

CHAPTER 9

Quality Assurance Program for TIMSS Advanced 2015

Ieva Johansone
Erin Wry

Considerable effort has been made to develop standardized materials and survey operations procedures so that the TIMSS Advanced 2015 data meet the highest standards. To document data collection activities and verify that the standardized TIMSS Advanced procedures were followed, the TIMSS & PIRLS International Study Center, working in coalition with the IEA Secretariat, developed and implemented an ambitious International Quality Assurance Program. The purpose of this chapter is to provide an overview of the International Quality Assurance Program and report on the data collected through the program.

Overview

The International Quality Assurance Program was implemented by independent International Quality Control Monitors (IQCMs) appointed by the IEA Secretariat. The major task of the IQCMs was to conduct site visits during the data collection process and report on their observations. In each country, the IQCM visited a sample of 24 participating schools during the testing sessions, 12 for advanced mathematics and 12 for physics.

For each school visit, IQCMs observed the testing session and recorded their observations, noting any deviations from the standardized administration script, timing, and procedures. In addition, IQCMs interviewed the School Coordinators about their experiences coordinating the TIMSS Advanced assessment. IQCMs also checked whether the suggestions made by the international translation and layout verifiers had been integrated into the final assessment instruments, as documented in the National Adaptations Forms.

Prior to beginning their assignments, the IQCMs were mandated to attend a training session conducted by the TIMSS & PIRLS International Study Center. During the training, IQCMs were introduced to the TIMSS Advanced survey operations procedures and the design of the TIMSS Advanced 2015 achievement booklets and context questionnaires. IQCMs were also supplied with a manual detailing their role and responsibilities as well as the necessary materials for completing the quality control tasks.

An important aspect of the International Quality Assurance Program is the independence of the IQCMs from the national centers. The Quality Control Monitor could not be a member of the national center, or a family member or personal friend of the NRC. Often, the ICQM was a school inspector, ministry official, or retired school teacher. The IQCM was required to be fluent in both English and the language(s) spoken in the country. In most participating countries, the IEA Secretariat recruited IQCMs who had served in the same role in previous IEA assessments. For the remaining countries, National Research Coordinators assisted the IEA Secretariat in nominating an International Quality Control Monitor.

When necessary, the IQCMs were permitted to recruit assistants in order to effectively cover the territory and testing timetable. One TIMSS Advanced IQCM was trained for each of the participating countries. In addition, the IQCMs trained 23 assistant monitors to assist them. Altogether, Quality Control Monitors observed 108 advanced mathematics testing sessions and 110 physics testing sessions. The results of the TIMSS Advanced 2015 IQCM observations are reported in the following sections of this chapter.

Quality Control Observations of the TIMSS Advanced 2015 Data Collection

International Quality Control Monitors (IQCMs) conducted site visits during TIMSS Advanced test administration to a sample of 24 participating schools (12 per subject) in each country. For each school visit, the IQCMs completed the TIMSS Advanced 2015 Classroom Observation Record. For purposes of reporting, the advanced mathematics records were combined with the physics records.

The observation records were organized into four sections:

- Section A—Documentation of the TIMSS Advanced Testing Session
- Section B—Summary Observations of the TIMSS Advanced Administration
- Section C—Student Questionnaire Administration
- Section D—Interview with the School Coordinator

Documentation and Summary Observations of the TIMSS Advanced 2015 Testing Sessions

Sections A and B of the Classroom Observation Record addressed activities that took place during the actual testing sessions. The achievement test was administered in 90 minutes. During test administration, IQCMs were asked to observe the activities of the Test Administrator, specifically the following:

- Distributing, collecting, and securing the test booklets
- Following the assessment administration script
- Making time announcements during the testing sessions

As shown in Exhibit 9.1, the IQCMs reported that the TIMSS Advanced assessments were conducted in accordance with the international procedures, particularly, in regard to booklet distribution and security. In 99% of the observations, the test booklets were distributed according to the booklet assignment on the Student Tracking Forms and secured immediately following the testing session. Furthermore, in 87% of the observations the total testing time was equal to the time allowed. In the cases where the testing time was not equal to the time allowed, this was usually due to students finishing early. IQCMs reported that in nearly 80% of the observed testing administrations the students finished the assessment in less than the 90 minutes allotted.

**Exhibit 9.1: Observations of TIMSS Advanced 2015 Assessment Administration Sessions—
218 Advanced Mathematics and Physics Sessions (Percent of IQCM Responses)**

Question	Yes (%)	No (%)	Not Answered (%)
Did the Test Administrator distribute the test booklets according to the booklet assignment on the <i>Student Tracking Form</i> and booklet labels?	99	1	0
Did the total testing time of the testing session equal the time allowed?	87	13	0
Did the Test Administrator announce “you have 10 minutes left” prior to the end of the testing session?	91	9	0
Were there any other time remaining announcements made during the testing session?	20	79	1
Did any students finish the TIMSS Advanced assessment early (before the time allowed was up)?	79	21	0
Did the test administrator have a watch with a seconds hand, a stopwatch, or a timer for accurately timing the testing session?	86	13	1
Were the booklets collected and secured after the testing session?	99	1	0

If Test Administrators observed students working faster than expected, a remaining-time announcement was made prior to the planned 10 minute warning to inform students that they still had ample time to complete their work.

Exhibit 9.2 reports on the activities conducted during the assessment sessions. One of the most important methods of standardizing the assessment administration was to have all test administrators follow the script provided in the TIMSS Advanced Test Administrator Manual. IQCMs reported that in 66% of the observations, the Test Administrators followed the script exactly. In the circumstances in which the Test Administrator deviated from the script, nearly all modifications were described as “minor.” In addition, the IQCMs reported that the test administrators appropriately addressed student questions, according to the guidelines outlined in the test administrator manual, in 98% of the observed sessions.

Exhibit 9.2: Following the Test Administration Script—218 Advanced Mathematics and Physics Sessions (Percent of IQCM Responses)

Question	Yes (%)	No (%)	Not Answered (%)
Had the test administrator familiarized himself or herself with the test administration script prior to the testing?	88	10	2 (<i>I Cannot Answer</i>) 0 (<i>Not Answered</i>)
Did the test administrator follow the test administration script in the Test Administrator Manual?	66	24 (<i>Minor changes</i>) 10 (<i>Major changes</i>)	0
<i>If the Test Administrator made changes to the script, how would you describe them?</i>			
<i>Additions</i>	19	20	0 (<i>Not Answered</i>) 61 (<i>Not Applicable</i>)
<i>Revisions</i>	23	15	0 (<i>Not Answered</i>) 62 (<i>Not Applicable</i>)
<i>Deletions</i>	15	24	0 (<i>Not Answered</i>) 61 (<i>Not Applicable</i>)
Did the test administrator address student questions appropriately?	98	2	0

Exhibit 9.3 presents observations on student compliance with instructions and overall cooperation during the assessment administration. According to the IQCMs' observations, in almost all of the sessions, students complied well or very well with the instruction to stop work at the end of testing session. In addition, IQCMs described the students as mostly orderly and cooperative during the testing sessions, with 70% of the observations cited as having students who were extremely orderly and cooperative.

Exhibit 9.3: Student Cooperation During Assessment Administration—218 Advanced Mathematics and Physics Sessions (Percent of IQCM Responses)

Question	Very Well (%)	Fairly Well (%)	Not well at all (%)	Not Answered (%)	
When the Test Administrator ended the testing session, how well did the student comply with the instruction to stop work?	85	12	2	1	
Question	Extremely (%)	Moderately (%)	Somewhat (%)	Hardly (%)	Not answered (%)
To what extent would you describe the students as orderly and cooperative?	70	24	6	0	0

Summary Observations of the TIMSS Advanced 2015 Testing Sessions

Exhibit 9.4 reports on the IQCMs' general observations of the TIMSS Advanced assessment administration. Overall, IQCMs reported that the quality of testing sessions was good, very good or excellent in 93% of their observations. In most of the testing sessions the IQCMs observed, no participation problems occurred; however, in 4% of the cases the IQCMs recorded several students refusing to take the test. These cases were mostly credited to time conflicts with other classes or other tests occurring within or near the same timeframe.

The IQCMs reported few problems with the instruments themselves. In only 1% of the observed testing sessions was a defective booklet detected after the testing began, and in 100% of the sessions the student identification information on the booklets corresponded exactly with the Student Tracking Form. Furthermore, 92% of the observed TIMSS Advanced test administrations took place under favorable room conditions that were suitable for students to work without distraction. For students requiring special accommodations, accommodations were implemented in 6% of the observed testing sessions. The most common special accommodations provided included booklets with larger print, extended time, use of a magnifying glass, and a separate room for increased focusing ability.

Exhibit 9.4: General Observations of the Testing Session—218 Advanced Mathematics and Physics Sessions (Percent of IQCM Responses)

Question	Yes (%)	No (%)	Not Answered (%)
Did the student identification information on the booklets correspond with the <i>Student Tracking Form</i> ?	100	0	0
Were any defective test booklets detected and replaced?	0 (BEFORE the testing began) 1 (AFTER the testing began)	100 (BEFORE the testing began) 97 (AFTER the testing began)	0 (BEFORE the testing began) 2 (AFTER the testing began)
<i>If any defective test booklets were replaced, did the Test Administrator replace them appropriately?</i>	2	2	0 (Not Answered) 96 (Not Applicable)
Did any students refuse to take the test?	4	96	0
<i>If a student refused, did the Test Administrator accurately follow the instructions for excusing the student?</i>	4	0	0 (Not Answered) 96 (Not Applicable)
Were any late students admitted to the testing room?	8 (BEFORE the testing began) 5 (AFTER the testing began)	82 (There were no late students) 5 (Late students were not admitted)	0
Did any students leave the room for an "emergency" during the testing?	28	72	0
<i>If a student left the room for an emergency during the testing, did the Test Administrator address the situation appropriately (collect the test booklet, and if re-admitted, return the test booklet)?</i>	17	11	0 (Not Answered) 72 (Not Applicable)

Exhibit 9.4: General Observations of the Testing Session—218 Advanced Mathematics and Physics Sessions (Percent of IQCM Responses) (Continued)

Question	Yes (%)	No (%)	Not Answered (%)
Were there any students requiring special accommodations (e.g., students with visual or hearing impairment, Dyslexia)?	6	94	0
Did students store away everything, including all electronic devices, having only a pen or a pencil and the test booklet for the duration of the test administration?	92	8	0
Were the conditions in the testing room suitable (lighting, temperature, noise, etc.) for the students to work without distractions?	92	8	0
Did the seating arrangement provide adequate space for students to work and not be distracted by each other?	94	6	0

Question	Excellent (%)	Very Good (%)	Good (%)	Fair (%)	Poor (%)	Not Answered (%)
In general, how would you describe the overall quality of the testing session?	48	30	15	4	3	0

Student Questionnaire Administration

Exhibit 9.5 summarizes the IQCMs’ observations of the Student Questionnaire administration. In order to link the achievement scores to Student Questionnaire data, it is essential that the students receive the correct student questionnaire. IQCMs reported that the Student Questionnaires were distributed according to the Student Tracking Forms and questionnaire labels in 94% of the observed sessions. In some cases, the Student Questionnaire was attached to the student’s booklet and therefore the Student Tracking Form was not needed. In 65% of the observed cases, Test Administrators followed the Student Questionnaire administration script exactly. If the Test Administrator deviated from the script, most frequently the modifications were “minor.” It should be noted that some schools chose to administer the questionnaire on a different date than the TIMSS Advanced achievement booklets, and in these cases, IQCMs were not required to observe the Student Questionnaire administration.

Exhibit 9.5: Student Questionnaire Administration—218 Advanced Mathematics and Physics Sessions (Percent of IQCM Responses)

Question	Yes (%)	No (%)	Not Answered (%)
When the test administrator read the script to end the assessment session followed by the Student Questionnaire administration, did the test administrator announce a break?	76	22	2
Did the Test Administrator distribute the Student Questionnaires according to the <i>Student Tracking Form</i> and questionnaire labels?	94	2	4 (Not Applicable)
Did the test administrator follow the questionnaire administration script in the Test Administrator Manual?	65	21 (Minor changes) 10 (Major changes)	0 (Not Answered) 4 (Not Applicable)
<i>If the Test Administrator made changes to the script, how would you describe them?</i>			
<i>Additions</i>	14	24	0 (Not Answered) 62 (Not Applicable)
<i>Revisions</i>	21	17	0 (Not Answered) 62 (Not Applicable)
<i>Deletions</i>	12	25	0 (Not Answered) 63 (Not Applicable)

Interview with the School Coordinator

Section D was the final component of the Classroom Observation Record and involved the IQCM conducting an interview with the School Coordinator. The interview addressed issues such as the following:

- Shipment of assessment materials
- Arrangements for test administration
- Responsiveness of the national center to queries
- Necessity for make-up sessions
- Organization of classes in the school (to validate within-school sampling procedure)

As shown in Exhibit 9.6, 90% of the School Coordinators considered that the TIMSS Advanced 2015 administration in their school went very well overall. Additionally, 89% of the School Coordinators felt that the provided School Coordinator Manual worked well and did not need improvement. The overall attitude of the other school staff members was regarded as mostly positive (73%) or neutral (24%). Several School Coordinators cited some resistance towards testing in general but not specific to TIMSS Advanced.

Exhibit 9.6: Interview with the School Coordinator, Overview—218 Advanced Mathematics and Physics Sessions (Percent of School Coordinator Responses)

Question	Very well, no problems (%)	Satisfactorily, few problems (%)	Unsatisfactorily, many problems (%)	Not Answered (%)
Overall, how would you say the testing went?	90	10	0	0
	Positive (%)	Neutral (%)	Negative (%)	Not Answered (%)
Overall, how would you rate the attitude of the other school staff members towards the TIMSS Advanced testing?	73	24	3	0
	Worked well (%)	Needs improvement (%)	Not Answered (%)	
Overall, do you feel the School Coordinator Manual worked well for you or does it need improvement?	89	11	0	

In 92% of the interviews, the School Coordinators felt the national center was responsive to their questions and concerns, as show in Exhibit 9.7. Additionally, nearly half of the School Coordinators reported that the School Questionnaire and Teacher Questionnaire were administered online with very few problems.

Because the sampling of classes requires a complete list of all classes in the school at the target grade, IQCMs were also asked to verify that the class list did indeed include all classes. Almost all of the School Coordinators confirmed that the complete list of classes had been documented and that all students appeared in one and only one of these classes. In 32% of the schools, the School Coordinator anticipated the need for a makeup session, and almost all of these coordinators intended to conduct one.

As a reflection of the successful planning and implementation of TIMSS Advanced 2015, 91% of respondents affirmed that they would be willing to serve as a School Coordinator in future international assessments. Finally, it is notable that the response rate for the Classroom Observation Records was considerably high on all questions, with only a handful of questions going unanswered.

Exhibit 9.7: Interview with the School Coordinator, Details—218 Advanced Mathematics and Physics Sessions (Percent of School Coordinator Responses)

Question	Yes (%)	No (%)	Not Answered (%)
Prior to the testing day, did you have time to check your shipment of materials from the national center?	73	24	3
Did you receive the correct shipment of the materials as listed in your School Coordinator Manual and according to the tracking forms?	74	19	7
<i>If no, did the national center provide the missing materials in time for the testing?</i>	1	13	0 (Not Answered) 86 (Not Applicable)
Was the national center responsive to your questions or concerns?	92	5	3
Was the Teacher Questionnaire administered online?	42	56	2
<i>If the Teacher Questionnaire was administered online, did the teacher(s) encounter any problems?</i>	3	50	0 (Not Answered) 47 (Not Applicable)
Was the School Questionnaire administered online?	43	56	1
<i>If the School Questionnaire was administered online, did the person completing it encounter any problems?</i>	3	49	0 (Not Answered) 48 (Not Applicable)
Do you anticipate that a makeup session will be required at your school?	32	67	1
<i>If yes, do you intend to conduct one?</i>	30	3	0 (Not Answered) 67 (Not Applicable)
Did the students receive any special instructions, motivational talk, or incentives to prepare them for the assessment?	65	35	0
Is this a complete list of the classes in this grade in this school?	97	3	0
To the best of your knowledge, are there any students in the target population who are not in any of these classes?	6	93	1
To the best of your knowledge, are there any students in the target grade in more than one of these classes?	9	90	1
If there was another international assessment, would you be willing to serve as a School Coordinator?	91	9	0