

The Third International Mathematics and Science Study

The Third International Mathematics and Science Study (TIMSS) is considered by many to be the most important international study of education in the 1990s. The study is sponsored by the International Association for the Evaluation of Educational Achievement and is taking place in approximately fifty countries from all parts of the world. Never before has an international comparative survey of education been conducted on such a scale. Nine-year-olds, thirteen-year-olds, and students in their last year of secondary school, their teachers, and the administrators of their schools comprise the target populations.

TIMSS goes beyond the traditional survey of achievement to include a comprehensive analysis of textbooks, curriculum guides, and instructional practices, as well as curricular influences on student learning. TIMSS seeks to identify variables associated with high levels of achievement in mathematics and science and will endeavor to explain factors that influence educational performance.

The study is of interest to a wide range of audiences, including parents, academics, educators, policymakers, researchers, and politicians. U.S. participation in TIMSS is sponsored by the National Science Foundation (NSF) and the National Center for Education Statistics (NCES). The U.S. National Research Center is located at Michigan State University but includes both the NCES and the NSF.

The study has several parts:

- A curriculum analysis component conducted with hundreds of coders from around the world collecting detailed content analytic data from over 1,600 mathematics and science textbooks and official curriculum guides. Results are anticipated for release in 1996. The curriculum analysis component is a study of the intended curriculum reflected in textbooks and curriculum guides. It is designed to uncover international trends in intentions for mathematics and science education. It is also designed to be linked to data on instructional practices and student achievement.

- A student survey component with three parts: student assessments, performance assessments, and questionnaires.

- Performance assessment tasks in which a number of countries participate. A subset of students in the national TIMSS sample participate in solving performance tasks in mathematics and science.

- Student assessments containing multiple choice, short answer, and extended response items. International scoring guidelines for short answer and extended response items define a number of correct and incorrect response categories. These allow varying degrees of correct responses to be evaluated. Additionally, there is a categorization of response types permitting the identification of alternative solutions and different types of misconceptions.

- Questionnaires completed by individual teachers about their background, education, and instructional practices and about their views on mathematics and science, both as disciplines and from the point of view of pedagogy.

This article was written by the staff of the Third International Mathematics and Science Study.

- Teachers' reports on their content goals from the school year, indicating topics from the TIMSS curriculum frameworks that they have taught or intend to teach.

- A questionnaire collecting information on curriculum, staffing levels, and availability of instructional resources, including science laboratories, completed by school administrators.

- The opportunity for states to compare the achievement of their students to all of the nations participating in TIMSS through participation in the TIMSS data collection of statewide samples making such comparisons possible. Minnesota, Illinois, and Colorado participated in this way.

- Year-long case studies conducted in ministries, schools, and homes in three countries (Germany, Japan, and the U.S.). The information on education policy issues thus collected supplements the data from the main study database by providing additional comparative information about four topics relating to students' opportunity to learn: teacher working conditions, the implementation of standards, how ability differences are dealt with in the classroom, and the role of schooling in adolescents' lives. The case study data were collected by researchers at the University of Michigan.

In the United States, data collection for the student, teacher, and school administrator surveys of the TIMSS study took place during spring 1995. About 600 schools agreed to participate in TIMSS, and these schools provided a total sample of approximately 40,000 students for the three populations combined.

The U.S. National Research Center publishes a newsletter for TIMSS. If you would like to be placed on the mailing list, please contact the TIMSS U.S. National Research Center at 464 Erickson Hall, College of Education, Michigan State University, East Lansing, MI 48824-1034; telephone: 517-353-7755; e-mail: jbabcock@msu.edu. Personnel at the Center are also interested in presenting more detailed information on TIMSS in person. If you have an upcoming meeting or event and you would like to schedule a presentation on the Third International Mathematics and Science Study, please contact the Center at the above address or send e-mail to: valverde@msu.edu.