CHAPTER 6

Survey Operations Procedures for TIMSS 2019

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Overview

As data-based indicators of countries student achievement profiles and learning contexts, TIMSS assessments are crucially dependent on the quality of the data collected by each participating country and benchmarking entity. Whereas the development of the assessments is an intensely collaborative process involving all of the partners in the enterprise, the process of administering the assessments and collecting the data is uniquely the responsibility of each individual country or benchmarking participant.

To ensure the consistency and uniformity of approach necessary for high-quality, internationally comparable data, all participants are expected to follow a set of standardized operations procedures. These procedures have been developed through a partners S1I8a0a7 ()ru(12.7&1s6 (p)-4.(e) 1 (.(e) 1 TIMSS & P from participating countries. The major steps of the operations and procedures are similar from one assessment cycle to the next. However, with each assessment cycle the operations procedures are update to enhance efficiency and accuracy and reduce burden, making use of developments in information technology to automate routine activities wherever possible.

Each new assessment cycle also brings something new and unique requiring the operations and procedures to be adapted. For example, the 2019 cycle of TIMSS began the transition to digital assessmen (known as eTIMSS) with about half of the participating countries switching from the previous paper-based version (known as paperTIMSS) to the new digital format. Adapting operational procedures for this new assessment mode and integrating the workflow into the existing TIMSS operations was a significant undertaking. In order to control for any assessment mode effects, in addition to the usual nationally representative sample, countries transitioning to eTIMSS were required to administer bridge paper instruments to an extra, equivalent sample of students, which also required integrating operations and procedures into the overall TIMSS 2019 assessment administration.

In each country or benchmarking entity, the National Research Coordinator was responsible for the implementation of TIMSS 2019. Internationally, National Research Coordinators provided the country s perspective in all international discussions, represented the country at international meetings, and were the responsible contact persons for all project activities. Locally, National Research Coordinators were responsible for implementing all the internationally agreed-upon procedures and facilitating all of the national decisions regarding TIMSS, including any adaptations for the national context.

The daily tasks of the National Research Coordinators varied over the course of the TIMSS 2019 cycle. In the initial phases, National Research Coordinators participated in the TIMSS 2019 assessment frameworks and assessment development process (see Chapter 1). and collaborated with Statistics Canada and IEA Hamburg in developing a plan to implement the TIMSS 2019 sampling design within the country or benchmarking entity (see Chapter 3).

Following the development of the draft achievement items and context questionnaires, countries conducted a full-scale field test of all instruments and operational procedures in March through May 2018 in preparation for the TIMSS 2019 data collection, which took place in October through December 2018 in Southern Hemisphere countries, and in March through June 2019 in Northern Hemisphere countries. As well as providing crucial data to support finalization of the assessment instruments (achievement items and questionnaires), the field test enabled the National Research Coordinators and their staff to become acquainted with the operational activities. The feedback they provided was used to improve the procedures for the data collection. As expected, the field test resulted in some enhancements to survey operations procedures, especially for eTIMSS which was new for the 2019 assessment cycle and contributed to ensuring the successful execution of TIMSS 2019.

As part of ongoing efforts to improve operations, the National Research Coordinators were asked to complete a Survey Activities Questionnaire (SAQ), which sought feedback on all aspects of their experience conducting TIMSS 2019. The feedback solicited in the SAQ included an evaluation of the quality of the assessment materials and the effectiveness of the operations procedures and documentation. The results of the TIMSS 2019 Survey Activities Questionnaire are presented in the final section of this chapter.

TIMSS 2019 Survey Operations Units, Manuals, and Software

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Coordinators could translate and adapt to their local situations. Often, separate versions of the units and manuals were provided for paperTIMSS and for eTIMSS. The TIMSS & PIRLS International Study Center and IEA Hamburg also provided National Research Coordinators and their staff with intensive training in constructed response item scoring and data management.

IEA Hamburg was responsible for the development of the eTIMSS software system, or eAssessment System (see Chapter 4). Hosted on IEA Hamburg s servers, the eAssessment System consisted of an integrated series of software modules for authoring achievement items (eTIMSS Item Designer), translating and verifying assessment instruments (eTIMSS Online Translation System), checking the suitability of computers for eTIMSS (eTIMSS System Check Program), administering the assessment to students (eTIMSS Player), monitoring the upload of student response and process data (eTIMSS Online Data Monitor), and scoring constructed response items (eTIMSS Online Scoring System, also known as IEAs CodingExpert Software).

In addition to the eAssessment System and consistent with the goal of automating and streamlining procedures wherever possible, IEA Hamburg provided National Research Coordinators in both eTIMSS and paperTIMSS countries with a range of custom-built software products to support project activities. These included the Windows Within-School Sampling Software (WinW3S) for sampling and tracking classes and students; the IEA Online SurveySystem (OSS) for administering school, teacher, and home questionnaires online; the IEA CodingExpert Software for documenting scoring reliability; and the IEA Data Management Expert (DME) software for creating and checking data files.

The *TIMSS 2019 Survey Operations Procedures*

Unit 2 was accompanied by field test versions of the School Coordinator and Test Administrator Manuals for paperTIMSS and eTIMSS, instructions on Preparing Computers and/or Tablets for eTIMSS, and a National Quality Control Monitor Manual.

In addition to the manuals, IEA Hamburg provided field test versions of the WinW3S within-school sampling software, the OSS online survey system for questionnaire administration, and the DME data management software.

eTIMSS countries also were provided with field test versions of the following systems: eTIMSS System Check Program, eTIMSS Online Translation System, eTIMSS Player, eTIMSS Online Data Monitor, and eTIMSS Online Scoring System (IEAs CodingExpert Software).

TIMSS 2019 Survey Operations Procedures Unit 3: Contacting Schools and Sampling Classes for the TIMSS 2019 Data Collection

Unit 3 was accompanied by the main data collection versions of the School Coordinator Manual and the WinW3S within-school sampling software and its manual. eTIMSS countries also received the eTIMSS System Check Program and instructions on Preparing Computers and/or Tablets for eTIMSS, which provided the necessary information and tools for countries to test their devices for eTIMSS compatibility and prepare them for eTIMSS data collection.

TIMSS 2019 Survey Operations Procedures Unit 4: Preparing the TIMSS 2019 Assessment Instruments

Separate versions of Unit 4 were provided for paperTIMSS and eTIMSS countries; the latter also received a manual on preparing the paper bridge booklets. The eTIMSS version provided access to the eTIMSS Online Translation System, which enabled National Research Coordinators to translate the eTIMSS achievement items into their language(s) of instruction. The translated materials were available online for translation and layout verification by IEA Hamburg and the TIMSS & PIRLS International Study Center (see Chapter 5).

Unit 4 was accompanied by the main data collection version of the OSS online survey system for online administration of the school, teacher, and home (Early Learning Survey) questionnaires.

TIMSS 2019 Survey Operations Procedures Unit 5: Conducting the TIMSS 2019 Data Collection

Unit 5 was accompanied by the main data collection versions of the Test Administrator Manuals for paperTIMSS and eTIMSS, the National Quality Control Monitor Manual, and the International Quality Control Monitor Manual.

eTIMSS countries also received the eTIMSS Player for administering the eTIMSS assessment to students and the eTIMSS Online Data Monitor for monitoring the uploading of the

data from the player to the IEA Hamburg data server. Each country s eTIMSS Player was customized to contain the country s translations of the eTIMSS assessment items.

TIMSS 2019 Survey Operations Procedures Unit 6: Scoring the TIMSS 2019 Constructed Response Items

Unit 6 was accompanied by the main data collection versions of the TIMSS 2019 scoring guides and IEAs CodingExpert Software (online scoring system) and manuals. The CodingExpert Software was used to facilitate eTIMSS online scoring and the trend and cross-country reliability scoring tasks.

TIMSS 2019 Survey Operations Procedures Unit 7: Creating and Submitting the TIMSS 2019 Databases

Unit 7 was accompanied by the main data collection versions of the DME data management software, codebooks, and manual. The DME software is used for data entry and data verification.

TIMSS 2019 Survey Tracking Forms

TIMSS uses a series of tracking forms to document class sampling procedures, assign assessment instruments, and track school, teacher, and student information, including the participation status of the respondents. The tracking forms also facilitate the data collection and data verification process. Four different tracking forms were used for TIMSS 2019:

Class Listing Form: This form was completed by each sampled school, listing the eligible classes and providing details about the classes, such as the class stream (if applicable), the number of students, and the names of teachers.

Student-Teacher Linkage Form: This form was completed for each class sampled, listing the names of the students and their teachers, student birth dates, gender, exclusion codes, and linking the students to their teachers.

Student Tracking Form: This form was created for each class assessed and was completed by the Test Administrators during test administration. The Test Administrators used this form to verify the assignment of survey instruments to students and to indicate student participation.

Teacher Tracking Form: This form was completed by each sampled school to indicate the completion of the Teacher Questionnaires.

Operations for Data Collection

The following sections describe the major operational activities coordinated by the National Research Coordinators:

- Contacting schools and sampling classes
- Overseeing translation and preparing assessment instruments
- Managing the TIMSS 2019 assessment administration
- Scoring the constructed response items
- Creating the TIMSS 2019 data files

Two other major TIMSS 2019 operational activities are described in separate chapters of this publication sampling schools (Chapter 3) and verifying translation and layout of the assessment instruments (Chapter 5).

Contacting Schools and Sampling Classes

Exhibit 6.1 illustrates the major steps in working with schools to sample classes and prepare for the TIMSS assessment administration. Once the school samples were drawn, National Research Coordinators were tasked with contacting schools and encouraging them to take part in the assessments. Depending on the national context, this could involve obtaining support from national or regional educational authorities. Survey Operations Procedures Unit 1 included suggestions on ways to encourage schools to participate in the assessment.

Exhibit 6.1:

In cooperation with school principals, National Research Coordinators were responsible for identifying and training School Coordinators for all participating schools. A School Coordinator could

Overseeing Translation and Preparing Assessment Instruments

Similarly, all context questionnaires (school, teacher, student, and, for fourth grade, home

to the national version of the 2015 cycle and to document any layout issues noted during the layout verification.

The documentation was completed and reviewed at various stages of preparing national assessment instruments. Version I of the forms and online documentation was completed during the internal translation and review process and sent along with the rest of the materials for international translation verification. After translation verification, the documentation (Version II) was updated in response to the translation verifier s comments, reflecting any changes resulting from the verification, and sent along with the national assessment instruments for layout and adaptations verification. Following layout verification, the national instruments and documentation were finalized (Version III) and submitted to IEA and the TIMSS & PIRLS International Study Center.

Managing the Administration of the TIMSS 2019 Assessments

Preparing and distributing assessment materials to the participating schools required careful organization and planning on the part of the National Research Coordinators. The assessment materials were packaged and sent to the School Coordinators prior to testing, giving ample time for the School Coordinators to confirm the receipt and correctness of the materials. The school and teacher questionnaires were then distributed, and the other instruments were kept in a secure room until the testing date.

Each sampled class was assigned a Test Administrator who followed procedures described in the Test Administrator Manual to administer the assessments and student questionnaire. Test Administrators were in most cases chosen and trained by School Coordinators, and in some cases, the School Coordinator doubled as the Test Administrator.

once the time allowed had expired. There was a required break between the two parts of assessment administration. The break was not to exceed 30 minutes. Students who completed part 1 or part 2 of the assessment before the allotted time were not allowed to leave the testing room and were asked to review their answers or read quietly. Some Test Administrators provided activity sheets for these students.

Following the administration of the TIMSS assessment, students were provided 30 minutes to complete the student questionnaire with extra time provided to students who needed it. Following the administration of the eTIMSS assessment, students also took a short computer-based questionnaire about their experiences and attitudes toward using a computer. During administration of the fourth grade student questionnaire, Test Administrators were permitted to read the questionnaire items aloud together with the students.

eTIMSS was mostly administered via individual USB sticks on individual eTIMSS compatible

Online Administration of the School, Teacher, and Home Questionnaires

Countries could choose to administer the school, teacher, and home questionnaires online. The benefits of administering the questionnaires online included saving money and time in printing, and improving the efficiency of questionnaire distribution, data entry, and data cleaning.

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Scoring the Constructed Response Items

Constructed response items represent a substantial portion of the TIMSS assessments, and because reliabl

required scorers of TIMSS 2019 to score student responses collected in 2015. The scores from 2019 were then compared with the scores awarded in 2015. Trend reliability scoring was conducted using IEAs CodingExpert Software provided by IEA Hamburg.

Student responses included in the trend reliability scoring (200 responses per item) were actual student responses to 22 fourth grade items (13 items for the less difficult mathematics assessment) and/or 27 eighth grade items (4 item blocks) from the TIMSS trend assessment blocks collected during the TIMSS 2015 assessment administration in each country and benchmarking entity. These responses were scanned and provided to each participating country and benchmarking entity, and were scored with IEAs CodingExpert Software. All scorers who scored the trend assessment blocks in 2019 were required to participate in the trend reliability scoring. If all scorers were trained to score all trend items, the software divided the student responses equally among the scorers. If scorers were trained to score specific assessment blocks, National Research Coordinators were able to specify within the software which scorers would score particular blocks, and the software allocated the student responses accordingly. Similar to the within-country reliability scoring, the trend reliability scoring had to be integrated within the main scoring procedure.

Finally, cross-country reliability scoring gave an indication about how consistently the scoring guides were applied from one country to the next. The cross-country reliability scoring also was conducted using IEAs CodingExpert Software. Student responses included in the cross-country reliability scoring (200 responses per item) were student responses to 22 fourth grade items (17 items for the less difficult mathematics assessment) and/or 27 eighth grade items. The same items were used for the trend scoring reliability study. Student responses were collected from the English-speaking countries during the TIMSS 2015 assessment administration. All scorers who could score student responses written in English were required to participate in the cross-country reliability scoring, and the student responses were equally divided among the participating scorers in each country. In most countries, the scoring exercise was completed immediately after all other scoring activities.

Creating the TIMSS 2019 Databases

The data entry process took place from March to May 2018 for the field test, from December 2018 to

The eTIMSS achievement test data were captured automatically by submitting them to the IEA Hamburg eTIMSS server immediately after the assessment administration. Countries were provided with

Exhibit 6.3: Survey Activities Questionnaire, Section One Sampling (Numbers of NRC Responses)

Question	Yes	No	Not Answered

to using the eTIMSS Online Translation System, receiving the eTIMSS Player, and preparing USBs in order to deliver eTIMSS to schools and students.

Question	Yes	No	Not Answered
Context questions(0Tf0Tc2Tw 8(No)Tj(No)Tj 8/Span/ActualText FEFF BDC ( )Tj 4S 1Span/ActualText FEFF BDC ( )Tj EMC 33 Tf0Tw			

Question	Yes	No	Not Answered
Learning to Read Survey ID labels	1	48	1 *(Not Answered)* 15 *(Not Applicable)*
Student Tracking Forms	3	59	1 *(Not Answered)* 2 *(Not Applicable)*
Teacher Questionnaires	3	59	1 *(Not Answered)* 2 *(Not Applicable)*
Teacher Tracking Forms	0	59	1 *(Not Answered)* 5 *(Not Applicable)*
School Questionnaire	0	63	1 *(Not Answered)* 1 *(Not Applicable)*
School Coordinator Manual(s)	3	57	1 *(Not Answered)* 4 *(Not Applicable)*
Test Administrator Manual(s)	0	61	2 *(Not Answered)* 2 *(Not Applicable)*
If any errors were detected, did you correct the error(s) before the testing began?	19	22	4 *(Not Answered)* 20 *(Not Applicable)*
Did you provide access to the Data Protection Declaration (provided by IEA and/or prepared by your country) to respondents in your country?	30	34	1
Does your country have a confidentiality policy that restricts putting respondents names on tracking forms and assessment instrument covers?	16	48	1
Did you encounter any problems translating and/or adapting the School Coordinator Manual(s)?	6	58	1
Did you encounter any problems translating and/or adapting the Test Administrator Manual(s)?	6	57	1
Were most/all School Coordinators appointed from within the participating schools?	56	8	1

Six National Research Coordinators reported difficulties translating the School Coordinator Manual and/or the Test Administrator Manual. Primarily, problems arose when the manual(s) had to be reorganized or adapted and the standardized procedures were modified (e.g., no Class Listing Forms or Teacher Tracking Forms were used). Countries administering both eTIMSS and bridge booklets also had two sets of manuals to prepare.

In 56 countries, School Coordinators were appointed from within the participating schools. In the remaining countries, School Coordinators were from the national center or were contracted externally. In most countries, the National Research Coordinators organized centralized training sessions for School Coordinators. In others, training was conducted through webinars, regional meetings, and online and written materials. In 37 countries, Test Administrators were trained by the School Coordinators within the participating schools. In the remaining countries, Test Administrators were trained by members of the national center staff.

Although the TIMSS administration mostly went well, Test Administrators occasionally reported difficulties. Among the problems documented by Test Administrators were the following: loud noises outside the classroom, some disruptive students, some students being unfamiliar with some of the subject material, some students having difficulty with the language of the test, some technical problems with eTIMSS administration, the length of the student questionnaire in some countries, and some commenting that the test was too long or that there was not enough time to complete it.

Less than half the countries that administered the school, teacher, and/or home questionnaires online reported issues. The great majority of these issues related to typos or user error when typing in the URL or login information. For some countries, the problem was easily solved by providing direct links to the correct web address.

In most countries administering eTIMSS, an additional person helped the Test Administrators during the eTIMSS testing sessions. This was usually the classroom teacher, School Coordinator, or an thmrw 6 (s)-33 (e (l)7)-5.8cof -0.(6 (, -5.8cof -0a)3 (si)513 (e n)]TJ g-86 (c)-p-6.2 0 -1dp)13 (e (la)3 (s

National Quality Control Program

The fourth section of the Survey Activities Questionnaire addressed the National Quality Control Program that each country implemented during data collection (see Chapter 7). As part of national

within the scoring guides. Almost half of National Research Coordinators reported creating their own national examples and practice papers for training their scorers, as suggested by the TIMSS & PIRLS International Study Center.

Exhibit 6.7: Survey Activities Questionnaire, Section Five Preparing for and Scoring the Constructed Response Items (Numbers of NRC Responses)