

CHAPTER 2

Updating the TIMSS 2019 Instruments for Describing the Contexts for Student Learning

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Introduction

about the educational factors that are related to mathematics and science achievement by examining these factors internationally across and within countries. The fundamental idea is for countries to learn from each other about possible ways to improve their own education systems.

Considering countries' mathematics and science achievement together with the factors that can facilitate that achievement is at the core of TIMSS. Collecting comparable data across countries about students' opportunities for learning mathematics and science is as central to TIMSS as collecting comparable data about students' mathematics and science achievement.

The areas of the student learning contexts addressed in the TIMSS 2019 context questionnaire instruments were described in the [TIMSS 2019 Context Questionnaire Framework](#). Because TIMSS has been administered every four years since 1995, making TIMSS 2019 the seventh TIMSS administration, many aspects of collecting the contextual data have become relatively stable across cycles. Similar to previous TIMSS assessments, in TIMSS 2019:

- The home, school, teacher, and student context questionnaires were administered together with the mathematics and science assessments
- Substantial portions of the 201 were devoted to reporting the data collected via the home, school, teacher, and student

addressed home and school factors that have been of interest for several assessment cycles. These scales either were brought forward in their entirety or modified for the 2019 cycle.

The following existing scales were included in the Home Questionnaire:

- Home Resources for Learning
- Home Early Literacy and Numeracy Activities Before Primary School
- Could Do Early Literacy and Numeracy Tasks When Beginning Primary School
- Parents' Perceptions of Their Child's School

Existing scales included in the School Questionnaire covered:

- Instruction Affected by Resource Shortages
- School Emphasis on Academic Success (also included in the Teacher Questionnaire)

Other topics also were brought forward to TIMSS 2019 from previous assessments. Collecting information about the curriculum has been central to TIMSS from the beginning, and TIMSS 2019 continued this by asking countries to describe their mathematics and science curricula in the curriculum questionnaire and in their chapters for the [201](#). The chapters detailed each country's nationally specified (or formal) curricula in mathematics and science (sometimes called the intended curriculum by TIMSS). To collect information about students' opportunity to learn the country's curriculum, the teachers of the TIMSS students were asked which TIMSS topics had been covered during the current or previous school years.

Teacher education policies and practices also have been of continued interest across assessment cycles. TIMSS 2019 asked countries to describe the education and credentialing procedures for becoming a teacher in the Curriculum Questionnaire and professional development requirements and programs were described in the chapters. The Teacher Questionnaire asked teachers themselves about their education degrees, areas of concentrated study while earning their degrees, and participation in professional development after becoming a teacher.

Updates to the TIMSS 2019 Context Questionnaires and Encyclopedia Chapters

Although a number of scales and questions were brought forward from TIMSS 2015, the TIMSS 2019 Home, School, Teacher, and Student Questionnaires as well as the Curriculum Questionnaire and the outline for the countries' chapters were updated to address important areas of current research, such as using digital devices in mathematics and science instruction. Considering recommendations from the participating countries about the most useful information to collect, TIMSS 2019 had three main goals for improving the context questionnaires: 1) enhancing the measures of teacher instructional quality, 2) addressing areas relevant to using technology in instruction and assessment, and 3) reducing the response burden for teachers.

TIMSS 2019 focused on scales of teacher instructional quality based on students' reports. New items were written for the Student Questionnaire to enhance existing measures aligned with research about "instructional clarity." To address the topic of classroom management, a new scale was developed asking students about the extent disorderly behavior occurs in their mathematics lessons. New items in the Student Questionnaire also asked about how often teachers use instructional activities related to problem solving and inquiry, such as conducting science experiments.

With more than half the participating countries transitioning to eTIMSS, TIMSS 2019 renewed efforts to collect data about technology use for instruction and assessment. The School Questionnaire asked principals about the availability of technology resources, such as digital learning resources (e.g.,

contributions in updating the [TIMSS 2019 Context Questionnaire Framework](#) and in modifying and developing the context questionnaires. This included conducting an online review and attending two committee meetings—a first meeting prior to the field test and a second meeting prior to data collection. The members of the TIMSS 2019 QIRC are listed in Exhibit 2.1.

Exhibit 2.1: TIMSS 2019 Questionnaire Item Review Committee (QIRC)

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Questionnaire, and 4) 121,454 students to the Student Questionnaire. The staff at the TIMSS & PIRLS International Study Center produced data almanacs containing item statistics for each questionnaire item, including the percentage of students responding to each response option, with the corresponding average student achievement in mathematics or science, respectively. The staff also prepared context questionnaire scale summaries to evaluate the suitability of the items for scaling with one parameter item response theory (Rasch) model. The scales were evaluated for unidimensionality, reliability, and their relationship with achievement. More information about the TIMSS 2019 context questionnaire scales and their measurement properties can be found in [Chapter 16: Creating and Interpreting the TIMSS 2019 Context Questionnaire Scales](#).

The TIMSS & PIRLS International Study Center reviewed the field test results and updated the questionnaires as necessary for the final round of reviews by the TIMSS 2019 QIRC and NRCs. The next section contains the complete schedule of activities included in the updating process.

Schedule of Activities for Updating the TIMSS 2019 Instruments for Describing Contexts for Student Learning

Exhibit 2.2 presents the schedule for updating the TIMSS 2019 instruments used to collect information about students' home, school, and classroom contexts for learning mathematics and science. The iterative review process formally began in February 2017 at the 1st TIMSS 2019 NRC meeting and ended with finalizing the Curriculum Questionnaire in April 2019.

Exhibit 2.2: TIMSS 2019 Schedule of Activities for Updating Context Questionnaires

Date(s)		Group and Activity
February	2017	NRCs reviewed the TIMSS 2015 context questionnaires, providing ideas for new topics that should be addressed in TIMSS 2019 (1 st NRC meeting—Hamburg, Germany)
February–June	2017	TIMSS & PIRLS International Study Center drafted the TIMSS 2019 Context Questionnaire Framework incorporating NRC feedback
June–July	2017	The TIMSS 2019 Questionnaire Item Review Committee (QIRC) conducted an online review of the draft TIMSS 2019 Context Questionnaire Framework
July–August	2017	TIMSS & PIRLS International Study Center finalized the TIMSS 2019 Context Questionnaire Framework incorporating QIRC feedback and drafted the updated TIMSS 2019 Field Test Home, School, Teacher, and Student Questionnaires
August	2017	TIMSS & PIRLS International Study Center published TIMSS 2019 Assessment Frameworks, including the TIMSS 2019 Context Questionnaire Framework
September	2017	QIRC reviewed the draft TIMSS 2019 Field Test Home, School, Teacher, and Student Questionnaires (1 st QIRC meeting—Hengelo, the Netherlands)
September–November	2017	TIMSS & PIRLS International Study Center incorporated the QIRC suggestions into the draft TIMSS 2019 Field Test Home, School, Teacher, and Student Questionnaires

