

Executive summary

Around the world, researchers, policy-makers, parents and children all agree that teachers matter for student outcomes. However we are only beginning to understand what makes a difference in terms of quality teaching. By directly observing teaching in the classroom, the *OECD Global Teaching InSights: A video study of teaching* looked into classroom management, social-emotional support and instructional practices in the classroom, as well as students' opportunities to learn the content specified in the curricula and how all of these aspects of teaching related to student learning and student non-cognitive outcomes.

The Study has a unique methodology. To obtain direct evidence from the classroom, about 700 teachers and 17 500 students from eight countries and economies were videotaped in two lessons from the unit of quadratic equations in secondary school Mathematics. The teaching materials were also collected, and both were coded following common and standardised protocols. Before and after the unit, teachers and students filled out questionnaires on their beliefs, practices and perspectives, and students also took tests to measure their learning gains.

The findings provide an overall picture of teaching quality observed across all participating countries/economies. Within a 1 (low) to 4 (high) observation score, teachers managed the classroom well (mean scores between 3.49 and 3.81), gave students moderate levels of social and emotional support (mean scores between 2.62 and 3.26), and provided them with reasonable instructional quality (mean scores between 1.74 and 2.24).

Classrooms were well managed and organised

Whole class instruction (frontal teaching) was observed in over 88% of lesson segments in each country/economy. Teachers often switched efficiently between speaking to the class from the front of the room to supervising students as they worked individually at their desks. However, student collaboration – whether in pairs or in small groups of three or more students – occurred in less than 22% of lesson segments across participating countries/economies.

Teachers' managed their classrooms well in this context. The average classroom had very well-organised and efficient routines in place. Teachers sometimes or frequently engaged in monitoring student behaviour. When disruptions occurred, virtually all teachers handled them quickly and effectively, and while students' focus on mathematics was interrupted momentarily, significant learning time was not lost. In questionnaires, teachers and students agreed that classrooms were very well-managed.

Students received some social-emotional support

Classrooms were respectful, with few negative interactions such as threats or degrading comments, but nine out of ten classrooms observed were not frequently warm and encouraging. Nearly all teachers surveyed believed that they provided students with support for learning and had a good relationship with

them. Most students also agreed, but teachers tended to perceive the social-emotional environment more positively than students.

One notable area for greater attention is how teachers dealt with student errors. Student mistakes provide rich learning opportunities – both for understanding the subject matter more deeply and for developing persistence. Yet, in less than half of countries/economies teachers tended to work with students to help them better understand their errors and persist with their mathematical struggle. Teachers in most participating countries/economies tended to ignore students' errors or treat them superficially, thus students had fewer opportunities to develop persistence.

The quality of instructional practices varied

The detail and depth of classroom discourse varied within and across countries/economies. Students were regularly asked to recall information and state answers, or to summarise and apply rules and procedures. Sometimes students participated in the classroom discourse by contributing detailed thinking. However, with the exception of Shanghai (China) and K-S-T (Japan), lengthier, deeper explanations were observed in less than 25% of lessons.

Teachers regularly assessed and responded to students' thinking. During lessons, teachers asked questions that elicited a moderate amount of student thinking. Feedback interactions between students and teachers were brief and focused on the accuracy of answers and procedures. Few teachers (between 2 and 18% per country/economy) provided feedback that was thorough and focused on why students' thinking was correct or incorrect.

Students had limited opportunities to connect the mathematics to real world contexts or to explore patterns in the mathematics. For example, student understanding, handling or application of quadratic equations was sometimes supported by graphs or drawings, but students rarely made connections among the different representations or aspects of the mathematics.

Students had frequent opportunities to develop mathematical fluency through repetitive practice. However, while there were exceptions, teaching materials and classroom interactions did not require students to engage frequently in cognitively demanding activities. Students seldom used multiple approaches to solve problems, articulated the rationale for mathematical procedures and processes, or used technology to enhance their conceptual understanding of the mathematics. For example, students did not use technology during the lessons observed in four out of five classrooms in all countries/economies but Germany* (56%).

The same topic was taught in very different ways

There was no common approach to teaching quadratic equations neither between nor within countries. The amount of time that should be spent on the topic according to curricula and textbooks varied from 6 to more than 15 lessons, pointing to differences in teaching and learning expectations between countries. The actual time spent on the topic as reported by teachers was generally lower than the intended one and varied considerably across classrooms.

There were also differences in the mathematical methods students learned. Most students used graphical representations in addition to the algebraic formulae and procedures to solve quadratic equations, except for students in K-S-T (Japan) and Shanghai (China). There were also differences in when specific methods were introduced, e.g., at the beginning of the unit or as an application in the end of the unit.

Teaching made a difference to students' mathematics-related interest, self-efficacy and achievement

Social-emotional support and classroom management were significant predictors of student personal interest and self-efficacy towards mathematics in half of the countries/economies, even after accounting for students' pre-unit scores and other background characteristics. The quality of instruction was associated with student achievement in five countries/economies, but this relationship was only significant in one country when accounting for students' background and prior achievement.

Moving forward to improve education across the world

Supporting every teacher to improve their practice is important for raising students' cognitive and non-cognitive outcomes, and approaches targeted to the largely varying needs of teachers might be more effective in doing so. The Study reveals that there is a world of difference in how just one topic is taught, and highlights how much researchers, policy-makers, teachers and educators alike stand to gain from looking outwards in efforts to further understand teaching and learning.



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