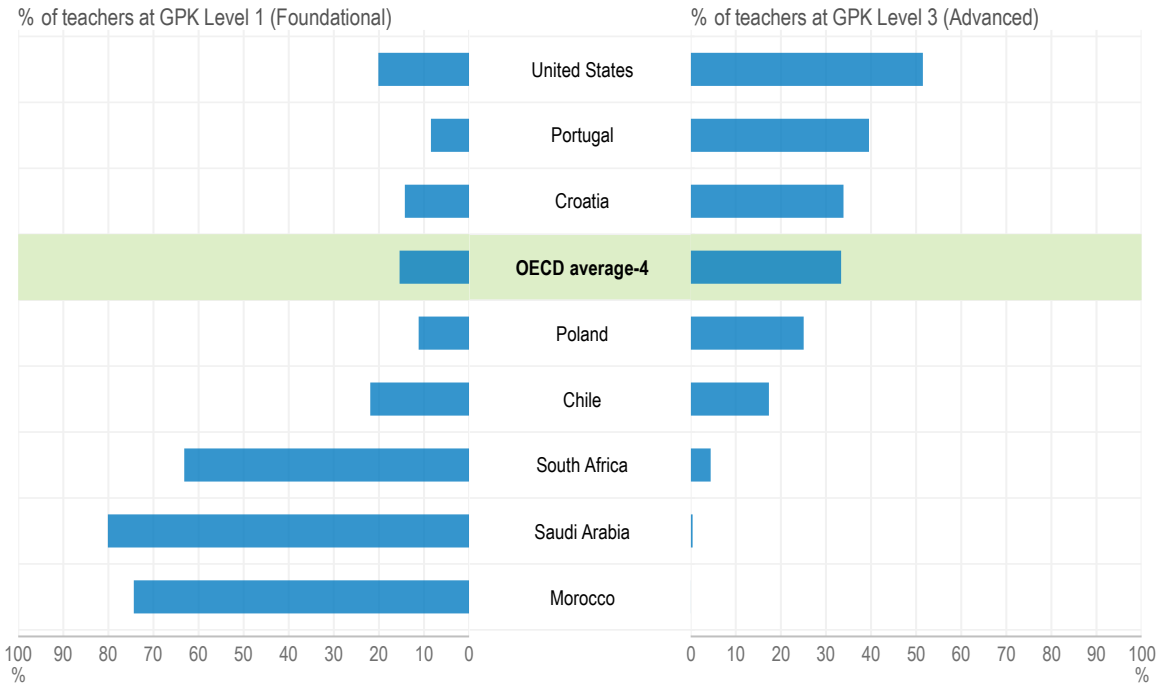
StatLink https://stat.link/t89uhp

Differences between teachers within the same country are often larger than cross-country differences in average scores. On average among the four OECD countries participating in TKS (henceforth, "on average"), 39 points separate teachers at the top and bottom quarter (interquartile range), and 96 points separate the top and bottom 10% of teachers (interdecile range; Table E.1.1).

The interquartile range is as high as 57 points in the United States and as low as 26 points in Morocco and lies between 30 and 40 points in most other countries; the interdecile range reaches 175 points in the United States, and only 51 points in Morocco, ranging between 60 and 86 points in the other countries.

Consistent with the large dispersion in the distribution of GPK, teachers in the United States have the highest share scoring at Level 3 (51%), but also a sizeable portion scoring at Level 1 (20%; Figure 1.2 and Table E.1.2; see "What is the Teacher Knowledge Survey?" and OECD (forthcoming[1]) for a description of the proficiency levels). In Chile, a similar share of teachers score at Level 1 (22%), but a much smaller share (17%) score at Level 3.

Figure 1.2. Share of teachers at different levels of general pedagogical knowledge



Note: Countries are sorted in descending order according to the share of teachers at Level 3 (Advanced). For a description of the knowledge possessed by teachers at different levels and a discussion of how the proficiency levels were established, see Table 1 in "What is the Teacher Knowledge Survey?" and OECD (forthcoming[1])
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.2.

StatLink https://stat.link/qavd49

Portugal stands out as a system that equips the vast majority of its teachers with a good level of GPK. It has the second-highest share of teachers scoring at Level 3 (40%) and the lowest share at Level 1 (8%). In Poland, only 11% of teachers scored at the lowest level of GPK, but the share scoring at Level 3 is below average at 25%. In Croatia, a higher share of teachers scored at Level 3 (34%), but also a higher share scored at Level 1 (14%). In South Africa, Saudi Arabia and Morocco, the majority of teachers scored at Level 1. In Morocco and Saudi Arabia, fewer than 1% of teachers scored at Level 3, whereas 4% did so in South Africa.

General pedagogical knowledge matters

Theory positions general pedagogical knowledge as a core element of teachers' professional competences, which underpin effective teaching (Guerriero, 2017[2]; OECD, 2025[3]). A growing body of empirical research has begun to test this claim, examining whether teachers who score higher on GPK assessments also teach more effectively, produce better outcomes for their students and enjoy better professional outcomes themselves. A systematic review of international evidence found a moderate positive effect of GPK on various indicators of teaching quality, as well as on student outcomes (Ulferts, 2019[4]). These findings suggest that GPK matters not only for what teachers do in the classroom — including how they structure lessons, support student learning and manage the classroom environment — but also for what students ultimately learn.

Beyond teaching and learning, more recent work has extended this line of inquiry to teachers' own professional well-being. Lauermann and König (2016[5]) demonstrated that GPK can function as a protective factor against burnout, both directly and indirectly through its positive association with teaching self-efficacy, suggesting that stronger pedagogical knowledge helps teachers cope with the demands of the profession.

This section draws on the results of the GPK assessment and the contextual information contained in the TKS questionnaire to assess the relationship between teachers' demonstrated pedagogical knowledge and students' outcomes, teaching practices and teachers' professional outcomes.

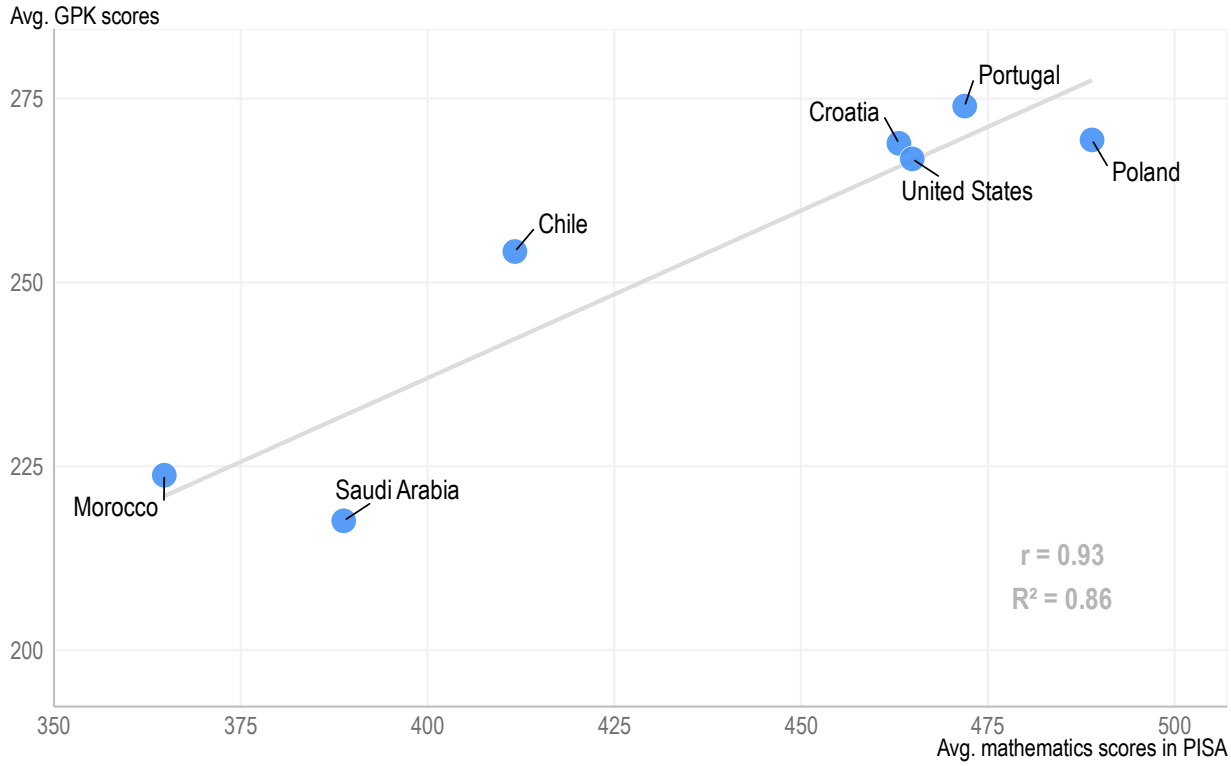
General pedagogical knowledge and students' outcomes

The Teacher Knowledge Survey does not link individual teachers and students, which prevents an investigation of the relationship between teachers' characteristics (including their general pedagogical knowledge) and students' outcomes. However, that relationship can be evaluated across countries. Figure 1.3 shows that in countries where teachers' average GPK scores are higher, 15-year-old students achieved better results in mathematics in the PISA 2022 survey, and a similar relationship holds for students' results in reading.

This correlation is based on only seven countries that participated in both PISA and TKS, and may therefore not be very robust. Moreover, it should not be interpreted as evidence of a causal link between teachers' general pedagogical knowledge and students' outcomes. It does, however, provide strong suggestive evidence that teachers' knowledge may have a concrete impact on students' learning, and suggests that investments in teacher professionalism can be vital.

Figure 1.3. Teachers' GPK and students' outcomes

Correlation between average scores in GPK in TALIS TKS 2024 and average mathematics scores of 15-year-old students in PISA 2022



Note: r is the Pearson correlation coefficient between average PISA mathematics scores and average GPK scores; R^2 is the R-squared from a linear regression of average GPK scores on average PISA mathematics scores.
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.1; OECD, PISA 2022 Database, Table I.B1.2.1.

StatLink https://stat.link/gpitrl

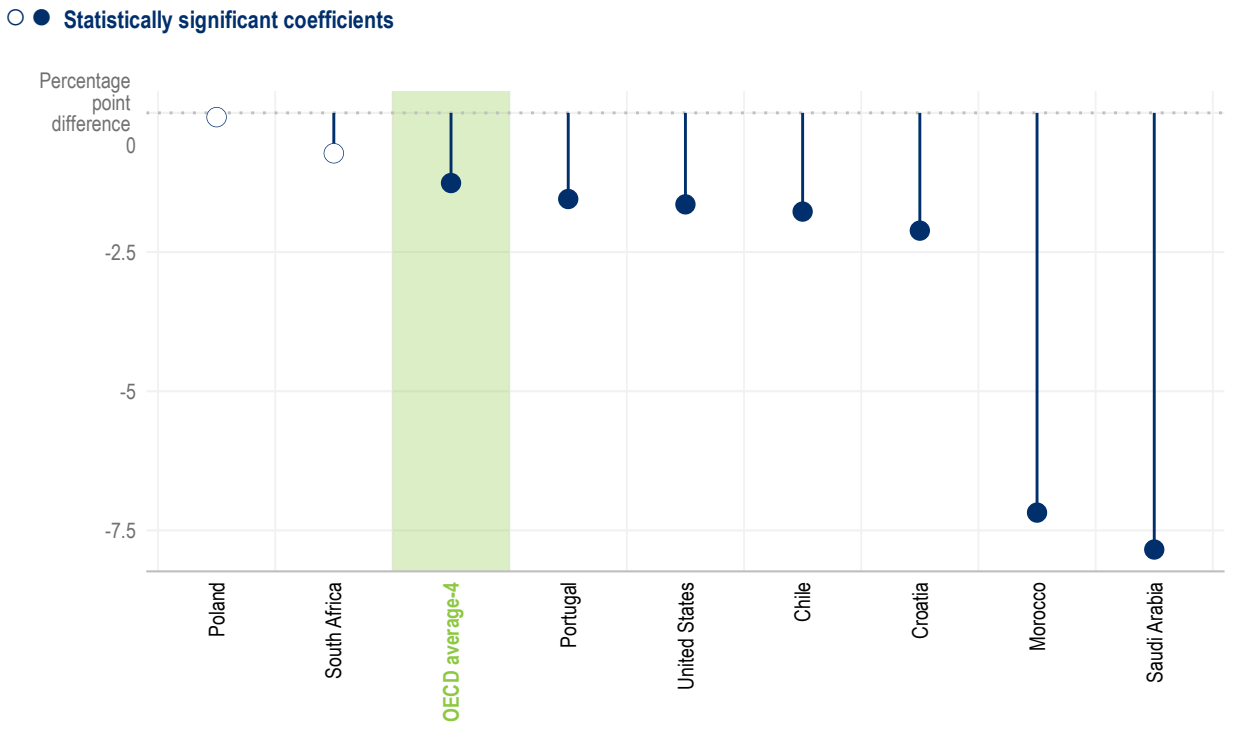
General pedagogical knowledge and classroom management

Classroom management is a key aspect of instruction as it supports the engagement of all students in appropriately paced learning (OECD, 2025[3]). It requires teachers to be aware of all classroom activities and to handle the development of a range of (possibly simultaneous) events to maintain students' attention on relevant tasks. Teachers may rely on a range of techniques and strategies in this endeavour, including, but not limited to, clarifying classroom expectations, establishing routines, using consistent consequence systems, or organising seating charts.

Teachers with more general pedagogical knowledge tend to report spending less time on classroom management. Holding constant a range of teachers and class characteristics (teachers' gender, age, years of experience, as well as class size and class composition), an increase of one-standard-deviation on the GPK scale is negatively associated with the reported share of class time spent on keeping order and maintaining discipline in all countries except Poland and South Africa (Table E.1.3 and Figure 1.4). Differences are most pronounced in Saudi Arabia, where this increase in GPK is associated with a decrease of almost 8 percentage points (p.p.) in the share of class time reportedly spent on keeping order. To put this number in perspective, teachers in Saudi Arabia report spending, on average 19% of class time keeping order and maintaining discipline (17% across OECD countries participating in TKS; Table E.1.4).

Figure 1.4. General pedagogical knowledge and time spent on maintaining discipline

Change in the average share of time teachers report typically spending on keeping order (maintaining discipline) in a target class[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Notes: Countries are sorted in descending order of the size of the coefficient.
Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK and the share of class time spent on keeping order in a typical class, while those below 0 reflect a negative relationship.
1. These data refer to a class randomly selected from teachers' current weekly timetable during the week preceding the survey.
2. Results based on linear regression analysis, showing the change in the outcome variable associated with a one-standard-deviation increase in the explanatory variable. The regressions control for teacher characteristics (gender, age and years of teaching experience) and class characteristics (class size and the shares of students in the class that teachers report having difficulties understanding the language of instruction, being low academic achievers and having special education needs).
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.3.

StatLink https://stat.link/s9j26o

The lower amount of time spent on maintaining order by more knowledgeable teachers is reflected in the reported frequency of certain behaviour management practices. In most countries, teachers with higher GPK (henceforth, "knowledgeable teachers") are less likely to report that they "frequently" or "always" tell students to listen to what they say (Table E.1.5). Similarly, having higher GPK tends to be negatively associated with frequently telling students to quiet down at the start of a lesson, telling students to follow classroom rules, and calming disruptive students.

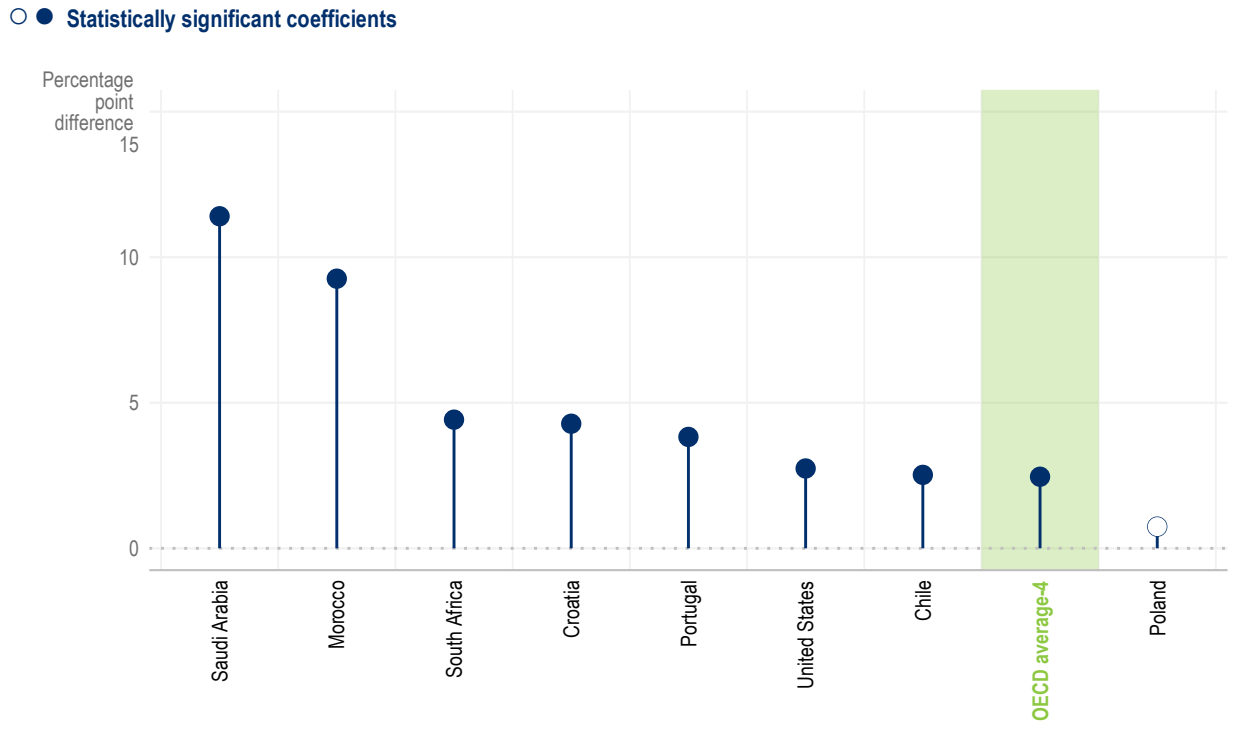
It's likely that teachers with higher GPK have implemented effective classroom management systems so they do not have to constantly discipline students. An alternative explanation could be that teachers with higher GPK are systematically assigned classes that are easier to teach, or students who naturally tend to behave better. The former interpretation is arguably more likely, though, given that the analysis controls for classroom composition and that teachers are asked to report on a randomly chosen class they teach.[2]

Teachers with higher GPK also tend to report spending less of their class time on administrative tasks: a one-standard-deviation increase in GPK is associated with a reduction in the share of class time spent on administrative tasks ranging between 0.6 p.p. in Poland and 3.6 p.p in Saudi Arabia (Table E.1.3). On average, teachers report spending about 10% of their class time on administrative tasks (Table E.1.4).

Spending less time on maintaining discipline and on performing administrative tasks leaves more time for actual teaching and learning. In all countries but Poland, higher GPK is positively associated with the share of class time reportedly spent on actual teaching and learning (Table E.1.3). This could contribute to the observed positive association between GPK and students' outcomes. On average, a one-standard-deviation increase in GPK is associated with a 2 p.p increase in the share of class time devoted to actual teaching and learning, with larger coefficients estimated for Morocco (9 p.p.) and Saudi Arabia (11 p.p.). Considering that, on average, teachers report spending 75% of their class time on actual teaching and learning in Morocco, and 69% in Saudi Arabia, these would translate to increases of 12% (in Morocco) and of 16% (in Saudi Arabia) in actual time spent on teaching and learning.

Figure 1.5. General pedagogical knowledge and time spent on actual teaching and learning

Change in the average share of time teachers report spending on actual teaching and learning in a typical lesson[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Note: Countries are sorted in descending order of coefficient size.
Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK and the share of class time spent on keeping order in a typical class, while those below 0 reflect a negative relationship.
1. These data refer to a class randomly selected from teachers' current weekly timetable during the week preceding the survey.
2. Results based on linear regression analysis, showing the change in the outcome variable associated with a one-standard-deviation increase in the explanatory variable. The regressions control for teacher characteristics (gender, age and years of teaching experience) and class characteristics (class size and the shares of students in the class that teachers report having difficulties understanding the language of instruction, being low academic achievers and having special education needs).
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.3.

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Teachers with more general pedagogical knowledge tailor their teaching practices

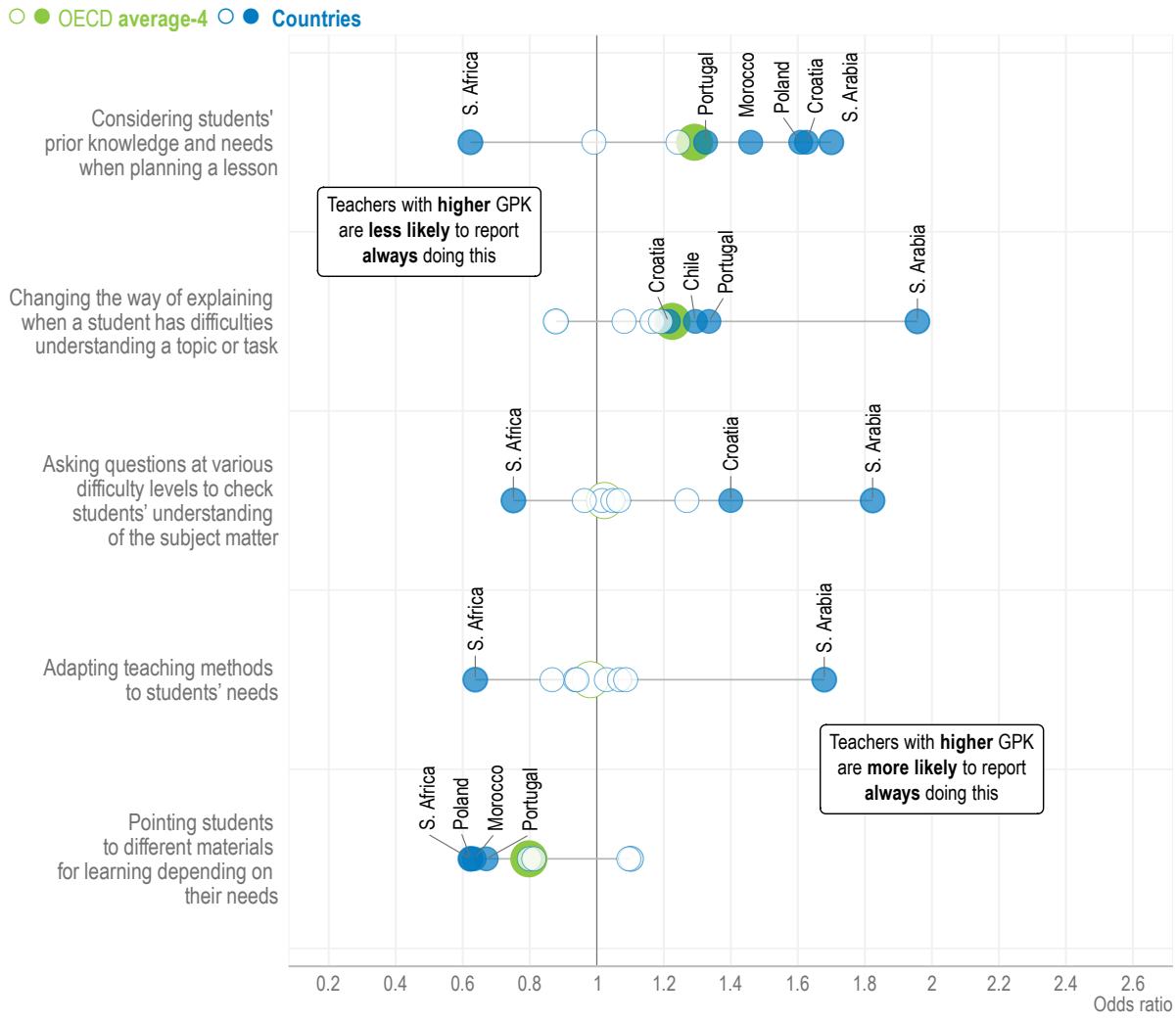
Teaching is a complex activity that requires professional judgement to select the best approach in a continuously evolving environment. In preparing lessons, teachers must make decisions about relevant teaching strategies, as well as the content, tasks and materials needed. In the classroom, teachers need to make ongoing decisions about how to interact with students and whether planned activities need to be adapted in response to classroom events. GPK can help to guide teachers' choices when adapting their teaching practices to the demands of specific classroom situations.

The TKS contextual questionnaire asked teachers to report how often they engage in certain teaching practices. Some of these practices explicitly focus on adapting teaching to the concrete context teachers face ("adaptive practices"). Other questions asked about practices focused on students' cognitive activation and others about assessment practices.

TKS results suggest that knowledgeable teachers strongly believe in tailoring their teaching to specific students' needs. In the majority of countries participating in TKS, the odds that teachers report "always" considering students' prior knowledge and needs when planning a lesson increase when teachers have higher GPK (Figure 1.6). Moreover, GPK can help teachers tailor their teaching within a lesson. In half of the participating countries, teachers with higher GPK are more likely to report "always" changing their approach to explaining when a student has difficulties understanding a topic or task (Figure 1.6).

Figure 1.6. Adaptive teaching practices and general pedagogical knowledge

Change in the likelihood of lower secondary teachers reporting that they "always" use the following practices[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D).
1. Binary variables: the reference category refers to teachers reporting that they "never or almost never", "occasionally", or "frequently" engage in the different practices.
2. Results based on 5 separate binary logistic regressions. The estimated odds ratios from each regression are displayed on a different line. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below 1 denotes a negative association; an odds ratio above 1 indicates a positive association; and an odds ratio of 1 means that there is no association. The regressions control for teacher characteristics (gender, age and years of teaching experience) and class characteristics (class size and the shares of students in the class that teachers report to having difficulties understanding the language of instruction, being low academic achievers and to having special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.6.

StatLink https://stat.link/axtn2w

However, tailoring teaching may not always be feasible or possible because of a lack of time, resources or an excessively heterogeneous composition of the class. In half the countries studied, more knowledgeable teachers are less likely to report "always" referring students to different materials for

learning depending on their needs. This could be because teachers with higher GPK select other adaptive teaching strategies that are less time-consuming to prepare and complex to implement than differentiated teaching materials (Gaitas and Alves Martins, 2016[6]). Also, few consistent relationships emerge between GPK and teachers reporting that they "always" adapt their teaching methods to students' needs. This could be because teachers account for students' prior knowledge and needs by adapting lesson content or their explanations, rather than by adapting their teaching methods – especially if they view differentiation strategies as being part of their regular practice.

When examining other teaching practices, a broad pattern emerges: teachers with higher GPK tend to be less likely to "always" adopt a given practice. This could again be evidence of the tendency of teachers with higher GPK to pick the tool appropriate to a specific situation – rather than blindly following prescribed lesson plans or teaching methods – or to appreciate the importance of diversifying teaching practices and the complementarities among them.

Having higher GPK, for example, is linked to a lower likelihood that teachers report "always" letting students practise similar tasks until every student has understood the subject matter (Table E.1.7). This relationship is statistically significant in Croatia, Poland, Portugal and South Africa. One possible explanation is that teachers with greater pedagogical knowledge may be more effective at supporting student progress, as they spend less time on tasks pitched at a similar level rather than increasingly challenging ones.

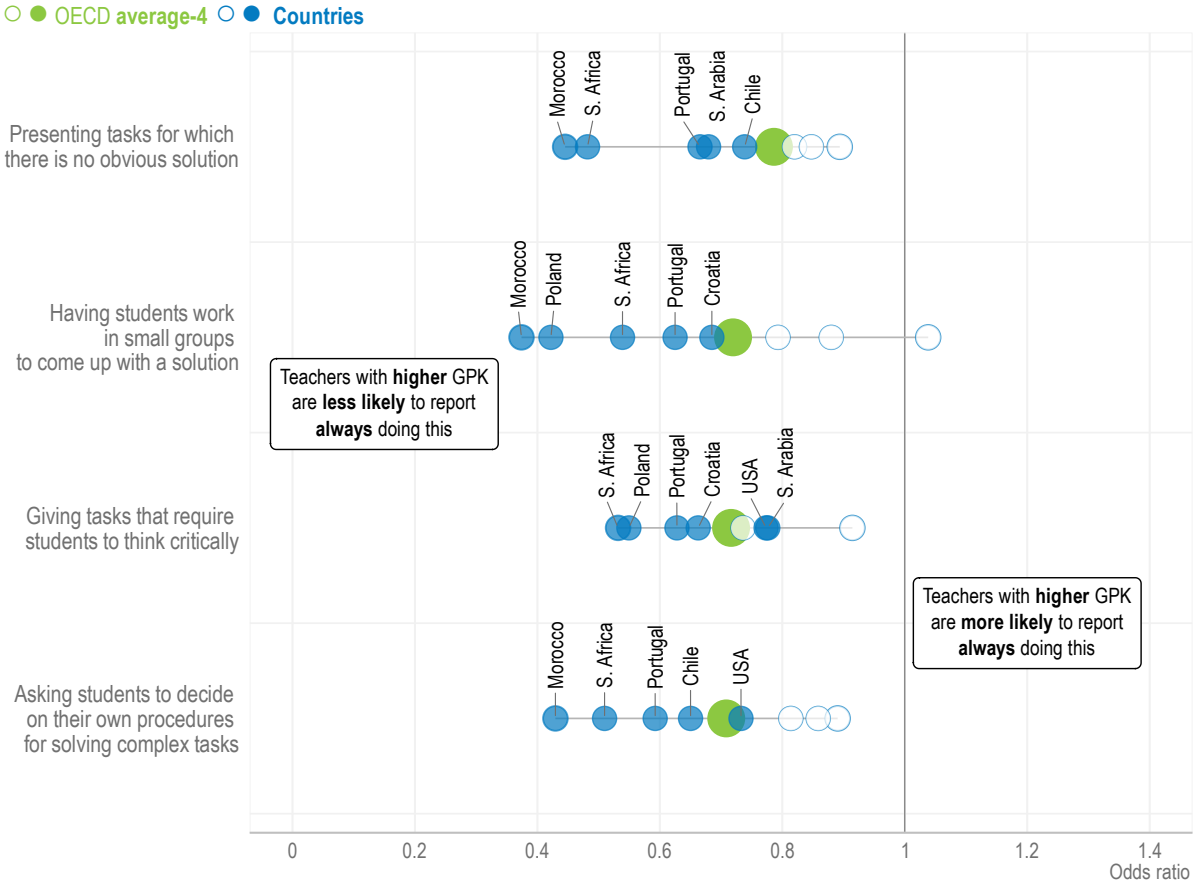
A consistent pattern emerges: teachers with higher GPK tend to report "always" performing only a limited number of teaching practices. This could reflect a consensus, among more knowledgeable teachers, on the effectiveness of these approaches. This may be the case, for example, for selecting tasks for student practice that gradually increase in difficulty. In Croatia, Morocco and Poland, GPK is positively associated with teachers "always" reporting doing this (Table E.1.7). Because more knowledgeable teachers report taking students' growing abilities into account when setting tasks, this finding aligns with the results above, demonstrating a positive association between GPK and teachers' consideration of students' prior knowledge in lesson planning. Possibly for a similar reason, teachers with higher GPK tend to report that they do not "always" let students practise similar tasks.

Teachers with higher GPK tend to be particularly discerning in their use of teaching practices for cognitive activation that aim to foster deep conceptual understanding and problem-solving skills. A one-standard-deviation increase in GPK is consistently associated with a decrease in the odds that teachers report "always" using a range of related practices (Table E.1.8, Figure 1.7). In all countries except Chile and Morocco, teachers with higher GPK are less likely to report "always" giving tasks that require students to think critically. Negative relationships are similarly found in five of the eight participating countries for presenting tasks for which there is no obvious solution, having students work in small groups to come up with a joint solution to a problem, and asking students to decide on their own procedures for solving complex tasks.

These findings are consistent with the positive relationships between teachers' GPK and their consideration of students' prior knowledge in lesson planning, as well as their selection of tasks that gradually increase in difficulty. Teaching practices for cognitive activation engage students in higher-level thinking, which requires them to work from a solid knowledge base – without which a task may become too challenging.

Figure 1.7. Teaching practices for cognitive activation and general pedagogical knowledge

Change in the likelihood of lower secondary teachers reporting that they "always" use the following practices[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D).
1. Binary variables: the reference category refers to teachers reporting that they "never or almost never", "occasionally", or "frequently" engage in the different practices.
2. Results based on 5 separate binary logistic regressions. The estimated odds ratios from each regression are displayed on a different line. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below 1 denotes a negative association; an odds ratio above 1 indicates a positive association; and an odds ratio of 1 means that there is no association. The regressions control for teacher characteristics (gender, age and years of teaching experience) and class characteristics (class size and the shares of students in the class that teachers report having difficulties understanding the language of instruction, being low academic achievers and having special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.8.

StatLink https://stat.link/vyxz6k

When looking at assessment practices, the use of students' self-assessment stands out as something that teachers with higher GPK are consistently less likely to "always" do. This is the case in all countries except Chile and Croatia, where the relationship, although negative, is surrounded by too large a margin of uncertainty and cannot therefore be considered statistically different from zero (Table E.1.9, Figure 1.8). This suggests that more knowledgeable teachers are cautious about over-reliance on students' self-assessments, although they may incorporate them in their teaching from time to time as part of their wider repertoire of assessment strategies, depending on their goals for a particular lesson.

Figure 1.8. Assessment practices and general pedagogical knowledge

Change in the likelihood of lower secondary teachers reporting that they "always" use the following practices[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]

Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D).
1. Binary variables: the reference category refers to teachers reporting that they "never or almost never", "occasionally", or "frequently" engage in the different practices.
2. Results based on separate binary logistic regressions. The estimated odds ratios from each regression are displayed on a different line. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below 1 denotes a negative association; an odds ratio above 1 indicates a positive association; and an odds ratio of 1 means that there is no association. The regressions control for teacher characteristics (gender, age and years of teaching experience) and class characteristics (class size and the shares of students in the class that teachers report having difficulties understanding the language of instruction, being low academic achievers and having special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.9.

StatLink https://stat.link/nfztya

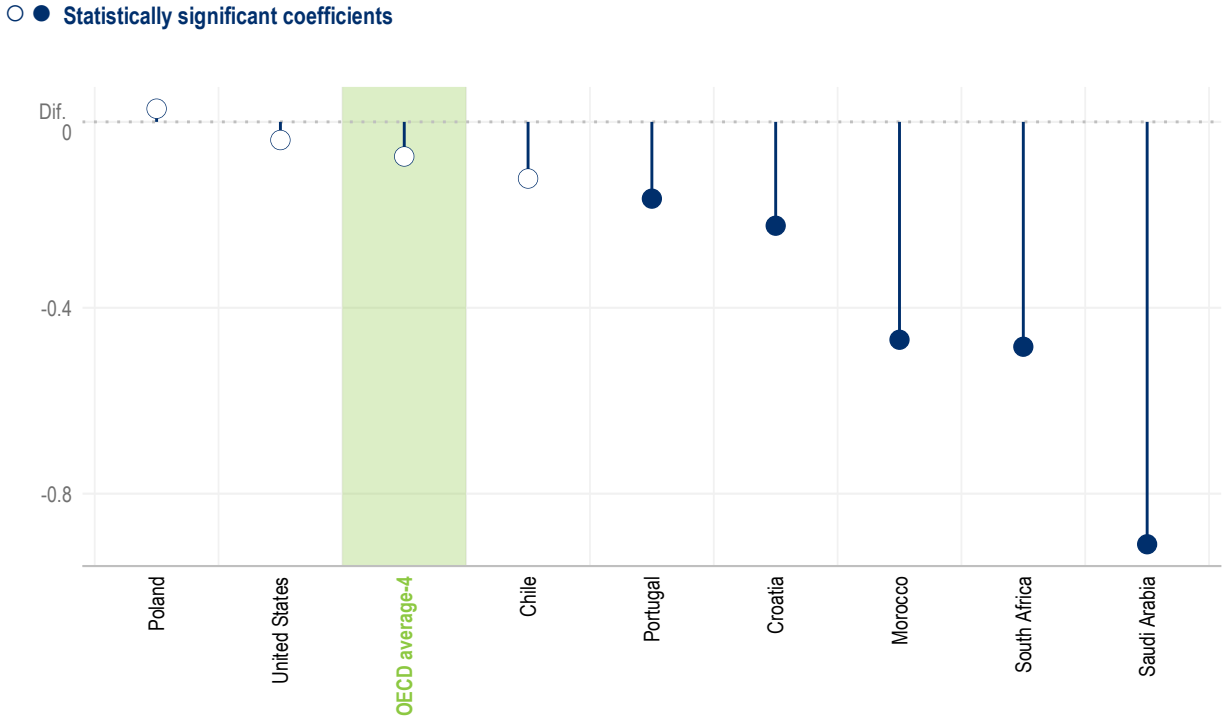
Administering an assessment at the end of a unit or a block of lessons, on the other hand, appears to be a practice favoured by knowledgeable teachers, with those in Croatia, Morocco and Poland more likely to report "always" doing this (Table E.1.9).

General pedagogical knowledge and teachers' professional outcomes

General pedagogical knowledge is an important resource that teachers can draw upon when coping with the demands of their job. It can potentially affect not only students' outcomes (through the adoption of more effective teaching practices) but also teachers' professional outcomes, such as their well-being. For example, GPK tends to be negatively related to teachers' reports of experiencing stress from students' behaviour. After accounting for a range of teacher and school characteristics, in five of the eight countries participating in TKS (Croatia, Morocco, Portugal, Saudi Arabia and South Africa), an increase of one-standard-deviation on the GPK scale is associated with a reduction in the scale of student behaviour stress (Table E.1.10 and Figure 1.9).[3] The relationship is particularly strong in Saudi Arabia, where a one-standard-deviation increase in GPK is associated with a reduction in the scale of student behaviour stress of about 45% of a standard deviation.[4]

Figure 1.9. Stress from student behaviour and general pedagogical knowledge

Change in the scale of student behaviour stress[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



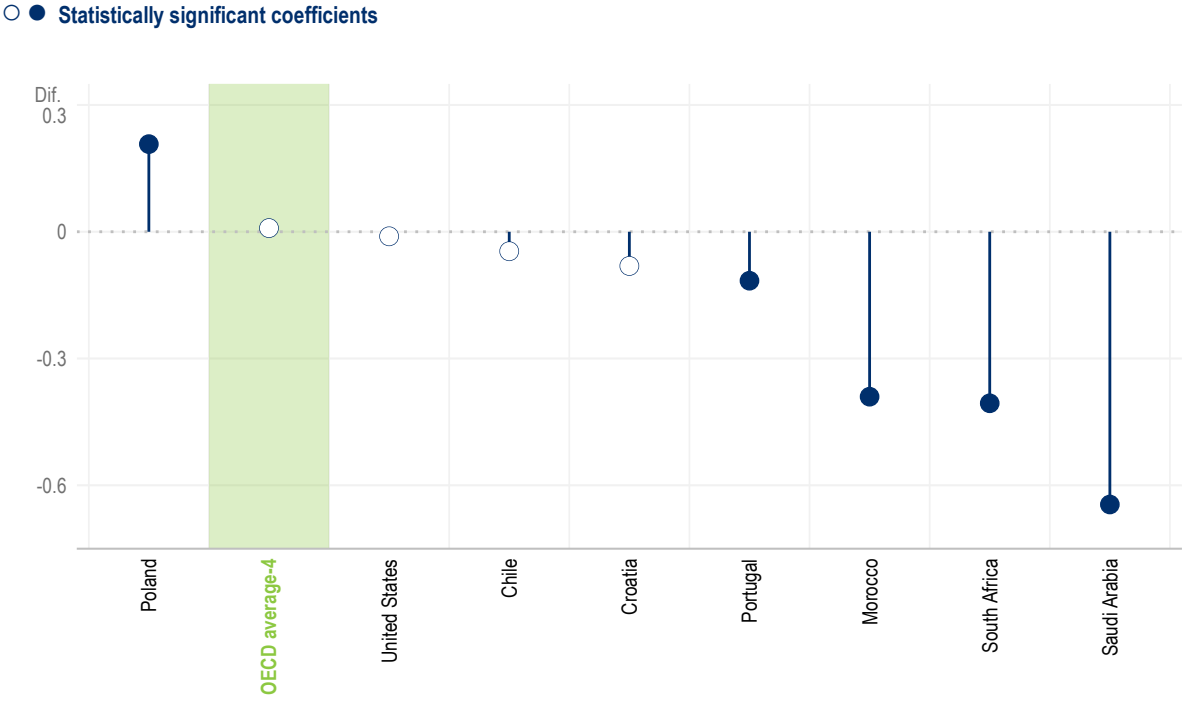
Note: Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between general pedagogical knowledge and the scale of student behaviour stress, while those below 0 reflect a negative relationship.
1. Standardised scale scores with a standard deviation of 2 and the value of 10 corresponding to the item mid-point value of the response scale. For more information on the scales, see Annex D.
2. Results based on linear regression analysis, showing the change in the outcome variable associated with a one-standard-deviation increase in the explanatory variable. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.10.

StatLink https://stat.link/oh4g7y

Another set of questionnaire items asks about workload-related stress. In Morocco, Portugal, Saudi Arabia and South Africa, teachers with higher GPK report lower levels of workload-related stress. The opposite is true, however, in Poland (Table E.1.11 and Figure 1.10).

Figure 1.10. Workload-related stress and general pedagogical knowledge

Change in the scale of workload stress[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Note: Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between general pedagogical knowledge and the scale of student behaviour stress, while those below 0 reflect a negative relationship.
1. Standardised scale scores with a standard deviation of 2 and the value of 10 corresponding to the item mid-point value of the response scale. For more information on the scales, see Annex D.
2. Results based on linear regression analysis, showing the change in the outcome variable associated with a one-standard-deviation increase in the explanatory variable. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.11.

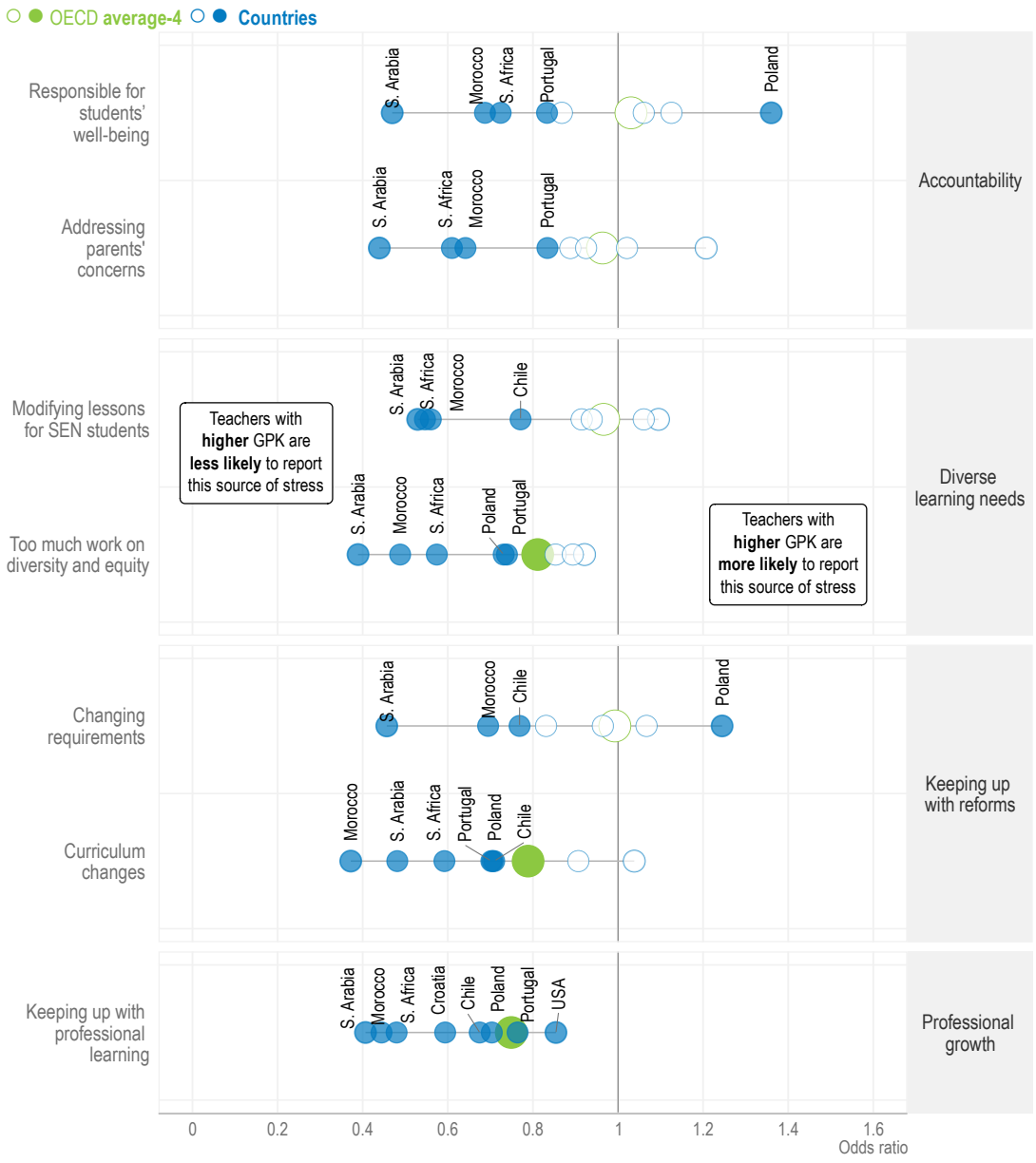
StatLink https://stat.link/xoqtpw

Looking at the specific sources of workload-related stress, the relationship observed in Poland appears to be driven by teachers with higher GPK, who are more likely to report stress from excessive marking (Table E.1.12). In Croatia, Portugal, Saudi Arabia and South Africa, teachers with higher GPK scores are less likely to report having too many lessons to teach as a source of stress (Table E.1.13).

Figure 1.11 summarises the relationship between GPK and the likelihood of reporting stress from numerous other sources, including accountability, diverse learning needs, keeping up with reforms and professional growth. Overall, there is a consistent negative relationship between GPK and stress from many of these sources in most countries, supporting the idea that general pedagogical knowledge helps (directly or indirectly) teachers cope with a broad range of job demands.

Figure 1.11. Other sources of stress and general pedagogical knowledge

Change in the likelihood of lower secondary teachers reporting the following[1] as a source of stress "quite a bit" or "a lot", associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D).
1. Binary variables: the reference category refers to "not at all" or "to some extent".
2. Results based on separate binary logistic regressions. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below 1 denotes a negative association; an odds ratio above 1 indicates a positive association; and an odds ratio of 1 means that there is no association. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.14.

StatLink https://stat.link/hp7t9i

Despite being less likely to report stress at work, teachers with more general pedagogical knowledge did not necessarily score higher on the composite scale of enjoyment of teaching: after accounting for teachers and school characteristics, the relationship between GPK and enjoyment of teaching is positive and statistically significant only in Portugal and Saudi Arabia (Table E.1.15 and Figure 1.12).

Figure 1.12. Enjoyment of teaching and general pedagogical knowledge

Change in the scale of enjoyment of teaching[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]

Note: Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between general pedagogical knowledge and the scale of student behaviour stress, while those below 0 reflect a negative relationship.
1. Standardised scale scores with a standard deviation of 2 and the value of 10 corresponding to the item mid-point value of the response scale. For more information on the scales, see Annex D.
2. Results based on linear regression analysis, showing the change in the outcome variable associated with a one-standard-deviation increase in the explanatory variable. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.15.

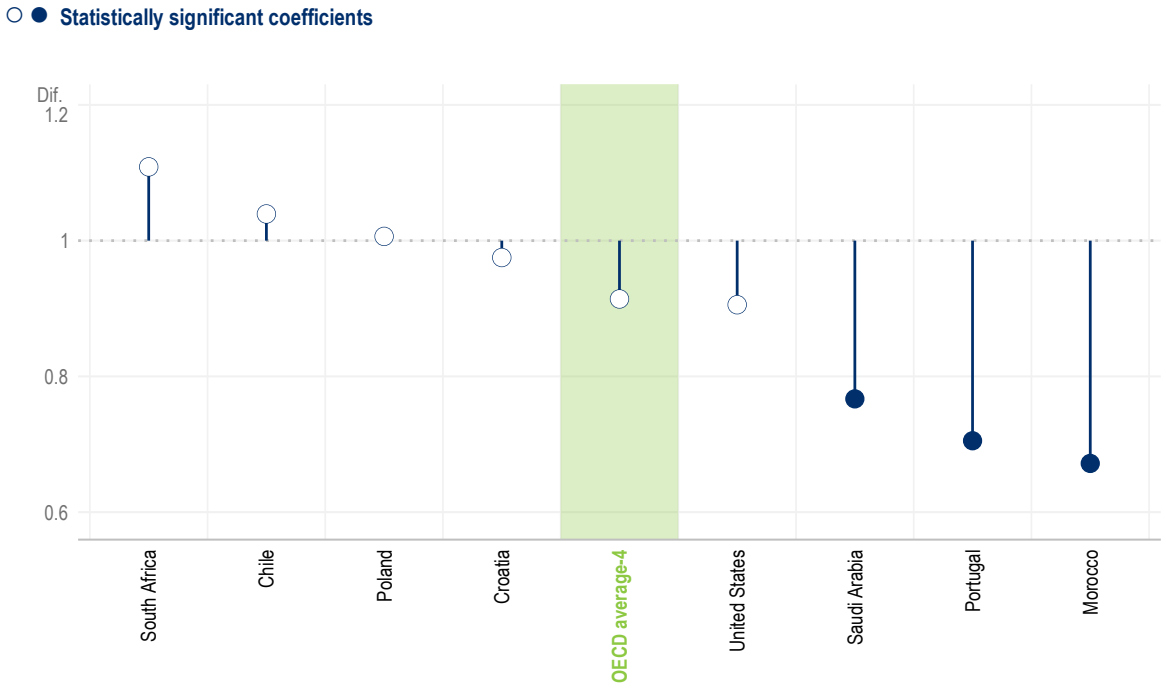
StatLink https://stat.link/hq5vod

Despite the broad positive association between general pedagogical knowledge and teachers' professional outcomes, having high GPK is not strongly associated with a higher likelihood of reporting an intention to continue working as a teacher for more than five years. After controlling for teacher and school characteristics, only in Saudi Arabia, Morocco and Portugal, teachers with more general pedagogical knowledge report being less likely to plan to quit the profession in the next five years (Table E.1.16, Table E.1.17 and Figure 1.13). This is likely because teachers' career intentions are influenced by a wide range of factors going beyond those analysed in this report. Findings from TALIS 2024, for example, point to the importance of intrinsic motivation and a broad range of employment conditions, such as material benefits, opportunities for career progression and work schedules (OECD, 2025[7]). The fact that more

knowledgeable teachers are equally likely to intend to stay in the profession should encourage education authorities to find ways to better value and recognise the professional contribution they provide.

Figure 1.13. General pedagogical knowledge and intentions to leave the teaching profession

Change in the likelihood that lower secondary teachers report willingness to leave the profession within the next 5 years[1] associated with a one-standard-deviation increase on the general pedagogical knowledge scale[2]



Note: Statistically significant coefficients are highlighted with filled circles (see Annex D).
1. Binary variables: the reference category refers to teachers wanting to continue to work as teachers for more than 5 years.
2. Results based on binary logistic regressions. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below 1 denotes a negative association; an odds ratio above 1 indicates a positive association; and an odds ratio of 1 means that there is no association. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD (2024), *TALIS TKS 2024 Database*, Table E.1.16.

StatLink https://stat.link/f2qick

Ensuring all students have access to teachers with high general pedagogical knowledge

An important objective of education policy is to reduce social and educational inequalities and to ensure equal access to publicly funded resources. The mechanisms governing the allocation of teachers to schools, and therefore the matching of teachers and students, are among the levers that education authorities can use to attain these objectives (OECD, 2022[8]). Allocating teachers is even more relevant given the large variation observed in teachers' GPK in some countries (Figure 1.1).

Equal access of students to high-GPK teachers implies randomly allocating teachers to schools. This would ensure that all schools would have a similar distribution of teachers' characteristics (including GPK).

Statistics that capture departures from a random allocation can be used to assess how close education systems are to achieving equality of access, at least at the school level.

Importantly, equality of access at the school level may not be sufficient to guarantee equal chances for all students, as different groups of students can then be assigned to different teachers within the school. Unfortunately, TKS data do not allow analysis at this more granular level.

The distribution of knowledgeable teachers across schools

This report analyses the distribution of teachers via two methods, decomposition and the dissimilarity index. Decomposition partitions the overall variance in GPK scores into two components: within-school and between-school. If a large portion of the variance lies between schools, it means that schools differ significantly in their teachers' average GPK. If most of the variance lies instead within schools, it means that most schools replicate the variation of GPK observed at the national level.

On average, only about 8% of the variance in GPK lies between schools (Table E.1.18 and Figure 1.14). The share of between-school variance is, however, as high as 23% in South Africa, and exceeds 10% in Chile, Saudi Arabia and the United States; it is smallest in Croatia (1%), Portugal (2%) and Poland (3%).

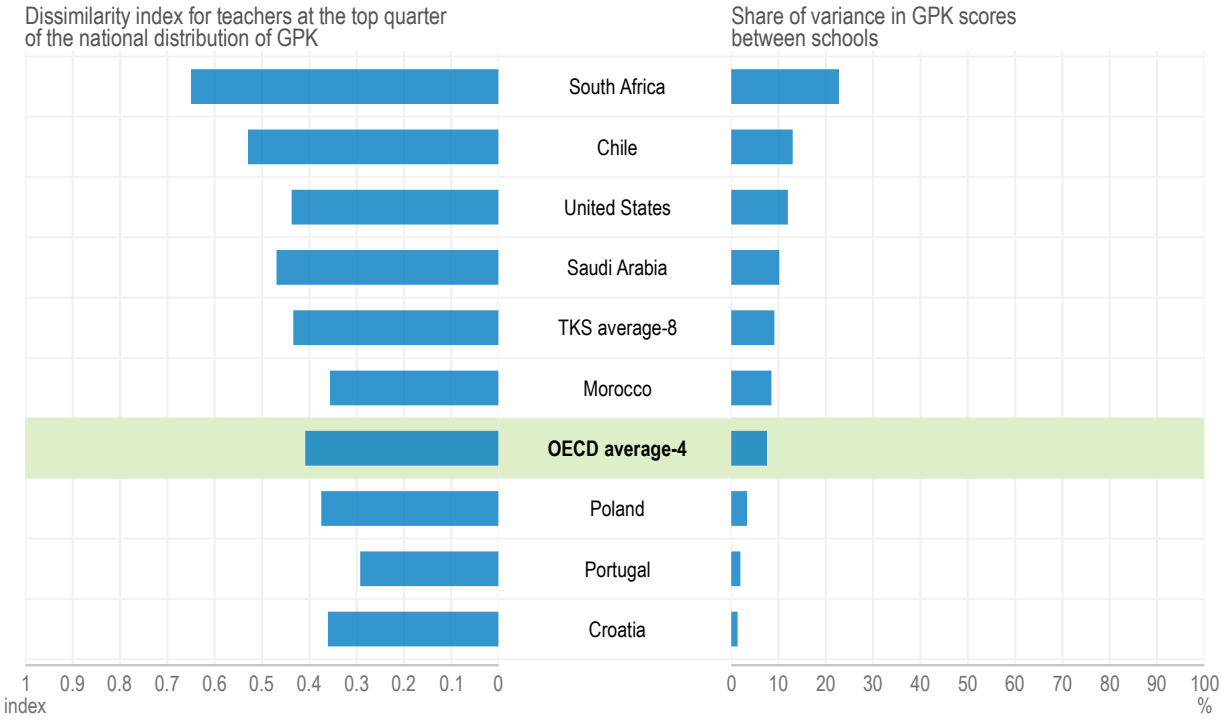
The dissimilarity index measures departure from an even allocation of high-GPK teachers (those in the top quarter of the national distribution of GPK). When the index equals 1, all high-GPK teachers (those in the top quarter of the national distribution of GPK) are concentrated in a single school. When the index equals 0, all high-GPK teachers are allocated equally across schools.

The dissimilarity index for teachers in the top quarter of the national distribution of GPK is highest in South Africa (0.65) and is lowest in Portugal (0.29; Table E.1.18 and Figure 1.14). This implies that 24% of teachers in South Africa would need to change schools in order to achieve an even allocation of high-GPK teachers, while in Portugal, only 11% of teachers would need to be involved in such transfers.[5]

Results from decomposition and the dissimilarity index provide different insights into how teachers are allocated. The decomposition approach suggests that teachers' GPK varies more within a school than across schools. However, decomposition results can be strongly influenced by teachers with very high GPK. For example, one high-performing teacher will have a greater effect on their school's within-school variance than on their country's between-school variance. The dissimilarity index, on the other hand, groups teachers by thresholds (e.g. the top quartile). According to this approach, there is considerable clustering of high-GPK teachers in schools. However, this approach ignores variation in GPK within those groups (e.g. the highest-performing teachers).

Figure 1.14. The distribution of teachers across schools

Share of variance in GPK between schools and dissimilarity index for teachers in the top quarter of the national distribution of GPK



Note: Countries are ranked in descending order according to the share of variance in GPK scores between schools. More details on the computation of the dissimilarity index and its interpretation can be found in Annex D.
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.18.

StatLink https://stat.link/vsgj8t

Which schools have more teachers with greater general pedagogical knowledge

In TKS, it is possible to compare schools according to their location (rural area, town or city), whether they are privately or publicly managed and according to the composition of the student body, in particular the intake of students from socio-economically disadvantaged homes, or who have difficulties understanding the language of instruction, or who have special education needs.

Box 1.1. Policy example: Encouraging talented teachers to move to disadvantaged schools in the United States

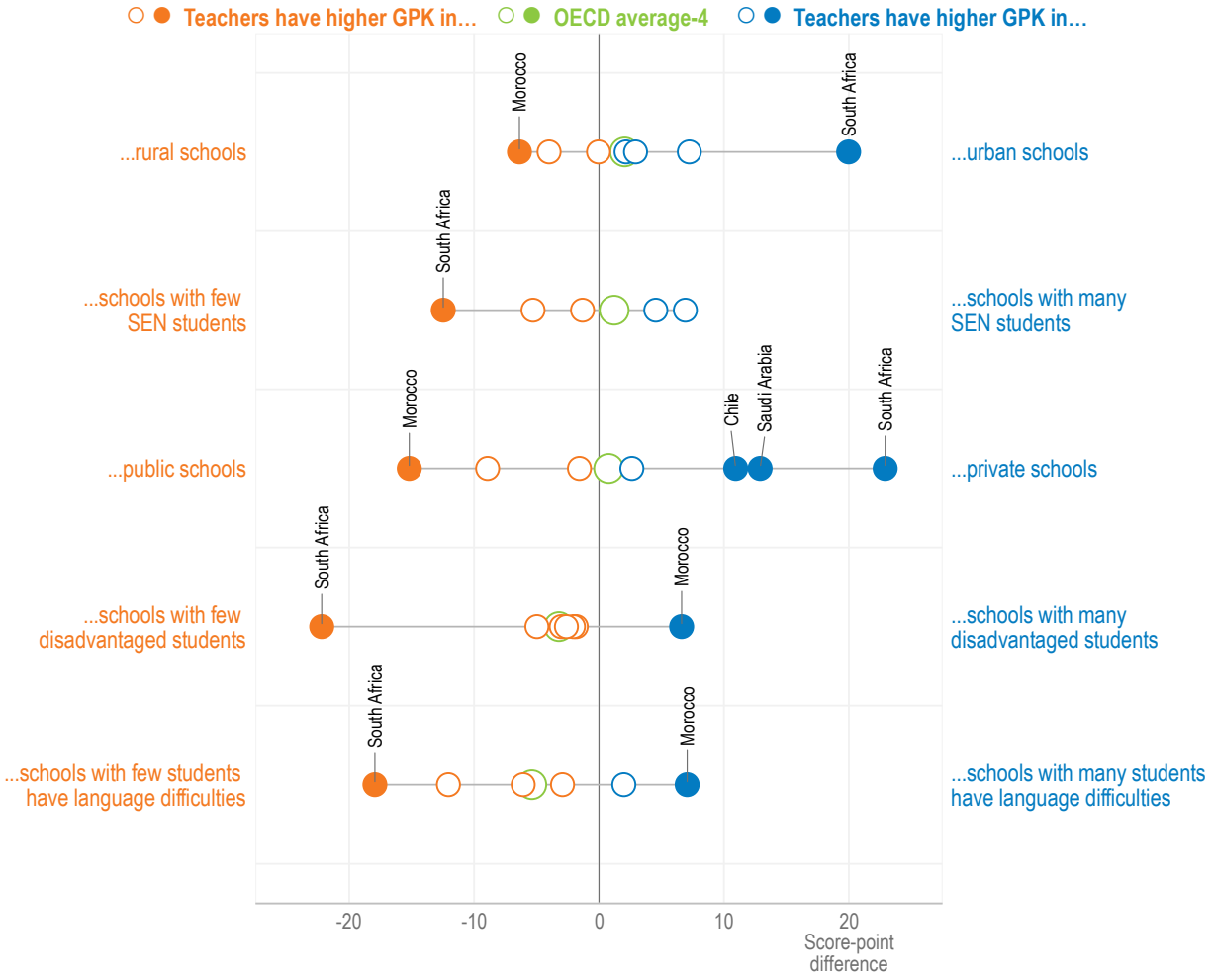
In California (United States), the Governor's Teaching Fellowship programme and the Talent Transfer Initiative provided financial bonuses to talented novice teachers who transfer to low-performing schools. The incentive amounted to USD 20 000 and was allocated competitively to talented novice teachers, who accepted to stay in the new school for at least four years.

Steele, Murnane and Willett (2010[9]) estimate that the programme successfully attracted teachers to low-performing schools – teachers who would not have chosen to work in these schools otherwise. Glazerman et al. (2013[10]) found that the programme had a positive impact on test scores (math and reading) in primary schools, but not in middle schools. The incentive also had a positive impact on teacher retention rates.

The Accelerating Campus Excellence (ACE) program in Dallas, Texas is another example of the effectiveness of financial incentives to attract high-performing teachers to low-performing schools (Morgan et al., 2023[11]). The reduction of the incentives, however, caused many high-performing teachers to leave and led to a drop in test scores. This suggests that policymakers should carefully consider the long-term financial sustainability of these types of programmes and perform rigorous cost-benefit analysis before introducing them.

South Africa is the only country where average GPK differs across schools along all these dimensions. In South Africa, more advantaged schools (those with a lower intake of disadvantaged students) and privately managed and urban schools systematically have teachers with higher GPK scores, on average. The gaps are relatively large (about 20 points) along all these dimensions, except for intake of students with special education needs, where the difference between advantaged and disadvantaged schools is 12 score points (Table E.1.19 and Figure 1.15).

Figure 1.15. Differences in average general pedagogical knowledge, by school characteristics



Notes: A rural school is located in a rural area or village of up to 3 000 people; an urban school is located in a city of over 100 000 people.
A public school is a school whose principal reported that it is managed by a public education authority, government agency, municipality, or governing board appointed by the government or elected by public franchise. The question does not refer to the source of the school's funding, which is reported in the preceding question.

A private school is a school whose principal reported that it is managed by a non-governmental organisation (e.g. a church, trade union, business or other private institution). The question does not refer to the source of the school's funding, which is reported in the preceding question. In some countries, the private school category includes schools that receive significant government funding (government-dependent private schools).
Schools with many disadvantaged students have at least 30% of students coming from socio-economically disadvantaged homes, while schools with few disadvantaged students have fewer than 10% of students from such homes. Socio-economically disadvantaged homes are those that lack the basic necessities or advantages of life, such as adequate housing, nutrition or medical care.
Schools with many SEN students have at least 30% of students with special education needs, while schools with few SEN students have fewer than 10%.
Students with special education needs are those for whom a special education need has been formally identified because they are mentally, physically or emotionally disadvantaged.
Schools where many students have language difficulties have at least 10% of students who have difficulty understanding the language(s) of instruction, while schools where few students have language difficulties have no students who have difficulty understanding the language(s) of instruction.
Source: OECD, *TALIS TKS 2024 Database*, Table E.1.19.

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Morocco is the only other country in which differences between schools are detected across most of these dimensions (the exception being differences by the intake of students with special education needs). In the case of Morocco, however, the differences are reversed (and smaller in magnitude), with more disadvantaged schools, as well as publicly managed and rural schools, having teachers with higher GPK scores on average.

In Croatia, Poland, Portugal and the United States, no differences in average GPK emerge across the school characteristics analysed. In Chile and Saudi Arabia, teachers in privately managed schools tend to have higher GPK than those in publicly managed schools, by 11 and 13 points, respectively (Table E.1.19 and Figure 1.15).

Table 1.2. Chapter 1 figures

Figure 1.1	The distribution of general pedagogical knowledge
Figure 1.2	Share of teachers at different levels of general pedagogical knowledge
Figure 1.3	Teachers' GPK and students' outcomes
Figure 1.4	General pedagogical knowledge and time spent on maintaining discipline
Figure 1.5	General pedagogical knowledge and time spent on actual teaching and learning
Figure 1.6	Adaptive teaching practices and general pedagogical knowledge
Figure 1.7	Teaching practices for cognitive activation and general pedagogical knowledge
Figure 1.8	Assessment practices and general pedagogical knowledge
Figure 1.9	Stress from student behaviour and general pedagogical knowledge
Figure 1.10	Workload-related stress and general pedagogical knowledge
Figure 1.11	Other sources of stress and general pedagogical knowledge
Figure 1.12	Enjoyment of teaching and general pedagogical knowledge
Figure 1.13	General pedagogical knowledge and intentions to leave the teaching profession
Figure 1.14	The distribution of teachers across schools
Figure 1.15	Differences in average general pedagogical knowledge, by school characteristics

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Notes

[1] This cut point is also called the 75th percentile of the distribution. Similarly, the cut point below which one quarter of teachers are located is called the 25th percentile.

[2] More precisely, teachers are asked to report on the first ISCED Level 2 class that they taught after 11 a.m. the last Tuesday preceding the survey. If they had not taught any class on that Tuesday, they should focus on the first class taught following the last Tuesday.

[3] The scale of Student Behaviour Stress – as all others in TALIS and TKS – is constructed by combining information from teachers' answers to a battery of questions and is standardised to have a standard deviation of two across all education systems participating in TALIS and so that the value 10 corresponds to the item mid-point value of the response scale. For more information on the scales, see Annex D.

[4] While the annex tables present regression coefficients, the text mostly expresses the estimated association in terms of standard deviation changes (this is done by simply dividing the estimated coefficient by 2). This is meant to facilitate interpretation, as all associations are expressed on the same metric. For more information on the scales, see Annex D.

[5] The dissimilarity index is directly related to the share of teachers from different groups (e.g. those with low and high GPK) that would need to change schools in order to achieve an equal distribution across schools, while maintaining school size constant. With only two groups (teachers who are or not in the top quarter of the national distribution of GPK), such movements would necessarily entail the swapping of teachers from the two groups, if school size needs to stay constant. In this setting, the dissimilarity index equals the sum of the shares of teachers from the two groups that would need to swap places to achieve an even allocation. As the relative size of the two groups in the population is known (by construction, 25% of teachers are in the top quarter of the distribution of GPK, and 75% are not), multiplying the dissimilarity index by $2 \times 0.75 \times 0.25 = 0.375$ gives the percentage of teachers in the overall teacher population that needs to change school to restore an even allocation. See Annex D for more details on the dissimilarity index and its interpretation.

2 Highly knowledgeable teachers: their characteristics and self-image

This chapter investigates whether certain types of teachers are more likely to be highly knowledgeable about general pedagogy. It analyses the relationships between general pedagogical knowledge and teachers' characteristics, such as gender, age, teaching experience and subject area. It also examines whether teachers' general pedagogical knowledge is associated with their self-efficacy and perceptions of their own preparedness for teaching.

Highlights

- **Experienced teachers outperform novice teachers in Portugal** (by 12 points) **and the United States** (by 31 points), but **novice teachers tend to have higher GPK scores in Saudi Arabia** (by 7 points) **and South Africa** (by 9 points).
- **Female teachers tend to have higher GPK** than their male colleagues. Gender differences are statistically significant in five of the eight countries studied. Women's outperformance of men is most marked in Croatia (15 points) and Saudi Arabia (14 points).
- **Higher GPK is related to less self-efficacy in specific areas of teaching like student engagement and reducing achievement gaps**. This may be due to higher performance standards arising from having higher GPK. However, teachers' GPK is not related to their overall self-efficacy in most countries.
- In most countries, teachers' **GPK is not associated with their views of whether their professional opportunities to learn (OTL) prepared them for different aspects of teaching.** However, more knowledgeable teachers in Saudi Arabia are consistently more likely to report that their OTL prepared them "quite a bit" or "a lot", across many topics.
- **Teachers tend to feel less prepared by their opportunities to learn about classroom management and supporting diverse learners** than they do regarding designing lessons or different assessment purposes, **even when their GPK is in the top quarter** of the national distribution of scores. This suggests that teachers need more than GPK alone to feel well-supported by their OTL in these topics.

Introduction

Given the importance of general pedagogical knowledge outlined in Chapter 1, it is valuable to investigate whether GPK varies across different types of teachers. This can provide a better understanding of how teachers develop their GPK and whether teachers' need for support in developing GPK differs according to their characteristics. There is some evidence that teachers' GPK is related to some characteristics, such as years of teaching experience, but not to others, such as gender (König et al., 2014[1]; Lauermann and König, 2016[2]; Sorge et al., 2017[3]). These findings, however, are based on smaller studies without representative samples of teachers. This chapter, therefore, analyses the relationships between teachers' GPK and their gender, age, experience and subjects taught in the current school year.

As well as shaping levels of GPK, teachers' personal characteristics may in turn be affected by their knowledge of general pedagogy, particularly in relation to their self-perceptions. The literature suggests that GPK operates alongside teachers' beliefs and affective-motivational competencies in decision-making and selection of teaching approaches (Guerriero and Révai, 2017[4]). Therefore, this chapter also analyses the relationships between GPK and teachers' self-efficacy. It also examines the relationships between GPK and teacher perceptions of their preparedness for various aspects of teaching.

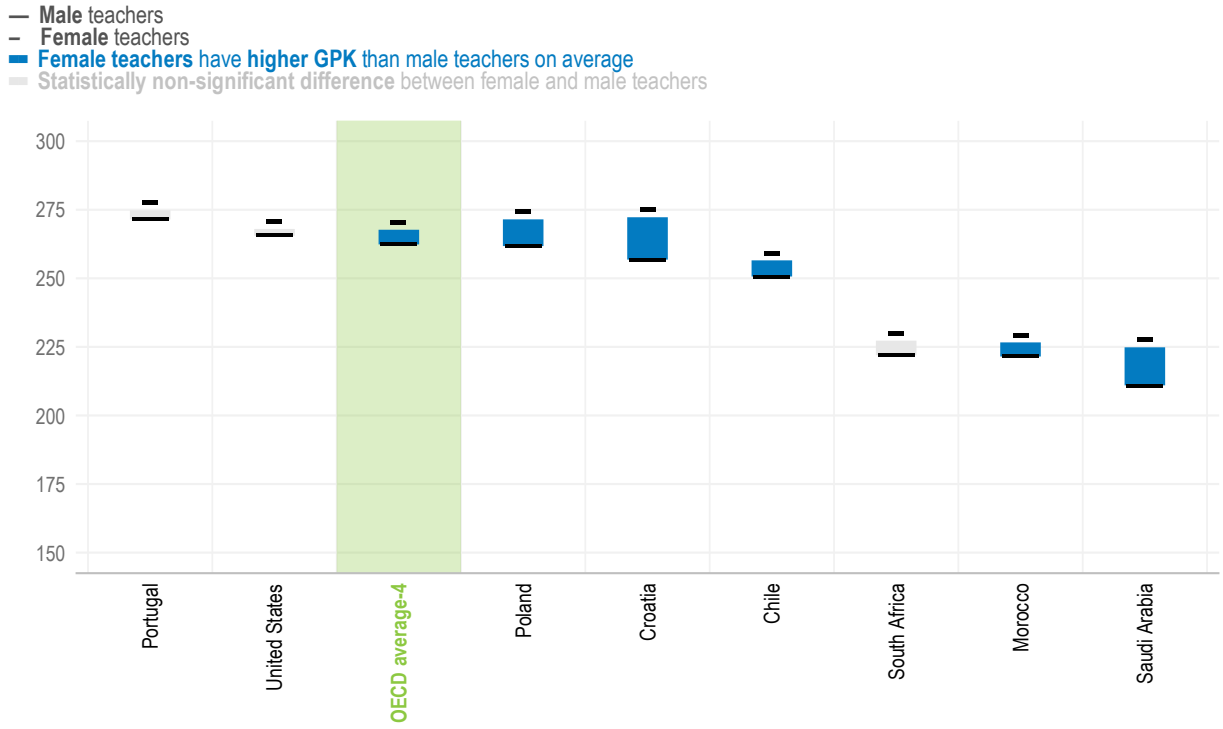
A profile of teachers with high general pedagogical knowledge

Gender differences

Teaching is a highly feminised profession in almost every education system that participates in TALIS (OECD, 2025[5]). On average across the OECD, around 70% of lower secondary teachers are women. Women now tend to attain higher levels of education than men (OECD, 2025[6]), and results from PISA show that girls outperform boys in reading (OECD, 2023[7]), although among adults, gender differences in literacy tend to be small (OECD, 2024[8]).

Results from TKS mirror these international trends. Female teachers tend to display higher general pedagogical knowledge than their male colleagues. On average across OECD countries participating in the Teacher Knowledge Survey (henceforth, "on average"), they scored 5 points higher than their male colleagues, while representing about 70% of the teaching workforce (Table E.2.1, Table E.2.2 and Figure 2.1). The largest differences are observed in Croatia (15 points) and Saudi Arabia (14 points). In Portugal, South Africa and the United States, gender differences in GPK are not statistically significant. In no participating country do men have higher average scores than women.

Figure 2.1. Gender differences in general pedagogical knowledge



Note: Countries are ranked in descending order according to average GPK of male teachers.
Source: OECD, *TALIS TKS 2024 Database*, Table E.2.1.

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In six of the eight countries participating in TKS (Chile, Croatia, Morocco, Poland, Portugal and Saudi Arabia), male teachers are over-represented at the lower end of the national distribution of GPK, compared to their female colleagues. In Croatia, 40% of male teachers scored in the bottom quarter of the distribution,

compared to 21% of female teachers – a gap of almost 19 percentage points (Table E.2.3). In Croatia, Poland and Saudi Arabia this is accompanied by a similar over-representation of female teachers at the higher end of the distribution. This is particularly evident in Saudi Arabia, where 34% of female teachers, but only 16% of male teachers, scored in the top quarter of the national distribution of GPK.

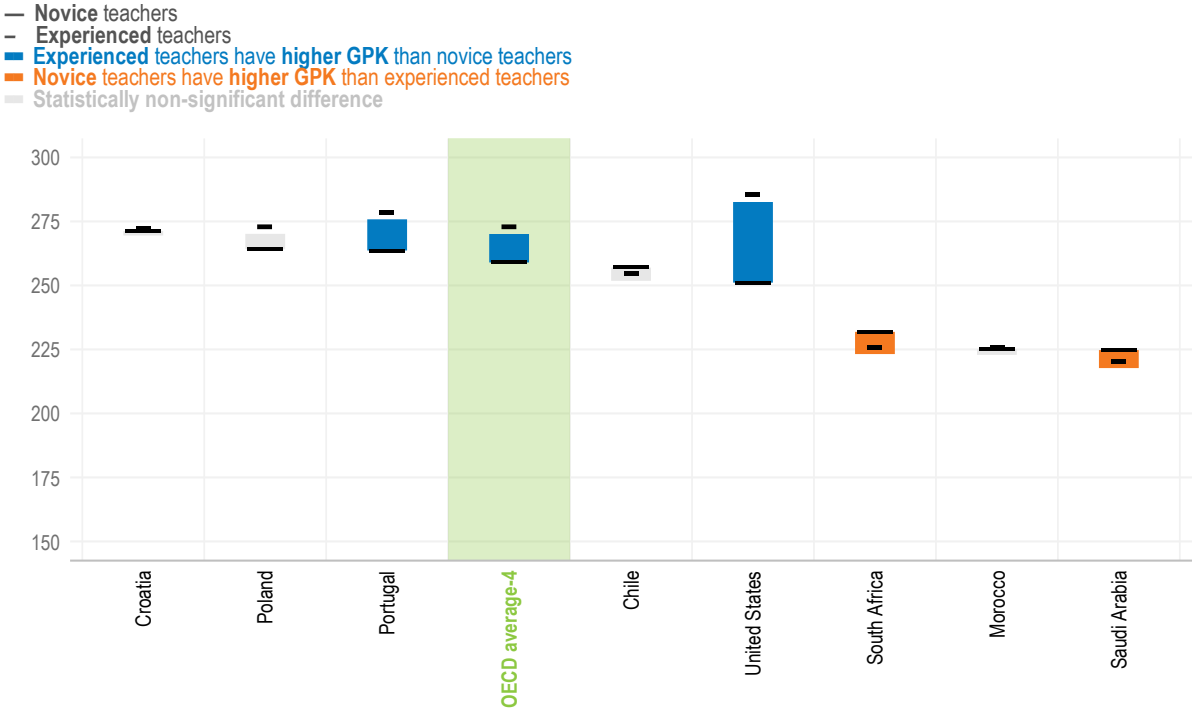
The observed gender differences in GPK could be due to differences between male and female teachers in other characteristics that, in turn, are related to GPK. For example, the average male and female teachers could have different years of experience or levels of education, they could teach different subjects, or work in different types of schools or with different students. Accounting for these compositional differences, indeed, does explain some of the observed gender differences, at least in some countries (Table E.2.4). In Chile, adjusted gender gaps (controlling for teacher and school characteristics) are lower than raw gender gaps by 1 score point; moreover, the uncertainty around the estimates increases, making the adjusted gaps not statistically different from zero. In Croatia, the gap between male and female teachers decreases by about 3 points when controlling for teacher characteristics but increases again by about 2 points when adding school-level controls. In Poland, controlling for teacher and school characteristics reduces the estimated gender gap from about 10 to 4 score points; in contrast to the raw gender gaps, adjusted gaps are not statistically different from zero.

Age and experience

GPK variation according to teachers' age and experience provides insights into how and when teachers develop knowledge. If younger teachers outperform older teachers, that might suggest that initial teacher education has improved over time. On the other hand, if more experienced teachers tend to perform better than novice teachers, that could suggest that teachers develop much of their GPK through continuous professional development and collaboration with other teachers (see Chapter 3).

The relationship between teachers' age, years of teaching experience and general pedagogical knowledge tends to vary across countries. In South Africa and Saudi Arabia, novice teachers (those with up to five years of teaching experience) have higher GPK scores, on average, than experienced teachers (those with more than ten years of teaching experience [Table E.2.1 and Figure 2.2]). In Portugal and the United States, by contrast, experienced teachers demonstrated higher GPK than their novice colleagues.

Figure 2.2. General pedagogical knowledge, by years of teaching experience



Note: Novice teachers are those with up to five years of teaching experience. Experienced teachers are those with more than ten years of teaching experience.
Source: OECD, *TALIS TKS 2024 Database*, Table E.2.1.

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In South Africa and the United States, the analysis by teachers' age mirrors the results for years of experience, with older teachers (50 and over) achieving higher GPK scores than their younger colleagues (below 30) in the United States, and lower GPK scores in South Africa. Morocco is the only other country in which teachers younger than 30 scored higher on the GPK assessment than those 50 and over.

Age and experience can be decoupled when teachers join the profession later, perhaps after a career change. In TALIS, these are called "second-career teachers" and are defined as teachers who report that teaching was not their first career choice and who have spent at least 10 years in a non-teaching role (OECD, 2025[5]).

The incidence of second-career teachers varies significantly across countries. Among the countries participating in TKS, the United States has the highest share of second-career teachers (16%), followed by Chile (7%) and Poland (6%) (Table E.2.5). The low number of second-career teachers makes it difficult to detect statistically significant differences in GPK: the estimated differences are non-negligible in size and tend to suggest that second-career teachers have lower GPK scores on average, but the uncertainty around these estimates is so great that the possibility that true differences are equal to zero cannot be rejected. Portugal and South Africa (where second-career teachers represent slightly less than 3% of the teaching workforce) are the only countries where the differences are so great that they are unlikely to be due to sampling or measurement error. In Portugal, second-career teachers scored about 14 points lower than non-second-career teachers, while in South Africa, the opposite seems to be true, with second-career teachers scoring about 18 points higher than non-second-career teachers (Table E.2.5).

Subject taught

There are no large or consistent differences in teachers' general pedagogical knowledge across the subject areas they teach. Across the four OECD countries participating in TKS, science teachers (who constitute about one quarter of the population surveyed by the study) achieved the highest scores (Tables E.2.6 and E.2.7). However, differences between science teachers and non-science teachers are not usually statistically significant. In Portugal, science teachers scored 9 points higher than other teachers. Meanwhile, in Saudi Arabia, science teachers actually scored 6 points lower than other teachers.

Across all countries (except Portugal), physical education teachers displayed lower GPK proficiency than teachers working in different subject areas. The gap is most pronounced in the United States (21 score points) and smallest in Morocco (5 score points). Portugal is the only country where the GPK scores of physical education teachers are not different than those of teachers in other subject areas.

General pedagogical knowledge and teachers' self-efficacy

As outlined in the TKS conceptual framework, teachers' professional beliefs, alongside their knowledge, influence their decision-making and selection of teaching approaches (OECD, 2025[9]). From a socio-cognitive perspective, for example, self-efficacy beliefs provide teachers with the necessary motivation to use their knowledge (Fives, 2003[10]). Teachers may be less inclined to abandon a task if they feel capable of succeeding at it, and they may also be more willing to persevere through difficult experiences and set themselves more challenging goals (Lauermann, 2017[11]). However, few studies have directly investigated the relationship between GPK and beliefs such as teacher self-efficacy, and the results have been mixed (Depaepe and König, 2018[12]; Dicke et al., 2015[13]; Lauermann and König, 2016[2]; Malva, Leijen and Poom-Valickis, 2018[14]).

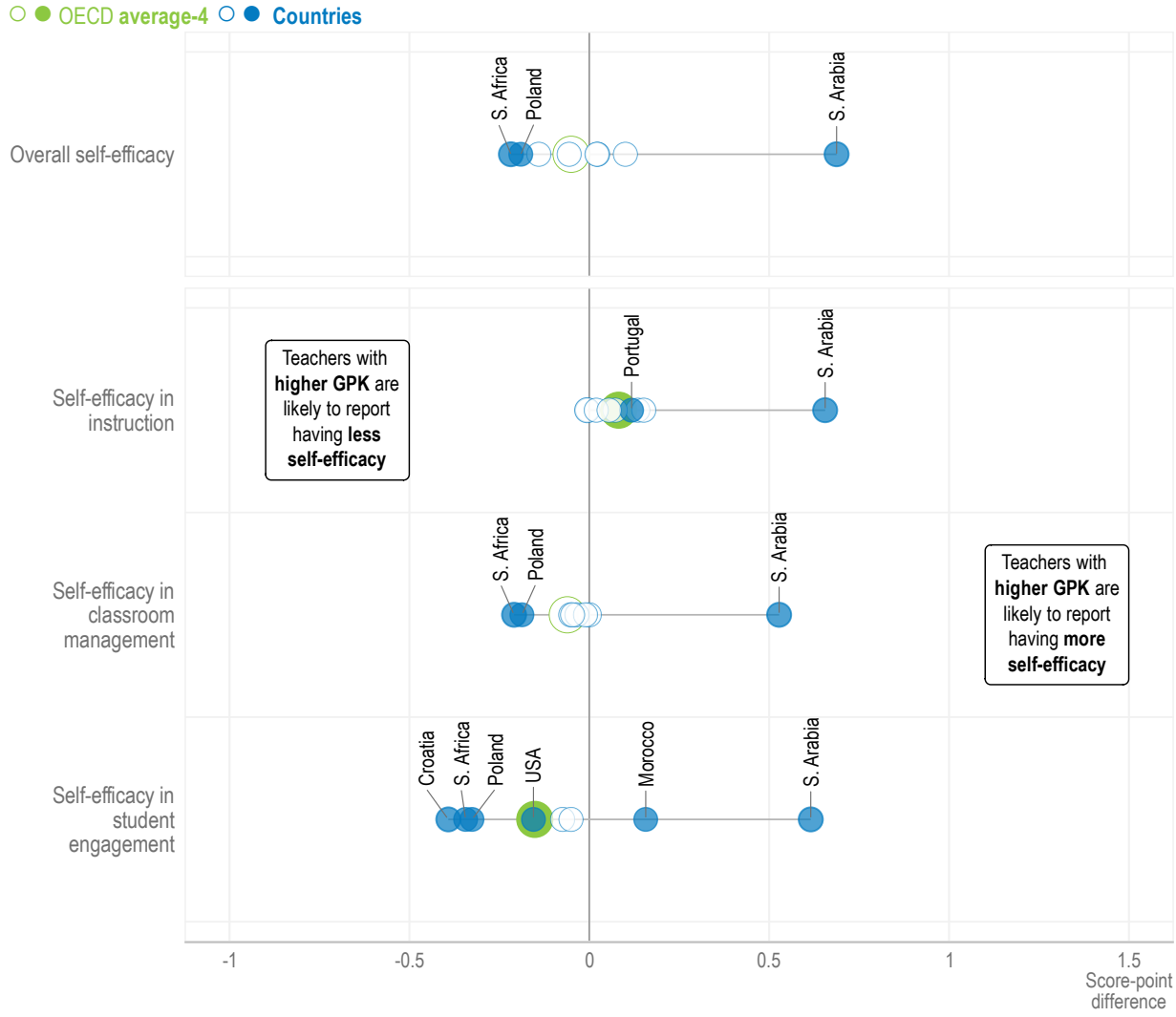
This section examines the relationships between GPK and teachers' beliefs about their ability and preparedness to manage different areas of teaching. Given the importance of self-efficacy for a range of teacher outcomes, TKS 2024 asked teachers to assess their capacity to perform tasks related to classroom management, instruction, student engagement and additional areas of teaching. Teachers taking TKS were also asked about the extent to which they felt their initial teacher education (ITE) and subsequent professional learning prepared them for a range of topics across the following dimensions of general pedagogy: classroom instruction, student learning and assessment.

Teachers' general pedagogical knowledge is not related to self-efficacy

In most countries, GPK scores are not associated with overall self-efficacy in teaching, which is an average measure of teachers' self-efficacy in classroom management, instruction and student engagement. When a relationship exists, it is more often negative. This is the case for South Africa and Poland (Figure 2.3). A positive relationship between GPK and overall self-efficacy is only found in Saudi Arabia.

Figure 2.3. Self-efficacy in core areas of teaching and general pedagogical knowledge

Change in the scales of teachers' self-efficacy[1] associated with a one-standard-deviation increase in GPK score[2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D). Filled circles above 0 indicate a positive association between teachers' self-efficacy and their GPK score, while those below 0 reflect a negative relationship.
1. Standardised scale scores with a standard deviation of 2 and a mean of 10 corresponding to the item mid-point value of the response scale. For more information on the scales, see Annex D.
2. Results based on four separate linear regression analyses, showing the change in the scale of self-efficacy associated with a one-standard-deviation increase in GPK. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD, *TALIS TKS 2024 Database*, Tables E.2.8, E.2.9, E.2.10, E.2.11.

StatLink https://stat.link/405yn9

In most countries, there are no significant associations between GPK and most individual aspects of teaching self-efficacy contained in TKS. For example, GPK is related to teachers' self-efficacy in classroom management in only three countries, with a positive relationship in Saudi Arabia and negative ones in

Poland and South Africa (Figure 2.3). Similarly, GPK is positively related to teachers' self-efficacy in instruction only in Portugal and Saudi Arabia.

Conversely, self-efficacy in student engagement seems to be significantly related to teachers' GPK. Higher GPK scores tend to predict less self-efficacy in student engagement, as is the case in Croatia, Poland, South Africa and the United States. However, teachers with higher GPK scores in Morocco and Saudi Arabia have more self-efficacy in this domain.

TKS 2024 also asked teachers about their self-efficacy in a number of additional areas, namely their capacity to:

- support student learning by using digital resources and tools
- help every student progress
- reduce achievement gaps among students
- support students' social and emotional learning.

In at least half of the countries studied, TKS shows that GPK is related to teachers' self-efficacy in helping every student progress, reducing achievement gaps, and supporting students' social and emotional learning (Figure 2.4). These relationships are negative in all cases except for Saudi Arabia – although Saudi Arabia is the only country in which teachers' GPK is significantly (and always positively) associated with every aspect of their self-efficacy, suggesting that these results might be influenced by cultural response patterns.

Figure 2.4. Self-efficacy in additional areas of teaching and general pedagogical knowledge

Change in the relative likelihood that teachers report being able to do the following[1] "quite a bit" or "a lot", associated with a one-standard-deviation increase in GPK score[2]

Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D).
1. Binary variables: the reference category refers to "not at all" and "to some extent".
2. Results based on four separate binary logistic regressions. An odds ratio indicates the degree to which an explanatory variable is associated with a categorical outcome variable. An odds ratio below 1 denotes a negative association; an odds ratio above 1 indicates a positive association; and an odds ratio of 1 means that there is no association. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD, *TALIS TKS 2024 Database*, Table E.2.12.

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Teachers with higher GPK scores may hold themselves to higher standards

In theory, having high GPK should facilitate the planning and teaching of effective lessons, thereby increasing the chances of positive mastery experiences that support teachers' self-efficacy (Dicke et al., 2015[13]). However, knowledge does not guarantee its effective application, nor the belief that an individual has performed a task successfully (Fives, 2003[10]). In fact, it is possible that teachers with more knowledge possess higher performance standards, as they are more aware of the features of effective teaching – and the instances in which they have not incorporated these into their practice (Dicke et al., 2015[13]; Lauermann and König, 2016[2]). This seems likely, especially in cases where negative relationships are found between GPK and certain aspects of teacher self-efficacy.

It may also be the case that GPK and teacher self-efficacy interact, but not in a direct or linear fashion. Using cluster analysis, one recent study in Estonia identified three distinct groups of teachers based on their overall self-efficacy and GPK. This grouping included "competent" teachers with high GPK and high self-efficacy; "insecure" teachers with average GPK and low self-efficacy; and "over-confident" teachers with low GPK and average self-efficacy (Leijen et al., 2024[15]). Further research could therefore examine similar relationships between GPK and self-efficacy across a larger group of countries, considering different aspects of teachers' self-efficacy and their connection with teachers' outcomes.

General pedagogical knowledge and teachers' views of their opportunities to learn

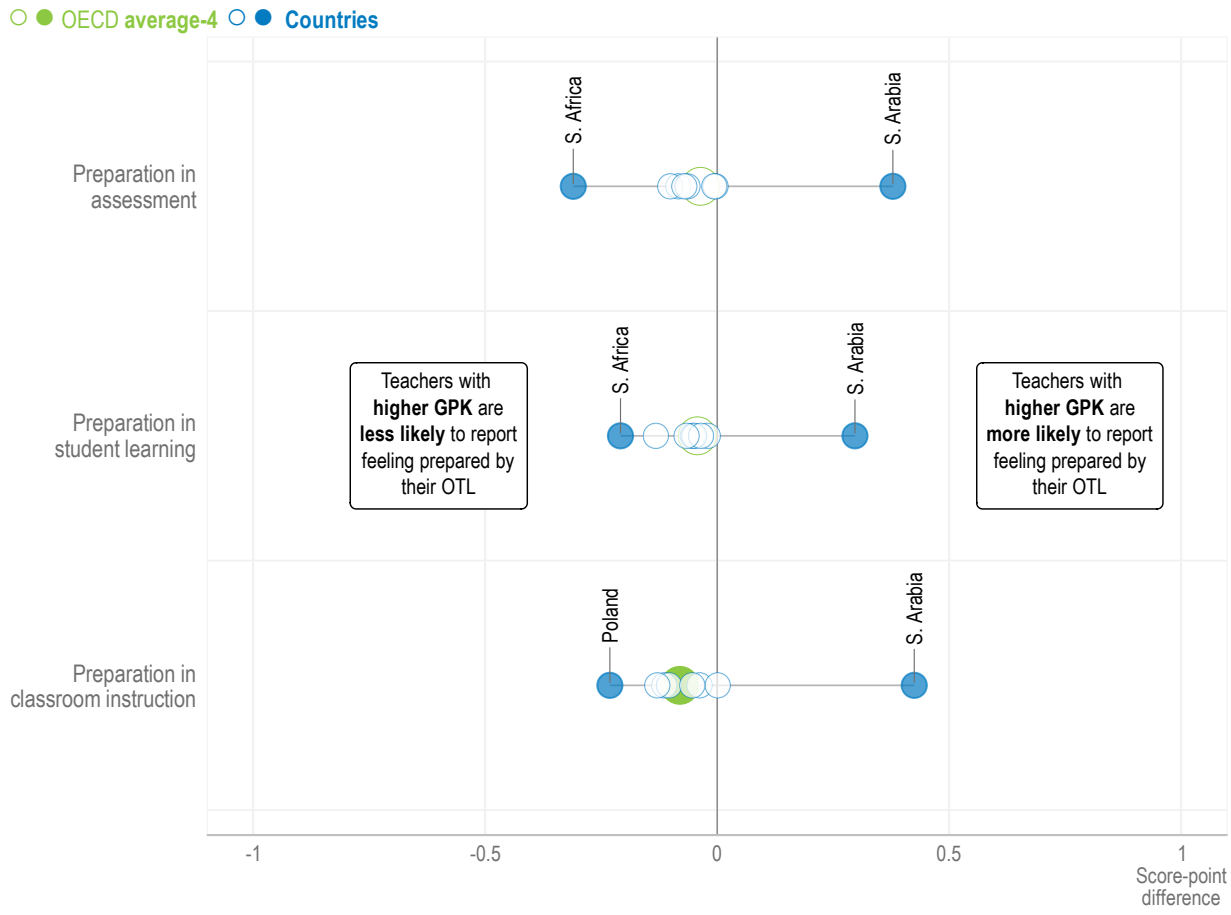
In the model of teachers' professional competence, teachers' opportunities to learn influence both teachers' knowledge and their affective-motivational competencies and beliefs (Guerriero and Révai, 2017[4]). High-quality opportunities to learn about general pedagogy may be expected to improve both teachers' level of GPK and their beliefs about being well-prepared in these areas. Although research on the connections between GPK and OTL remains somewhat limited, some evidence suggests that GPK is associated with teachers' OTL about certain topics related to general pedagogy (König et al., 2017[16]; OECD, 2025[9]).

Teachers with higher GPK scores do not feel more prepared for teaching

However, TKS data suggest that teachers with higher GPK are not more likely to believe that their initial teacher education and subsequent professional learning (i.e. the entirety of their OTL) prepared them well for teaching. In most countries, no relationships are found between teachers' GPK and their beliefs in the extent to which their OTL prepared them in classroom instruction, student learning, and assessment (Figure 2.5). As with self-efficacy, Saudi Arabia is the only country where teachers' GPK is positively associated with reported sense of preparedness across the three dimensions of GPK (instruction, learning and assessment). Meanwhile, in Poland, teachers with higher GPK reported a lower sense of preparedness in classroom instruction. A similar relationship emerges in South Africa for student learning and assessment.

Figure 2.5. General pedagogical knowledge and sense of preparedness

Change in the scales of teachers' beliefs about their preparation in topics related to general pedagogy[1] from their opportunities to learn (OTL) associated with a one-standard-deviation increase in GPK score[2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D). Filled circles above 0 indicate a positive association between teachers' beliefs about their preparation in topics related to general pedagogy and their GPK score, while those below 0 reflect a negative relationship.

1. Standardised scale scores with a standard deviation of 2 and a mean of 10 corresponding to the item mid-point value of the response scale. For more information on the scales, see Annex D.

2. Results based on three separate linear regression analyses, showing the change in the scale of beliefs about preparation associated with a one-standard-deviation increase in GPK. The regressions control for teacher characteristics (gender, age and years of teaching experience) and school characteristics (school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).

Source: OECD, *TALIS TKS 2024 Database*, Table E.2.13, E.2.14, E.2.15.

StatLink https://stat.link/dhanip

There are several possible explanations for the lack of relationships found between GPK and teachers' perceptions of their OTL. Similar to self-efficacy, higher performance standards may accompany greater awareness of different ways to create effective teaching and learning environments. As a result, teachers with high GPK may be more critical of their pedagogical training and learning opportunities.

It could also be that perceptions of preparedness are more strongly influenced by other factors that mediate between teacher knowledge and actual practice. For example, teachers need certain skills to apply their

knowledge in practice, such as noticing relevant classroom events and linking interpretations of these events to prior knowledge (Guerriero, 2017[17]). To feel adequately prepared by their OTL, teachers might need opportunities to apply their knowledge. This is supported by data from TALIS 2024, where 85% of teachers reported that opportunities to practise or apply new ideas and knowledge was an important characteristic of professional learning, on average across the 27 participating OECD countries (OECD, 2024[18]). Of all the characteristics included in the survey, this had the highest average share of teachers assigning it "quite a bit" or "a lot" of importance. Further research would be needed to ascertain how GPK and teachers' perceptions of their preparation relate to the features of OTL offered, as TKS lacks an objective measure of the quality or even the quantity of teachers' OTL.

Knowledgeable teachers feel much more prepared for lesson design than for classroom management and supporting diverse learners

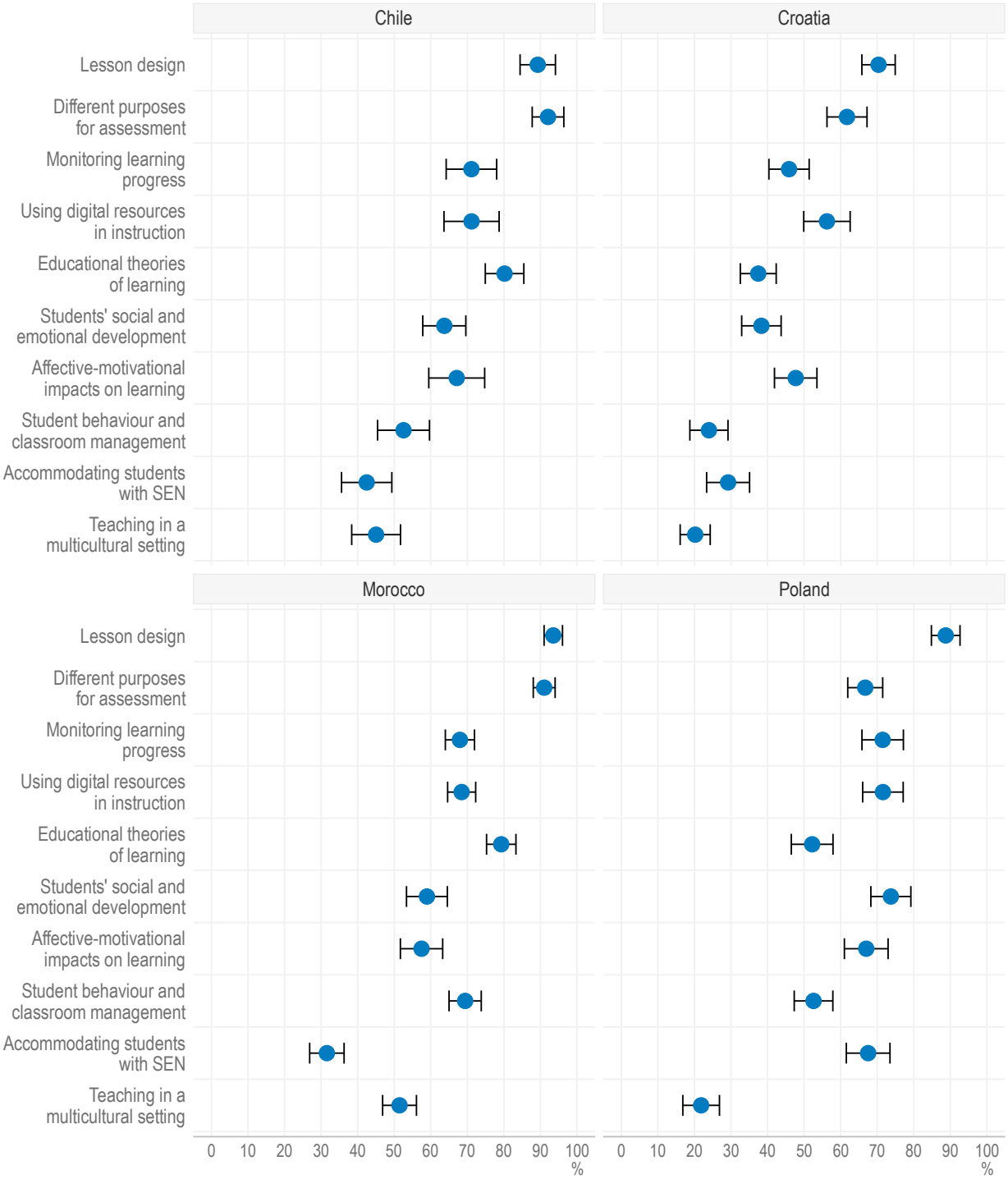
Data from TKS 2024 show that teachers' perceptions of their preparedness for different aspects of teaching vary greatly, even when they have relatively high levels of GPK. Limiting analyses of OTL to teachers with high levels of GPK provides insights into what the most knowledgeable and discerning teachers believed prepared them most. Teachers scoring in the top quarter of the national distribution of GPK scores (i.e., the 25% of teachers with the highest GPK scores in each country) are particularly positive about their preparedness for lesson design, a core dimension of instruction. Out of 10 topics related to different dimensions of general pedagogy, lesson design is the one for which knowledgeable teachers report a high sense of preparedness in six of the eight participating countries (Figure 2.6). In all countries, lesson design is among the top three topics for which knowledgeable teachers were prepared "quite a bit" or "a lot".

It is also common for these knowledgeable teachers to report feeling prepared for certain aspects of student learning and assessment. In six countries, the top three topics that knowledgeable teachers report being prepared "quite a bit" or "a lot" for included different purposes for assessment (Figure 2.6). Educational theories of learning also featured in the top three topics for knowledgeable teachers in four participating countries.

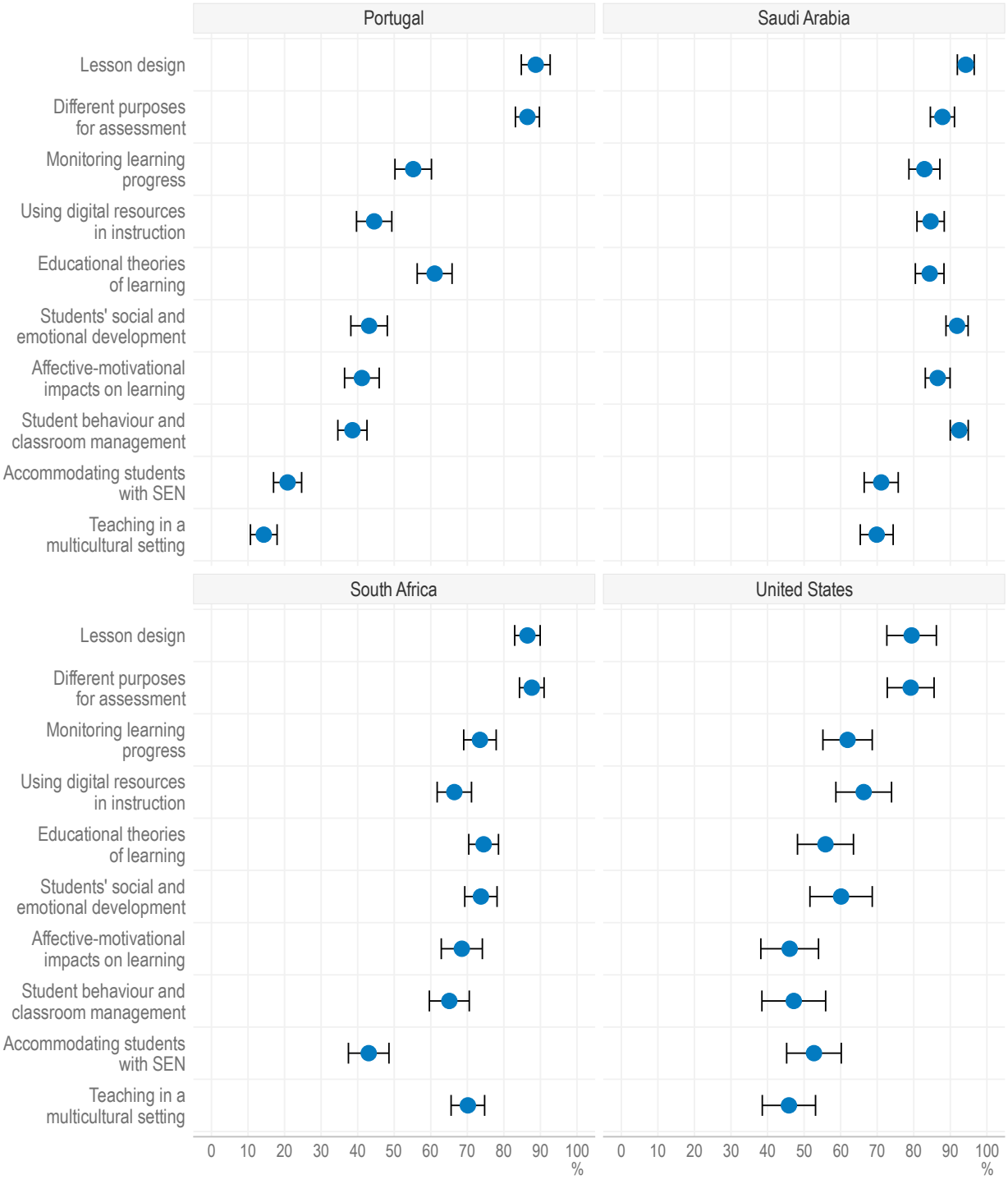
Figure 2.6. Knowledgeable teacher reports of preparation in different dimensions of teaching, by country

Percentage of teachers in the top quartile of the national GPK distribution reporting that their formal teacher education and/or subsequent professional learning prepared them “quite a bit” or “a lot” in the following topics

95% Confidence intervals are shown as **error bars**



95% Confidence intervals are shown as **error bars**



Note: Topics are sorted in descending order of the OECD average share of teachers reporting that they were prepared in it "quite a bit" or "a lot" by their opportunities to learn.
Students with SEN refer to students with special education needs.
Source: OECD, *TALIS TKS 2024 Database*, Tables E.2.16, E.2.17, E.2.18, E.2.19.

StatLink https://stat.link/g3na7r

In contrast, knowledgeable teachers are less likely to report feeling prepared for topics related to supporting diverse learners. Teaching in a multicultural setting is one of the three topics that knowledgeable teachers reported being least prepared for ("quite a bit" or "a lot") in seven out of eight participating countries (Figure 2.6). Accommodating students with special education needs was also among the three topics for which knowledgeable teachers were least prepared in six countries studied.

Country context, including the development of various education policies, could help to explain some of the differences observed between countries. For example, teaching in a multicultural setting may be a topic that teachers encounter in their OTL relatively more frequently in South Africa. Principles of multicultural education have been promoted since 1996 with the South African Schools Act, which requires schools to "promote and advance our diverse cultures and languages" (Republic of South Africa, 1996[19]). The importance of multiculturalism is reflected in the content of teachers' recent professional learning. TALIS 2024 tells us that 64% of teachers in South Africa who recently participated in professional learning activities learned about teaching in multicultural or multilingual settings (OECD, 2024[18]). This was far higher than the average share (30%) of teachers across the 27 participating OECD countries.

Sense of preparedness for student behaviour and classroom management is also relatively low compared to other areas of teaching. This topic is among the three least frequently reported by knowledgeable teachers as an area in which they were prepared "quite a bit" or "a lot" in six of eight participating countries (Figure 2.6).

Differences in teachers' perceptions of the extent to which their professional learning opportunities prepared them for these topics could reflect differences in the quality or availability of relevant OTL. For these topics, knowledgeable teachers may have developed their GPK through self-initiated learning to account for gaps in their formal training and subsequent professional learning. However, it is also possible that some areas of teaching are more exclusively reliant on teachers' GPK, while others require a broader range of skills and competencies, or practical experience, for teachers to feel prepared. For example, knowledge about lesson design may be easier to translate directly into day-to-day teaching practice than knowledge about classroom management, which requires teachers to notice and interpret classroom events and then decide how to apply relevant GPK in the moment.

Further research will be needed to shed light on the relationships between GPK, teachers' beliefs and the quality of their professional learning. If GPK does not explain the variation in teachers' perceptions of their preparation, it would be interesting to know whether there are certain features of professional learning that help teachers feel more prepared, especially in areas where teachers feel relatively unprepared despite having higher GPK. A better understanding of these relationships can then inform evaluations of the quality of teachers' professional learning and policies that support teachers in developing their pedagogical practice.

Table 2.1. Chapter 2 figures

Figure 2.1	Gender differences in general pedagogical knowledge
Figure 2.2	General pedagogical knowledge, by years of teaching experience
Figure 2.3	Self-efficacy in core areas of teaching and general pedagogical knowledge
Figure 2.4	Self-efficacy in additional areas of teaching and general pedagogical knowledge
Figure 2.5	General pedagogical knowledge and sense of preparedness
Figure 2.6 (Chile)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country
Figure 2.6 (Croatia)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country
Figure 2.6 (Morocco)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country
Figure 2.6 (Poland)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country
Figure 2.6 (Portugal)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country
Figure 2.6 (Saudi Arabia)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country

Figure 2.6 (South Africa)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country
Figure 2.6 (United States)	Knowledgeable teacher reports of preparation in different dimensions of teaching, by country

StatLink https://stat.link/yngodt

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3 Education systems can help teachers develop general pedagogical knowledge

This chapter examines how teachers can develop their general pedagogical knowledge (GPK) through a variety of system- and school-level resources. It analyses relationships between GPK and teachers' preparation through their initial teacher education (ITE) and their continuing professional learning opportunities. The importance of induction and collaborative practices for GPK is also analysed.

Highlights

- **General pedagogical knowledge tends to increase with the highest level of formal education completed by teachers**. The benefits of a bachelor's level qualification are clear. However, the advantages of a master's or doctoral degree are not consistently observed.
- **Teachers whose first teaching qualification included only subject-specific education or training tend to have lower levels of GPK** in Chile, Croatia, and Portugal. Training through a fast-track, shorter or specialised teacher education programme is also related to lower GPK in Saudi Arabia, but the reverse is found in Portugal and South Africa.
- **Teachers tend to have higher GPK when they exchange teaching materials with their colleagues**. Teachers are also likely to have **higher GPK when they regularly engage in discussions with colleagues about the learning development of specific students**. But not all forms of teacher collaboration are linked to increased GPK. In most countries, teachers involved in **team teaching are likely to have lower GPK scores.**
- **Teachers with formal teacher education or training in the arts and physical education often have lower GPK scores** on average**.** Teachers with training in the arts have lower GPK scores than those without such training in half of the countries studied. Similarly, teachers with training in physical education have lower GPK scores in half of the countries participating in TKS.
- **GPK is not associated with the year of completion of formal teacher education and training** in most countries. However, **in South Africa, teachers with more recent teacher training tend to have higher GPK scores** than those who trained in previous years (more than five years prior to TALIS 2024). Conversely, **in Portugal, teachers with older qualifications** tend to have **higher GPK scores**.
- Teachers' level of **GPK does not tend to vary according to whether their school offers induction programmes**, except in Morocco. However, in three participating countries, novice teachers have **higher GPK** when working in schools where induction activities include **planned meetings with the principal and/or experienced teachers.** Meanwhile, **online activities in induction programmes are associated with a decrease in GPK** for novices in Poland and Portugal.

Introduction

Teachers can acquire knowledge of general pedagogy at all stages of their careers. They start developing relevant general pedagogical knowledge during their initial teacher education (ITE). Continuous professional development is necessary – and often mandated – for teachers to keep their knowledge up to date. Every experience of teaching and interacting with students can help teachers develop their understanding of applied knowledge. Meanwhile, interactions with colleagues and other professionals working in education can also present opportunities for learning. The extent to which teachers can access and benefit from these learning opportunities is shaped by system-level policies, including the organisation of teacher education programmes, requirements for professional development, and the provision of time and resources for collaboration.

Understanding how teachers' GPK relates to their education, training and various resources can inform policy discussions about how education systems can better support teachers' acquisition of GPK. This chapter examines teachers' educational backgrounds and analyses whether particular pathways into

teaching are associated with different levels of GPK. It also examines the relationships between GPK and certain resources that could help teachers cultivate GPK once they start teaching, including induction and collaboration with other teacher colleagues.

General pedagogical knowledge and teachers' training

Level of educational attainment

Education requirements for teachers vary between countries as policymakers balance multiple policy priorities regarding teacher recruitment. For example, raising the criteria for entry into teaching with master's level programmes can boost the status of teaching by positioning the profession as one that requires highly specialised knowledge (OECD, 2019[1]). However, implementing such policies may increase the risk of teacher shortages, as they act as barriers to the profession.

Lower secondary school teachers have a master's level degree in most OECD countries (OECD, 2024[2]). In TALIS 2024, 59% of teachers reported holding a master's or a higher level of qualification across the 27 OECD countries that participated in TALIS (Table 1.7; OECD, (2025[3]). The remaining teachers tend to hold a bachelor's degree or equivalent. In most countries, few teachers have a short-cycle tertiary degree or a lower qualification. Among countries participating in the Teacher Knowledge Survey (TKS), the share of teachers with this level of qualification is around 1% or less in Chile, Croatia, Poland, Portugal and the United States. This share is also low in Saudi Arabia (2%) but more substantial in Morocco (18%) and South Africa (14%).

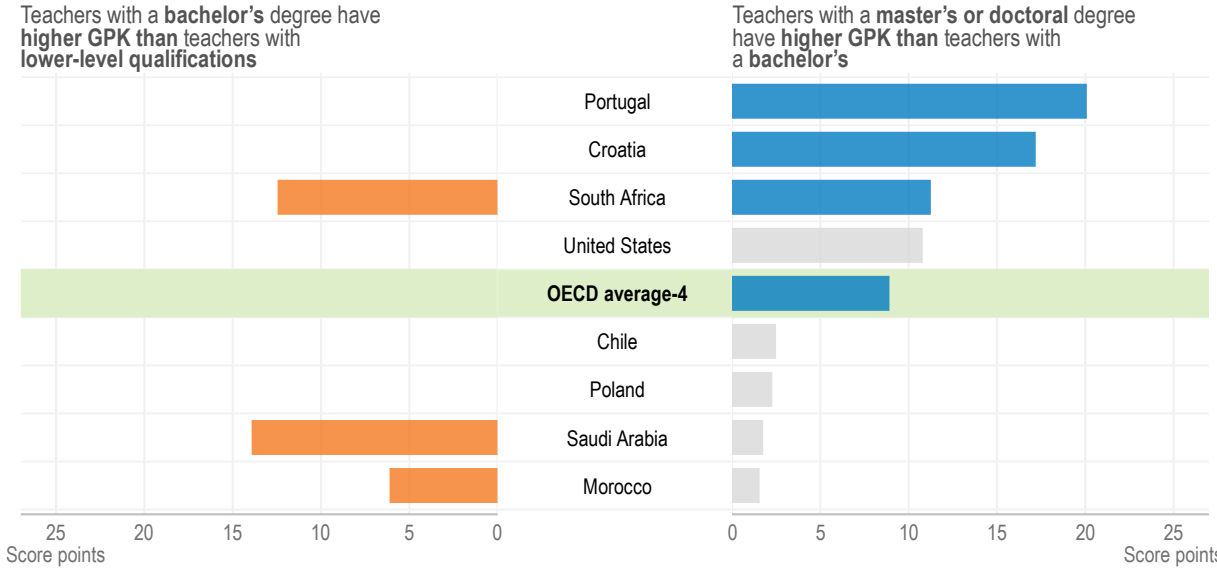
Results from the Teacher Knowledge Survey (TKS) show the importance of bachelor's-level education for teachers' GPK. Teachers with a bachelor's-level qualification consistently attained higher GPK scores than teachers with lower-level qualifications, in countries with a sufficient share of teachers without a bachelor's degree for comparisons to be drawn (Figure 3.1). Differences are smaller in Morocco at 6 score points on average, compared to 13 in South Africa and 14 in Saudi Arabia.

Teachers' GPK can also increase with higher levels of education. Teachers with master's degrees or higher qualifications have higher GPK than bachelor's graduates in Croatia, Portugal and South Africa. But in Chile, Morocco, Poland, Saudi Arabia and the United States, differences are statistically insignificant. These findings echo past research, which has not always indicated a strong relationship between a master's-level degree and improved teacher quality (Hanushek and Rivkin, 2006[4]; Horn and Jang, 2017[5]).

An important consideration in these analyses is what teachers studied during their degree programmes. One might expect a teacher to have higher GPK if their master's degree included relevant content such as educational theory, but not if the degree was in a particular discipline, like mathematics. TKS does not ask teachers to specify which field they studied as their highest level of formal education, but country policies can provide some answers. In Croatia and Portugal, where teachers with master's degrees have higher GPK, initial teacher education typically involves a 3-year undergraduate programme followed by a 2-year master's in education, or a relevant subject area in Croatia (Table B.1).

Figure 3.1. Differences in general pedagogical knowledge, by teachers' level of educational attainment

Difference in average GPK scores between teachers with bachelor's degrees and those with other levels of educational attainment



Note: Countries are sorted in descending order of the average difference in GPK scores between teachers with a master's or doctoral level degree and teachers with a bachelor's level degree. Statistically non-significant differences are shown in grey. Results are missing for countries where the number of teachers without a bachelor's level degree is too low to make robust comparisons.
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.1.

StatLink https://stat.link/w39ixu

Initial teacher education in Poland also awards a master's degree, but differences in GPK are not statistically significant between bachelor's graduates and those with higher degrees. Poland has the smallest share of teachers (at only 2%) without a master's- level degree among TKS countries, since exemptions from master's-level qualification requirements only exist in very specific circumstances (OECD, 2025[3]; Table 1.7; Table B.5). The fact that very few teachers have only a bachelor's-level qualification may affect whether statistically significant differences can be detected. However, the lack of significant differences may also be due to the mandatory requirements for all qualified teachers to undergo pedagogical and practical training, regardless of their pathway into the profession (Table B.5). Teachers in Poland who did not take pedagogical studies during their initial degree can only become qualified by completing a non-degree postgraduate teacher education programme, lasting at least 3 semesters (Table B.1).

It is also possible that some master's-level studies in education provide pre-service teachers with very specific knowledge and skills, which are not reflected in higher GPK scores, as the TKS instrument is designed to assess teachers' knowledge across a broad range of GPK. This is supported by qualitative evidence from teachers with master's qualifications, who have indicated that the content of teacher education can be too specific and removed from the realities of teaching to be useful in their day-to-day work (Eklund, Aspfors and Hansén, 2019[6]; Kowalczuk-Walędziak, Clipa and Daniela, 2017[7]).

Type of initial teacher education or training

Different pathways into teaching

Teachers can enter the profession via diverse pathways, which can help make teaching more attractive and accessible to a wider range of candidates. Nevertheless, different pathways have different requirements, which can influence how prepared teachers are upon entering the profession (Gansle, Noell and Burns, 2012[8]; von Hippel and Bellows, 2018[9]). TKS asked teachers to indicate how they acquired their first teaching qualification, considering the following routes:

- A regular teacher education or training programme, where teachers complete post-secondary education leading to a teaching credential, typically at a university with a focus on subject-matter, pedagogy and practice either concurrently or consecutively.
- A fast-track/shorter or specialised teacher education or training programme, which is generally shorter in duration than regular training programmes and usually designed for specific groups (e.g. second-career candidates, candidates with some teaching experience or candidates with high levels of subject knowledge).
- A subject-specific programme, meaning teachers only learned content knowledge and have minimal or no training in pedagogy and practice.

According to TALIS 2024, around 77% of teachers completed regular teacher education or training as their first teaching qualification across the OECD (OECD, 2025[3]; Table 4.1). Among TKS countries, the share of teachers with this type of qualification varies greatly. In Saudi Arabia, only 16% of teachers completed a regular training programme. However, in Poland and Portugal, 94% of teachers report having the same type of training.

In Saudi Arabia, teachers most often have only subject-specific training (49% of teachers), but fast-track teaching qualifications are also more common (22%) than regular teacher education (16%) (OECD, 2025[3]; Table 4.1). Teachers in Morocco also report having only subject-specific degrees (20%) more frequently than fast-track qualifications (15%), although regular teacher education remains the most common educational background. The contrary holds for South Africa, where more teachers have completed a fast-track programme (37%) than a subject-specific degree (9%).

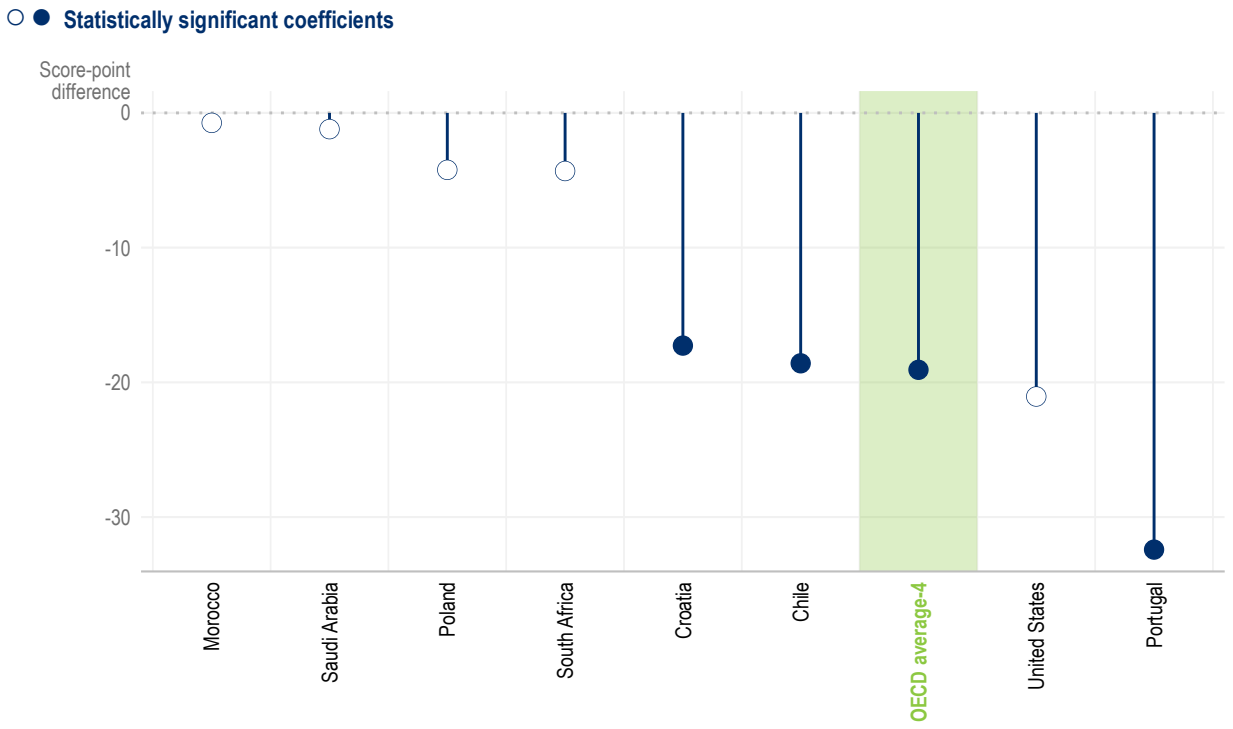
Teaching pathways and GPK

Providing multiple pathways into teaching could help make teaching more attractive and accessible to a wider range of candidates. Whilst GPK is but one aspect of teachers' professional competence, results from the TKS can indicate whether teachers pursuing different pathways into the profession benefit from similar levels of support and preparation in pedagogy.

Teachers with regular teacher education generally have higher GPK than those with subject-specific qualifications only, although this relationship is only statistically significant in three participating countries (Figure 3.2). In Chile, having only subject-specific ITE is associated with a 19-point decrease in GPK, after accounting for teacher and school characteristics. In Croatia, the associated decrease is 17 points. In Portugal, the difference is greater at 32 points, but fewer than 1% of teachers complete only subject-specific ITE (OECD, 2025[3], Table 4.1).

Figure 3.2. General pedagogical knowledge and subject-specific teacher education

Change in teachers' GPK score associated with completing subject-specific education or training only as their first teaching qualification[1,2]



Note: Countries are sorted in descending order of the size of the coefficient.
Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK and their completion of subject-specific education or training only, while those below 0 reflect a negative relationship.
1. Binary variable: the reference category refers to "a regular teacher education or training programme".
2. Results are based on linear regression analysis, showing the change in the outcome variable associated with a one-unit increase in the explanatory variable after controlling for teacher and school characteristics. Teacher characteristics include gender, age and years of teaching experience; school characteristics include school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have
difficulties understanding the language(s) of instruction and school intake of students with special education needs.
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.2.

StatLink https://stat.link/7t1nl2

It may not be surprising that teachers with only subject-specific qualifications have lower GPK, since their ITE did not, by definition, include pedagogical studies. It is interesting, however, that in several countries, such teachers do not have significantly lower GPK, especially in Morocco and Saudi Arabia, where the subject-specific pathway into teaching is relatively common (OECD, 2025[3]; Table 4.1). This may indicate that the support available to in-service teachers through continuous professional learning is sufficient for them to acquire GPK that is comparable to teachers who completed regular teacher education. At the same time, these findings might also highlight how teachers are being trained through regular teacher education.

Teachers who participated in fast-track or specialised ITE programmes tend not to have different levels of GPK compared to those who completed regular ITE in most TKS countries (Figure 3.3). In fact, teachers who completed such programmes tend to have higher GPK than those undergoing regular teacher

education in Portugal and South Africa. Differences are slightly greater in Portugal (10 points) than in South Africa (6 points), but a much smaller proportion of teachers have this type of educational background. Fewer than 2% of teachers in Portugal completed a fast-track programme, and alternative pathways into teaching other than regular teacher education are generally not available (OECD, 2025[3]; Table 4.1; Table B.5).

Figure 3.3. General pedagogical knowledge and fast-track/shorter or specialised teacher education

Change in teachers' GPK score associated with completing a fast-track/shorter or specialised education or training programme as their first teaching qualification[1,2]

Note: Countries are sorted in descending order of the size of the coefficient.
Statistically significant coefficients are highlighted with filled circles (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK and their completion of a fast-track/shorter or specialised education or training programme, while those below 0 reflect a negative relationship.
1. Binary variable: the reference category refers to "a regular teacher education or training programme".
2. Results are based on linear regression analysis, showing the change in the outcome variable associated with a one-unit increase in the explanatory variable. Teacher characteristics include gender, age and years of teaching experience; school characteristics include school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs.
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.2.

StatLink https://stat.link/mz1vod

These data suggest that fast-track teacher education programmes can prepare teachers to the same level of pedagogical knowledge as regular teacher education programmes. Nevertheless, it should be noted that not all fast-track programmes are equal in duration and content. Both factors could influence the level of preparation of their graduates vis-à-vis graduates from regular teacher education programmes.

In South Africa, graduates from any bachelor's programme may enter teaching by completing pedagogical studies through a fast-track Post-Graduate Certificate in Education (PGCE) over the course of one year, instead of studying the 4-year bachelor's in education (Table B.1). PGCE programmes in South Africa have faced scepticism due to the reduced amount of time that student teachers have to develop their pedagogical knowledge (Nomlomo and Sosibo, 2016[10]; Verbeek, 2014[11]). TKS results suggest that these programmes provide teachers with sufficient opportunities to learn general pedagogy as regular ITE. Significant differences may also be due to the types of candidates that are attracted to different pathways into teaching. For example, teachers' GPK scores may be linked to their motivations to teach, which can vary between different routes into teaching (König and Rothland, 2012[12]; Lucksnat et al., 2022[13]).

Conversely, teachers with fast-track qualifications have significantly less knowledge than those with regular ITE in Saudi Arabia, though the difference is modest at 6 points. This finding may not be surprising given that these teachers may be university graduates of subject-specific degrees who passed the teacher licensing examination but did not complete any prior teacher training (Table B.5). Prospective teachers do require some GPK to gain teacher certification as they are tested on their professional and practical knowledge, as well as their values and responsibilities (OECD, 2024[14]). The structure of this fast-track route into teaching is very different from the fast-track PGCE in South Africa, which comprises a year of teacher education, including ten weeks of a teaching practicum (Table B.3, Table B.5).

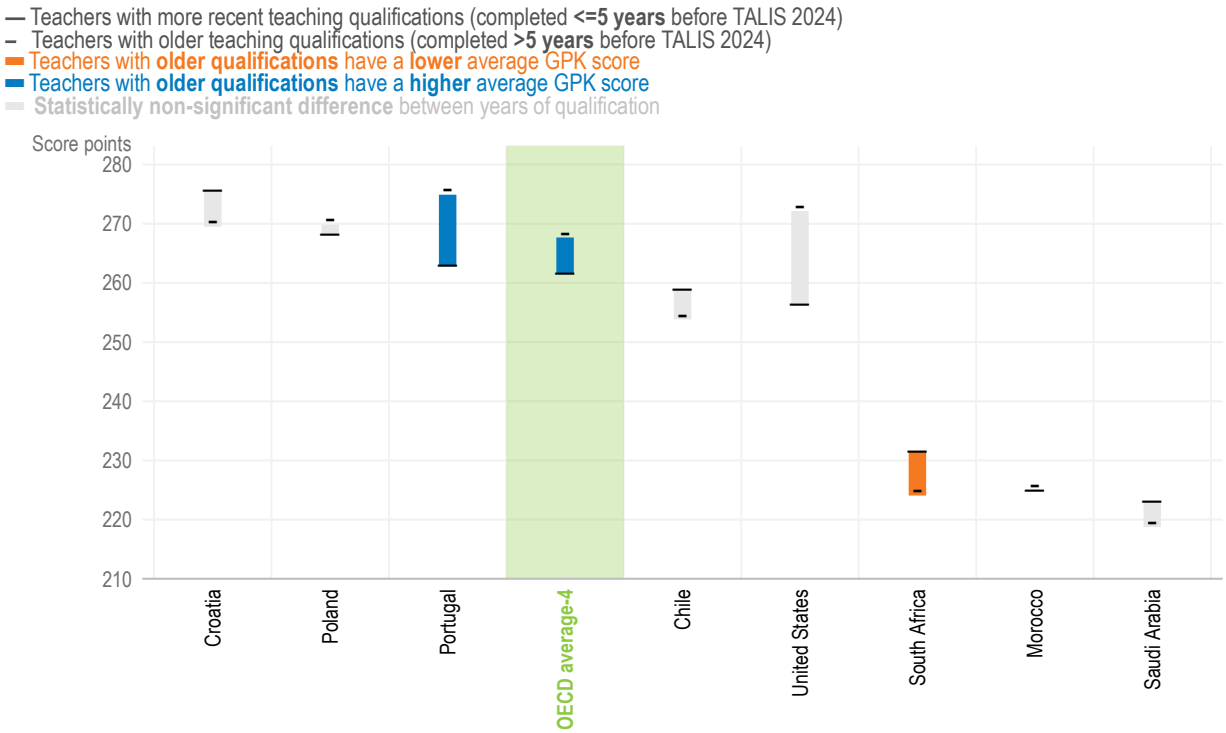
Year of completion of initial teacher education or training

Even if teachers completed the same broad type of initial teacher education, what their training entailed could have differed widely depending on changes in the approach, content or structure of their training. TKS asks teachers about the year they completed their first teaching qualification to understand how these changes might have influenced teachers' learning.

Significant differences in GPK between recent graduates and more experienced teachers are found in Portugal and South Africa (Figure 3.4). In Portugal, teachers with qualifications more than 5 years prior to TALIS 2024 tend to have higher GPK than recent graduates. However, the reverse is true in South Africa. Such differences may be linked to changes in requirements for teachers and regulations around ITE that have occurred in recent years in these countries (see Box 3.1 for context). On the other hand, they could reflect differences in how teachers acquire GPK after completing their initial training.

Figure 3.4. General pedagogical knowledge, by qualification vintage

Average GPK score of teachers



Note: Countries are sorted in descending order of the average GPK score of teachers who completed their first teaching qualification less than five years prior to TALIS 2024.
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.3.

StatLink https://stat.link/j74hc5

Box 3.1. Reforms to initial teacher education

Ensuring that initial teacher education adequately prepares teachers for the classroom is an important policy priority. To improve its quality, policymakers may consider a variety of reforms, including changing minimum requirements for teachers, reforming the organisation of initial teacher education, or introducing different quality assurance mechanisms. This box describes some of the changes made in recent decades in Morocco, Portugal and South Africa.

Morocco

Minimum education requirements to become a teacher were raised in 2012, as the competitive exam to access teacher training programmes was restricted to graduates with a bachelor's degree. New *Centres régionaux des métiers de l'éducation et de la formation* (Regional Centres for Education and Training, CRMEF) were established to provide initial teacher training in a one-year programme, replacing the *Centres pédagogiques régionaux* (Regional Pedagogical Centres, CPR) for teaching at the lower secondary level. An additional exam was introduced for teacher candidates to access the profession following their initial training and internship in 2015.

In 2018, the Ministry of Higher Education, Scientific Research and Innovation introduced the bachelor's degree programme in education. This initiative seeks to further enhance the quality of teacher recruitment by equipping teachers with five years of pedagogical training. This course included three years at university and two years with the CRMEF, which would provide 60 hours of training during the final year spent completing a full-time teaching internship.

Portugal

Several changes were introduced to initial teacher education with the Legal Framework for Professional Qualification for Teaching outlined in 2007. For one, the minimum qualification for entry into teaching became a master's degree. The Legal Framework also outlined structures for ITE programmes and time allocations to four core training components: subject knowledge, pedagogical knowledge, learner guidance skills and social and cultural understanding.

A Knowledge and Skills Assessment Test (KSAT) was also made a prerequisite for entry into teaching in 2007. However, this requirement was dropped in 2016 in response to concerns raised about negative effects on teacher autonomy and the reputation of teacher training institutions.

South Africa

The Minimum Requirements for Teacher Education Qualifications (MRTEQ) were revised in 2015 to tackle continued challenges with teacher knowledge in the country. The MRTEQ emphasised the importance of acquiring different types of knowledge through a mix of disciplinary learning (subject-matter knowledge), pedagogical learning (general pedagogical knowledge), practical learning (applied and tacit knowledge), fundamental learning (knowledge of a second official language, ICT and academic literacy) and situational learning (knowledge of diverse contexts).

The MRTEQ outlined the competences required of beginner teachers and designated the Bachelor of Education degree (BEd) and the Postgraduate Certificate in Education (PGCE) as the established routes available to qualified teacher status. The document lays out the minimum number of academic credits required to graduate as well as the general knowledge mix that should be included. For the BEd, at least 192 credits are reserved for and spread between educationally focused disciplinary learning, general pedagogical learning, fundamental learning and situational learning. For the PGCE, at least 32

credits are allocated to the study of the foundations of education, while 40 credits must be given to specialised pedagogical learning and 8 credits to general pedagogical learning.

Source:
Lahchimi (2015[15]), *La réforme de la formation des enseignants au Maroc*, https://journals.openedition.org/ries/4402.
Bourquia et al. (2021[16]), *Le métier de l'enseignant au Maroc. À l'aune de la comparaison internationale*, https://www.csefrs.ma/wp-content/uploads/2021/11/30-11-Rapport-me%CC%81tier-de-lenseignant-V-Fr.pdf.
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Republic of South Africa (2009[18]), *National Qualifications Framework Act, 2008 (Act No. 67 of 2008)*, https://www.gov.za/sites/default/files/gcis_document/201409/31909167.pdf.

Subject(s) included in initial teacher education or training

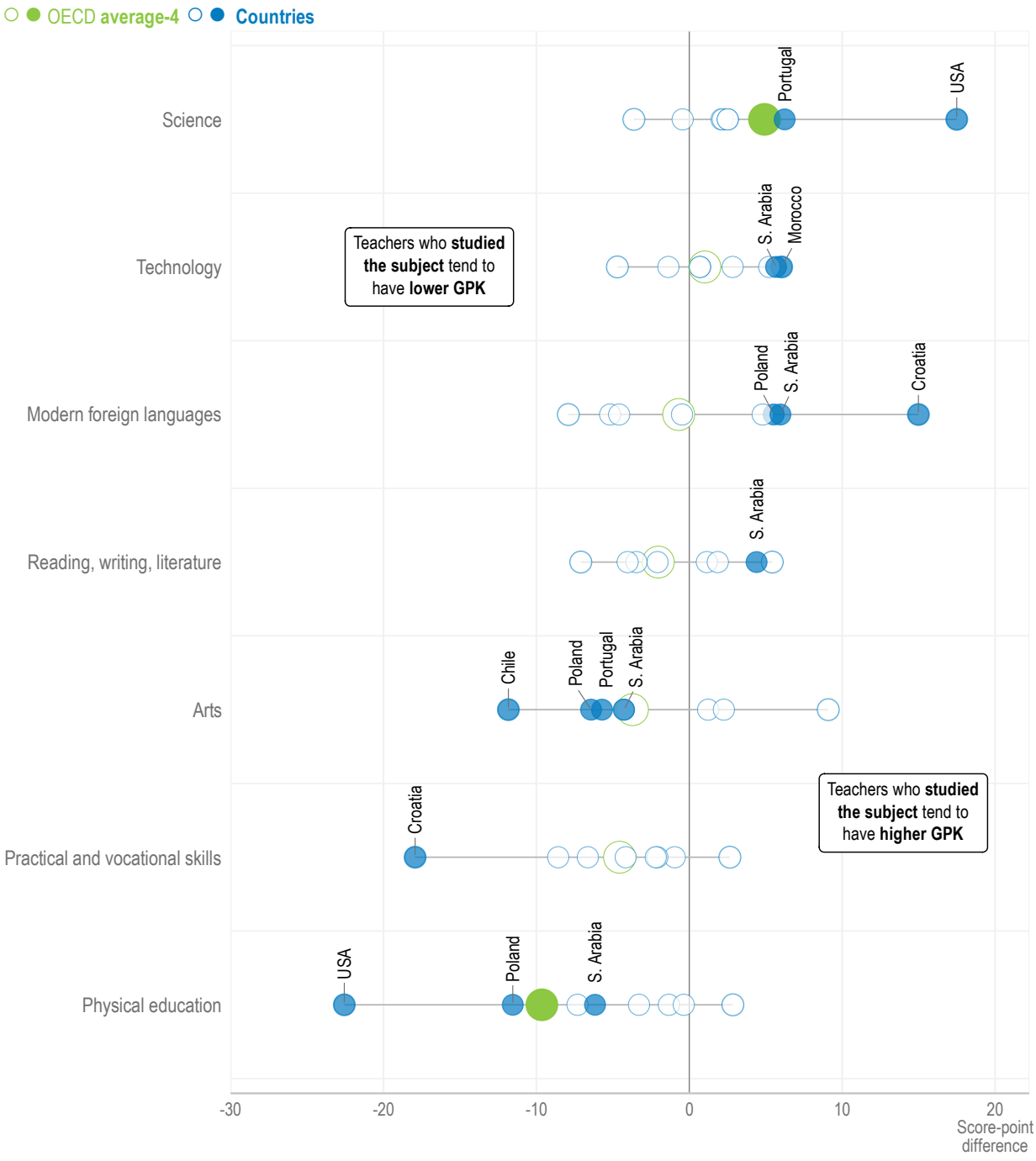
General pedagogical knowledge is relevant for teaching and learning regardless of teachers' subject area. However, teachers' professional knowledge also comprises subject-specific content knowledge (CK) and pedagogical content knowledge (PCK) on how to teach particular topics or skills within that discipline (OECD, 2025[19]). Past research suggests that GPK and PCK are related, so teachers' GPK may vary by the PCK levels they have across different subjects, even if they receive similar courses in general pedagogy.

In most cases, the inclusion of a particular subject category in teachers' formal training is not significantly related to their GPK (Figure 3.5). Where relationships are found, they tend to be negative in non-academic subject categories and positive in academic ones. For example, the arts are negatively associated with GPK in Chile, Poland, Portugal and Saudi Arabia. GPK is negatively associated with formal teacher training in physical education in Poland, Saudi Arabia and the United States. Conversely, teachers with formal teacher training in modern foreign languages are likely to have higher GPK in Croatia, Poland, and Saudi Arabia.

Differences in GPK across subject categories are more common in some countries than others. The subject of teachers' initial teacher education is not related to their GPK in any category in South Africa. However, in Saudi Arabia, the inclusion of reading, writing and literature; modern foreign languages; technology; the arts and physical education is related to their GPK.

Figure 3.5. General pedagogical knowledge and subject categories of initial teacher education

Change in teachers' GPK score associated with subject categories included in their formal teacher education or training[1,2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK score and the inclusion of a subject category in their formal teacher education or training, while those below 0 reflect a negative relationship.

1. Binary variables: the reference category refers to subjects that are not included in a teacher's formal teacher education or training.

2. Results based on a single linear regression analysis, showing the change in teachers' GPK score associated with a one-unit increase in the explanatory variable. The regression controls for teacher characteristics (gender, age and years of teaching experience) and school characteristics (i.e. school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.4.

StatLink https://stat.link/cjbufv

General pedagogical knowledge and school-level support

School-based support after initial teacher education is essential for teachers to continue to develop their knowledge and skills. For teachers new to the profession, formal and informal induction programmes are common and often mandatory across the OECD (OECD, 2022[20]). Teachers may participate in a variety of activities as part of induction programmes, but evidence for the impact of induction initiatives is currently strongest for mentoring and coaching (OECD, 2019[1]).

Of course, teachers may learn from interactions with their colleagues outside of structured programmes. TALIS 2024 shows that teachers can engage in a range of collaborative activities and that these are significantly associated with teachers' outcomes, such as perceived fulfilment of their lesson aims, job satisfaction and well-being (OECD, 2025[3]). Data from TKS can help inform whether – and which – collaborative practices are also linked to teachers' knowledge of general pedagogy.

Induction

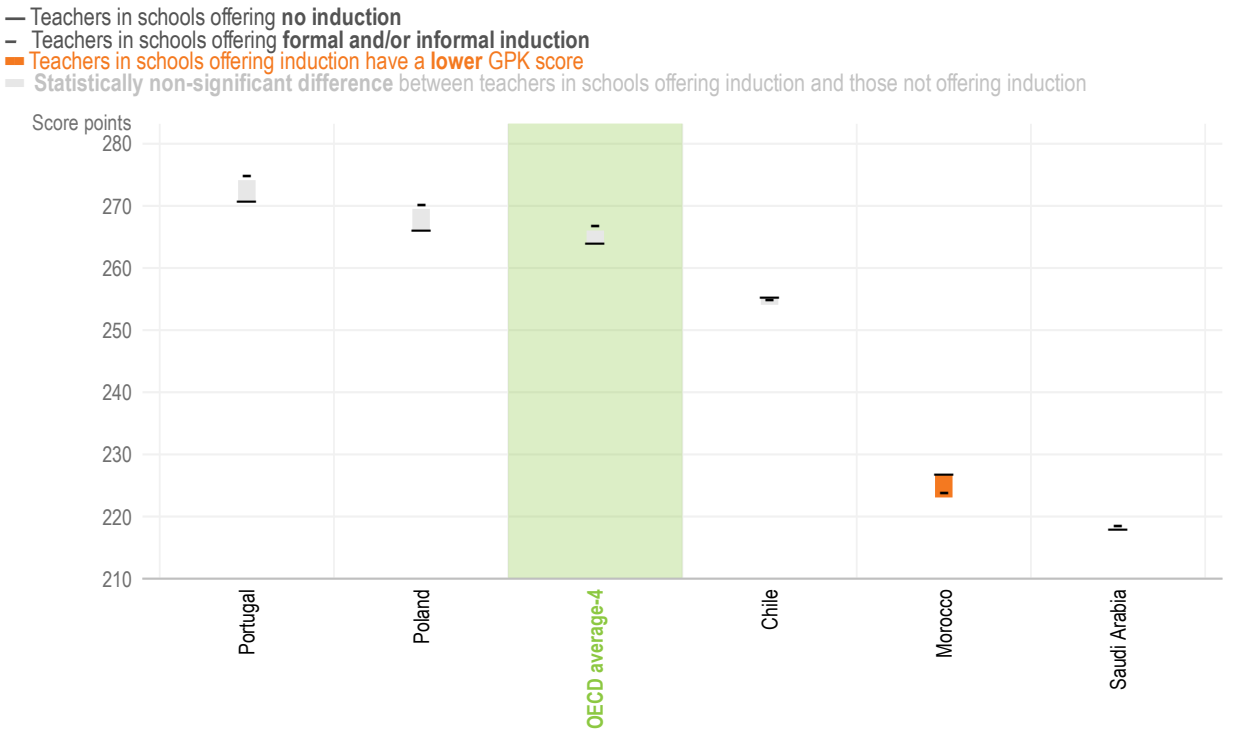
Induction programmes can be valuable in helping new teachers learn to utilise the knowledge and skills gained during their ITE, rather than resorting to survival strategies once they enter the classroom (OECD, 2019[1]). Among countries participating in TKS, it is mandatory for schools to offer formal induction programmes for teachers new to the profession in Croatia, Poland, Saudi Arabia and South Africa (Table B.4). However, the duration of these induction programmes varies greatly, ranging from just three to five days in Saudi Arabia to three years and nine months in Poland. At the same time, schools may offer formal induction programmes or informal induction activities that go beyond mandatory requirements.

TALIS 2024 reports that most teachers participated in induction activities, whether formal or informal, across all TKS-participating countries. The share of new teachers (with less than 5 years of teaching experience at their current school) reporting participation in induction ranges from 54% in Morocco to 88% in the United States (OECD, 2025[3]; Table 4.7). These figures likely underestimate the share of teachers who have ever benefited from induction, though, since they only refer to activities offered at teachers' current schools. This may explain why some teachers do not report participating in such programmes even when induction is mandatory for novice teachers, since they may have participated in a previous school.

TKS includes TALIS 2024 data from school principals on whether teachers have access to induction activities. It is therefore possible to compare the GPK of teachers across schools offering an induction programme (whether formal or informal) and those without. In most cases, differences in GPK are small and statistically insignificant, although in Morocco, teachers in schools with induction programmes tend to have slightly lower GPK (Figure 3.6).

Figure 3.6. General pedagogical knowledge, by availability of school induction programmes

Average GPK score of teachers



Note: Countries are sorted in descending order of the average GPK score of teachers who work in schools that offer formal and/or informal induction programmes, based on reports of principals. Results for Croatia, South Africa and the United States are not reported because the number of teachers in schools offering no induction was too small to reliably estimate their GPK.
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.5.

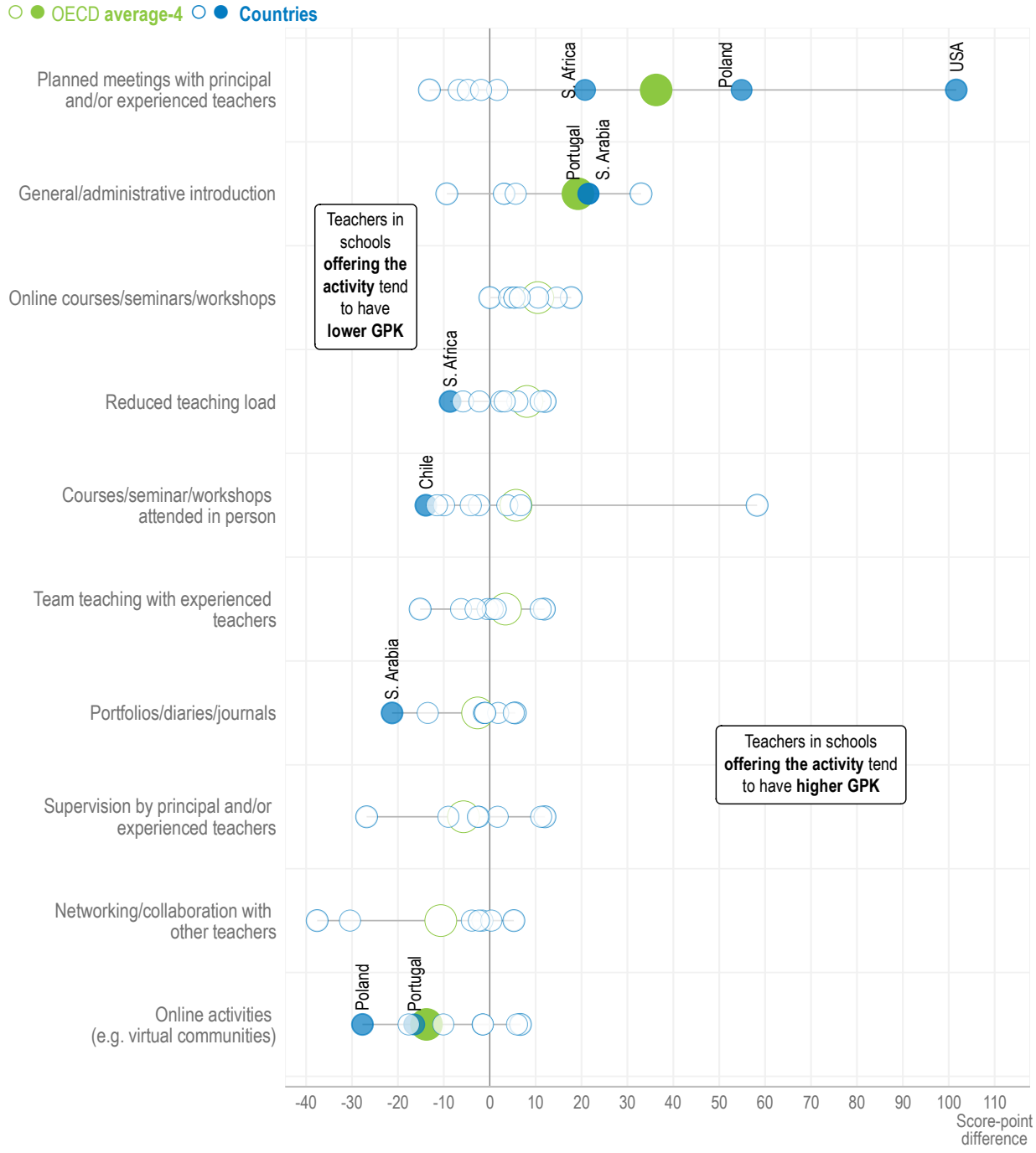
StatLink https://stat.link/2mocwl

TALIS 2024 also asks principals about the provisions included in teacher induction at their schools. Among schools providing formal and/or informal induction activities, support for teachers most often includes working with other staff. Across the OECD, more than 90% of principals in such schools report that induction activities include planned meetings with the principal or experienced teachers, supervision by the principal or experienced teachers, and networking or collaboration with other teachers (OECD, 2024[21]). Provisions affecting timetabling and the number of teachers available to teach different classes are less common. 65% of schools with induction programmes arrange team teaching with experienced teachers, while only 34% offer a reduced teaching load.

Associations between specific induction activities and novice teachers' GPK are not found in most cases, but they are statistically significant and sizeable in a few instances. In particular, providing planned meetings with principals or experienced teachers is associated with higher average GPK scores in Poland, South Africa and the United States, with estimated coefficients ranging from 42% of a standard deviation in South Africa to 203% of a standard deviation in the United States (Table E.3.6; Figure 3.7).[1] The inclusion of a general or administrative introduction in induction was also related to higher levels of GPK in novice teachers in Portugal and Saudi Arabia. Conversely, the inclusion of online activities in induction programmes is related to lower levels of GPK in Poland (an average decrease of 55% of a standard deviation) and Portugal (an average decrease of 33% of a standard deviation).

Figure 3.7. General pedagogical knowledge and school induction activities

Change in novice teachers' GPK score associated with provisions included in induction at their school[1,2,3]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK score and the inclusion of a measure in teacher induction at their school, while those below 0 reflect a negative relationship.

1. Binary variables: the reference category refers to measures that are not included in teacher induction at a teacher's school, based on principals' reports.

2. Results based on a single linear regression analysis, showing the change in teachers' GPK score associated with a one-unit increase in the explanatory variable. After controlling for teacher (i.e. gender, age and years of teaching experience) and school characteristics (i.e. school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
3. Analyses are restricted to teachers with less than 5 years of teaching experience.
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.6.

StatLink https://stat.link/ibglzo

Teacher collaboration

Teachers can also broaden their knowledge of teaching and learning by working with their colleagues. Professional collaboration can help individual teachers express their implicit knowledge, making it more accessible to themselves and to the collective of teachers in their school (Guerriero, 2017[22]). Professional exchanges can also encourage teachers to share and co-construct knowledge (Ulferts, 2021[23]).

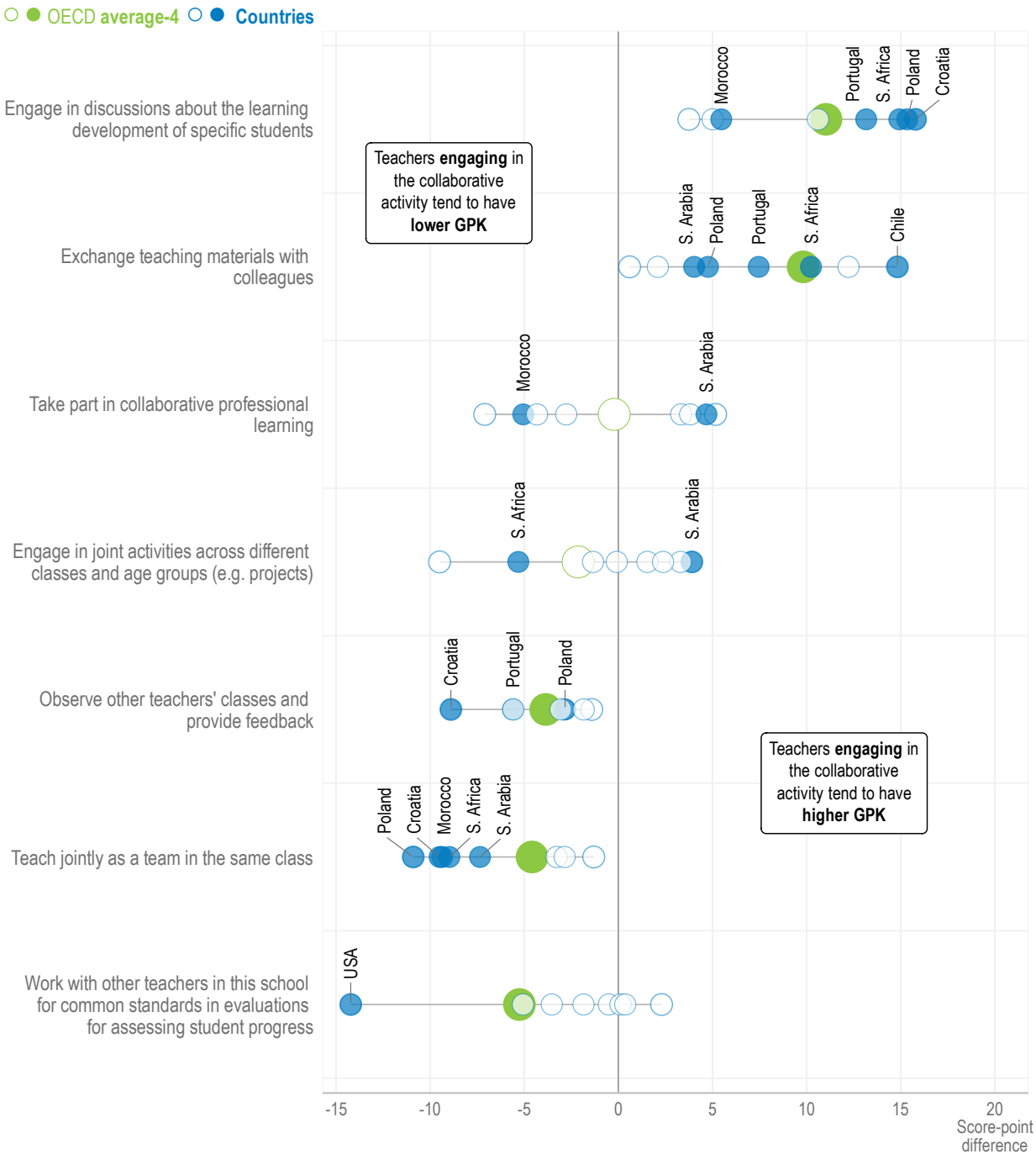
Teachers in TKS are asked about how often they work with their colleagues in a range of practices. These include deeper forms of professional collaboration, such as team teaching, providing feedback based on classroom observations, engaging in joint activities across different classes and participating in collaborative professional learning. Teachers are also asked about their engagement in simpler forms of exchange and co-ordination for teaching, namely through exchanging teaching materials, discussing the learning development of specific students, and working with other teachers to ensure common standards in evaluations.

TKS results suggest that some forms of professional collaboration are positively associated with teachers' GPK. For example, relationships between teachers' GPK and the exchange of teaching materials with colleagues are consistently positive, and statistically significant in Chile, Poland, Portugal, Saudi Arabia and South Africa (Figure 3.8). In addition, engaging in discussions with colleagues about the learning development of specific students is also associated with higher GPK in Croatia, Morocco, Poland, Portugal and South Africa. These positive relationships could reflect the impact of these activities and the types of teachers who voluntarily share materials and discuss student learning with colleagues.

However, other collaborative activities are negatively associated with GPK. Teachers who are involved in team teaching at least once a year tend to have lower GPK in Croatia, Morocco, Poland, Saudi Arabia and South Africa. In addition, teachers are likely to have a lower GPK score if they regularly participate in classroom observations in Croatia, Poland and Portugal. Negative relationships might be observed between GPK and these practices if they are used as measures to help teachers in need of support. Thus, teachers who are less established in their practice might be more likely to be asked to team teach with other colleagues or to observe other teachers' classes.

Figure 3.8. General pedagogical knowledge and teachers' engagement in collaborative practices

Change in teachers' GPK score associated with their engagement in the following collaborative practices at least 2-4 times a year[1,2]



Note: Statistically significant coefficients are highlighted with filled circles and country labels (see Annex D). Filled circles above 0 indicate a positive association between teachers' GPK score and their engagement in a collaborative practice, while those below 0 reflect a negative relationship.

1. Binary variables: the reference category refers to teachers who "never" engage in a practice or do so "once a year or less".

2. Results based on a single linear regression analysis, showing the change in teachers' GPK score associated with a one-unit increase in the explanatory variable. The regression controls for teacher characteristics (gender, age and years of teaching experience) and school characteristics (i.e. school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction and school intake of students with special education needs).
Source: OECD, *TALIS TKS 2024 Database*, Table E.3.7.

StatLink https://stat.link/csgbwx

Table 3.1. Chapter 3 figures

Figure 3.1	Differences in general pedagogical knowledge, by teachers' level of educational attainment
Figure 3.2	General pedagogical knowledge and subject-specific teacher education
Figure 3.3	General pedagogical knowledge and fast-track/shorter or specialised teacher education
Figure 3.4	General pedagogical knowledge, by qualification vintage
Figure 3.5	General pedagogical knowledge and subjects of initial teacher education
Figure 3.6	General pedagogical knowledge, by availability of school induction programmes
Figure 3.7	General pedagogical knowledge and school induction activities
Figure 3.8	General pedagogical knowledge and teachers' engagement in collaborative practices

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Notes

[1]Based on comparisons of regression coefficients with the standard deviation of GPK (50 score points) across the eight participating countries.

Annex A. The development of the Teacher Knowledge Survey

Pedagogical knowledge is a fundamental component of teachers' professionalism and effectiveness. It forms a specialised body of knowledge whose relevance is unique to the teaching profession, as it underpins teachers' decision-making about how to help students to learn. One could argue that pedagogical knowledge is essentially what differentiates a teacher from a professional who is simply very competent on a subject.

The body of research about the importance of teacher knowledge has been growing for several decades but international studies that directly assess pedagogical knowledge have been limited (Weyers, Ligtvoet and König, 2024[1]; König et al., 2011[2]). The Teacher Knowledge Survey (TKS) has been developed to improve our understanding of teachers' pedagogical knowledge base.

TKS focuses on general pedagogical knowledge (GPK), which is general to all teachers, as opposed to pedagogical content knowledge, which is knowledge about teaching and learning a specific subject. TKS stands as the first international large-scale assessment of teachers' general pedagogical knowledge, using representative samples of teachers across participating countries (Ulferts, 2021[3]).

TKS 2024 was conducted as an optional module within the fourth cycle of TALIS (TALIS 2024) in eight countries: Chile, Croatia, Morocco, Poland, Portugal, Saudi Arabia, South Africa, and the United States. The Survey includes both a contextual questionnaire and a direct assessment of GPK. The data collected in the Survey can help policymakers and other stakeholders answer questions such as:

- How broad is teachers' general pedagogical knowledge base?
- Which teachers tend to have more general pedagogical knowledge?
- What system- and school- level resources are associated with having greater knowledge of general pedagogy?
- How does general pedagogical knowledge relate to teachers' practices?

TKS was designed as an optional module that countries participating in the 2024 Teaching and Learning International Survey (TALIS 2024) could decide to administer together with the core TALIS survey. To maximise synergies between the two surveys, teachers participating in TKS were randomly drawn from the pool of teachers teaching at ISCED Level 2 in the same schools that were also sampled for the TALIS core survey.[1] There are therefore also opportunities to analyse TKS results alongside data from principals and other teacher colleagues in the same school.

The TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework (OECD, 2025[4]) presents a detailed overview of the theoretical foundations upon which the TKS instruments were constructed. The development of TKS 2024 largely relied on a pilot study conducted in five countries by the OECD's Centre for Educational Research and Innovation (CERI) as part of its Innovative Teaching for Effective Learning (ITEL) project (Guerriero, 2017[5]; Sonmark et al., 2017[6]). Development of the TKS 2024 assessment and questionnaire was led by ACER (under a contract with the OECD), with the support and guidance of an international group of experts on teacher knowledge (See Annex F List of contributors).

Defining general pedagogical knowledge

Following Shulman's (1987[7]) seminal work on conceptualising teacher knowledge into seven different types, most scholars have identified three categories of knowledge as key to the work of teachers: content knowledge (CK), pedagogical content knowledge (PCK) and general pedagogical knowledge (GPK) (Leijen et al., 2022[8]; Baumert et al., 2010[9]). Shulman's original definition of GPK refers to the "broad principles and strategies of classroom management and organisation that appear to transcend subject matter" (Shulman, 1987, p. 8[7]). Other authors continue to highlight the "cross-curricular" or "generic" nature of GPK, which is "shared by teaching professionals across disciplines and educational levels" (Ulferts, 2021[3]; Guerriero, 2017[5]; Voss, Kunter and Baumert, 2011[10]). Subsequent definitions of GPK have, however, often been extended to include topics beyond classroom management and organisation, such as learning processes, student motivation or teaching methods (OECD, 2025[4]).

The conceptualisation of general pedagogical knowledge (GPK) for TKS 2024 focuses on its relevance for all teachers regardless of their subject. Thus, GPK is identified as "*the specialised knowledge of teachers for creating effective teaching and learning environments for all students, independent of subject matter*", as defined in the OECD ITEL pilot study (Guerriero, 2017, p. 80[5]).

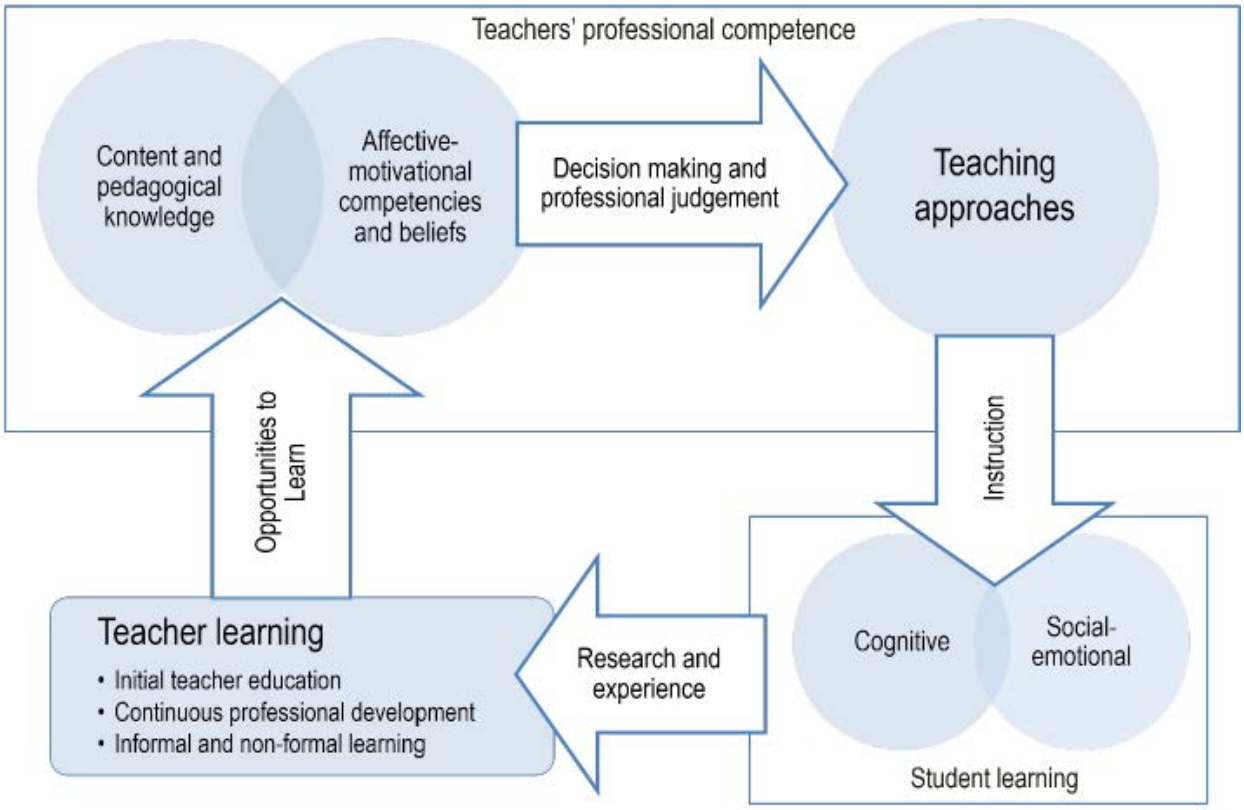
Based on the research conducted for the ITEL pilot study (König, 2014[11]), GPK is conceived as a multi-faceted construct, which includes the following dimensions:

- instruction: including teaching methods, didactics, structuring a lesson, and classroom management;
- student learning: including their cognitive, motivational, emotional individual dispositions; their learning processes and development; their learning as a group taking therefore into account student heterogeneity and adaptive teaching strategies;
- assessment: including diagnosing principles irrespective of the subject, evaluation procedures.

General pedagogical knowledge and teachers' professional competence

While general pedagogical knowledge (GPK) can be considered as a core competence for teachers, it interacts with other factors that are also essential for the provision of effective teaching. The CERI framework of teachers' professional competence illustrates how (general) pedagogical knowledge operates alongside content knowledge and affective-motivational competencies and beliefs in teachers' selection and implementation of teaching approaches (Figure A A.1). Together, these shape students' learning experience and outcomes. In turn, research into student learning and teachers' experiences in the classroom support further opportunities for teachers to learn about pedagogy and thereby the development of teachers' knowledge base.

Figure A A.1. CERI Conceptual framework of teachers' professional competence



Source: Guerriero, S. and N. Révai (2017[12]), "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, Figure 11.2.

The development of the TKS 2024 instruments

Ensuring that TKS provides a valid and internationally comparable measurement of GPK was a core concern in the development of the survey instruments. Three methods of validation were used in the development of the TKS conceptual and assessment frameworks:

- reviews of teaching models, frameworks and national teaching standards;
- support by the specifically established Teacher Knowledge Expert Group (TKEG);
- expert feedback from participating countries (OECD, 2025[4]).

Review of national teaching standards

To examine the cross-cultural validity of the TKS assessment framework, teacher professional standards from Chile, Croatia, South Africa and the United States were analysed. This was an important step to confirm the relevance of the theorised dimensions and categories of GPK across diverse countries, since previous literature on the topic was based largely on studies of Western, English-speaking or European countries (König, 2014[11]; Toledo-Figueroa, Révai and Guerriero, 2017[13]). The following documents containing teacher professional standards were reviewed, as these were considered likely to reflect the professional knowledge that teachers in each country were expected to have:

- Council for Educators: Professional Teaching Standards (South Africa)

- National Council for Education and Training: Framework of National Qualification Standards for Teachers in Primary and Secondary Schools (Croatia)
- Council of Chief State School Officers: InTASC Model Core Teaching Standards (United States)
- Center for Improvement, Experimentation and Pedagogical Research: Framework for Good Teaching (Chile)

This validation analysis provided support for the use of the TKS GPK assessment framework, as every sub-dimension from the framework was reflected in each set of the teacher professional standards at least once if not multiple times. All sets of professional standards also included reference to topics relating to the emergent priorities for teacher knowledge, as well as core knowledge. In particular, the sub-themes of diversity and technology in education were present in documents from all four countries.

Teacher Knowledge Expert Group (TKEG)

Work on developing the TKS was supported by a Teacher Knowledge Expert Group (TKEG).[2]

The TKEG provided feedback on the conceptual and assessment frameworks for GPK developed by ACER. Each TKEG member also independently conducted a review of individual GPK items for the TKS assessment, providing ratings and suggestions for consideration. Item ratings from the TKEG supported the selection of items at each stage of survey development, from the pilot and field trial to the main survey.

TKEG members were also consulted in the development of the TKS context questionnaire. Their feedback and suggestions guided the development of new items on teachers' opportunities to learn and the selection of items shared with the TALIS core survey.

Expert feedback from participating countries

National project managers (NPMs) in each participating country invited representatives from teacher standards bodies, national experts, and teacher education institutions to review the TKS conceptual and assessment framework. These expert reviewers assessed the cultural sensitivity of materials, their alignment with national teacher standards, and their relevance to teachers and teaching in their country. The Teacher Knowledge Expert Group (TKEG) reviewed this feedback and recommended further revisions before the framework was submitted to the TALIS Governing Board (TGB) for finalisation.

The design of the Teacher Knowledge Survey

TKS 2024 was designed as a 45-minute survey, to be taken within a 24-hour window, including two sections:

- Context questionnaire: A 20-minute set of self-report questions in a selected-response format with Likert scale matrix questions. All teachers received the same questions.
- General pedagogical knowledge assessment: A 25-minute set of selected-response assessment items, including simple and complex multiple-choice items. This section followed a rotated block design, meaning that teachers did not all receive the same questions. Each individual teacher answered 39 assessment items from the total pool of 52 GPK items, which were split between four assessment forms.

Context questionnaire

To help contextualise GPK results, TKS 2024 includes a questionnaire to gather data on characteristics of teachers and features of their teaching practices that are relevant to GPK. For the most part, the wording

of items in the TKS context questionnaire follows that of corresponding items administered in the core survey. This was intended to provide opportunities to explore whether analytical inferences can be made at the country level between TKS and the core survey, and whether analyses can be conducted using data combined from the two sources.

A few additional questions were included in the TKS context questionnaire only, to capture constructs expected to be more strongly linked or particularly relevant for teachers' GPK. By doing so, the TKS contextual questionnaire is more closely aligned with the content of the GPK assessment. The CERI conceptual framework of teachers' professional competence also guided the choice of such content areas: opportunities to learn, affective-motivational characteristics, and teachers' work practices. These are summarised in Table A A.1 and explained more fully in the TALIS TKS 2024 Conceptual and Assessment Framework (OECD, 2025[4]).

Table A A.1. TALIS 2024 TKS context areas related to general pedagogical knowledge

TKS context area	Sub-area	Content description	Derived or modified from
Opportunities to learn	Pedagogical content	A detailed set of questions asking the extent to which teachers have learned specific topics of pedagogy in either their initial teacher education or their continuing professional learning. Questions correspond to the dimensions of the GPK assessment framework: instruction, learning, and assessment. A fourth question covers content relating to the emergent priorities for teacher knowledge topics identified in the present TKS framework: teaching diverse students, using technology for teaching, supporting social and emotional learning, and developing 21st century thinking skills. While these correspond to aspects of the teachers' learning and development content area of TALIS, they are distinctly different questions.	ITEL TKS 2016 Pilot study – Opportunities to learn
Affective-motivational characteristics	Teacher self-efficacy	Records the extent to which teachers feel confident in their ability to achieve certain outcomes in their teaching such as engaging students, effecting student learning, delivering high-quality instruction, managing the classroom and accommodating diversity.	TALIS 2024 ISCED level 2 core survey – Occupational perceptions
	Job satisfaction and teacher's well-being	Elicits the extent to which teachers feel stress related to workload, student behaviour and other demands. Questions also measure the extent to which teachers enjoy teaching.	TALIS 2024 ISCED level 2 core survey – Occupational Perceptions
	Planned persistence	Indicates the extent to which teachers plan to remain in the teaching profession. Question asks how long teachers wish to remain in teaching.	TALIS 2024 ISCED level 2 core survey – Occupational perceptions
Teachers' work practices	Teaching practices	Measures the extent to which teachers report engaging in seven general teaching practices: classroom and time management; clarity of teaching; cognitive activation; assessment and feedback; adaptation; supporting students' social and emotional learning; support for consolidation. Also, use of class time and achievement of lesson aims.	TALIS 2024 ISCED level 2 core survey – Teachers' work practices
	Professional practices	Indicates the extent to which teachers engage in collaborative activities with colleagues related to aspects of planning, teaching, assessment and professional learning.	TALIS 2024 ISCED level 2 core survey – Teachers' work practices

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

However, items on teachers' opportunities to learn (OTL) in the TKS module were developed separately. Unlike the core survey items that are more generally related to teachers' learning and development, the TKS OTL items ask teachers about the extent to which their OTL prepared them in specific topics related to the key dimensions of GPK: instruction, learning and assessment. In addition, teachers participating in TKS are asked about their preparation in topics related to the emergent priorities for teacher knowledge (classroom diversity, technology in education, social and emotional learning, and 21st century thinking skills).

Direct assessment of GPK

The assessment framework for TALIS TKS 2024, which guided the development of GPK assessment items, is based on the ITEL assessment framework and the background research conducted by König (2014[11]) on instruction, learning and assessment (OECD, 2025[4]). This assessment framework elaborates six sub-dimensions of GPK, outlined in Table A A.2.

Table A A.2. TALIS 2024 TKS assessment framework of general pedagogical knowledge

Dimension	Sub-dimension	Description
Instruction	Teaching methods and lesson planning	Knowledge of principles of instruction, how to productively use instructional time, and various teaching methods (e.g. direct instruction, discovery learning); knowing when and how to apply and adapt each teaching method to promote both individual and collective student understanding of learning tasks; how to select and use learning resources for teaching and prepare, structure and evaluate learning objectives, lessons and curricular units.
	Classroom management	Knowledge of classroom management principles, techniques and strategies: awareness of all classroom activity, handling multiple classroom events concurrently, pacing lessons appropriately and using routines to maintain momentum, providing clear directions, maintaining student attention and managing behaviour.
Learning	Learning and development	Knowledge of sources of student heterogeneity and how it impacts learning; knowledge of theories of learning and learner development as well as various cognitive learning processes, including learning strategies, memory and information processing, impact of prior knowledge, 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, various frames of reference (e.g. social, individual, criterion-based), quality of assessment and impacts of assessment feedback on student motivation and learning.
	Data literacy, interpretation and use	Knowledge of how to analyse, interpret, evaluate and use student data or learning data to inform the teaching and learning process.

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

In order to capture the broad range of GPK that is relevant for effective teaching and learning, the TKS GPK assessment framework also includes the additional knowledge categories outlined in Table A A.3

Table A A.3. TALIS 2024 TKS supplementary categories of general pedagogical knowledge

Category	Sub-category	Description
Cognitive demand	Recall	Items of this type require teachers to recall a definition, or identify elements of a phenomenon, term or concept.
	Analyse or apply	Items of this type require teachers to analyse a problem outlined by the item and apply recalled knowledge. Hence, they must understand a phenomenon or concept, and compare, categorise, assign or interpret a phenomenon, situation, or a general term.
Knowledge base	Theoretical/scientific	Items of this type require teachers to use knowledge of educational theories or scientific research that is formal, systematic, ordered and context-independent.
	Practice-based	Items of this type require teachers to apply professional judgement to answer classroom- or situation-based, context-specific items. Teacher judgement is interpreted here as deriving both from theoretical and working knowledge (i.e. a variety of contextually-specific experiences).
Thematic orientation	Core knowledge	Items of this type require teachers to use knowledge of established educational concepts, theories, and pedagogical principles (e.g. Piaget, Vygotsky, Bloom, Bandura, Erikson, etc.).
	Emergent priorities for teacher knowledge	Items of this type require teachers to use knowledge related to recent international priorities in education. For the purpose of TKS 2024, the focus is on: • Teaching diverse learners. Knowledge of how to provide inclusive learning opportunities to meet the diversity of learners and their needs • Using technology for teaching. Knowledge of the affordances of technology resources and how to use them to enhance teaching and learning • Supporting social and emotional learning. Knowledge of social and emotional skills: their impact on learning and how to support their development in students • Developing 21st century thinking skills. Knowledge of transferable, cross-curricular cognitive skills and how to teach them.

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

The composition of the final GPK assessment according to different knowledge dimensions and categories is outlined in Table A A.4 to Table A A.7. The target proportion of each knowledge dimension or category is indicated in parentheses, while the “achieved” percentages indicate the share of items actually included in the main survey instrument following the attrition of items after the pilot and field trial. Targets for each knowledge dimension or category were set up based on the assessment framework, as well as feedback from the Teacher Knowledge Expert Group (TKEG) and teachers and national experts from participating countries.

In terms of GPK dimensions and sub-dimensions, the aim was to have roughly equal coverage of the main GPK dimensions of instruction, learning and assessment. For each dimension, one sub-dimension was identified as containing fundamental content while another included additionally important knowledge, which was reflected in the target weights.

Table A A.4. GPK item proportions by dimension and sub-dimension

Dimension	Instruction (31-35%) Achieved: 38%	Learning (31-35%) Achieved: 32%	Assessment (31-35%) Achieved: 30%
Sub-dimension 1 : 59%	Teaching methods and lesson planning (18-22%) Achieved: 23%	Learning and development (18-22%) Achieved: 18%	Evaluation and diagnosis procedures (18-22%) Achieved: 18%
Sub-dimension 2 (33-45%) Achieved: 41%	Classroom management (11-15%) Achieved: 15%	Motivational-affective dispositions (11-15%) Achieved: 14%	Data literacy, interpretation and use (11-15%) Achieved: 12%

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

Regarding theoretical and practice-based knowledge, feedback from the TKEG, national experts and teacher focus groups suggested that practice-based items are more directly relevant to high-quality teaching. The aim was, therefore, to have a larger proportion of practice-based items in the GPK assessment overall Table A A.5. However, more emphasis was to be placed on theory-based items in the dimension of student learning, as relevant content tends to come from theoretical knowledge (e.g. psychological theory, cognitive science) rather than from classroom practice. Targets for practice-based items were difficult to achieve though, due to the weaker performance of these items in the pilot and field trial.

Table A A.5. GPK item proportions by knowledge base

Knowledge base	Instruction (31-35%) Achieved: 38%	Learning (31-35%) Achieved: 32%	Assessment (31-35%) Achieved: 30%
Theoretical/scientific (30-35%) Achieved: 48%	(6-8%) Achieved: 12%	(18-20%) Achieved: 24%	(6-8%) Achieved: 12%
Practice-based (65-70%) Achieved: 52%	(25-27%) Achieved: 26%	(13-15%) Achieved: 8%	(25-27%) Achieved: 18%

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

Feedback on the cognitive demand of GPK items suggested that the assessment should include a higher share of items requiring teachers to analyse or apply knowledge. Similarly to practice-based items, items requiring teachers to apply knowledge to specific situations were identified as more relevant to effective teaching, while the stand-alone value of recalled knowledge was questioned. Table A A.6 shows the targets set for recall and applied knowledge items, which were achieved in the design of the main survey instrument.

Table A A.6. GPK item proportions by cognitive demand

Knowledge base	Instruction (31-35%) Achieved: 38%	Learning (31-35%) Achieved: 32%	Assessment (31-35%) Achieved: 30%
Recall (33-45%) Achieved: 33%	(11-15%) Achieved: 11%	(11-15%) Achieved: 11%	(11-15%) Achieved: 11%
Analysing or applying (55-67%) Achieved: 67%	(18-22%) Achieved: 27%	(18-22%) Achieved: 20%	(18-22%) Achieved: 20%

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

Target ratios for the thematic orientation of GPK items placed more emphasis on core knowledge. By definition, core knowledge constitutes essential content that is likely to constitute the main part of initial teacher education programmes. As shown in Table A A.7, targets for the split of items were achieved in this domain.

Table A A.7. GPK item proportions by thematic orientation

Thematic orientation
Core knowledge (65-70%) Achieved: 67%
Emergent priorities for teacher knowledge (30-35%) Achieved: 33%

Source: OECD (2025[4]), TALIS Teacher Knowledge Survey 2024 Conceptual and Assessment Framework.

The scaling of GPK items and the construction of the GPK scale

ACER was responsible for conducting an exhaustive analysis of the GPK assessment data collected in the Teacher Knowledge Survey. At various points in the process, these analyses were discussed with and vetted by the TALIS Technical Advisory Group and the Teacher Knowledge Expert Group. whose advice and feedback informed further analysis and final scaling procedures.

The following types of analysis were undertaken:

- review of percentages of missing data
- log data analysis, such as time per item and time per whole test
- investigation of the factorial structure of the GPK scale using multi-dimensional item response theory (IRT) models
- review of test reliability (IRT-based) for the overall GPK scale and potential sub-scales
- analyses based on IRT and classical test theory to examine item and test performance, such as:
  - item facility
  - adjusted (rest) and non-adjusted item-total correlation
  - item fit (weighted infit mean square [MNSQ])
  - mean latent construct estimates for respondents (per each question/item)
  - key and distractor analyses
  - item characteristic curves
- differential item functioning (DIF):
  - by gender
  - by country.

The analyses and scaling procedures were conducted using appropriate sampling weights for all TKS teacher data. For analyses and calibrations based on data from the combined international sample, so-called “senate weights” were used to ensure that each of the eight participating education systems contributed to the results with the same weight.

Established psychometric models grounded in Item Response Theory (IRT), such as the two-parameter logistic model and the generalised partial credit model, were employed for item calibration and scaling.

Chapter 12 of the TALIS Technical Report (OECD, forthcoming[14]) describes in detail the various set of analysis conducted on the GPK assessment items and the main results. Here it is worth discussing the results of differential item functioning analysis, as it has the most direct implications for the interpretation of the results presented in this report.

Comparability of data and results from cross-national large-scale assessments relies on assessment items having comparable properties across participating countries. An assessment item shows item-by-country

interaction (country DIF) when respondents with the same levels of knowledge, but from different countries, display a different probability of correctly answering the item. These variations may indicate problems in the translation or national adaptation of the items (for example, by including content that is not appropriate to specific national contexts). Cultural factors may also influence how some assessment items are perceived in different national contexts.

The first step to ensure the universal applicability of the assessment items in all the eight participating countries was the thorough review and piloting of the items at the pilot and field trial stage. Such activities were conducted by the different national teams, under the coordination of the OECD, ACER, and the other members of the international consortium in charge of the implementation of TALIS.

The occurrence of item-by-country interactions was then finally verified by analysing the data collected during the Main Study. Nationally calibrated item parameters were compared with those from a calibration of item parameters based on the combined dataset from all eight participating countries.

National project managers (NPMs) received detailed national reports that included information about the psychometric quality of their GPK assessment items in comparison with results for the international sample. NPMs were also provided with a list of items that were flagged for concerns about their psychometric quality (such as low discrimination, or larger deviations in facility from the international sample results) and asked to review regarding possible context effects or adaptation/translation issues that might explain these anomalies.

The comparisons of psychometric properties (such as facility or discrimination) of items at the national level (considering issues with psychometric quality only occurring in individual national samples), in combination with feedback from countries, led to the identification of five items (two in Chile and three in Poland) whose translations deviated from the original English source version. These items were discarded from the scaling for those countries and were set to “Not administered” in the TALIS database. Preliminary calibrations further showed that one item in Saudi Arabia (KTF4G46E1) had a negative 2PL slope parameter (indicating that respondents correctly answering that item had lower GPK scores, on average, than respondents who provided the wrong answer). This item was discarded at the national level from the international calibration and the national scaling but was preserved in the TALIS database.

Subsequently, item fit was further reviewed to identify items with larger country DIF warranting treatment as (separate) national items in the final scaling with their corresponding national item parameters. To this end, the 49 adjudicated items were included in an international calibration. Item fit was then reviewed at the national level based on the following fit statistics, in combination with visual inspections of expected and observed item characteristic curves for each national sample:

- the mean deviation (MD) statistic
- the root mean square deviation (RMSD) statistic
- the standardised chi square (S-X2) statistic
- the weighted mean square (Infit) statistic.

All four fit statistics were calculated based on comparisons between the expected and observed probabilities of correct responses to each assessment item.

Following the initial calibration with all items, two further calibrations were performed to derive the final item parameters for the scaling of GPK items. After discarding three items (KTF4G33D1, KTF4G45T1 and KTF4G641) from the item set and those national items that had translation deviations or negative discrimination, the remaining 49 items were calibrated, and the residual-based fit statistics were calculated within each participating education system.

After the first calibration, 11 national items were identified as presenting lack of item fit and treated as national items with country-specific parameters. The second calibration showed no further instances of item misfit at the national level and was used as the final calibration for the scaling of GPK items.

Table A A.8 shows a list of items that were either: (i) excluded for all countries from scaling; (ii) excluded from national scaling and the national database due to translation deviations; (iii) excluded from national scaling due to negative discrimination parameters; or (iv) treated as national items for scaling due to lack of measurement invariance.

Table A A.8. List of items that were excluded or treated as national items

Item	Level	Treatment	Rationale
KTF4G45T1	International	Discarded from scaling for all countries	Poor psychometric item quality
KTF4G641			
KTF4G33D1			
KTF4G36A1	Poland	Discarded from national database and scaling	Translation error reported by national centre
KTF4G721	Chile		
KTF4G70E1	Poland		
KTF4G51S1			
KTF4G69D1	Chile		
KTF4G46E1	Saudi Arabia	Discarded from national scaling	Negative slope parameter in preliminary calibration
KTF4G54H1	Chile	Treated as national item for scaling	Country DIF (national item fit issues)
KTF4G591			
KTF4G50S1			
KTF4G49E1			
KTF4G78Q1	Croatia		
KTF4G55F1	Morocco		
KTF4G591	Poland		
KTF4G54H1	Portugal		
KTF4G29T1			
KTF4G32F1	Saudi Arabia		
KTF4G42T1	United States		

Source: OECD (forthcoming[14])

For the final scaling of GPK, the Generalized Partial Credit Model was used, and plausible values were computed as final GPK scale scores. Using item parameters anchored at their estimated values from the calibration based on the international TKS data, plausible values were generated as random draws from the posterior distribution that depend on response data (the conditional item response model), other available context data (conditioning variables) and group membership, which in the case of TALIS TKS 2024 was determined by the education system in which an individual was assessed.

In a first step, GPK items were calibrated with a sample consisting of data from all eight countries participating in the TALIS TKS, using senate weights (see information on item calibration procedures above). In a second step, the item parameters obtained from this calibration were anchored for the subsequent generation of plausible values, that was conducted separately for each national datafile. For each teacher, five plausible values were drawn, that provide a robust basis for computing the measurement error as part of the final reported standard error for all statistics based on TKS GPK data.

The conditioning part of the model included some direct regressors (number of not-reached responses, average GPK of all other teachers at the school, explicit stratum, teachers' gender) as well as factor scores derived from a principal component analysis (PCA) of all other information available in the TKS questionnaire. Including all available information is important to strengthen the process of generating plausible values as well as to allow an unbiased analysis between questionnaire data and GPK, regardless of the size of correlations between conditioning variables and GPK. All variables (both direct regressors and factor scores from the PCA) that are included in the conditioning model were scored so that they have no missing information (by giving cases with missing data the national mean or mode of the respective variable) and (dummy) missing indicators will be added to the model. School differences were accounted for by adding a variable reflecting the average GPK score (adjusted for the contribution of each respondent) as well as explicit stratification variables.

The plausible values were transformed to an international metric, where the average score was set to 250 and the standard deviation to 50 for the international dataset using senate weights.

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Notes

[1] A teacher could not participate in both TKS and the core TALIS survey, though.

[2] The list of TKEG members is contained in Annex F.

Annex B. Background survey on pathways into teaching and teachers' professional development

To support the analysis of the results of the Teacher Knowledge Survey (TKS), the OECD Secretariat conducted a survey on pathways into teaching and teachers' professional development in participating countries. This survey was adapted from the 2021 OECD-INES-NESLI survey on pathways to become a teacher and the professional development of teachers. Countries completed the survey in March-April 2025, with reference to fully-qualified teachers at the lower secondary (ISCED 2) level in the school year 2023/24 (2024 for Southern Hemisphere countries).

The results of this survey are summarised in Table A B.1 to Table A B.6.

Table A B.1. Initial teacher education

Country	Total duration	Predominant organisation[1]	Total duration of pedagogical and practical training (for consecutive models)	ISCED qualification awarded	Additional information
Chile	m	m	m	m	
Croatia	4 or 5 years	Consecutive	2 years	ISCED 7	The total duration of initial education for ISCED 2 teachers depends on whether candidates complete only an undergraduate university programme or both undergraduate and graduate programmes. They may complete a 3-year undergraduate programme (BA or equivalent), or a 3-year undergraduate programme followed by a 2-year graduate programme (MA in education or a relevant subject). However, if they complete only the 3-year undergraduate programme, they are required to complete additional pedagogical, psychological, didactic, and methodological training (usually lasting 1 year if taken separately). In most cases, ISCED 2 teachers complete 5 years of initial education.
Morocco	4 years	Consecutive	1 year	ISCED 6	After completing a bachelor's degree in university (3 years), initial teacher education includes one school year in which teachers receive theoretical training in pedagogy and didactics while also completing classroom practice placements (6 hours per week over the course of 20 weeks).
Poland	5 or 6.5 years	Concurrent	a	ISCED 7	The duration of initial teacher education for the concurrent model is typically 5 years (at least 9 semesters); for the consecutive

					model it is typically 6.5 years (at least 11 semesters). The predominant concurrent model combines subject-specific and pedagogical and practical training within general degree programmes. Students, enrolled in fields preparing for diverse careers, may opt for a teaching specialisation, choosing it by the second year (e.g. Polish studies, where students may prepare for careers in literary institutions, publishing, media, or teaching). This model is delivered either as a long-cycle programme (min. 9 semesters) or a first-cycle plus second-cycle programme (min. 6 + 3 semesters), as defined in the national standards for initial teacher education. Part-time programmes may last longer than the corresponding full-time programmes. In the consecutive model, graduates of a degree programme—either long-cycle or a combination of first- and second-cycle studies— without teacher training can qualify as teachers by completing a non-degree postgraduate teacher education programme, lasting at least 3 semesters, also in line with the national standards.
Portugal	5 years	Consecutive	2 years	ISCED 7	Initial teacher education includes a first degree in a scientific/subject area (3 years) and a master's in education (2 years), obtained through an initial teacher training course at a college or university.
Saudi Arabia	4 years	Concurrent	a	ISCED 5	
South Africa	4 years	Consecutive	1 year	ISCED 6	The Bachelor of Education is 4 years in duration. However, a candidate with a degree completed over 3 years (BSC, BA, BCOM) can then complete a post graduate PGCE in 1 year to become a qualified teacher, satisfying the 4 years. Universities may have their own requirements for the duration of the pedagogic and practical components of a teaching qualification. Teaching practice duration can vary but typically ranges between 5-6 weeks per module depending on the phase and university. The duration of pedagogical / theory modules can be 5 weeks per module and varies across universities.
United States	m	m	m	m	

Note:
1. Initial teacher education can follow a concurrent model or a consecutive model. In the concurrent model, pedagogical and practical training are provided at the same time as subject matter courses. In the consecutive model, pedagogical and practical training follow the subject matter courses. Both models may be offered in the same country.

Table A B.2. Content of initial teacher education

Country	Content required as part of initial teacher education					
	Academic subject/subject matter studies	Pedagogical studies/ didactics	Educational science studies	Child/adolescent development studies	Research skills development	Dissertation[1]
Chile	m	m	m	m	m	m
Croatia	Yes	Yes	Yes	Yes	At the discretion of teacher education institutions	At the discretion of teacher education institutions
Morocco	Yes	Yes	At the discretion of teacher education institutions	At the discretion of teacher education institutions	Yes	Yes
Poland	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	Yes	Yes	Yes	Yes	Yes	Yes
Saudi Arabia	Yes	Yes	Yes	Yes	Yes	Yes
South Africa	Yes	Yes	Yes	Yes	m	m
United States	m	m	m	m	m	m

Note:
1. Dissertation on pedagogical issues required based on students' own research.

Table A B.3. Teaching practicum requirements

Country	Teaching practicum required as part of initial teacher education	Typical total duration of teaching practicum
Chile	m	
Croatia	Yes	Varies depending on the specific programme and institution
Morocco	Yes	In the first year of pedagogical training, internships are conducted for 6 hours per week in educational establishments over a period of 20 weeks.
Poland	Yes	150 hours. The minimum total number of hours for practical training/internships is defined in national standards on ITE, but the number of hours specifically devoted to teaching practicum understood as “supervised/guided teaching experience” is not separately specified. The typical total duration of the internship is 120 hours for the subject area of teaching and learning processes, and another 30 hours for the psychology and pedagogy component; together 150 hours.
Portugal	At the discretion of teacher education institutions	Between 1 semester and 1 year.
Saudi Arabia	Yes	3 months i.e. 1 semester.
South Africa	Yes	Varies depending on the university, e.g. UNISA have a 5- week module for BEd programmes (Foundation, Intermediate, Senior and FET phases); Wits University have 6-week sessions of Teaching practice. The PGCE can have 10 weeks of teaching practice that are split into 2x5 weeks; University of Cape Town (UCT) can have 3 periods of teaching practice ranging from 2-6 weeks. Teaching practice takes place at different schools each time.
United States	m	

Table A B.4. Formal induction programmes in schools

Country	Requirements for schools to offer formal induction programme for new teachers	Typical duration	Completion of induction programmes required to obtain credentials/ full certification	Additional information
Chile	m	m	m	
Croatia	Mandatory	12 months	Yes	In accordance with legal provisions (Act on Education in Primary and Secondary Schools), a person employed for the first time in the profession as a teacher, educator, or professional associate enters into an employment relationship as a trainee. The traineeship lasts one year, during which the trainee is prepared for independent work. During the traineeship, the trainee is required to attend at least 30 hours of their mentor's classes, while the mentor must observe at least 10 hours of the trainee's classes. The manner and conditions for completing the traineeship, as well as for taking the professional examination for teachers and professional associates in primary education and teachers in secondary education, are regulated by the Regulation on Taking the Professional Examination for Teachers and Professional Associates in Primary Education and Teachers in Secondary Education. These matters fall under the jurisdiction of the Education and Teacher Training Agency and the relevant Professional Chamber.
Morocco		One school year, depending on the dynamics of the relationship between the teachers (not mandatory)	No	In each institution, there is a mentor teacher who supports the newcomers, chosen according to a procedure specific to each institution
Poland	Mandatory	45 months (regulations stipulate: 3 years and 9 months)	No	If employed for at least half of the statutory teaching load, novice teachers undergo a compulsory induction period.
Portugal	m		No	There are no officially defined induction programmes for teachers, only projects, such as LOOP (DGAE; www.dgae.medu.pt).
Saudi Arabia	Mandatory	3-5 days	No	
South Africa	Mandatory	2 years	Yes	In South Africa, the Department of Basic Education has collaborated with VVOB to develop and pilot an Induction Programme for newly qualified teachers. Guidelines for the orientation programme were also developed and disseminated. An impact study of the induction programme is 4 provinces was conducted.
United States	m	m	m	

Table A B.5. Alternative pathways into the teaching profession

Country	Existence of alternative pathways into teaching profession	Number of possible pathways	Additional information
Chile	m	m	
Croatia	No	a	
Morocco	No	a	
Poland	No	a	In Poland, while there is no general alternative training pathway to become a fully qualified teacher, national legislation allows subject-specific exceptions to the standard requirement of a long-cycle Master's degree or combined first- and second-cycle studies. All qualification pathways, including exceptions, must include pedagogical and practical training. At ISCED level 2, these exceptions with respect to expected teacher qualifications include: Family Education (can be taught by fully qualified teachers of other subjects who completed a qualification course in Family Education*), Regional Language (can be taught by those with a first-cycle degree in this language), Religion (can be taught by those meeting specific qualifications defined in agreements with religious authorities), and Foreign Languages (can be taught, inter alia, by individuals holding a first- or second-cycle/long-cycle degree in any field and a certain foreign language proficiency certificate or a certificate of having passed a second-degree state teacher exam in the given foreign language, or individuals with a higher education diploma (with no level specified) from a country where the language to be taught is an official language. As mentioned earlier, All qualification pathways must include pedagogical and practical training. * Since the school year 2025/2026, Family Education has been withdrawn from the national curriculum.
Portugal	No	a	Decree-Law no. 32-A/2023, of 8 May https://diariodarepublica.pt/dr/detalhe/decreto-lei/32-a-2023-212770101/ Decree-Law no. 57-A/2024, of 13 September https://diariodarepublica.pt/dr/detalhe/decreto-lei/57-a-2024-887747449/ Decree-Law no. 51/2024, of 28 August https://diariodarepublica.pt/dr/detalhe/decreto-lei/51-2024-885927817/ Tertiary education teachers and researchers with a doctorate and scientific training appropriate to the subjects of the recruitment groups provided for in Decree-Law no. 27/2006, of 10 February.
Saudi Arabia	Yes	1	Some teachers can be fully qualified teachers after they graduate from the university and they get the teacher license issued by ETEC without attending any prior teacher training.
South Africa	Yes	2	A candidate with a degree (3 years) can study a PGCE for 1 year to qualify as a teacher. In South Africa, there is also the possibility to appoint graduates (BSC, Engineering, and other scarce skills) who do not have a teaching qualification in terms of our Personnel Administrative Measures. In these instances, the expertise is required at technical schools or where there is a shortage of Mathematics or Physical Sciences, Information Technology teachers- schools then apply for approval from the Provincial Head of Education or a representative to appoint these graduates / people coming from the corporate or industrial sectors. It is expected that they will study for their PGCE qualification. Their salary scales / remuneration is also determined accordingly as they do not have the REQV14 requirement (i.e. a BEd).
United States	m	m	

Table A B.6. Teachers' professional development

Country	Requirements for professional development	Minimum duration required	Roles of persons/bodies involved in decisions on the compulsory professional development activities an individual teacher undertakes			Additional information
			Teacher	School management[1]	Local/ regional/ central education authority	
Chile	m	m	m	m	m	
Croatia	Compulsory for all	100 hours every 5 years for promotion to a higher teaching position	Proposing activities	Both proposing and validating the choice of activities	Proposing activities	ISCED 2 teachers have the right and obligation to continuously participate in professional training and development through programs approved by the Ministry. According to Article 18 of the State Pedagogical Standard for the Primary School Education System, teachers are required to engage in ongoing professional development by: participating in national-level professional development at least once every two years; attending county-level professional development sessions at least three times per year; regularly taking part in professional development activities within their school; and pursuing individual professional development in accordance with their duties and responsibilities. The Teachers' Council adopts an annual plan for continuous professional development, which is mandatory for all educational staff. The Annual Plan and Program for the Professional Development of Teachers and Professional Associates forms an integral part of the school's annual work plan. This plan specifies, for each teacher and professional associate, the types of professional development activities and the anticipated number of hours for each.
Morocco	Compulsory for all	Not defined	Proposing activities	m	m	
Poland	Compulsory for all	Not defined	Proposing activities	Both proposing and validating the choice of activities	Both proposing and validating the choice of activities	
Portugal	Compulsory for specific purposes	25 hours every 2 years	No role	Deciding activities in full autonomy	Validating the choice of activities	There is a compulsory requirement for teachers in order to be promoted to a higher position in the teaching career and to receive the associated salary

						increases.
Saudi Arabia	Compulsory for specific purposes	Not defined	Proposing activities	Proposing activities	Deciding activities in full autonomy	
South Africa	Compulsory for all	80 hours per year	Proposing activities	Validating the choice of activities	Proposing activities	SACE requires teachers engage in 3 types of CPD activities (Type 1 - Structured learning such as attending workshops, presenting at a conference, etc.; Type 2- Self directed learning such as reading academic articles, journals, online learning, own research studies conducted; Type 3- Professional experience such as mentoring, coaching, participating in projects, developing new skills) Teachers are required to achieve 150 CPD points over a 3- year cycle. SACE mandates that all educators/ teachers engage in 80 hours of CPD per year. Teachers are required to do SACE endorsed courses or CPD programmes. This is in accordance with a Collective Agreement negotiated at the Education Labour Relations Council (ELRC).
United States	m	m	m	m	m	

Note:
1. For example, school head, department head.

Annex C. Technical notes on sampling, participation rates and adjudication

Sampling procedures

The objective of the Teaching and Learning International Survey (TALIS) 2024 was to obtain a representative sample of teachers for each International Standard Classification of Education (ISCED) level in which an education system participated. The international sampling plan employed a stratified two-stage probability sampling design. Schools served as the first-stage units (primary sampling units), randomly selected from within strata. Teachers were then randomly selected from the list of eligible teachers within those schools, serving as secondary sampling units. A more detailed description of the survey design and its implementation can be found in the TALIS 2024 Technical Report (OECD, forthcoming[1]).

Education systems had the option to limit the coverage of their TALIS 2024 implementation for reasons of practicality, safety or economy. However, they were encouraged to minimise such exclusions and ensure that their national survey population covered at least 95% of teachers. National Project Managers (NPMs) were required to document the reasons for each exclusion, along with details such as the school's size, location and student population, for every ISCED level in which the system participated.

The target population and the sampling procedure for the Teacher Knowledge Survey (TKS) were identical to the ones for the TALIS core survey, i.e. teachers and their principals in ISCED level 2. In the countries that participated in TKS, the same schools were selected to participate in both the TALIS core survey and the TKS. Within the selected schools, teachers were randomly assigned to participate in either the TALIS core survey or TKS.

Sample size requirements

To ensure reliable estimation and allow for some non-response, a minimum of 200 in-scope schools were to be selected for TALIS 2024. Within each participating school, the minimum sample size was set at 15 teachers for TKS an 20 teachers for the core survey. In schools with fewer than 35 teachers, all teachers were selected and distributed proportionally., resulting in a nominal sample size of at least 3 000 ISCED 2 teachers.

Education systems could expand their samples by selecting more schools, more teachers per school or both. In some cases, systems were required to increase the number of teachers sampled within schools to offset selecting too many schools with fewer than 15 teachers.

For systems with a limited number of eligible schools, the sample size requirement was reduced. In a few instances, where the average number of teachers per school was lower than expected, the number of schools sampled was increased to meet the minimum required number of participating teachers.

In many systems, ISCED level divisions do not align with distinct school buildings or administrations. For example, schools covering Grades 8 to 12 span ISCED Levels 2 and 3, but may not fully represent all of ISCED Level 2.

If a system participated in multiple modules at different ISCED levels, overlap control was applied to avoid selecting the same schools for multiple modules. While teachers may work across ISCED levels and belong to multiple target populations, it was not feasible for them to complete separate questionnaires for each level. Similarly, principals were not expected to complete multiple questionnaires for different ISCED levels within the same school. As a result, schools were generally selected for only one ISCED level, and only teachers at that level were listed and sampled.

Definition of teachers and principals

A teacher at ISCED Level 2 is defined as someone who, as part of their regular duties at a school, provides instruction in programmes corresponding to that ISCED level. Teachers who teach a mix of programmes across different ISCED levels within the target school are included in the TALIS target population. There is no minimum threshold for the amount of instruction a teacher must provide at ISCED Level 2 to be included.

The international target population of TALIS 2024 (including TKS) includes only teachers who teach regular classes in ordinary schools, as well as the principals of those schools. The following teachers are considered out of scope for TALIS 2024 (and TKS):

- teachers teaching in schools exclusively serving students with special education needs[1]
- teachers teaching exclusively to adults
- substitute and emergency teachers
- teachers who also act as school principals
- teachers on long-term leave (e.g. disability, sabbatical)
- teachers who had taken part in the TALIS 2024 field trial.

Non-teaching staff (nurses, school psychologists, teachers' aides, etc.) are also out of the international target population.

A principal is defined as the individual with the highest level of responsibility for the administrative, managerial and/or pedagogical leadership of a school. This role may include overseeing students, supervising teachers, engaging with parents and guardians, and planning, preparing and implementing the school's pedagogical activities. Principals may also dedicate part of their time to teaching.

Adjudication process

Adjudication is the process of determining whether the data released were "fit for use" as intended. The issues examined concerned, among others, the questionnaire adaptation to national context, translation and verification, quality of the sampling frame, handling of out-of-scope and refusal units (i.e. teachers and/or schools), within-school sampling, data collection, data cleaning, the reports of quality observers, participation rates and overall compliance with the technical standards. The adjudication of the TKS data followed the same procedures adopted for the core TALIS 2024 survey data.

During the adjudication session, each individual dataset (one per module per education system) was submitted to the same examination. Principal/school data were adjudicated independently of teacher data.

Once each survey process had been assessed, a recommended adjudication rating was formulated. While the rating was mostly dictated by the participation rate thresholds set in the TALIS 2024 Technical Standards (see Table A C.1 and Table A C.2), the adjudication committee at times improved the rating of a dataset if, after expert consideration, unique and favourable conditions were met (e.g. closeness to the threshold value and/or the non-response bias analysis (NRBA) report showing evidence for negligible bias

risks). Among countries that participated in TKS, applying this holistic assessment led to increase the rating of the United States from “insufficient” to “poor” for reporting purposes.

To note, the adjudication rating is made at the education system level. However, potential non-response bias is specific to each estimate. Therefore, some estimates of systems with an adjudication rating of “good” might still have a high non-response bias; correspondingly, some estimates of systems with an adjudication rating of “poor” might still be reliable. For more detailed information, please refer to the TALIS 2024 Technical Report (OECD, forthcoming[1]).

The adjudication rules, based on participation rates for principals and teachers, are displayed in Table A C.1 and Table A C.2.

Table A C.1. Adjudication rules for school or principal data

School/principal participation before replacement	School/principal participation after replacement	Risk of non-response bias	Rating
≥75%	≥75%		Good
≥50% but <75%	≥75%		Fair (A)
≥50% but <75%	≥50% but <75%	Low	Fair (C)
≥50% but <75%	≥50% but <75%	High	Poor (D)
<50%			Insufficient

Source: TALIS 2024 Technical Standard 3.26.

Table A C.2. Adjudication rules for teacher data

School/principal participation before replacement	School/principal participation after replacement	Teacher participation after school replacement	Risk of teacher non-response bias	Rating
≥75%	≥75%	≥75%		Good
≥75%	≥50% but <75%			Fair (A)
≥50% but <75%	≥75%	≥75%		Fair (B)
≥50% but <75%	≥75%	≥50% but <75%	Low	Fair (C)
≥50% but <75%	≥75%	≥50% but <75%	High	Poor (D)
≥50% but <75%	≥50% but <75%			Poor (E)
<50%	≥75%			Poor (F)
<50%	<75%			Insufficient

Source: TALIS 2024 Technical Standard 3.26.

The following bulleted list aims to help data users understand what constitutes limitations on use or quality of the data:

- **Good:** the data of the participating system can be used for all reporting and analytical purposes and should be included in international comparisons.
- **Fair (line A):** national and subnational estimates can be produced; some teacher/staff characteristics may be less precise, as indicated by a larger standard error (S.E.), hence the warning “fair”, but with no additional warnings to users deemed necessary.

- **Fair (line B, only for teacher data adjudication):** national and subnational estimates can be produced; some subnational estimates may be of lower precision (larger S.E.) if the sample size is locally low, hence the warning "fair", but with no additional warnings to users considered necessary.
- **Fair (line C):** national and subnational estimates can be produced; some subnational estimates may be of lower precision (larger S.E.) if the sample size is locally low, hence the warning "fair", but with the possible inclusion of a note on data quality that points to the outcome of the NRBA; school participation somewhat lower than under (B), meaning that comparison of subnational estimates needs to be done with care given that some of these results are based on just a few schools; comparison of small subnational estimates with similar groups from other education systems is unlikely to uncover statistically meaningful differences because of potentially overly large standard errors.
- **Poor (line D):** in addition to the warnings issued for the previous category, a note that warns users of higher risks of non-response bias in some estimates should be appended; comparisons of subnational estimates need to be limited to the groups with the larger sample sizes (because the sample at this point represents between 37% and 56% of teachers/staff from a relatively small sample of schools, comparisons with similar groups in other education systems is inadvisable).
- **Poor (line E, only for teacher data adjudication):** subnational estimates are not recommended; a note pointing out the difficulty of obtaining a representative sample of schools, therefore, needs to be appended.
- **Poor (line F, only for teacher data adjudication):** limitations similar to those for line E, but with the inclusion of a note pointing out the difficulty of obtaining at least 50% participation of the selected sample of schools; evident risk of having a non-representative sample of schools.
- **Insufficient:** weights should not be calculated for any official tabulations, meaning that data should not be incorporated into international tables, models, averages, etc.

Participation rates and adjudication ratings

The participation rates and adjudication ratings for each participating education system are presented in Table A C.3 and Table A C.4. Detailed results of unweighted and weighted participation can be found in Annex G of the TALIS 2024 Technical Report (OECD, forthcoming[1]).

Table A C.3. ISCED Level 2: Principal participation and recommended ratings

Participating education system	Number of participating principals	Estimated size of school population	Principal participation before replacement (%)	Principal participation after replacement (%)	Recommended rating
Chile	362	5 776	70.0	84.3	Fair
Croatia	259	857	87.8	87.8	Good
Morocco	398	3 860	99.7	100.0	Good
Poland	279	12 502	93.6	99.6	Good
Portugal	224	1 195	98.8	99.3	Good
Saudi Arabia	319	7 743	95.6	95.6	Good
South Africa	318	7 806	84.4	84.6	Good
United States[1]	152	59 531	48.0	59.4	Insufficient

Note: A school was deemed a participating school if the principal returned their questionnaire with at least one question answered.

1. United States: The national centre managed questionnaire delivery from their own servers using the platform provided by the IEA in a single participant setup. Following data collection, the United States assessed disclosure risk and applied related measures based on federal requirements (https://nces.ed.gov/fcsm/dpt/). No documentation of these measures was provided.

Table A C.4. Teacher Knowledge Survey: Teacher participation and recommended ratings

Participating country/territory	Number of participating schools	Number of participating teachers	Estimated size of teacher population	School participation before replacement (%)	School participation after replacement (%)	Teacher participation in participating schools	Overall teacher participation	Recommended rating
Chile	341	1 645	59 136	64.4	78.5	80.5	63.2	Fair
Croatia	262	2 282	16 182	88.5	88.5	81.6	72.2	Good
Morocco	398	4 584	73 480	99.7	100.0	98.5	98.5	Good
Poland	279	2 831	171 437	93.6	99.6	94.8	94.4	Good
Portugal	224	2 634	39 447	98.7	99.1	91.6	90.8	Good
Saudi Arabia	324	2 435	112 287	98.6	98.6	93.4	92.1	Good
South Africa	359	2 376	85 677	92.7	93.2	91.5	85.3	Good
United States[1]	145	1 362	1 175 282	46.5	56.6	79.7	45.1	Poor

Note: A school was deemed a participating school if at least 50% of the selected teachers returned their respective questionnaires with at least one question answered.
TKS: Teacher Knowledge Survey.
1. United States: The national centre managed questionnaire delivery from their own servers using the platform provided by the IEA in a single participant setup. Following data collection, the United States assessed disclosure risk and applied related measures based on federal requirements (https://nces.ed.gov/fcsm/dpt/). No documentation of these measures was provided. Following the results of the non-response bias analysis, the rating for the United States was defined as "poor" for reporting purposes, although the participation rates of schools before replacement did not completely reach 50%.

References

OECD (forthcoming), *TALIS 2024 Technical Report*, TALIS, OECD Publishing, Paris. [1]

Notes

[1] Similar to TALIS 2013 and 2018, teachers working with special education needs students within regular school settings were considered in scope. If a school is composed exclusively of such teachers, the school itself was considered out of scope.

Annex D. Technical notes on analyses in this volume

Use of teacher and school weights

The statistics presented in this report were derived from data obtained through samples of schools, principals and teachers. Samples were collected following a stratified two-stage probability sampling design. This means that teachers (secondary sampling units) were randomly selected from the list of in--scope teachers for each of the randomly selected schools (first-stage or primary sampling units). For these statistics to be meaningful for a country, they needed to reflect the whole population from which they were drawn and not merely the sample used to collect them. Thus, survey weights must be used in order to obtain design-unbiased estimates of population or model parameters.

Final weights allow the production of country-level estimates from the observed sample data. The estimation weight indicates how many population units are represented by a sampled unit. The final weight is the combination of many factors reflecting the probabilities of selection at the various stages of sampling and the response obtained at each stage. Other factors may also come into play as dictated by special conditions to maintain the unbiasedness of the estimates (e.g. adjustment for teachers working in more than one school).

The statistics presented in this report that are based only on responses of principals were estimated using school weights (SCHWGT). Results based only on responses of teachers or on responses of teachers and principals (i.e. responses from school principals merged with teachers' responses) were weighted by teacher weights (TCHWGT).

Use of scales

In this report, several scales are used, in particular in regression analyses. TALIS 2024 and TKS scales were constructed using the same international model parameters to be statistically equivalent across countries/territories and populations, facilitating scale score comparability across education systems. In general, scale scores created for TKS can be used in different types of analyses, including comparisons of country/territory means for each individual scale.

TKS scale scores are standardised to have a standard deviation of 2 across all education systems participating in TKS and where value 10 corresponds to the item mid-point value of the underlying items' response scale. The only exceptions are the composite scales that combine different scales. These are standardised to have a standard deviation of 2 across all education systems participating in TKS and a mean of 10.

Analysing different scale scores based on the same items (e.g. a composite scale and its subscales) requires caution, as shared variance can influence the results. A detailed description of the construction and validation of TALIS 2024 and TKS scales can be found in Chapter 11 of the TALIS 2024 Technical Report (OECD, forthcoming[1]).

Exchange of information and ideas among teachers

The scale of exchange of information and ideas among teachers (T4EXINF) was constructed using teacher responses ("never", "once a year or less", "2-4 times a year", "5-10 times a year", "1-3 times a month", "once a week or more") about the following statements on how often they (TTG426/TKS18): "Exchange teaching materials with colleagues"; "Engage in discussions about the learning development of specific students"; "Work with other teachers in this school to ensure common standards in evaluations for assessing student progress".

Professional collaboration in lessons among teachers

The scale of exchange of information and ideas among teachers (T4COLES) was constructed using teacher responses ("never", "once a year or less", "2-4 times a year", "5-10 times a year", "1-3 times a month", "once a week or more") about the following statements on how often they (TTG426/TKS18): "Teach jointly as a team in the same class"; "Observe other teachers' classes and provide feedback"; "Engage in joint activities across different classes and age groups (e.g. projects)"; "Take part in collaborative professional learning".

Self-efficacy in classroom management

The scale of self-efficacy in classroom management (T4SECLS) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which they can do the following (TT4G27/TKS15): “Control disruptive behaviour in the classroom”; “Make my expectations about student behaviour clear”; “Get students to follow classroom rules”; “Calm a student who is disruptive or noisy”.

Self-efficacy in instruction

The scale of self-efficacy in instruction (T4SEINS) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which they can do the following (TT4G27/TKS15): “Craft good questions for students”; “Use a variety of assessment strategies”; “Provide an alternative explanation, for example when students are confused”; “Vary instructional strategies in my classroom”.

Self-efficacy in student engagement

The scale of self-efficacy in student engagement (T4SEENG) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which they can do the following (TT4G27/TKS15): “Get students to believe they can do well in school work”; “Help students value learning”; “Motivate students who show low interest in school work”; “Help students think critically”.

Self-efficacy (overall)

The scale of teacher self-efficacy overall (T4SELF) is a composite scale score that was constructed as an average of the three subscales: self-efficacy in student engagement (T4SEENG), self-efficacy in instruction (T4SEINS) and self-efficacy in classroom management (T4SECLS). Composite scale scores have a mean of 10 and a standard deviation of 2.

Clarity of instruction

The scale of clarity of instruction (T4CLAIN) was constructed using teacher responses (“never or almost never”, “occasionally”, “frequently”, “always”) about the frequency of performing the following actions in the target class (TT4G55/TKS24): “I present a summary of recently learned content”; “I set goals at the

beginning of instruction"; "I explain what I expect the students to learn"; "I explain how new and old topics are related".

Cognitive activation

The scale of cognitive activation (T4COGAC) was constructed using teacher responses ("never or almost never", "occasionally", "frequently", "always") about the frequency of performing the following actions in the target class (TT4G55/TKS24): "I present tasks for which there is no obvious solution"; "I give tasks that require students to think critically"; "I have students work in small groups to come up with a solution"; "I ask students to decide on own procedures for solving complex tasks".

Classroom management

The scale of classroom management (T4CLASM) was constructed using teacher responses ("never or almost never", "occasionally", "frequently", "always") about the frequency of performing the following actions in the target class (TT4G51/TKS22): "I tell students to follow classroom rules"; "I tell students to listen to what I say"; "I calm students who are disruptive"; "When the lesson begins, I tell students to quiet down quickly".

Adaptive learning

The scale of adaptive learning (T4ADLE) was constructed using teacher responses ("never or almost never", "occasionally", "frequently", "always") about the frequency of performing the following actions in the target class (TT4G55/TKS24): "I consider students' prior knowledge and needs when planning a lesson"; "I point students to different materials for learning depending on their needs"; "I change my way of explaining when a student has difficulties understanding a topic or task"; "I adapt my teaching methods to students' needs"; "I ask questions at various difficulty levels to check students' understanding of the subject matter".

Progression-based learning

The scale of progression-based learning (T4PBLE) was constructed using teacher responses ("never or almost never", "occasionally", "frequently", "always") about the frequency of performing the following actions in the target class (TT4G56/TKS25): "I let students review multiple examples"; "I select tasks for student practice that gradually increase in difficulty"; "I prepare students for difficulties that can occur while practicing"; "I let students practice similar tasks".

Fulfilment of lesson aims

The scale of fulfilment of lesson aims (complexity of teaching) (T4FULFIL) was constructed using teacher responses ("not at all", "to some extent", "quite a bit", "a lot") about the extent to which the following aims were fulfilled in the past week (TT4G58/TKS26): "Presenting the content in a comprehensible way"; "Engaging students in work that challenges them"; "Providing students with feedback to support their learning"; "Offering students opportunities to practise what they learnt"; "Adapting teaching to meet the different needs of students".

Workload stress

The scale of workload stress (T4WLOADT) was constructed using teacher responses ("not at all", "to some extent", "quite a bit", "a lot") about the extent to which the following situations are sources of stress at work

(TT4G767/TKS16): “Having too much lesson preparation”; “Having too many lessons to teach”; “Having too much marking”; “Having too much administrative work to do”.

Higher values on the workload stress scale reflect greater perceived stress related to workload.

Student behaviour stress

The scale of student behaviour stress (T4STBEH) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which the following situations are sources of stress at work (TT4G767/TKS16): “Being held responsible for students’ achievement”; “Maintaining classroom discipline”; “Being intimidated or verbally abused by students”.

Higher values on the student behaviour stress scale reflect greater perceived stress related to student behaviour.

Workplace well-being and stress

The scale of workplace well-being and stress (T4WELS) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which the following situations occur (TT4G76): “I experience stress in my work”; “My job leaves me time for my personal life”; “My job negatively impacts my mental health”; “My job negatively impacts my physical health”.

Higher values on the workplace well-being and stress scale reflect lower levels of well-being.

Joy of teaching

The scale of joy of teaching (T4JOYTCH) was constructed using teacher responses (“strongly disagree”, “disagree”, “agree”, “strongly agree”) about the following statements (TT4G80/TKS27): “I like the subject(s) that I teach”; “I often feel happy while I teach”; “I generally teach with enthusiasm”; “The interesting challenges of teaching give me satisfaction”.

Job satisfaction with the profession

The scale of job satisfaction with the profession (T4JSPROT) was constructed using teacher responses (“strongly disagree”, “disagree”, “agree”, “strongly agree”) about the following statements related to how they feel about their job (TT4G78): “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”; “All in all, I am satisfied with my job”.

Job satisfaction with the work environment

The scale of job satisfaction with the work environment (T4JSENVT) was constructed using teacher responses (“strongly disagree”, “disagree”, “agree”, “strongly agree”) about the following statements related to how they feel about their job (TT4G78): “I would like to change to another school if that were possible”; “I enjoy working at this school”; “I would recommend this school as a good place to work”.

Job satisfaction (overall)

The scale of job satisfaction overall (T4JOBSAT) is a composite scale score that was constructed as an average of the two subscales: job satisfaction with the profession (T4JSPROT) and job satisfaction with the work environment (T4JSENVT). Composite scale scores have a mean of 10 and a standard deviation of 2.

Opportunities to learn – classroom instruction

The scale of opportunities to learn – classroom instruction (T4OTLCI) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which their training or subsequent professional learning prepared them in various topics about classroom instruction (TK4G11/TKS11): “Lesson design”; “Long-term planning”; “Time management in the classroom”: “Student behaviour and classroom management”; “Collaborative learning”; “Adaptive teaching”; “Classroom discourse and dialog”; “Setting clear learning expectations”; “Student-centred approaches”; “Teaching clarity”.

Opportunities to learn – student learning

The scale of opportunities to learn – student learning (T4OTLSL) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which their training or subsequent professional learning prepared them in various topics about student learning (TK4G12/TKS12): “Educational theories of learning”; “Student individual differences”; “Identification of learning difficulties”; “Psychological theories of child development”; “Science of learning”; “Taxonomies of learning”; “Self-regulated learning”; “Affective-motivational impacts on learning”.

Opportunities to learn – assessment

The scale of opportunities to learn - assessment (T4OTLSAS) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which their training or subsequent professional learning prepared them in various topics about assessment (TK4G13/TKS13): “Different purposes for assessment”; “Standards used to assess students”; “Creating and using rubrics for assessment”; “Peer and/or self-assessment”; “Standardised tests; “Grades and grading”; “Providing effective feedback to students”; “Data literacy”; “Monitoring learning progress”.

Opportunities to learn – additional pedagogical topics

The scale of opportunities to learn – additional pedagogical topics (T4OTLSAP) was constructed using teacher responses (“not at all”, “to some extent”, “quite a bit”, “a lot”) about the extent to which their training or subsequent professional learning prepared them in various topics about assessment (TK4G14/TKS14): “Teaching in a multicultural setting”; “Teaching in a multilingual setting”; “Teaching students from socio-economically disadvantaged homes”; “Methods for inclusion and inclusive pedagogies”; “Accommodating students with special education needs”; “Identifying and/or meeting the learning needs of gifted students”; “Teaching cross-disciplinary”; “Using <digital resources and tools> in instruction”; “Classroom climate”; “Students' social and emotional development”; “Identifying and intervening when students display emotional problems”.

International averages

This report includes eight arithmetic and one weighted average (for more detail about the country coverage of the international averages, see Table A D.1):

- **OECD average-4**: arithmetic average across the 4 OECD education systems with a data adjudication rating of “good”, “fair” or “poor” participating in TKS 2024. The report refers to the average teacher as equivalent shorthand for the average teacher “across the 4 OECD education systems participating in TKS”.
- **TKS average-8**: arithmetic average across the 8 TKS 2024 education systems with a data adjudication rating of “good”, “fair” or “poor”.

Table A D.1. Country coverage of international averages in TKS 2024

Country/territory	OECD average-4	TKS average-8
Chile	X	X
Croatia		X
Morocco		X
Poland	X	X
Portugal	X	X
Saudi Arabia		X
South Africa		X
United States	X	X

In this publication, the OECD average is generally used when the focus is on providing a global tendency for an indicator and comparing its values across education systems. In the case of some education systems, data may not be available for specific indicators, or specific categories may not apply. Therefore, readers should keep in mind that the term "OECD average" refers to the OECD education systems included in the respective comparisons. In cases where data are not available or do not apply to all sub-categories of a given population or indicator, the "OECD average" may be consistent within each column of a table but not necessarily across all columns of a table.

Standard errors and significance tests

The statistics in this report represent estimates based on samples of teachers and principals, rather than values that could be calculated if every teacher and principal in every country had answered every question. Consequently, it is important to measure the degree of uncertainty of the estimates. In TALIS, each estimate has an associated degree of uncertainty that is expressed through a standard error. The use of confidence intervals provides a way to make inferences about the population means and proportions in a manner that reflects the uncertainty associated with the sample estimates. From an observed sample statistic and assuming a normal distribution, it can be inferred that the corresponding population result would lie within the confidence interval in 95 out of 100 replications of the measurement on different samples drawn from the same population. The reported standard errors were computed with a balanced repeated replication (BRR) methodology.

Differences between sub-groups

Differences between sub-groups along teacher (e.g. female and male teachers) and school characteristics (e.g. schools with a high concentration of students from socio-economically disadvantaged homes and schools with a low concentration of students from socio-economically disadvantaged homes) were tested for statistical significance. All differences marked in bold in the data tables of this report are statistically significantly different from 0 at the 95% level.

In the case of differences between sub-groups, the standard error is calculated by taking into account that the two sub-samples are not independent. As a result, the expected value of the covariance might differ from 0, leading to smaller estimates of standard error as compared to estimates of standard error calculated for the difference between independent sub-samples.

Analysis using scores from the assessment of general pedagogical knowledge

Following standard practices in international large-scale assessments, IRT modelling was used to construct a scale of general pedagogical knowledge on the basis of teachers' answers to assessment

items. The scale was set in such a way that the average score across all TKS participating countries, giving the same weight to each country, equals 250 points, with a standard deviation of 50 points.

For each teacher, five plausible values were drawn a posterior distribution of scores, after conditioning on all available background information.

Plausible values allow to compute standard errors that correctly reflect the imputation variance, accounting for both sampling and measurement error. All statistics, including regression coefficients, based on GPK use all five plausible values, and the associated standard errors account for both the sampling and the imputation variance (OECD, forthcoming[1]).

For ease of interpretation, when GPK scores are used as regressors in a regression analysis, they are standardised to have a mean of zero and a standard deviation of one across all participating countries. In this way, the resulting coefficient can be directly interpreted as the expected change in the dependent variable associated with a one-standard deviation change in GPK.

Pearson correlation coefficient

In this report, Pearson correlation coefficients are used to quantify relationships between system-level statistics. Correlation coefficients measure the strength and direction of the statistical association between two variables. They vary between -1 and 1; values around 0 indicate a weak association, while the extreme values indicate the strongest possible negative or positive association. The Pearson correlation coefficient (indicated by the letter *r*) measures the strength and direction of the linear relationship between two variables.

Statistics based on regressions

Regression analysis was conducted to explore the relationships between different variables. Multiple linear regression was used in those cases where the dependent (or outcome) variable was considered continuous. Binary logistic regression was employed when the dependent (or outcome) variable was a binary categorical variable. Regression analyses were carried out for each country separately. Similarly to other statistics presented in this report, the OECD and TKS averages refer to the arithmetic mean of country-level estimates.

Control variables included in a regression model are selected based on theoretical reasoning:

- Controls for teacher characteristics: teacher's gender, age and years of teaching experience.
- Controls for target class characteristics: class size, class intake of students who have difficulties understanding the language(s) of instruction, class intake of low achieving students, and class intake of students with special education needs.
- Controls for school characteristics: school location, school governance type, school intake of students from socio-economically disadvantaged homes, school intake of students who have difficulties understanding the language(s) of instruction, and school intake of students with special education needs

In the case of regression models based on multiple linear regression, the explanatory power of the regression models is also highlighted by reporting the R-squared (R^2), which represents the proportion of the observed variation in the dependent (or outcome) variable that can be explained by the independent (or explanatory) variables.

In order to ensure the robustness of the regression models, control variables were introduced into the models in steps. This approach also required that the models at each step be based on the same sample. The restricted sample used for the different versions of the same model corresponded to the sample of the

most extended (i.e. with the maximum number of independent variables) version of the model. Thus, the restricted sample of each regression model excluded those observations where all independent variables had missing values.

Regression analyses presented in this report handle missing data by listwise deletion. In the result tables, regression models that are based on 25% to 50% of the full sample are highlighted with a † next to the country/territory label. Analyses based on less than 25% of the full sample are excluded from the report.

Restrictive models that include many independent variables and are based on small samples can lead to limited variability in some independent variables. This, in turn, may cause the corresponding coefficients to appear either very small or very large. In this report, such independent variables are treated as constants and therefore excluded from the regression model. These suppressed variables are marked with the missing value symbol “m” in the results tables. Please note that this approach – suppressing independent variables with little or no variability – is not applied to control variables.

Multiple linear regression analysis

Multiple linear regression analysis provides insights into how the value of the continuous dependent (or outcome) variable changes when any one of the independent (or explanatory) variables varies while all other independent variables are held constant. Everything else held constant, on average, a one-unit increase in the independent variable (X_i) is associated with an increase in the dependent variable (Y) by the units represented by the regression coefficient (β_i):

$$\mathrm{Y} = \beta_0 + \beta_1 X_1 + \ \ldots \ + \beta_i X_i + \varepsilon$$

When interpreting multiple regression coefficients, it is important to keep in mind that each coefficient is influenced by the other independent variables in a regression model. The influence depends on the extent to which independent variables are correlated. Therefore, each regression coefficient does not capture the total effect of independent variables on dependent variables. Rather, each coefficient represents the additional effect of adding that variable to the model, if the effects of all other variables in the model are already accounted for. It is also important to note that, due to the cross-sectional nature of TALIS data, no causal conclusions can be drawn.

Regression coefficients in bold in the data tables are statistically significantly different from 0 at the 95% confidence level.

Binary logistic regression analysis

Binary logistic regression analysis enables the estimation of the relationship between one or more independent (or explanatory) variables and the dependent (or outcome) variable with two categories. The regression coefficient (β) of a logistic regression is the estimated increase in the log odds of the outcome per unit increase in the value of the predictor variable.

More formally, let Y be the binary outcome variable indicating no/yes with 0/1, and p be the probability of Y to be 1, so that $p = prob(Y = 1)$. Let $X_1 , \ldots X_k$ be a set of explanatory variables. Then, the logistic regression of Y on $X_1 , \ldots X_k$ estimates parameter values for $\beta_0, \beta_1, \ldots \beta_k$ via the maximum likelihood method of the following equation:

$$Logit(p) = \log(p/(1-p)) = \beta_0 + \beta_1 X_1 + \ \ldots \ + \beta_k X_k$$

Additionally, the exponential function of the regression coefficient $\left(exp(\beta)\right)$ is obtained, which is the odds ratio (OR) associated with a one-unit increase in the explanatory variable. Then, in terms of probabilities, the equation above is translated into the following:

$$p = \ exp(\beta_0 + \beta_1 X_1 + \ \ldots \ + \beta_k X_k / 1 + exp(\beta_0 + \beta_1 X_1 + \ \ldots \ + \beta_k X_k))$$

The transformation of log odds (β) into odds ratios ($exp(\beta); OR$) makes the data more interpretable in terms of probability. The odds ratio (OR) is a measure of the relative likelihood of a particular outcome when a specific condition is present (the antecedent) compared to when it is not. The odds ratio for observing the outcome when an antecedent is present is:

$$OR = \frac{(p_1/(1-p_1))}{(p_2/(1-p_2))}$$

where $p_1/(1-p_1)$ represents the "odds" of observing the outcome when the antecedent is present, and $p_2/(1-p_2)$ represents the "odds" of observing the outcome when the antecedent is not present. The reader should note here that odds are not probabilities, but relative probabilities, i.e. the ratio between the probability of an event occurring over the probability of the event not occurring. This distinction matters especially when the probability of the outcome is high. When the probability of the outcome is low, $p/(1-p) \approx p$.

An odds ratio below one indicates that the odds of the outcome decrease when the value of the explanatory variable increases by 1; an odds ratio above 1 indicates that the odds of the outcome increase when the value of the explanatory variable increases by 1; and an odds ratio equal to 1 indicates that the odds of the outcome are not related to changes in the explanatory variable.

For instance, if the association between being a female teacher and working part-time is being analysed, the following odds ratios would be interpreted as:

- **0.2**: Female teachers have 80% lower odds of working part-time than male teachers.
- **0.5**: Female teachers have half the odds of working part-time than male teachers.
- **0.9**: Female teachers have 10% lower odds of working part-time than male teachers.
- **1**: Female and male teachers have equal odds of working part-time than male teachers.
- **1.1**: Female teachers have 10% higher odds of working part-time than male teachers.
- **2**: Female teachers have twice the odds of working part-time than male teachers.
- **5**: Female teachers have five times the odds of working part-time than male teachers.

A bold character indicates that the odds ratios are statistically significantly different from 1 at the 95% confidence level. To compute statistical significance around the value of 1 (the null hypothesis), the odds-ratio statistic is assumed to follow a log-normal distribution, rather than a normal distribution, under the null hypothesis.

Statistics based on multilevel models

In this volume, variance components (between- and within-school variation) and the share of variation between schools (Table MCOB.UND.VARSEG) are estimated using multilevel models. Multilevel models are generally specified as two-level regression models (teacher and school levels), with normally distributed residuals, and estimated with maximum likelihood estimation. Models were estimated using the Stata (version 19) "mixed" module, accounting for teachers and schools weights.

The total variation in teachers' general pedagogical knowledge is calculated directly from the distribution of teachers' scores as the square of the standard deviation for all teachers, using only final teacher weights. Due to the unbalanced, clustered nature of the data, the sum of the between- and within-school variation components, as an estimate from a sample, does not necessarily add up to the total.

The share of variation between schools equals the intraclass correlation coefficient (ICC):

$$ICC = \frac{\sigma_B^2}{\sigma_B^2 + \sigma_W^2}$$

where σ_B^2 and σ_W^2 represent, respectively, the between- and within-variance component.

For statistics based on multilevel models (such as the estimates of variance components) the standard errors are not estimated with the usual replication method, which accounts for stratification and sampling rates from finite populations. Instead, standard errors are "model-based": their computation assumes that schools, and teachers within schools, are sampled at random (with sampling probabilities reflected in school and student weights) from a theoretical, infinite population of schools and students, which complies with the model's parametric assumptions. The standard error for the estimated ICC is calculated by deriving an approximate distribution for it from the (model-based) standard errors for the variance components, using the delta method.

The dissimilarity index

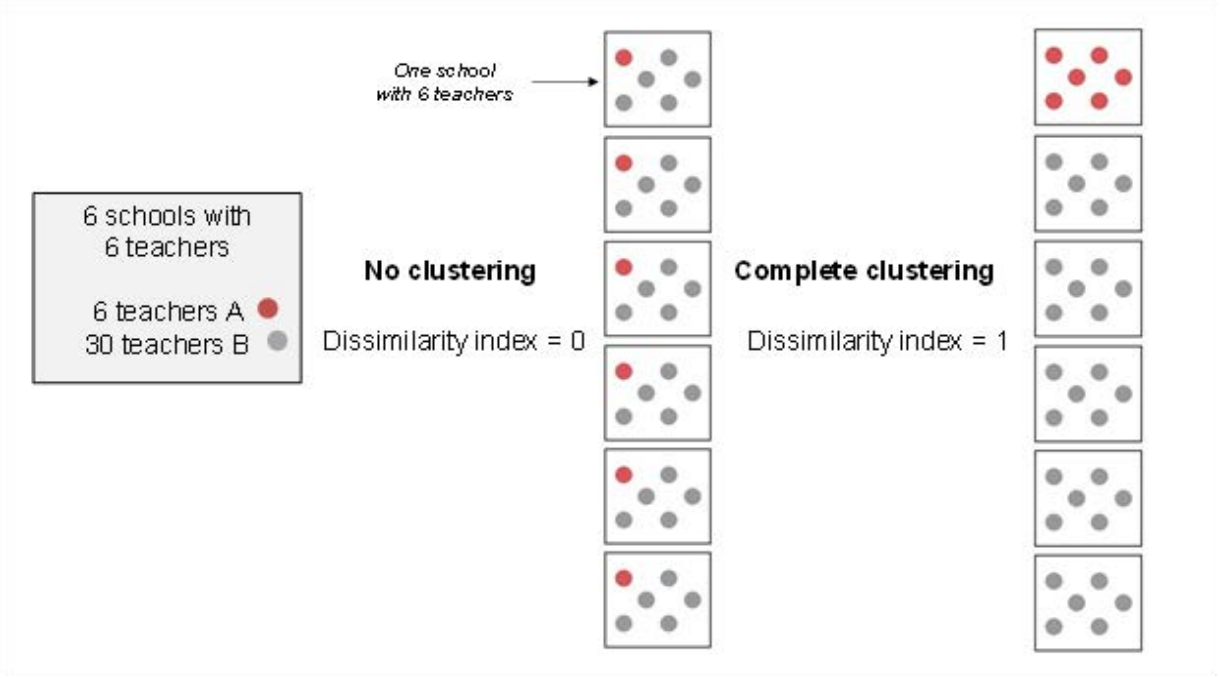
The dissimilarity index, which is commonly used as a measure of segregation, captures departure from evenness in the allocation of teachers with different characteristics (in the context of this volume, teachers with different levels of general pedagogical knowledge) to schools. If teachers were randomly allocated to schools, one would expect an even allocation, where the share of teachers with high GPK in each school would equal the share of high GPK teachers in the population. When the population is divided in two mutually exclusive groups a and b (for example, teachers being or not in the top quarter of the national distribution of GPK), the dissimilarity index can be written as:

$$D = \frac{1}{2}\sum_{j=1}^{J}\left|\frac{n_j^a}{N^a} - \frac{n_j^b}{N^b}\right|,$$

Where n_j^a and n_j^b stand for the number of teachers of type a and b in school j and $N^a$and N^b denote the number of teachers of the two groups in the population.

The dissimilarity index can take values between 0 (when the allocation of teachers in schools perfectly resembles the teacher population of the country) and 1 (when teachers with a certain characteristic are concentrated in a single school). A high dissimilarity index is an indication of teachers with a certain characteristic being highly concentrated in certain schools. Figure A D.1 shows an example in which teachers may be Type A or Type B. They are distributed across six schools, each with a capacity of six teachers. Complete clustering is observed when all the Type A teachers are in one and only one school. No clustering corresponds to a situation where all schools are equally composed of one Type A teacher and five Type B teachers.

Figure A D.1. Illustrative example: complete vs. no clustering of teachers



Source: (OECD, 2022[2])

The dissimilarity index can be interpreted as the sum of the share of teachers of the two mutually exclusive groups who have to be reallocated in order to obtain an identical distribution across all schools. This is best clarified with a concrete example. Consider the same number of schools and of type A and type B teachers as depicted in Figure A D.1, but a different, intermediate situation in which the six type A teachers would be only present in two schools (for example three in the first school and three in the second school). To restore evenness, four type A teachers (ie. $2/3$ of all type A teachers) would need to move to a different school. To preserve school size constant, four type B teachers (ie. $4/30$ of all type B teachers) would also need to change schools, to replace the type A teachers. In this situation, the dissimilarity index would then equal $\frac{4}{30}+\frac{2}{3}=\frac{24}{30}=\frac{4}{5}=0.8$.

In case the share of type A and type B teachers in the overall population are known, it is possible to easily derive from the dissimilarity index the percentage of all teachers that need to change school to restore evenness. Let $M^a_{\square}$ and $M^b_{\square}$ denote the number of teachers of groups a and b who need to move to restore evenness. Since school size must be preserved, teachers will always need to swap, therefore $M^a = M^b = M$. The dissimilarity index can then be written as and letting $p = N^a/(N^a + N^b)$ denote the share of group a in the population, the dissimilarity index can be rewritten as:

$$D = \frac{M}{N^a} + \frac{M}{N^b} = M\frac{N^a + N^b}{N^a N^b}$$

The share S of the total teacher population that needs to move can be then expressed as a function of D and $p = \frac{N^a}{N^a+N^b}$ the share of teachers of type a in the population:

$$S = \frac{2M}{N^a + N^b} = 2D\frac{N^a N^b}{(N^a + N^b)^2} = 2Dp(1-p)$$

In the example made above, $p = \frac{6}{36} = \frac{1}{6}$. Knowing that $D = 0.8$, it is then possible to derive $S = 2 \times \frac{4}{5} \times \frac{1}{6} \times \frac{5}{6} = \frac{8}{36}$.

In the analysis presented in Chapter 1 of this report, the dissimilarity index is computed focusing on teachers in either the top or the bottom quarter of the national distribution of GPK. As a result, in all countries $p = 0.25$, and $S = 2Dp(1-p) = 0.375 \times D$.

It should be noted that the interpretation of the dissimilarity index can become more difficult when the share of one group is very small. When there are more schools than actual teachers with a certain characteristic, the value of the dissimilarity index will be larger than zero, even if those teachers are randomly allocated across schools (OECD, 2019[3]; OECD, 2022[2]). This situation should not apply to the analysis presented in this report, as by construction the analysis focus on a relatively large group, composed of 25% of the overall teacher population.

The value of the dissimilarity index is also affected by the size of the units (i.e. schools) across which the distribution of individuals is analysed. Notably, if the units' sizes are small, then the dissimilarity index tends to overestimate the level of deviations from randomness (also known as small-unit bias) (Carrington and Troske, 1997[4]; D'Haultfœuille and Rathelot, 2017[5]). For example, the smaller the schools in terms of the number of teachers teaching in the school, the more likely it is to observe a deviation from the random allocation of teachers with certain characteristics.

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Annex E. List of tables available online

1. The following tables are available in electronic form only.

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StatLink https://stat.link/0clfxz

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Annex F. List of TKS 2024 contributors

TALIS – and its TKS module – is a collaborative effort, bringing together expertise from participating countries that share an interest in developing a survey programme to inform their policies about teachers, teaching and learning.

Engagement with bodies representing teachers (Education International) and regular briefings and exchanges with the Trade Union Advisory Council (TUAC) at the OECD have been very important in the development and implementation of TALIS. In particular, the co-operation of the teachers and principals in the participating schools has been crucial in ensuring the success of TALIS.

The TALIS Governing Board has, in the context of OECD objectives, driven the development of TALIS and has determined its policy objectives. For TKS, this includes the objectives of the analysis and reports produced, the conceptual framework and the development of the contextual questionnaire and the general pedagogical knowledge (GPK) assessment. The governing board has also overseen the implementation of the survey and the preparation of this report.

Participating countries implemented TALIS (and TKS) at the national level at national project centres through, among others, national project managers (NPMs), national data managers (NDMs) and national sampling managers (NSMs). Survey implementation was subject to rigorous technical and operational procedures. The NPMs played a crucial role in helping to secure the co-operation of schools, to oversee the national adaptation, translation and validation of the survey instruments, to manage the national data collection and processing and to verify the results. The NDMs co-ordinated data processing at the national level and liaised in the cleaning of the data. The NSMs were responsible for implementing the survey, respecting sampling procedures and other rigorous technical and operational procedures.

A Teacher Knowledge Expert Group (TKEG) was established to advise on the conceptualisation of GPK and on the crafting of assessment items that would measure it. The TKS contextual questionnaire heavily relied on the core TALIS questionnaire developed with the help of the TALIS Questionnaire Expert Group. A Technical Advisory Group (TAG) was assembled to advise during the decision-making process for technical or analytical issues.

The co-ordination and management of implementation at the international level was the responsibility of the appointed contractor, the International Association for the Evaluation of Educational Achievement (IEA) and its consortium members, the Australian Council for Educational Research (ACER, Melbourne, Australia), cApStAn and RAND Europe AISBL. The TALIS 2024 Consortium included staff from the IEA offices in Amsterdam and Hamburg, ACER, cApStAn and RAND Europe AISBL. IEA Hamburg was responsible for the overall survey planning, survey administration, the international data management, item analyses and scaling for the TALIS core. IEA Amsterdam was responsible for overseeing the verification of the translation and for the implementation of the international quality control programme. The sampling unit at the IEA Hamburg, developed the sampling plan, advised countries on its application, calculated the sampling weights and advised on the calculation of sampling errors. cApStAn linguistic quality control, Brussels Belgium, was responsible for organising and implementing the translation verification process for all administered languages. ACER was responsible for the development of the TKS instruments and conceptual and assessment frameworks, and for the analysis of data from the GPK assessment.

The OECD Secretariat had overall responsibility for managing the programme, monitoring its implementation on a day-to-day basis and serving as the secretariat of the TALIS Governing Board.

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Agnes Stancel-Piątak (Senior Research Analyst, Team Lead, 2020-2022)

Purya Baghaei Moghadam (Senior Research Analyst)

Falk Brese (Senior Research Analyst)

Minge Chen (Research Analyst)

Andres Christiansen (Senior Research Analyst)

Alec Kennedy (Senior Research Analyst)

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Ana Maria Mejia-Rodríguez (Senior Research Analyst)

Maximiliano Romero (Research Analyst, 2024-)

Rolf Strietholt (Co-head Research and Analysis Unit)

Andres Ignacio Strello Toledo (Senior Research Analyst)

Pablo Torres Irribarra (Research Analyst, 2024-)

Software development (IEA StudyExpert)

Guido Martin (Lead)

Sascha da Silva Burger (Quality Assurance)

Sven Flachsbarth (Quality Assurance, 2022-2023)

Christian Harries (Developer)

André Schäfer (Quality Assurance)

Katharina Sedelmayr (Developer)

Harpreet Singh (Developer)

Daniela Specks (Quality Assurance)

Sheung Kong Tai (Developer)

Sujith Thulaseedharan (Quality Assurance)

Software development (IEA DME, IEA DPE, IEA WinW3S, IEA IDB Analyzer)

Yasin Afana (Research Analyst)

Mohamadreza Atrian (Developer)

Limiao Duan (Developer)

Marwan Elkholy (Student Assistant, 2022-2023)

Maike Junod (Developer)

Marius Kaltenbach (Developer)

Delnaz Mohebigilani (Developer)

Tam Nguyen (Developer)

Meng Xue (Senior Advisor, Unit Head)

Contracts, events, and administration

Mira Bocti (Event Coordinator, 2024-)

Connie Crossman (Unit Coordinator)

Aisha Elsayed (SharePoint Administrator)

Eva Feron (Unit Head International Studies)

Christian Groth (Finance Director)

Juliane Hencke (Director)

Laiza Souza (Event Coordinator, 2021-2024)

Viola Wittmann (Contracts)

Bettina Wietzorek (SharePoint Administrator)

IEA Amsterdam (Amsterdam, the Netherlands)

Betina Borisova (Data Protection Officer)

Jan-Peter Broek (Financial Director, 2023-)

Roel Burgers (Financial Director, 2021-23)

David Ebbs (Senior Research Officer, Lead Translation Verification)

Kateřina Hartmanová (Research Officer, 2021-24)

Florence Mitchell-Green (Junior Research Officer, 2024-)

Marta Moreno Hidalgo (Research Officer)

Lauren Musu (Head Translation Verification and International Quality Control)

Tahira Qadri (Research Officer)

Anna Wikström (Junior Research Officer, 2023-24)

Australian Council for Educational Research (ACER, Melbourne, Australia)

Pina Tarricone (Project Lead, 2021-23)

Wolfram Schulz (Framework Lead, Project Lead, 2023-)

Jonathan Heard (Test Developer, Deputy Project Lead 2023-)

John Ainley (Framework Lead)

Nicola Andrews (Test Developer)

Trish Dowsett (Test Developer)

Eunjung Lee (Data Analyst)

Gregory Macaskill (Data Analyst)

Juliette Mendelovits (Supervising Test Developer)

Ray Peck (Lead Test Development, 2021)

Toby Simmer (Administrative Officer)

Adam Wardell (Test Developer)

cApStAn Linguistic Quality Control (Brussels, Belgium)

Josiane Tyburn (Lead Project Manager)

Steve Dept (Founding Partner)

Elica Krajčeva (Senior Project Manager, Cross-cultural Survey Translation and Adaptation)

Roberta Lizzi (Senior Project Manager, External Human Resources Director)

Adrien Mathot (Translation Technologist)

Manuel Souto Pico (Lead Translation Technologist)

Laura Wayrynen (Operations Director)

Trade Union Advisory Committee to the OECD (TUAC)

Antonia Wulff (Education International)

This information was correct as of 22 April 2026.

TALIS

Results from the Teacher Knowledge Survey

What Teachers Know About General Pedagogy

The OECD Teacher Knowledge Survey (TKS) is the first large-scale study of teachers' general pedagogical knowledge with internationally comparable data from representative samples of teachers. In 2024, eight countries participated in this new optional module of the Teaching and Learning International Survey (TALIS). Teachers completed an assessment of their general pedagogical knowledge and reported on their professional experiences, practices, and perceptions. Data from TKS give insights into the importance of pedagogical knowledge, where to find it and how to support its development.

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