Nations refine mathematics and science education to keep pace with a changing world

November 17 2020

The TIMSS 2019 Encyclopedia: Education Policy and Curriculum in

Mathematics and Science details math and science curriculum and policy from 64 countries. Credit: IEA's TIMSS and PIRLS International Study Center at Boston College

Across the world, many new mathematics and science curricula have been implemented in the last decade, according to results released today from TIMSS, the longest running large-scale international assessment of mathematics and science education in the world. IEA's TIMSS assessment, directed by the TIMSS & PIRLS International Study Center at Boston College, was conducted in 64 countries as well as eight benchmarking systems in 2019.

About two-thirds of the TIMSS 2019 countries reported having new or updated mathematics and science curricula since 2010, and others are currently revising their curricula. Countries also reported providing children with an early foundation in mathematics and science, with these subjects included in national early childhood curricula in most countries.

Moreover, countries reported having policies that reflect the growing importance of technology. About four-fifths of the countries reported having national policies related to information and communications technology and digital devices in mathematics and science instruction, ranging from the development of digital competence broadly to the use of technology to support specific mathematics and science curricular goals.

The findings were published online today in the *TIMSS 2019 Encyclopedia: Education Policy and Curriculum in Mathematics and Science*, a companion volume to the forthcoming report that contains the latest global achievement results—TIMSS 2019 International Results in Mathematics and Science Achievement—which will be released on

December 8, 2020.

The *TIMSS 2019 Encyclopedia* presents a profile of mathematics and science education in each of the TIMSS 2019 countries as well as the benchmarking systems, providing essential context for understanding countries' mathematics and science achievement results.

Each participating country and benchmarking system wrote a chapter describing its education system, mathematics and science curricula in primary and lower secondary school, teacher professional development requirements and programs, approaches to monitoring student progress, and special initiatives in mathematics and science education.

The chapters, together with comparative data provided by countries about the characteristics of their early childhood education, aspects of mathematics and science curricula and instruction, and preparation routes and requirements for teachers and principals, provide a comprehensive picture of mathematics and science education around the world.

"*The TIMSS 2019 Encyclopedia* is an indispensable resource with comprehensive data about global mathematics and science education," said Dr. Stanton E. F. Wortham, the Charles F. Donovan, S.J., Dean of Boston College's Lynch School of Education and Human Development, home of the TIMSS & PIRLS International Study Center. "This volume provides a rich source of information for researchers working to understand how countries organize their mathematics and science education and prepare their young people for a changing world."

TIMSS 2019 was the seventh cycle of TIMSS, which has been conducted every four years since 1995.

"Countries are adapting to the changing demands of today's highly

interconnected and technologically advanced world," said Dr. Ina Mullis, one of the executive directors of the TIMSS & PIRLS International Study Center. "Policymakers and educators see the importance of equipping their students with the mathematics and science skills that will help students participate in a rapidly evolving global community."

Other highlights from the *TIMSS 2019 Encyclopedia* include:

- Mathematics and science are core subjects. Countries allocated about one-quarter to one-third of instructional time in fourth and eighth grades to these subjects, with a higher proportion of time devoted to mathematics in fourth grade and a higher proportion of time devoted to science in eighth grade.
- Countries' mathematics and science curricular goals are largely consistent with the mathematics and science content and skills assessed by TIMSS. There is greater diversity across countries in curricular goals and topics addressed in primary school science curricula than in mathematics curricula.
- Problem solving is an important, and in some cases central, component of many countries' mathematics curriculum. The development of science inquiry skills is central in many countries' science curriculum.

More information: TIMSS 2019 Encyclopedia: Education Policy and Curriculum in Mathematics and Science: timssandpirls.bc.edu/timss2019 … yclopedia/index.html

Provided by Boston College

mathematics-science-pace.html