

Foreword

This thematic report explores results of the 2003 cycle of the Programme for International Student Assessment (PISA) in order to identify teaching and learning strategies that contribute to increased achievement, particularly in mathematics. The analysis helps to clarify an understanding of the following: (i) the differences between teaching and learning practices across countries that can allow countries to benchmark practices; (ii) the extent to which teaching and learning practices vary among schools in each country; and (iii) the extent to which individual aspects of teaching and learning strategies are associated with better performance in mathematics.

Teaching strategies range from the ways in which classrooms and resources are organised and used to the ways in which teachers and students engage in day-to-day activities in order to facilitate learning. Student learning strategies include the cognitive and meta-cognitive processes employed by students attempting to learn something new. PISA measures these strategies using a variety of questionnaire items, which can be combined and scaled to yield a number of composite or index variables representing broad constructs. Examples of the constructs examined here are disciplinary climate, teacher-student relations, memorisation strategies and time spent on various learning activities.

After presenting the theoretical framework, the report follows a two-stage analytical approach. It first offers an analytical description of mathematics teaching and learning in different countries and identifies similarities and differences between countries. In the second stage, the report presents findings generated from a multilevel, prediction model of the factors influencing mathematical achievement. After controlling for other factors, this model shows the “unique” effects of a particular factor on achievement. The results presented in this report are mainly based on separate analyses for each country. The within-country results are then combined to allow for comparisons across a range of countries.

The report offers useful information and analyses to education policy makers and academic researchers concerned with mathematics teaching and learning strategies. Further analysis of the effects of these strategies on student learning, particularly in reading and science, are used and will be possible to use in later PISA surveys. This report also offers suggestions on how to improve data collection and measurement of teaching and learning strategies in large international cross-sectional surveys such as PISA.

This report is the product of a collaborative effort between the countries participating in PISA, the experts and institutions working within the framework of the PISA Consortium, the OECD, and Edudata Canada at the University of British Columbia. Robert Crocker, professor emeritus at Memorial University of Newfoundland, the principal author, drafted

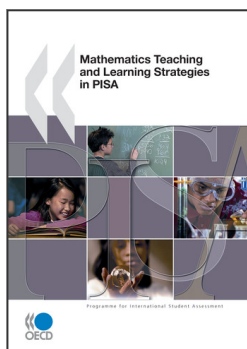
the report with the collaboration of Christian Monseur, University of Liège, Victor Glickman, University of British Columbia, Ben Levin, University of Toronto, Linda Schachter, L. L. Schachter Research, John Anderson, University of Victoria, Charles Ungerleider, University of British Columbia, and Andreas Schleicher, Claire Shewbridge and Pablo Zoido from the OECD. Julia Tompson proposed editorial comments, Juliet Evans provided administrative guidance, Elisabeth Villoutreix, Niccolina Clements and Simone Bloem offered editorial input, and Peter Vogelpoel prepared the typesetting of the report.



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