



TIMSS, Put to the Test

Fourth and Eighth Graders to Take International Math and Science Assessment

In March, some 15,000 students in Qatar will take the Trends in International Mathematics and Science Studies, or TIMSS, a key international assessment that will allow the country to gauge student performance in mathematics and sciences along with the context in which the learning takes place.

Fourth and eighth graders from Ministry of Education and Independent Schools, along with private Arabic schools, will sit for the test. Some 67 countries, five of them from the Gulf Cooperation Council, will take part in the study, and Qatar's participation forms part of the Qatari leadership's drive to upgrade its

education system in order to keep pace with developed countries.

In doing so, Qatar will have a comprehensive, evaluative picture of its students' academic achievements, and be able to identify some weaknesses and strengths in students' performance, skills, knowledge, and talents. Qatar will be able to detect some positives and negatives of the education system, and compare itself with other countries participating in the study.

TIMSS is concerned with policies and education systems. In particular, it studies the effectiveness of curriculum (knowledge, skills, and attitudes to be

developed by students through their formal education) and instruction in relation to student achievement in mathematics and science. For fair comparisons, it is important for TIMSS to assess mathematics and science achievement at the same point in schooling across countries.

TIMSS emphasizes questions and tasks that offer insight into students' analytical, problem-solving, and inquiry skills and capabilities. TIMSS helps countries monitor and evaluate their mathematics and science teaching across time and across grades. Countries may monitor the relative effectiveness of teaching and learning

at the fourth as compared to the eighth grade, since the cohort of fourth-grade students is assessed again as eighth graders, and understand the context in which students learn best. TIMSS enables international comparisons among the key policy variables in curriculum, instruction, and resources that result in higher levels of student achievement.

TIMSS 2007 will be comprised of written tests in mathematics and science together with a set of questionnaires to gather contextual information. These questionnaires include: a school questionnaire completed by the principal; a teacher questionnaire to be completed by science and math teachers; a student questionnaire completed by students in a special session, normally after two testing sessions. The questionnaires provide information to understand the home and school environment at the national level and to identify other factors affecting math and science learning and the teaching process.

The TIMSS 2007 contextual framework encompasses five broad areas on which information is collected: curriculum; schools; teachers and their preparation; classroom activities and characteristics; and students. It examines -- in particular -- the curricular goals of the education system and how the system is organized to attain those goals; the education resources and facilities provided; the teaching force and how it is educated, equipped, and supported; classroom activities and characteristics; home support and involvement; and the knowledge and attitude that students and teachers themselves bring to the

educational enterprise. Just as the mathematics and science framework describes what should be assessed in those areas, the contextual framework identifies the major characteristics of the educational and social contexts that will be studied with a view to improving student learning.

A school's goals include -- but are not limited to -- basic literacy, academic excellence, personal growth, human relation skills, good work habits, and self-discipline as well as building and sustaining a learning environment. But all these goals can not be achieved without resources which include: teaching materials, budget for supplies, school building and supplies, heating/cooling and lighting systems, and classroom space. Subject-specific resources for mathematics and science may include computers, computer software, calculators, laboratory equipment and materials, library materials, and audio-visual resources.

The contextual framework also places great importance on teachers, since it is the actions of teachers in class that most affect student learning. What teachers know and are able to do is of crucial importance. To ensure excellence, teachers should have high academic skills, teach in the fields in which they received their training, have more than a few years of experience, and participate in high-quality induction and professional development programs.

In addition to the questionnaires, students' knowledge and understanding of mathematics and science are assessed through a range of questions in each subject. Two question formats are used

in the TIMSS assessment: multiple-choice and constructed-response questions. For constructed-response questions, students are required to construct a written response, rather than select a response from a set of options. These questions are used for assessing aspects of knowledge and skills that require students to explain phenomena or interpret data based on their background knowledge and experience. The focus is solely on students' achievements with respect to the topic being assessed, and not on their ability to write well. However, students need to communicate in a manner that will be clear to those scoring their responses. At least half of the total number of the points represented by all the questions will come from multiple-choice questions. Each multiple-choice question is worth one score point, whereas constructed response questions generally are worth one or two score points depending on the nature of the task and skills required to complete it.

To ensure the highest quality and accuracy in testing, all procedures will be consistent with established standards, including selecting the student sampling, translating the tests, designing the questionnaire booklets and other materials, managing the testing, scoring, analyzing responses, and reporting.

