

Trends in International Mathematics and Science Study (TIMSS)

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Citation

Trends in International Mathematics and Science Study (TIMSS). National Center for Education Statistics, Institute of Education Sciences (IES), U.S. Department of Education. Organized by the International Association for the Evaluation of Educational Achievement (IEA).

Description

The International Association for the Evaluation of Educational Achievement (IEA), an international organization of research institutions and governmental research agencies, developed the Trends in International Mathematics and Science Study to assess and compare achievement in cross-national context. Since 1995 students have been tested every four years in the U.S. and other participating countries in mathematics and science at the fourth and eighth grade levels. In the United States, TIMSS is sponsored by the U.S. Department of Education's Institute of Education Sciences and National Center for Education Statistics and coordinated by the International Study Center at Boston College.

In 2003, some 46 countries participated in TIMSS, at either the fourth- or eighth-grade level, or both. Formerly known as the Third International Mathematics and Science Study, TIMSS has as its centerpiece a set of mathematics and science assessments. The assessment is constructed around a design framework composed of grade-specific objectives based on guidelines for item development that reflect input from experts and representatives of participating countries. Between one-third and one-half of the TIMSS assessments items are released to the public, while the other items are used to measure trends over time.

Students in every participating country answer the same assessment and questionnaire items in their language of instruction. The grades assessed, participating countries, and accompanying supplemental research studies vary with each administration of the exam. Each participating country is responsible for drawing a representative sample of students in assessed grades. The International Study Center uses a variety of procedures to assure the data are comparable across countries, including a review of school and student samples, site visits, and an extensive review of data collected.

TIMSS administers questionnaires to students, teachers, and principals to provide a context for interpreting assessment performance. Those questions cover a wide variety of topics, such as teachers' attitudes and beliefs about teaching and learning, instructional practices, study and homework habits, and educational resources in the students' homes. In addition to the assessments and questionnaires, TIMSS conducted two special studies with the 1995 and 1999 administration. The TIMSS Benchmarking Study administered the TIMSS assessments and questionnaires to participating states and districts within the United States. The Videotape Study involved the taping of representative samples of eighth-grade mathematics and science classes in participating countries.

Results of TIMSS are used by policy-makers as a gauge of American competitiveness on the international stage as compared to students in other countries. Findings from TIMSS have sparked concern in that the U.S. has been outperformed by a number of other developed countries. For example in 2003 the U.S. finished 12th out of 25 countries in 4th grade math, 20th out of 45 countries in 8th grade math, ninth out of 25 countries in 4th grade science, and 12th out of 32 countries in 8th grade science. Results also allow educators to compare the U.S. to its own previous record and to track improvements over time for segments of the American population such as minority groups.

For More Information

TIMSS data and reports can be found online at nces.ed.gov/timss.