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**Summary of Presentation by
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Sponsored by the International Association for the Evaluation of Educational Achievement, the goal of TIMSS (the Third International Mathematics and Science Study) was

1. To measure student achievement in mathematics and science in the participating countries and,
2. To assess some of the curricular and classroom factors that were related to student learning in these subjects.

TIMSS focused on student learning at three different age levels or populations, roughly parallel to the 3rd and 4th grade students, the 7th and 8th grade students and the high school seniors. The design of the study and its instrumentation were based on a conceptual framework that focused on the system, school, classroom, and individual student levels.

TIMSS was guided by the questions

1. What were students expected to learn?
2. Who delivered the instruction?
3. How was the instruction organized?
4. What had students learned?

Curriculum analysis, context questionnaire surveys and student assessments were conducted between 1993 and 1994. Data of various sources were collected from 49 different countries.

Although TIMSS was not designed to address technological literacy, it did collect data on the introduction and coverage of topics related to technology in the curriculum. More specifically, it focused on topics that dealt with the nature or conceptions of technology, interactions of science, mathematics, technology and society, and the history of science and technology. Furthermore, to the extent that technological literacy is related to science and mathematics literacy, many of the items from the student assessments speak to the state of technological literacy.

Some of the findings from TIMSS curriculum analysis and teacher questionnaires revealed that:

?? While a small number of countries intended to introduce topics related to technology as early as the first grade, the majority of the countries (58%) intended to cover these topics only in the later years, beginning at the 8th grade.

?? Of the 36 countries providing science curriculum guides and textbooks for the 14-year old students (8th graders) for analysis, only one country (Japan) did not have topics related to technology in either science curriculum guides or textbooks.

?? In contrast to other countries in TIMSS, more teachers of US 7th and 8th grade students (more than 80%) were likely to indicate that they covered topics in the history of science and technology and topics in the nature or conceptions of technology and interactions among science, technology and society.

From the student assessment instruments, there are items directly related to the understanding of the use of technology. For example, the following science item (released to the public) was for the 7th and 8th grade students:

?? “Write down one example of how computers help people do their work.”

The US students were more likely to provide an acceptable answer than their international counterparts: for the 7th grade, 87% of the US students as compared to 68% of the international students; and for the 8th grade, 89% as compared to 73% internationally.

Another item deals with chemical changes and fire extinguishers:

?? “Carbon dioxide is the active material in some fire extinguishers. How does carbon dioxide extinguish a fire?”

Again, the US students did better than their international counterparts: 53% and 62% for US 7th and 8th grade students respectively, as compared to 42% and 50% internationally.

Likewise, as we move toward the Information Age, being able to interpret data represented in graphs or tables accurately is an important skill that could properly be part of the definition of technological literacy. There are six items that deal with data representation and analysis in the mathematics portion of TIMSS test for 7th and 8th grade students. Generally, US students did better than the international average.

In summary, TIMSS collected data from 49 countries and more than 500,000 students. Information about science and mathematics literacy could be used to inform us about the state of technological literacy.