



Chapter 6

TIMSS 2003 Survey

Operations Procedures

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In conducting field operations in each country, the National Research Coordinator was the key person. The NRC had ultimate responsibility for collecting the data for the TIMSS assessment according to internationally agreed-upon

- The *TIMSS 2003 National Quality Control Observer's Manual* (TIMSS, 2002g) provided instructions for conducting classroom observations during data collection in a sample of participating schools.

Additionally, six software packages were supplied by the IEA Data Processing Center to assist NRCs with the data collection:

- The within-school sampling software (WinW3S) is a computer program that helps NRCs randomly sample the TIMSS class or classes in each sampled school; prepare the survey tracking forms that keep track of sampled students, classes, and teachers; and assign test booklets to students. The software stores all tracking information in an MS-Access database so that it can be used later in constructing sampling weights and in verifying the integrity of the sampling procedure.
- The DataEntryManager for Windows (WinDEM), is a computer program developed by IEA to enable national center staff to capture all of the TIMSS data through keyboard data entry and to perform a range of validity checks on the keyed data. The WinDEM database includes codebooks for each of the TIMSS 2003 test booklets and questionnaires, providing all information necessary to produce data files for each instrument in a standard international format.
- The WinLink program allows NRCs to check the correspondence between the tracking information stored in the WinW3S database and the student, teacher, and school information keyed into the WinDEM files. Using this program, for example, NRCs can check that each student listed on the student tracking form has a corresponding data record in the student achievement and student questionnaire WinDEM files.
- The Data Correction Software (DCS) is a program that enables national center staff to detect and correct inconsistencies in TIMSS background data files.
- The Trend-Scoring Reliability Software (TSRS) incorporates a database for each country containing a sample of student responses to constructed-response questions administered and scored as part of the TIMSS 1999 data collection. The TSRS software allowed NRCs to have their 2003 scoring staff rescore the 1999 student sample to document the reliability of the scoring process over time. This effort is described in Chapter 8.
- In a related effort, the Cross-Country Scoring Reliability Software (CCSRS) incorporates a database containing a sample of student responses to constructed-response items collected from English-speaking countries participating in TIMSS 2003. The CCSRS software enables every country with English-speaking scoring staff to score these common student responses in order to document the reliability of the scoring across countries participating in 2003. For more information, please refer to Chapter 8.

Each software package was supplied with a detailed manual describing how to install and use the software. In addition to the manuals, NRCs

Exhibit 6.1 presents the major activities conducted by National Research Coordinators and school personnel while sampling classes within schools. These activities are incorporated in the WinW3S software, which automatically produces all necessary forms, lists, and labels, and assisted NRCs in keeping track of the field operations' status.

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NRC activity	School activity
<p>1. School Tracking</p> <ul style="list-style-type: none"> • Contact schools participating schools • Prepare Class Listing Forms to be completed by schools 	<p>2. Complete the Class Listing Form listing all mathematics classes in the target grade (4 or 8) along with the names of their mathematics teachers.</p>
<p>3. Class Tracking and Sampling</p> <ul style="list-style-type: none"> • Sample a class or classes using the information on the Class Listing Form. • Prepare Student-Teacher Linkage Forms so that schools can list the students in the sampled class(es) and link them to their mathematics and science teachers. 	<p>4. Complete Student-Teacher Linkage Forms by listing all of the students in the sampled class(es) (name, birth dates, sex) together with their mathematics and science teachers and course names.</p>
<p>5. Student/Teacher Tracking and Student-Teacher</p> <ul style="list-style-type: none"> • Prepare a Student Tracking Form for each sampled class listing all students to be tested and their booklet assignments • Prepare a Teacher Tracking Form for each sampled class listing all mathematics and science teachers of the students in the class, their questionnaire assignments and their student-teacher link numbers • Send tracking forms, labels and test-instruments to schools 	<p style="text-align: center;">TEST ADMINISTRATION</p> <p>6. After the tests and questionnaires have been administered, record the participation status on Student and Teacher Tracking Forms; complete Test Administrator Forms.</p>
<p>7. Record Participation Information and Test Administrator Information in Data Files.</p>	

eight-digit teacher/class identification number. Careful implementation of these procedures is necessary so that during data analysis each class may be linked to a teacher, and student outcomes may be analyzed in relation to teacher-level variables.

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At both eighth and fourth grades, the mathematics and science assessment questions were packaged into 12 student test booklets. Each sampled student was required to complete one booklet, as well as the student questionnaire. Booklets were assigned to students by the WinW3S software using a random assignment procedure.

Each teacher listed on the teacher tracking form was assigned a teacher questionnaire. At eighth grade there were separate questionnaires for mathematics and science teachers. Where teachers taught both mathematics and science to the class, every effort was made to collect information about both subjects. However, NRCs had the final decision as to how much response burden to place on such teachers. Where a teacher taught both subjects to a class but completed only one questionnaire, the information from the general background part of the completed questionnaire was copied into the missing questionnaire.

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The School Coordinator was the person in the school responsible for administering the TIMSS 2003 assessment. The coordinator could be the principal, the principal's designee, or an outsider appointed by the NRC with the approval of the principal. The NRC was responsible for ensuring that the School Coordinators were familiar with their responsibilities.

- arranging for a Test Administrator and giving a briefing on the TIMSS 2003 study, the assessment materials, and the assessment sessions; and
- working with the school principal, the Test Administrator, and the teachers to plan the testing day – this involved arranging rooms, times, classes and materials.

The Test Administrator was responsible for administering the TIMSS tests and student questionnaires. Specific responsibilities were described in the *TIMSS 2003 Test Administrator Manual* (TIMSS, 2002c), and included:

- ensuring that each student received the correct testing materials which were specially prepared for him or her;
- administering the test in accordance with the instructions in the manual;
- ensuring the correct timing of the testing sessions by using a stopwatch and recording the time when the various sessions started and ended on the Test Administration Form; and
- recording student participation on the Student Tracking Form.

The responsibilities of the School Coordinator after the test administration included:

- ensuring that the Test Administrator returned all assessment materials, including the completed Student Tracking Form, the Test Administration Form, and any unused booklets;
- calculating the student response rate and arranging for makeup sessions if it was below 90 percent;
- distributing the teacher questionnaires to the teachers listed on the Teacher Tracking Form, ensuring that the questionnaires were returned completed, and recording teacher participation information on the Teacher Tracking Form;
- preparing a report for the NRC about the test administration in the school; and
- returning both completed and unused test materials and all tracking forms to the NRC.

The NRC prepared two packages for each sampled class. One contained the

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Reliable application of the scoring guides to the constructed-response questions, and empirical documentation of the reliability of the scoring process, were critical to the success of TIMSS 2003. The *TIMSS 2003 Survey Operations Manual* (TIMSS, 2002a) provided suggestions about arranging for staff and

in selected questions, and practice papers to help scorers achieve a consistent level of scoring.

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student test booklets scored independently by two different scorers. The reliability sample of booklets was selected randomly by the WinW3S software. The degree of agreement between the scores assigned by the two scorers is a measure of the reliability of the scoring process. Since the purpose of the double scoring was to document the consistency of the scoring procedure in each country, the procedure used for scoring the booklets in the reliability sample had to be as close as possible to that used for scoring the booklets in general. The procedure recommended by the TIMSS International Study Center was designed to blend the scoring of the reliability sample with the normal scoring activity, to take place at the same time, and to be systematically implemented across student responses and scorers.

In scoring the booklets for the main data set, scorers entered their

6.3.1.4 Monitoring Scoring Reliability over Time (1999 to 2003)

The double scoring of a sample of the student test booklets provided a measure of the consistency within each country with which constructed-response questions were scored. To measure trends since 1999 and 1995, TIMSS 2003 included items from both of these assessments. TIMSS 2003 took steps to show that those constructed-response items used in 2003 that also

- The **student background file** contained data from the student background questionnaire.
- The student achievement file contained the achievement test booklet data.
- The **constructed-response scoring reliability file** contained the within-country scoring reliability data for the constructed-response items.

When all data files had passed the WinDEM and WinLINK/LinkCheck quality control checks, they were dispatched to the IEA Data Processing Center in Hamburg for further checking and processing.

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NRCs were requested to maintain a record of their experiences during the TIMSS 2003 data collection and to send a report to the TIMSS International Study Center when data-collection activities were completed.

