



TALIS 2013 Technical Report



TEACHING AND LEARNING INTERNATIONAL SURVEY



TALIS 2013 Technical Report



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The OECD recognises the significant contributions of the IEA Data Processing and Research Centre in Hamburg, Germany who authored this report. The principal authors of specific chapters were for Chapter 1: Steffen Knoll, Friederike Westphal; Chapter 2: Steffen Knoll, Paulina Koršnáková; Chapter 3: Ralph Carstens, Paulina Koršnáková; Chapter 4: Paulina Koršnáková, Friederike Westphal; Chapter 5: Jean Dumais, Sylvie LaRoche; Chapter 6: Friederike Westphal, Paulina Koršnáková, Steffen Knoll; Chapter 7: Paulina Korsnakova, Steffen Knoll, Friederike Westphal, Alana Yu; Chapter 8: Alena Becker, Mark Cockle; Chapter 9: Jean Dumais, Sylvie LaRoche; Chapter 10: Deana Desa, Eugenio Gonzalez, Plamen Mirazchiyski.

The editorial work at the OECD Secretariat was carried out by Julie Bélanger, Simon Normandeau and Elisa Larrakoetxea. The layout of this report was carried out by Elisa Larrakoetxea, Louise Binns and Sophie Limoges. Administrative assistance was provided by Elisa Larrakoetxea.

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List of abbreviations and acronyms

Acronym	Description	Comment
AEG	Analysis Expert Group	
BPC	Board of Participating Countries	
DME	Data Management Expert	Software
DPE	Data Processing Expert	Software
FT	Field Trial	
IDEG	OECD TALIS Instrument Development Expert Group	
IEA	International Association for the Evaluation of Educational Achievement	
IEA DPC	IEA Data Processing and Research Center	Part of IEA
INES	OECD Education Indicators Programme	
IQCM	International Quality Control Monitor	Contracted by IEA
ISC	International Study Center	In TALIS, the IEA Data Processing and Research Center published in 1997
ISCED	International standard classification of education	
ISCED 1	Primary school	
ISCED 2	Lower secondary school	
ISCED 3	Upper secondary school	
MOS	Measure of Size	
MS	Main Survey	
MTM	Mathematics teacher module	For TALIS-PISA link only
NADB	National Adaptations Database	
NAF	National Adaptation Form	
NDM	National Data Manager	
NPM	National Project Manager	
NQM	National Quality Monitor	
NRBA	Non-response-bias-assessment	
NSM	National Sampling Manager	
ODC	Online Data Collection	
OECD	Organisation for Economic Co-operation and Development	
P&P	Paper and Pencil	
PISA	Programme for International Student Assessment	
PQ	Principal/School Questionnaire	
PRE	Participation Rate Estimator	Software
SAQ	Survey Activities Questionnaire	
SC	School Coordinator	
TAG	Technical Advisory Group	
TALIS	Teaching and Learning International Survey	

Acronym	Description	Comment
TLF	Teacher Listing Form	Form produced by WinW3S
TQ	Teacher Questionnaire	
TTF	Teacher Tracking Form	Form produced by WinW3S
TV	Translation verification	
WinW3S	Windows Within School Sampling Software	Software

List of 3-digit ISO codes of TALIS 2013 participants

TALIS participant	ISO code
Australia	AUS
Brazil	BRA
Bulgaria	BGR
Chile	CHL
Croatia	HRV
Czech Republic	CZE
Cyprus ^{2,3}	CYP
Denmark	DNK
Estonia	EST
Finland	FIN
France	FRA
Iceland	ISL
Israel	ISR
Italy	ITA
Japan	JPN
Korea	KOR
Latvia	LVA
Malaysia	MYS
Mexico	MEX
Netherlands	NLD
Norway	NOR
Poland	POL
Portugal	PRT
Romania	ROU
Serbia	SRB
Singapore	SGP
Slovak Republic	SVK
Spain	ESP
Sweden	SWE
United States	USA
Abu Dhabi (United Arab Emirates)	AAD
Alberta (Canada)	CAB
England (United Kingdom)	ENG
Flanders (Belgium)	BFL

Chapter 1: Introduction and Summary

Overview

This OECD *Teaching and Learning International Survey (TALIS) 2013 Technical Report* documents the development of the TALIS survey instruments and the methods used to conduct sampling and data collection, scaling and analysis. It enables readers to review and replicate these procedures and to gain insight into the rigorous quality control programme that encompassed all phases of the survey. The study involved numerous OECD partners as well as external experts.

TALIS is the first international series of surveys to focus on the learning environment and the working conditions of teachers in schools. It offers teachers and school principals the opportunity to provide their perspectives on school contexts. Countries can then use this information to deepen analysis of the issues TALIS examines and to aid development of policy relating to these matters. TALIS data also allow countries to identify other countries facing similar challenges and to learn from their approaches to policy development.

The first cycle of TALIS, conducted in 2008, involved 24 countries.¹ The success of this cycle, especially its valuable contribution to teacher policy development in those countries, led to the TALIS Board of Participating Countries (BPC) and the OECD Secretariat agreeing to conduct a second cycle, TALIS 2013. This cycle focused on the following policy-related matters:

- appraisal of teachers' work in schools, the form and nature of the feedback teachers receive and how the information gained from these processes is used to reward teachers and facilitate their professional development;
- the amount and type of professional development available to teachers and their needs, and identification of barriers to this development;
- teachers' pedagogical and professional practices;
- school-level policies and practices, including those relating to school leadership, that shape the learning environment in schools and the work of teachers;
- the creation and support of effective school leadership in an era of accountability and devolution of educational authority;
- the impact on teachers of recent trends in school leadership and management; and
- teachers' reported feelings of self-efficacy and job satisfaction and their perceptions of the climate in the schools and classrooms in which they work.

The TALIS 2013 countries included Abu Dhabi (United Arab Emirates), Alberta (Canada), Australia, Belgium (Flanders), Brazil, Bulgaria, Chile, Croatia, Cyprus,² Czech Republic, Denmark, England (United Kingdom), Estonia, Finland, France, Iceland, Israel, Italy, Japan, Republic of Korea, Latvia, Malaysia, Mexico, Netherlands, Norway, Poland,

Portugal, Romania, Serbia, Singapore, Slovak Republic, Spain, Sweden and the United States.

TALIS used two questionnaires to collect data: a principal questionnaire, completed by school leaders, and a teacher questionnaire, completed by the sampled teachers. Respondents could choose to fill in the questionnaires on line or with paper and pencil.

TALIS required all participating countries to conduct the study's "core" survey at the lower secondary level of education, that is, Level 2 of the International Standard Classification of Education (ISCED 1997; UNESCO Institute of Statistics, 2006). However, countries could elect to administer the survey at ISCED Level 1 (primary education) and/or ISCED Level 3 (upper secondary education) as well. A third option invited those countries that took part in the OECD's 2012 Programme for International Student Assessment (PISA) to implement TALIS in the same schools that participated in PISA. This option is called the TALIS-PISA Link.

Twenty-seven countries chose to collect data on line (the on-line data collection or ODC option). Chapter 6 provides more detail about this process. Six countries opted for the ISCED Level 1 option, ten for the ISCED Level 3 option and eight for the TALIS-PISA Link. More details about these options can be found in Chapter 5. The remainder of this current chapter briefly describes the management of TALIS 2013 at the international and national levels and outlines the three major phases and milestones of the survey.

Managing the study

In January 2011, the OECD entered a partnership with the International Association for the Evaluation of Educational Achievement Data Processing and Research Center (IEA DPC) and its consortium member, Statistics Canada. Under the terms of the partnership, the OECD contracted the IEA DPC to conduct the TALIS 2013 survey. The TALIS Consortium thus included staff from the IEA DPC (Hamburg, Germany), which housed the TALIS International Study Centre (ISC), Statistics Canada (Ottawa, Canada) and the IEA Secretariat (Amsterdam, the Netherlands). The ISC completed its work in June 2014.

The OECD Secretariat in Paris, France, was responsible for overall management of the project. There, Kristen Weatherby and Julie Bélanger from the OECD Directorate for Education and Skills monitored the day-to-day conduct of the study through close communication with the international contractor. The two women also served as the Secretariat for the TALIS Board of Participating Countries, mediating between it and the international contractor, and fostering consensus across the TALIS countries.

Team members at the ISC included Steffen Knoll (study director), Ralph Carstens (deputy director), Friederike Westphal (project manager) and Mark Cockle (deputy project manager). Mark Cockle also supported Alena Becker (international data manager) through his additional role of deputy data manager. Dirk Hastedt, IEA's executive director, acted as advisor.

The team appointed to develop the TALIS framework consisted of assistant professors Leslie Rutkowski and David Rutkowski as well as Ellen Prusinski, all three of whom are based at Indiana University, Bloomington, USA. Steffen Knoll, from the IEA DPC, served as team coordinator.

The study's sampling referee, Jean Dumais, and his sampling team manager, Sylvie LaRoche, both of Statistics Canada, were responsible for the survey's sample design,

implementation, weighting and adjudication. The sampling team used the sampling-frame information provided by the participating countries to draw the field trial and main survey school samples in each of those countries. They completed this work before the field trial. Weighting of the main survey data occurred before data scaling and analysis, as did sample adjudication.

At the IEA Secretariat, Juriaan Hartenberg managed the financial and contractual affairs of the TALIS Consortium/OECD partnership until the end of 2013, after which Roeland Burger did this work until the end of the project in June 2014. Paulina Koršňáková coordinated the tasks involved in verifying translation of the survey questionnaires into different languages and ensuring the quality of survey implementation in all participating countries. cApStAn Linguistic Quality Control, an independent linguistic quality control agency based in Brussels, Belgium, performed the translation verifications. This work encompassed 32 languages. The IEA Secretariat also appointed, contracted and trained independent International Quality Control Monitors to collect information on survey implementation in each participating country.

Standardised procedures to ensure high-quality data

The *TALIS 2013 Technical Standards* (OECD, 2012a), prepared by the TALIS Consortium, guided the participating countries in all stages of survey preparation, survey administration and data processing. Adherence to these standards was necessary in order to ensure the international comparability of the questionnaires and the quality of the TALIS International Database. The TALIS Consortium also developed a set of manuals and guidelines describing the steps that all countries needed to take to ensure successful implementation of the survey (see also Chapter 6).

The Statistics Canada team performed all school sampling and weighting procedures in line with the rules and guidelines presented in the *TALIS 2013 Sampling Manual* (OECD, 2012b). More details on the sampling procedures and on the sampling weights and participation rates appear in Chapters 5 and 9 respectively.

IEA provided all countries with within-school sampling, data entry and on-line data collection software. During a three-day data management seminar at the beginning of the study, National Data Managers received training in the correct use of the three programs. This extensive hands-on training familiarised them with the software at an early stage (survey preparation) of the TALIS project.

The TALIS National Project Managers used the first software package—IEA's Windows Within-School Sampling Software (WinW3S)—to draw the teacher sample for each nationally sampled school. Staff in the TALIS National Study Centres used the second software package, the IEA Data Management Expert program, also developed by IEA, to enter the information contained on all returned survey questionnaires. All countries used these first two programs, both previously successfully used in numerous IEA surveys and TALIS 2008, and now adapted for TALIS 2013. Countries that elected to collect data on line used the third program, the IEA SurveySystemDesigner, for this purpose (see Chapters 6 and 8).

Implementation of quality control procedures during all phases of the survey allowed close monitoring of national instrument production, survey procedures and data outcomes. The IEA Secretariat coordinated quality control of these procedures at the international level, while the National Project Managers took on this responsibility at the

national level. The IEA Secretariat also asked these managers to nominate people who could serve as National Quality Control Monitors (see Chapter 7).

During the three-year survey cycle, the ISC held four meetings for all national project managers. During these meetings, the TALIS Consortium provided updates on survey progress and facilitated discussions of procedures, questionnaires and data. Managers also had opportunity to exchange experiences and learn different approaches to (for example) coping with survey fatigue, ensuring confidentiality and simultaneously managing the different international options. ISC also organised bilateral on-demand webinars between itself and any country requesting specific support and guidance. In spring 2014, the ISC offered the National Project Managers and other national staff members responsible for data analysis training in the use of the IDB Analyzer, software developed by IEA that enables users to conduct statistical analyses of survey data.

National Study Centres and National Project Managers

During its meeting in January 2011, the TALIS BPC confirmed that the first task for participating countries was to establish a national centre under the auspices of an experienced National Project Manager. This person would be responsible for preparing and coordinating the survey at the national level. In most countries, the national managers were supported by a National Data Manager and/or a National Sampling Manager. Their role was to manage the data-related and technical aspects of survey administration. The number of staff members in the centres varied considerably from country to country, with that variation dependent on the size of the country and how it chose to organise its national centre.

Regular communication between the project managers and the ISC ensured that survey administration proceeded according to the international schedule. All participating countries met international deadlines and submitted all data and documentation on time.

Countries in both the Northern and Southern Hemispheres collected their TALIS data towards the end of the school year and in line with the *TALIS 2013 Technical Standards*. National centres distributed questionnaires to teachers and principals, who completed and returned (in the case of paper administration) the questionnaires within a defined period of time.

In some countries, survey administration was mandatory. The project managers in these countries reported that administration was straightforward. However, in countries where survey participation was voluntary, the managers anticipated difficulty achieving high participation rates at the school and teacher level. They consequently worked closely with teacher unions, local, regional and state authorities and/or the national education ministry to secure the needed participation. Countries also engaged in extensive public relation efforts to raise awareness among principals and teachers before the main data collection, and many created their own TALIS websites.

The tasks required of the National Project Managers and Data Managers included the following:

- establishing an overall survey preparation and survey administration schedule in co-operation with the ISC;
- attending National Project Manager meetings in order to become familiar with all TALIS instruments, materials and survey procedures;

- providing Statistics Canada with an up-to-date national sampling frame of ISCED Level 2 schools and, where applicable, of ISCED Levels 1, 3 and TALIS-PISA Link schools;
- holding direct discussions with Statistics Canada’s sampling experts on national options, such as oversampling;
- performing within-school sampling and tracking using IEA WinW3S;
- appointing an experienced translator to produce the national versions of the international instruments;³
- documenting required national adaptations to the instrument on the National Adaptation Forms released by the ISC;
- using the IEA SurveySystemDesigner to prepare for on-line data collection (if applicable);
- nominating and training School Coordinators;
- nominating and training National Quality Control Monitors (if applicable);
- monitoring the return status of the on-line questionnaires using the “participation rate estimate” software tool provided by the ISC (if applicable);
- entering paper data manually using IEA DME Tools, or monitoring data entry if an external agency had been subcontracted to do this work;
- using IEA DME Tools to perform quality control procedures;
- completing the survey activities questionnaire after survey administration; and
- sending a data file to the ISC and responding to questions from the centre after it had run edits on the data file.

Study phases

The TALIS design included three major components – a pilot study, a field trial and the main survey.

As preparation for the qualitative pilot study, the ISC asked participating countries to establish focus groups that included teachers, principals, school administrators and researchers. The purpose of these groups was to discuss the proposed field trial survey items and to provide feedback on their performance.

The field trial followed a quantitative approach. The ISC asked all participating countries to run the trial according to the standardised procedures outlined in the *TALIS 2013 Technical Standards*. Countries that had opted to participate in one or more of the international options had to trial them as well.

No countries dropped out of the survey during the study cycle. This meant that all countries which completed the field trial also conducted the main survey.

The TALIS pilot study

The main objectives of the pilot were to:

- trial mainly new items developed by the Instrument Development Expert Group;

- collect information on the international applicability of the items;
- gather information on how well the instruments performed in the field;
- determine whether the ISCED Level 2 questionnaires could be applied at other ISCED levels or if items required adaptation;
- collect information on the mathematics teacher module, an additional section to be included in the questionnaire for the TALIS-PISA Link school sample; and
- fine-tune the questionnaires for the field trial based on analysis of the pilot outcomes.

To facilitate implementation of the main survey, the IEA DPC in Hamburg, Germany, held the first (three-day) meeting of the National Project Managers in April 2011, prior to administration of the pilot study. The purpose of the meeting was to present and discuss the study's conceptual framework, its sampling procedures, instruments and materials, its survey operations procedures and the project managers' roles and responsibilities with regard to TALIS. The project managers were also introduced to the main survey schedule and received initial information on communication strategies and best practices collated from TALIS 2008.

The qualitative pilot study was run in the second and third quarter of 2011 in 21 countries with a total of 110 school leaders and 135 teachers, who formed focus groups (Table 1.1; refer to Chapter 3 for more details).

Because of the limited time available to conduct the pilot study data collection and analysis, the TALIS BPC decided early in the study, after the National Project Managers had consulted together at their first meeting, to implement the pilot study using a qualitative methodology (i.e. focus groups of teachers and school leaders) rather than a quantitative methodology (i.e. administering the questionnaires to a larger group of teachers and school leaders). Countries from different locations, with different cultural and language backgrounds, volunteered to participate in the pilot. To provide these countries' national project managers with training related to the pilot study, the ISC conducted a web-based session during which they provided the relevant documents and described the standardised procedures.

Table 1.1 Distribution of countries participating in TALIS 2013 pilot Survey

Instrument	ISCED Level/Option	No. of countries
Principal Questionnaire	2	16
	1	5
	3	6
Teacher Questionnaire	2	19
	1	4
	3	9
	MTM	4

Source: OECD *TALIS Database*.

The project managers established focus groups of five to nine people to discuss the pilot instruments. Translation into national languages was not required if all focus group members were fluent in English or French. However, the managers did have to make mandatory national adaptations (e.g. replacing <ISCED Level X> with lower secondary), but these were not subject to international verification procedures.

The project managers led the focus group discussions according to the requirements of the Pilot Feedback Survey and in line with the probing questions prepared by the ISC. Outcomes of the focus group discussions were reported back to the ISC in standardised format and made available to the Instrument Development Expert Group for analysis and fine-tuning of the field trial instruments.

The TALIS field trial

The objective of the field trial was to test the survey instruments and the operational procedures in all participating countries in preparation for the main survey.

In November 2011, the second two-day meeting of National Project Managers took place in Cancun, Mexico. Those attending discussed the outcomes of the pilot study and the required changes to the instruments for the field trial. Meanwhile, each participating country discussed sampling issues and their individual survey preparation schedules as well as other topics of interest with the TALIS Consortium. After the project managers' meeting, the ISC conducted a three-day data-management seminar to train the National Data Managers in using IEA WinW3S for within-school sampling, IEA DME for data entry, and the IEA SurveySystemDesigner for on-line data collection. The 27 countries that had decided to collect the main survey data on line trialled the on-line procedures and data collection during the field trial.

All participating countries conducted the field trial during a six-week timeframe encompassing the third and fourth quarters of 2011. Sampling, translation verification and layout verification were performed according to main survey standards.

The expected sample size per country and per option was 400 teachers and 20 principals from the 20 schools sampled by Statistics Canada prior to the field trial. Exceptions were made for some countries – Croatia, Finland, Iceland, the Netherlands and Singapore – where the samples were smaller due either to a relatively small total number of schools or to other local circumstances (see Chapter 5 for more details). However, in countries that participated in the survey options, the field trial sample could be quite large. Poland, for example, had a field trial sample size of 1 200 teachers and 60

principals from 60 schools because of conducting the survey at the core level (lower secondary) as well as at ISCED Levels 1 and 3.

In each country, the National Project Manager or Data Manager supervised data entry, performed using IEA DME software. Scrutinising the quality of the data required all principal questionnaires and a minimum of 100 teacher questionnaires to be entered twice into DME. National data sets were then submitted to the ISC for data processing and additional quality checks.

Careful analysis of the field data by the Instrument Development Expert Group and consultation with the TALIS BPC led to improvements in the main survey instruments. These were released on 1 August 2012 (refer to Chapter 3 for more details).

TALIS main survey

The third three-day meeting of National Project Managers was held in July 2012 in Reykjavik, Iceland. Its purpose was to prepare the project managers for administering the main survey. The meeting focused on the outcomes of the field trial and presented the final main survey instruments. Countries were again asked to continue discussing sampling and survey operation procedures with the TALIS Consortium beyond the meeting, and to request individual consultations with the ISC on the field trial data. The July meeting also provided an opportunity to explain the rules governing the international and national quality control monitoring (see Chapter 7); unlike the field trial, the main survey utilised external experts for quality control at the international level.

Southern Hemisphere countries conducted the main survey in the fourth quarter of 2012 and submitted their data in January 2013. Northern Hemisphere countries administered the survey within a self-selected period during the first and second quarter of 2013, with a final data submission deadline of 31 May 2013. All data were then processed and cleaned at the ISC. Statistics Canada conducted data weighting and weight adjustments during the third quarter of 2013.

Also during the third quarter of 2013, all main survey data were made available to the Analysis Expert Group, the members of which ran the analysis according to the main survey analysis plan agreed to during the TALIS BPC meeting in January 2013. In September 2013, the TALIS Consortium and the OECD Secretariat met for three days at Statistics Canada in Ottawa to discuss the weighting and adjudication of the TALIS main survey data.

In October 2013, the fourth three-day National Project Manager meeting took place in Bucharest, Romania. The purpose of this meeting was to review prototype tables for the TALIS international report in plenary sessions and to discuss country data in individual country sessions. All countries had opportunity to verify their entries in the National Adaptation Database. The sampling experts also discussed sampling outcomes and weights in bilateral country consultations. During the meeting, the ISC also asked project managers to provide feedback about TALIS 2013, so allowing their experiences to inform what will be the third cycle of the TALIS survey programme.

In March 2014, the National Project Managers and other interested national centre staff received training in the correct use of the IDB Analyzer so that they could run their own analyses of their national TALIS data and prepare high-quality national reports on the study and its findings.

Survey milestones

Table 1.2 provides an overview of TALIS 2013's key milestones.

Table 1.2 Distribution of countries participating in TALIS 2013 pilot survey

Year	Activity
2011: second quarter	Pilot study: 21 countries reviewed the items in focus groups
2011: third and fourth quarter	FT: preparation of survey instruments and software; sampling, school contacts
2012: first and second quarter	FT administration: testing of software and procedures; mandatory for all participating countries
2012: second and third quarter	Finalisation of instruments; fine-tuning of software and procedures
2012: fourth quarter	MS: Southern Hemisphere countries
2013: first and second quarter	MS: Northern Hemisphere countries
2013: third quarter	Data processing, cleaning, weighting
2013: third and fourth quarter	Analysis of the MS data; drafting of the International and the Technical Reports
2014: first and second quarter	Finalisation and release of the International Report
2014: second quarter	International database analyser training at the ISC; finalisation and release of the Technical Report and the TALIS User Guide

Source: OECD *TALIS Database*.

The success of TALIS 2013 was made possible by the strong commitment of all parties involved. The ISC greatly appreciated the work of and working with the representatives of the OECD Secretariat, the TALIS Consortium and the National Study Centres, all of which kept to timeframes and exercised great care despite tight schedules. We therefore sincerely thank all participants who contributed to the successful realisation of TALIS 2013.

References

- OECD (2012a), *TALIS 2013 Technical Standards* (prepared by the IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, Statistics Canada, Ottawa), OECD, Paris.
- OECD (2012b), *TALIS 2013 Sampling Manual*, OECD (prepared by Statistics Canada, Ottawa), OECD, Paris
- UNESCO-UIS (UNESCO Institute for Statistics) (2006), *International Standard Classification of Education: ISCED 1997*, UNESCO-UIS, Montreal.

Notes

- 1 In this report, the term country also refers to federal states and national entities or regions.
- 2 Note from Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the island. No single authority represents both the Turkish and Greek Cypriot peoples on the island. Turkey recognises the Turkish Republic of Northern Cyprus. Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”. Note from all the European Union member states of the OECD: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
- 3 English- and French-speaking countries were asked to adapt the generic questionnaires according to cultural considerations.

Chapter 2: Overview of TALIS 2013 and the Study's Framework Development

Abstract

This second chapter of this technical report presents the rationale for and aims of TALIS, the design of the TALIS survey programme, and the development of the conceptual framework that shaped the development of the second cycle of the programme (i.e. TALIS 2013). It outlines the policy emphasis, dimensions and indicators considered and selected for this round. A detailed description of the conceptual background of TALIS 2013 can be found in the publication documenting the study's conceptual framework (OECD, 2013a).

The rationale for and aims of TALIS

The Teaching and Learning International Survey (TALIS) is part of the Indicators of Education Systems (INES) programme implemented by the OECD. TALIS's origins lie in a data strategy designed to increase the amount of international information available to OECD countries on teachers, teaching and the impact that teachers can have on student learning. This strategy led to a survey of teachers in schools that was developed and implemented through the first round of TALIS.

This first cycle of TALIS, successfully conducted in 2007/08 in the 24 participating countries,¹ provided valuable information on teachers' working lives and school-based working conditions. The results and products of the first TALIS cycle have been used in *Education at a Glance* (OECD, 2008, 2010a, 2011, 2012, 2013b). The TALIS 2008 international report (OECD, 2009) was followed by valuable thematic reports (European Commission, 2010; Jensen et al., 2012; Vieluf et al., 2012) that provided more in-depth investigation of important aspects of the data.

In 2010, the individuals attending the eighth meeting of the TALIS Board of Participating Countries (BPC) outlined and discussed TALIS's strategic direction, suggesting ways in which TALIS could progress the aim of providing a comprehensive appreciation of teachers as they work to shape students' learning outcomes. The first cycle of TALIS had provided policy makers and researchers with valuable insights into some of the policies and practices that can improve the conditions for teaching and learning at schools. TALIS 2008 investigated four policy themes:

- the role and function of school leadership;
- how the work of teachers is evaluated and how teachers receive feedback;
- teachers' continuous professional development; and
- teachers' beliefs and attitudes about teaching and their pedagogical practices.

The aim of the second round of TALIS, implemented in school year 2012/13, was to fill the gaps in the evidence base on effective teaching and learning practices and determine the policy levers likely to create the prerequisites for these practices.

According to the TALIS 2013 conceptual framework, “the overall objective of TALIS is to provide, in a timely and cost-effective manner, robust international indicators and policy-relevant analysis on teachers and teaching in order to help countries review and develop policies in their efforts to promote conditions for effective teaching and learning” (OECD, 2013a, p. 7). In order to reach these goals, TALIS 2008 established the following principles guiding the survey strategy and set down in the *TALIS 2008 Technical Report* (OECD, 2010b, pp. 24-25):

- Policy relevance. Clarity about key policy issues and a focus on the questions that are most relevant for participating countries are both essential.
- Value added. International comparisons should be a significant source of the study's benefits.
- Indicator-oriented. The results should yield information that can be used to develop indicators.
- Validity, reliability, comparability and rigor. Based on a rigorous review of the knowledge base, the survey should yield information that is valid, reliable and comparable across participating countries.
- Interpretability. Participating countries should be able to interpret the results in a meaningful way.
- Efficiency and cost-effectiveness. The work should be carried out in a timely and cost-effective way.

The TALIS survey programme design

TALIS is designed as a sequence of cross-sectional surveys that follows a modular approach regarding the investigated content areas and the sample design. By providing important information about teachers, principals and the schools in which they work, TALIS fills in some important data and policy gaps not previously addressed by, for example, the OECD's Programme for International Student Assessment (PISA).

The first TALIS cycle generated system-level results based on the responses of a representative sample of teachers and principals in lower secondary schools, with this level of schooling defined according to the International Standard Classification of Education (ISCED 1997; UNESCO-UIS, 2006). TALIS 2008 also offered participating countries the choice of gathering data from three other representative samples. The first, Option 1, was a representative sample of teachers of primary education (ISCED Level 1) and the principals of their schools. Option 2 was a representative sample of teachers working in upper secondary education (ISCED Level 3) and the principals of their schools, and Option 3 a representative sample of teachers of 15-year-olds in the TALIS 2013 schools that also took part in PISA 2006 and the principals of those schools. Only Iceland selected the ISCED Level 1 option. Mexico added a national sample of Telesecundaria (distance learning) schools, teachers and their principals (SEP, 2009).

Almost all TALIS participants stressed that the design of the second cycle of TALIS should be the same as that of the first cycle, which would mean defining ISCED Level 2

schools, teachers and principals as the target population of the so-called core survey and making implementation of that survey mandatory for all TALIS countries. Participants also agreed that the core survey should be augmented by three international options to accommodate countries' growing interest in investigating additional teacher target populations. The international options included teachers, principals and schools of: (a) ISCED Level 1; (b) ISCED Level 3, (c) a sample of teachers and their principals drawn from the schools that also took part in the PISA 2012 cycle.

The third option, commonly referred to as the TALIS-PISA Link option, required the drawing of a sample from within each sampled PISA school of all teachers of 15-year old students. The number of teachers in each resultant sample comprised 20 non-mathematics teachers and all mathematics teachers. This procedure enabled investigation into and comparison of the teaching practices and learning environments of both sets of PISA 2012 teachers (non-mathematics and mathematics).

In contrast to the first round of TALIS, there was a greater up-take of the international options: six countries selected the ISCED Level 1 population option, ten selected the ISCED Level 3 option and eight chose the TALIS-PISA Link option. Chapters 4 and 9 of this report describe the sampling options in detail.

In both the 2008 and 2013 cycles, TALIS offered two different data collection modes: paper and pencil, and on-line. In 2013, 27 of the 34 countries participating in TALIS used the on-line option. Only seven used paper and pencil.

Choosing the policy focus for TALIS 2013

In order to guide the policy focus of the second round of TALIS, the TALIS Consortium invited all OECD countries (whether previous TALIS participants or not) to complete a rating exercise during March and April 2010. Twenty-five countries agreed to do so. Once completed, the ratings were sent to the OECD Secretariat for compilation of the overall results. The results of the exercise and the policy content proposals arising from it are documented here.

The overall objective of the priority rating exercise was to guide the content of TALIS 2013 so that it would enable a more focused survey of countries' policy priorities. This, in turn, would lead to the outputs of the deliverables and analysis. More specifically, countries provided ratings that helped determine not only which themes and indicators should be included in the second round of the survey but also which indicators from the survey's first round of the survey should be included in the second.

The priority rating exercise consisted of three main parts. First, countries allocated 200 rating points amongst 20 proposed themes across 5 overall policy-relevant areas, with higher points representing a higher priority. The OECD Secretariat compiled the results through an aggregation of the points allocated by countries to each theme (see Tables 2.1 and 2.2). Second, countries indicated, for those themes that had been assigned points, which of 90 indicators associated with the themes they considered most important to include in the second round of the survey (see Annex B, Table 2.4). Finally, countries were asked to indicate which of 25 indicators from TALIS 2008 should be maintained in TALIS 2013 to permit analysis of change trends.

The TALIS BPC reviewed these results at its meeting in September 2010 and decided on the main policy issues for the second round of TALIS. Tables 2.1 and 2.2 show the results of the first priority rating exercise (related to themes). The first table provides the

ranking of the policy areas by the average ratings of associated themes; the second provides the ranking of the 20 individual themes.

Table 2.1 Results of priority-rating: average rating for themes within the five policy areas

Policy Area	Average Rating
School policies supporting effectiveness	220
Effective teachers and teaching	173
Developing teachers within the profession	167
Retaining teachers in the profession	141
Attracting teachers to the profession	137

Source: OECD *TALIS Database*.

Examination of the rankings of individual themes showed high priority placed on those relating to school leadership and teachers' instructional practices and beliefs. Themes that countries considered to be of less importance included, for example, support and guidance for the most experienced teachers and effective recruitment and selection procedures and incentives.

Table 2.2 Results of priority- rating: themes by ranking

Ranking	Theme number	Theme
1	14	School leadership
2	16	Teachers' instructional practices and beliefs
3	6	Profile of teachers' in-service education and training
4	15	School climate and ethos
5	2	Initial teacher education
6	8	Satisfaction and effectiveness of in-service education and training
7	11	Recognition, reward and evaluation of teachers
8	18	Teachers' professional practices
9	5	Motivations and early career experience of teachers
10	1	Attracting good students into teaching
11	19	21st Century skills: ICT in teaching
12	10	Job satisfaction and teacher human resource measures
13	17	Education and qualifications of teachers
14	7	Frequency of in-service education and training
15	20	Innovation and creativity
16	13	Division of teachers' working time
17	9	Teacher attrition and turnover rates
18	3	Adequacy of teacher supply and teacher shortages
19	12	Support and guidance for the most experienced teachers
20	4	Effectiveness of recruitment and selection procedures and incentives

Source: OECD *TALIS Database*.

The third rating exercise focused on whether or not to repeat indicators included in the first round of TALIS in the second. Table 2.3 shows that the 22 countries participating in this part of the exercise wanted 23 of the 25 indicators repeated. Each of these 23 indicators attracted a "yes" response from at least half or more of the countries.

Table 2.3 Results of priority-rating: indicators to repeat from the first round of TALIS

Indicators from TALIS 2008	Number of votes
On-going professional development: Impact	19
On-going professional development: Types of activities	18
On-going professional development: Participation rates	17
Teacher-student relations	17
Classroom disciplinary climate	17
On-going professional development: Needs/demand	17
Profile of teachers' teaching practices	17
Profile of school leadership style	17
On-going professional development: Barriers preventing participation	16
On-going professional development: Intensity of participation	15
Teacher appraisal and feedback: Teacher perceptions	15
Profile of teachers' working time	15
Teacher appraisal and feedback: Frequency and source	15
Profile of teachers' beliefs about teaching	15
Profile of co-operation among teaching staff	15
Frequency of mentoring and induction programmes	15
Teacher appraisal and feedback: Outcomes and impact	14
Teacher self-efficacy	14
Teacher appraisal and feedback: Criteria	13
School evaluation: Frequency and type	13
School evaluation: Impact and outcomes	13
School evaluation: Criteria	12
On-going professional development: Support provided	11
Adequacy of school resources	10
Degree of school autonomy	8

Source: OECD *TALIS Database*

The themes and associated indicators carried forward for possible inclusion in TALIS 2013 as a result of the rating exercise included the following:

- school leadership;
- teacher training and in-service professional development/initial teacher education;
- teacher appraisal and feedback;
- school climate and ethos;
- teachers' pedagogical beliefs;
- teachers' pedagogical practices;

The final inclusion of these indicators in the TALIS 2013 main survey questionnaires ultimately depended on the length of the questionnaires and the results of the study's pilot phase and field trial.

Developing the TALIS 2013 conceptual framework

A team of policy, analysis and survey experts under the supervision of the OECD Secretariat and the BPC developed the TALIS 2013 conceptual framework. This work was initially coordinated by Paulina Koršňáková and Steffen Knoll of the International Association for Educational Achievement (IEA). However, the OECD Secretariat (Kristen Weatherby and Julie Bélanger) were responsible for the final stage of adaptation and revision.

The final version of the conceptual framework (June 2013) has three sections:

- Section I: General purpose and the policy relevance of TALIS.
- Section II: Knowledge surrounding themes and main indicators.
- Section III: Design of TALIS 2013.

Full details of the TALIS 2013 framework are contained in the OECD document *Teaching and Learning International Survey TALIS 2013: Conceptual Framework* (OECD, 2013a).

The next chapter discusses the development of the TALIS survey instruments with respect to providing the information pertaining to the chosen themes.

References

- European Commission (2010), Teachers' Professional Development: Europe in International Comparison: An Analysis of Teachers' Professional Development Based on the OECD's Teaching and Learning International Survey (TALIS), European Commission, Luxembourg.
- Jensen, B., et al. (2012), *The Experience of New Teachers: Results from TALIS 2008*, OECD Publishing. doi: [10.1787/9789264120952-en](https://doi.org/10.1787/9789264120952-en).
- OECD (2008), OECD (2008), *Education at a Glance 2008: OECD Indicators*, OECD Publishing. doi: [10.1787/eag-2008-en](https://doi.org/10.1787/eag-2008-en)
- OECD (2009), *Creating Effective Teaching and Learning Environments: First Results from TALIS*, OECD, Paris.
- OECD (2010), *Education at a Glance 2010: OECD Indicators*, OECD Publishing. doi: [10.1787/eag-2010-en](https://doi.org/10.1787/eag-2010-en)
- OECD (2010), *TALIS 2008 Technical Report*, OECD Publishing. doi: [10.1787/9789264079861-en](https://doi.org/10.1787/9789264079861-en)
- OECD (2011), *Education at a Glance 2011: OECD Indicators*, OECD Publishing. doi: [10.1787/eag-2011-en](https://doi.org/10.1787/eag-2011-en)
- OECD (2012), *Education at a Glance 2012: OECD Indicators*, OECD Publishing. doi: [10.1787/eag-2012-en](https://doi.org/10.1787/eag-2012-en)
- OECD (2013a), *Teaching and Learning International Survey: Conceptual Framework*, OECD, Paris, www.oecd.org/edu/school/TALIS%202013%20Conceptual%20Framework.pdf
- OECD (2013), *Education at a Glance 2013: OECD Indicators*, OECD Publishing. doi: [10.1787/eag-2013-en](https://doi.org/10.1787/eag-2013-en)
- SEP (Ministry of Education) (2009), “Estudio Internacional sobre la Enseñanza y el Aprendizaje (TALIS): Resultados de México” (The Teaching and Learning International Survey (TALIS): Results from Mexico), SEP, Mexico.
- UNESCO-UIS (UNESCO Institute for Statistics) (2006), *International Standard Classification of Education: ISCED 1997*, UNESCO-UIS, Montreal.
- Vieluf, S., et al. (2012), *Teaching Practices and Pedagogical Innovation: Evidence from TALIS*, OECD Publishing, Paris; doi: [10.1787/9789264123540-en](https://doi.org/10.1787/9789264123540-en)

Notes

- 1 The term country in this report also refers to federal states and national entities and regions.

Chapter 3: Development of the Teacher and Principal Questionnaires

Abstract

The development of survey instruments needs to be strictly guided by a conceptual framework that identifies not only the goals, themes, constructs and indicators to be surveyed but also the connections between them and their interdependency. As a key starting point for the second cycle of TALIS, the TALIS Board of Participating Countries (BPC) conducted a priority rating exercise (see Chapter 2), the purpose of which was to provide information that would help determine the goals needed to guide development of the TALIS 2013 questionnaires. The BPC then established an Instrument Development Expert Group to translate the identified goals and priorities into survey questionnaires and analysis plans. The key challenges associated with this instrument development work related to the significant extension of the survey to additional target populations, the time series nature of TALIS and the experimental link to PISA at the school level. Because development of the TALIS 2013 conceptual framework, an expanded version of the 2008 framework, partly paralleled development of the survey instruments, the former guided the latter for each of the main themes covered by TALIS, and vice versa. At the operational level, instrument development and validation were implemented in several stages/phases, with the observations and outcomes of the previous step influencing revisions and plans for the subsequent phase.

Overview

As with any sample-based survey, TALIS 2013 had to be theoretically sound. This process, which was critical to the success of the study, involved identifying and documenting the conceptual knowledge and theoretical underpinnings of key themes, research questions and desired indicators. The conceptual framework, described in detail in Chapter 2, outlines and explains these concepts as well as the key design aspects of TALIS 2013.

This chapter describes the aims, principles, individuals, timeline and key deliberations and decisions with respect to the instrument development work, which commenced in early 2011 and continued until the release of the main survey instruments to the TALIS 2013 National Study Centres in mid-2012.

General instrument development aims and principles

The primary aims of the instrument development process were to create instruments and survey questions that aligned well with the conceptual framework, were of high technical and psychometric quality and had the potential to generate data, measures and scales that addressed TALIS's key themes, priorities and indicators. At the same time, because TALIS 2013 was the second cycle of this survey programme, the development team had to acknowledge, evaluate and, where appropriate, revise work done for the first

cycle in order to ensure continuity and compatibility (where this was desired) with the second.

TALIS 2013 accordingly strived to apply the following set of key principles to the development process to the maximum extent possible:

- a theory-driven development wherein a conceptual framework guided the inclusion of questions;
- maximum country input (at the political as well as operational level) into the development and selection of constructs, questions and items;
- extensive consultations with experts in the corresponding thematic areas as well as experts in questionnaire and sample design;
- retention of selected constructs, variables and measures from 2008 to allow analyses of changes between that year and 2013;
- improvements to questions and items as deemed appropriate; and
- descriptions of the cross-cultural validity of measures.

The remainder of this chapter documents how these principles guided the development of the 2013 survey instruments. Chapter 10 provides a detailed report of the results of this investigation into the instruments' cross-cultural validity/invariance.

Instrument Development Expert Group role, membership and collaborators

As in TALIS 2008, the OECD Secretariat appointed experts to an Instrument Development Expert Group (IDEG) on behalf of the BPC. Having called on BPC members and the OECD Secretariat to nominate suitable people, the BPC determined and approved the group's final composition. Three key criteria governed selection: expertise in the main policy themes selected for TALIS, considerable experience in survey-based educational policy research, and expertise in relation to instrument development in an international context.

The IDEG's overall task was to design and develop instruments for the core survey population (i.e. teachers at ISCED Level 2) and for all three international options (ISCED Levels 1 and 3 and the TALIS-PISA Link). The IDEG's specific tasks included:

- reviewing questions and items from 2008 in order to decide on their retention, possible improvement or exclusion;
- reviewing proposed new indicators to ensure that these were complete, coherent and formed a robust basis for analysis;
- drafting suitable questions addressing the newly added indicators and research questions;
- drafting corresponding sections of the conceptual framework with respect to TALIS's theoretical underpinnings, existing research and overall aims;
- reviewing and revising questions and items in accordance with pilot and field trial evidence and results, especially with respect to functioning and response burden;
- advising on foreseeable challenges during translation/adaptation for the field trial and main survey and, based on this, developing a glossary, explanatory notes,

adaptation notes and mappings between the 2008 and 2013 instruments at each key stage (pilot, field trial, main survey);

- considering and advising on implications resulting from the expansion of the teacher target population in 2013 for the sample design and for questionnaire development;
- contributing to the drafting of the field trial and main survey analysis plans; and
- guiding the interpretation of psychometric analysis conducted for the field trial, especially if cross-cultural validity could not be asserted.

The IDEG's key responsibility, similar to that in TALIS 2008, was to develop proposed questionnaire content for review by the TALIS BPC and, by extension, the TALIS National Project Managers (NPMs). The BPC's primary role was to advise on the political relevance of the questionnaire content and its adherence to the TALIS goals and on the applicability of the anticipated data in both national and cross-national contexts. As an extension of this role, the BPC had final approval of the questionnaires used in the three major stages of validation and implementation (i.e. the pilot, field trial and main survey). The NPMs' main role was to advise on the validity of questions, foreseeable issues with respect to translation, and the clarity of the wording and sequencing of the questions for the defined target populations, which were significantly expanded from TALIS 2008 in order to accommodate the international options.

The international contractor, the International Association for the Evaluation of Educational Achievement (IEA), was commissioned to chair and attend IDEG meetings, organise communication amongst IDEG members, ensure that the IDEG produced proposals on time and ensure that proposals covered sample design aspects and set out implications and needs pertaining to survey operations.

The IDEG's core members were:

- Dr Ben Jensen, School Education Program Director, Grattan Institute, Australia. Dr Jensen was responsible for the teacher appraisal and feedback themes. He was also involved in the TALIS 2008 design, management and analysis.
- Dr Eckhard Klieme, Head of the Center for Education Quality and Evaluation, German Institute for International Educational Research, Frankfurt, Germany. Dr Klieme was responsible for the sections in the questionnaires related to teaching practices. He also led the teaching attitudes, beliefs and practices theme in TALIS 2008.
- Dr Peter Kloosterman, Indiana University, USA. Dr Kloosterman was responsible for the TALIS-PISA Link module on teaching practices in mathematics. He also contributed to the review of the teaching practices-related sections in the core survey teacher questionnaire.
- Dr Sang Wan Park, Busan National University of Education, Korea. Dr Park, an OECD intern at the time, was responsible, up until the time of the field trial, for the school leadership and teacher initial education themes. After she left the OECD, the OECD Secretariat covered these themes (see below).
- Dr Eva Wirén, JRC/CRELL researcher, European Commission, Belgium. On behalf of the commission, Dr Wirén covered the in-service professional

development theme, which included teacher professional development, induction and mentoring sections.

- *Ex officio* members from the OECD, the international contractor and its partners included:
- Dr Julie Bélanger, Analyst, OECD, Paris, France. Dr Bélanger was responsible for the school leadership theme (from the time of the field trial stage) as well as for the school management, school climate and job satisfaction themes and indicators.
- Mr Ralph Carstens, Senior Research Analyst, IEA Data Processing and Research Center (DPC), Hamburg, Germany. Mr Carstens observed instrument development in his capacity as deputy director of the contractor work. He also supported the IDEG Chair, advised on operational and data implications, and further oversaw development of the instruments' demographic/background questions.
- Mr Jean Dumais, Chie, Statistical Consultation Group, Statistics Canada, Ottawa, Canada. Mr Dumais, the study's appointed sampling referee, carried key responsibility for issues and implications relating to the sampling design.
- Dr Paulina Koršňáková, IEA Secretariat, Amsterdam, the Netherlands. Dr Koršňáková served as the IDEG's Chair.
- Ms Kristen Weatherby, Senior Analyst, OECD, Paris, France. Ms Weatherby was jointly responsible with Dr Bélanger for the teacher initial education theme.

In addition to these IDEG experts, the following individuals and experts served as invited experts within the IDEG. They provided advice relating to particular issues of interest at various stages of the instruments' development.

- Dr Mareike Kunter, University of Frankfurt, Germany: teacher self-efficacy measures.
- Dr Susan Seeber, University Goettingen, Germany: applicability of the TALIS instruments for vocational education and training (VET) institutions at ISCED Level 3.
- Dr Fons van de Vijver, Tilburg University, the Netherlands: methods and approaches to lessen the impact of response-style bias.
- Dr Mara Westling Allodi, Stockholm University, Sweden: school climate, ethos and special education needs.

The IDEG also profited from additional input and feedback received from individuals and groups at various stages of the study:

- OECD: Dr Dirk Van Damme, Mr Michael Davidson, Dr Sarah Gielen and Ms Jaana Puukka.
- Trade Union Advisory Council: Mr John Bangs.
- Perspective of Mediterranean countries: Dr Giovanna Barzano.
- TALIS framework development team: Dr David Rutkowski, Dr Leslie Rutkowski and Dr Steffen Knoll.

- TALIS Technical Advisory Group: Dr Eduardo Backhoff, Dr Jesper Lund and Dr Fons van de Vijver (Chair).
- TALIS Analysis Expert Group (initial composition for field trial): Dr Leslie Rutkowski (Chair), Ms Miyako Ikeda, Dr Heather Price and Dr Svenja Vieluf.
- TALIS Consortium members: Ms Alena Becker, Mr Mark Cockle, Mr Dirk Hastedt, Dr Steffen Knoll and Ms Friederike Westphal.
- In general, all BPC members and their NPMs, in particular, BPC members who attended the final IDEG meeting before completion of the main survey instrument: Ms Anne-Berit Kavli (BPC Chair, Norway), Ms Elsebeth Aller (Denmark), Mr Julius Björnsson (Iceland), Dr Patrick Gonzales (United States), Mr Kimmo Hämäläinen (Finland), Mr Pierrette Briant (France), Mr Akio Fujiwara (Japan), Mr Mark Unwin and Mr Chris Freeman (Australia).

The breadth and depth of expertise as well as the availability of contributions and feedback from the vast range of stakeholders and perspectives were instrumental to developing survey instruments that the BPC could safely endorse. Indeed, the BPC's role was vital in decisions relating to alternative approaches. For example, there were a number of cases where the BPC advised the IDEG on how to improve the clarity, focus or wording of a question, item or its response category rather than maintain strict retention of 2008 formats and wording.

The IDEG's responsibilities ended after finalisation of the international master instruments. The subsequent adaptation and translation stage was completed prior to the main survey. During the main survey data collection work in late 2012/early 2013, an expanded Analysis Expert Group was formed to begin work associated with analysing and reporting the main survey data.

In terms of languages, the IDEG's primary responsibility was to produce master instruments in international English (UK spelling). The international contractor was responsible for translating master questionnaires versions into French. National Project Managers were responsible for adaptation and translation at the national level (see Chapter 4).

Timeline and key phases of instrument development

As is common practice in similar international large-scale surveys, the TALIS 2013 instrument development progressed in three major phases – a pilot, a field trial and a main survey.

The pilot study was conducted in a large number of participating countries in order to validate the quality, clarity, appropriateness and relevance of questionnaire content, especially new questions and items. The IDEG then substantially modified questionnaires in accordance with the qualitative results and feedback collected during this phase.

The main goal during the field trial stage was to collect quantitative information about the statistical and psychometric properties of the survey instruments, questions and measures. Qualitative feedback

(e.g. from school leaders relayed by national centres) was also collected at this time and used to inform revisions of the main survey instruments. These changes were usually less extensive than those made following the pilot phase.

The main survey stage primarily focused on supporting countries' translators during adaption of specific terminology, the provision of instrument errata, and related guidance.

In summary, development of the TALIS 2013 instruments progressed on a somewhat more compressed timeline than that implemented in 2008 given the expanded scope of the survey. Although all stakeholders and the individuals contributing to this process were satisfied with the products and results, the instrument development could have benefitted from additional time to reflect on feedback and data.

Key instrument-development dates

The following list includes the key dates and periods of instrument development. Additional consultation and revisions occurred at numerous points between these key dates through written exchange or virtual meetings.

Pilot phase

- 27-28 January 2011: TALIS 2008 instruments reviewed and broad plans and responsibilities for 2013 instrument development agreed on at first IDEG meeting (Hamburg, Germany).
- 4-7 April 2011: NPMs present their ideas and thoughts on the instruments and related implications for sampling at the first NPM meeting (Hamburg, Germany).
- 12-13 May 2011: TALIS 2013 instruments developed during the second IDEG meeting (Paris, France).
- 19 May 2011: Revised draft framework along with comments and recommendations for future extensions and elaboration and draft pilot instruments submitted for BPC review.
- 6-7 June 2011: Draft framework and pilot instruments presented at the eleventh BPC meeting (Paris, France).
- 8-30 June 2011: IDEG draft (during a series of virtual meetings) pilot instruments; contractor finalises the instruments based on BPC feedback.
- 15 July 2011: Pilot instruments, glossary and focus group guidelines released to countries.
- 1 August to 9 September 2011: Pilot conducted in countries (focus group approach).

Field trial phase

- 25-27 September 2011: Pilot data and feedback reviewed and evaluated; proposed field trial questionnaire revisions and reductions submitted and discussed at third IDEG meeting (Hamburg, Germany).
- 14 October 2011: Field trial instruments, accompanying document and draft field trial analysis plan submitted for BPC review.

- 27-28 October 2011: Field trial instrument proposals presented at twelfth BPC meeting (Paris, France).
- 14-18 November 2011: Information on proposed field trial instruments presented and commented on at second NPM meeting (Cancun, Mexico).
- 25 November 2011: Field trial instruments, glossary, adaptation guidelines and adaptation forms released to NPMs.

Main survey phase

- 24-25 May 2012: Initial meeting of Analysis Expert Group held in Frankfurt, Germany.
- 2-4 July 2012: Field trial data and feedback reviewed and instruments for the main survey finalised at fourth IDEG meeting (Paris, France).
- 9 July 2012: Proposed main survey instruments and glossary submitted for BPC review.
- 12 July 2012: Feedback from BPC representatives made available to IDEG for (re)consideration.
- 16-18 July 2012: Presentation of information and call for comments on proposed main survey instruments at third NPM meeting (Reykjavik, Iceland).
- 20 July 2012: BPC agrees on final form of instruments (on-line meeting).
- 1 August 2012: Main survey instruments, glossary, adaptation guidelines and adaptation forms released to NPMs.

Many individual-level consultations and numerous virtual meetings were held among the members of the IDEG, invited experts, BPC representatives and other stakeholders before, after and in between the above-stated key activities, meetings and milestones. In addition, the International Study Centre at the IEA DPC carried out operational work relating to copy editing, instrument layout and finalisation of guidelines and glossaries before releasing the questionnaires and accompanying materials to the BPC for review and to NPMs for translation and adaptation.

Pilot phase

The main goals at this initial stage were to:

- discuss and agree on draft forms of the TALIS 2013 teacher and principal questionnaires;
- advise on the development of the mathematics teacher module;
- elaborate the conceptual framework document and agree on the contributions needed;
- consider not only whether to have separate questionnaires or a generic questionnaire for all ISCED levels but also the sampling implications of this choice; and
- produce proposed instruments and related recommendations for the BPC and subsequent collection of pilot data.

The remainder of this section outlines the development process and key considerations and directions taken before application of the pilot-phase instruments in the field.

Development of proposal for the core ISCED Level 2 questionnaires

Using the BPC's priorities for 2013 as a starting point, the IDEG reviewed and discussed the themes, constructs, questions and items in the TALIS 2008 principal and teacher questionnaires as well as the conceptual underpinnings of this first cycle of the TALIS programme. The IDEG then used the information generated by this review to discuss the framework development goals and the input required from IDEG members and other experts for 2013. During this time, the IDEG gave attention to the TALIS 2013 optional survey populations and the corresponding sampling implications. They also considered issues and constraints with respect to data consistency and reliability across countries and the international options, and also in regard to analysis and comparisons of the 2013 data with the TALIS 2008 results. The criteria for reviewing 2008 questions and items included, among others, the BPC's priority rating, item functioning from a statistical/psychometric point of view, reliability, explanatory power, use of data in reporting and relevance for comparisons between the two survey cycles.

The IDEG then designed and drafted, on the basis of the BPC's broad specifications, the teacher and school principal questionnaires for all the surveyed populations as well as the mathematics teacher module questions for the TALIS-PISA Link participants.

The IDEG based their subsequent work on the proposed core ISCED Level 2 instruments on the extensive review of the first draft of the instruments. The review incorporated feedback from fellow IDEG members and other invited experts, the BPC, NPMs (during and after their first meeting), participating countries, especially Chile, the Czech Republic, Denmark, England (the United Kingdom), France, Iceland, Japan, Norway, Portugal, Sweden, and the United States, the Technical Advisory Group, and other stakeholders, especially the Trade Union Advisory Committee to the European Commission.

The above reviews informed the drafting and rewording of the second draft of the instruments as well as the questions, items and response categories to include in them. The guiding priority for the IDEG was to shorten the instruments significantly and offer advice on improving the instruments' capacity to collect the required information. The review process included all questions and items and focused on a number of aspects, such as the rationale for and value of inclusion, reading load for the respondents, repetitive and long wording, inconsistent or unclear terminology, and so on.

Two specific examples and areas of discussion illustrate the development process:

- The IDEG considered two options for the teaching practices and beliefs section of the teacher questionnaire. The first used a "target class" approach to contextualise the questions. The second option, a generic one, did not refer to a particular target class. Because of the BPC's interest in teaching practices and the prevailing opinion that the context of teaching influences these practices, the IDEG decided to pursue the target class option and present it to the BPC.
- In TALIS 2008, the scales measuring teachers' and principals' beliefs and practices showed considerable cross-cultural bias. Even scales that were similar to those used in the PISA student questionnaire showed lower levels of cross-cultural equivalence when compared to PISA data. Why the teacher scales were

less comparable than their student counterparts remains an open question, but a possible explanation is that the teacher population is considerably more diverse in terms of age, background, education and specialisation. One promising approach for improving cross-cultural comparability was the development of alternative item types, for example situational judgments or anchoring vignettes. Those involved in developing the TALIS 2013 items for measuring teacher beliefs and classroom teaching practices hence attempted to improve the scales by drawing on research in cross-cultural psychology in general and from PISA in particular.

Inclusion of teachers teaching special educational needs students in regular schools

The IDEG considered, with respect to teacher population definition(s), the feedback received from countries and stakeholders regarding the inclusion of teachers of students with special education needs in regular schools and the implications of this inclusion for population coverage. While schools entirely devoted to special education needs students remained excluded for practical reasons, as occurred in 2008, the BPC proposed to the IDEG that the population definition should include teachers teaching exclusively to special educational needs students in regular schools. The IDEG consequently determined that the teacher questionnaire should contain an additional question that would enable ready identification of these teachers and thus allow, by sub-setting the database, comparative analysis of the TALIS 2008 and 2013 data.

The IDEG clarified their understanding that while the proportion of these teachers was relatively high in a small number of countries, the purpose of the survey was not to investigate and report on this part of the population but to increase the coverage of the teacher workforce. The IDEG noted also that although the *TALIS 2013 Sampling Manual* (OECD, 2012) provided the OECD Indicators of Education Systems' definition of "special educational needs", national definitions and understanding would probably be somewhat divergent.

Suitability of core ISCED Level 2 instruments for ISCED Levels 1 and 3

The IDEG received and discussed an expert paper on the sampling and analytical consequences of using: (i) universal instruments across all ISCED levels; or (ii) instruments focused on the ISCED levels offered by a school and/or taught by the individual teacher. While schools in many countries were allocated to only one ISCED level, some or all schools in other countries offered programmes at multiple and sometimes all ISCED levels.

TALIS's interest lay in comparing characteristics between and across ISCED levels and also in enabling countries participating in only the core survey (ISCED Level 2) to collect data similar in scope to that collected in 2008. The recommended solution was to randomly assign a school in which more than one level was being taught to one of the levels prior to sample selection and then to request all participating teachers within the selected school to respond in accordance with the ISCED level to which their school had been assigned.

The main consequences of an instrument design that allocated a teacher to one and only one level was that teacher responses could only be used for one series of estimates. Sample overlap therefore had to be minimised so that comparisons were uncorrelated and multivariate/level analysis used a sufficient number of within-school units. This preferred approach required a more sophisticated and centralised means of selecting the school and

teacher sample in the small number of countries with a finite number of schools (see Chapter 5).

The IDEG also agreed that producing instruments that were otherwise “universal” across levels was possible, as this process would require only minor adaptations to the wording and reference context for a limited number of questions and items, therefore allowing a more inclusive database to be built. Such a database would enable broader analysis of and comparisons among ISCED levels and tracks. Because (in particular) the teaching beliefs and practices section of the teacher questionnaire needed to be specific to an ISCED level, the IDEG proposed that a “target class” approach could be used to contextualise these questions.

The IDEG invited an expert to review the applicability of the core instruments for ISCED Level 3 and especially for vocational education and training institutions and teachers. This person reviewed the instruments question by question and recommended, after also taking into account country feedback, some minor modifications (e.g. rewording or adding a small number of items).

The review of the core ISCED Level 2 questionnaires provided sufficient indication that they could be used at ISCED Level 1 (primary education) with no or very few modifications. However, concern was expressed that because instruction and teaching at this level is more cross-curricula in nature than at ISCED Levels 2 and 3, primary school teachers would have difficulty answering questions asking for a specific, single (academic) subject taught. The IDEG nonetheless agreed on the basis of pilot feedback that the above approach was still an acceptable one.

Mathematics teacher module for the TALIS-PISA Link

In addition to enabling links between TALIS schools and data and PISA schools and data, the main purpose of the mathematics teacher module was to achieve an overall goal of TALIS 2013, namely, gathering more detailed information on teaching practices at the classroom level. The IDEG, noting the experimental nature of the school-level TALIS-PISA Link, agreed that a more detailed conceptual and analytical framework would be needed to specify the relationship to PISA. As a guiding principle, the TALIS BPC agreed that the TALIS results should not be used to explain or contextualise student results in PISA. Instead, student and school results should be used to contextualise the teacher/principal responses.

The IDEG also discussed whether a specific reference group should be used to contextualise the data collected through implementation of the mathematics module. They eventually agreed that the reference group should be a specific class consisting predominantly of PISA-eligible students (i.e. 15-year-olds) in contrast to classes predominantly composed of students not under focus in PISA or an artificially composed group of students without a common instructional context. The mathematics module thus included questions that facilitated the identification of a class in which the majority of students were 15 years of age, similar to the pseudo-random target class mechanisms in the core teacher questionnaires. The IDEG acknowledged that such a class might include students not eligible for PISA but considered that if this were the case, it would not adversely affect the analytical utility of the link data.

The IDEG agreed that while piloting the mathematics module was essential, shortening the module was necessary in order to keep the average response time within a

15-minute time frame (and to less than one hour when combined with the core teacher questionnaire).

Piloting operations

For TALIS 2013, the BPC initially requested a quantitative pilot approach for TALIS 2013, in line with the terms of reference for the survey. Eventually, however, the international contractor in consultation with the IDEG recommended a qualitative approach, which the BPC and the OECD Secretariat duly approved.

The key reasons for this decision related to the significantly expanded and/or revised contents of the questionnaire on the one hand and the extension of the survey to primary and upper secondary schools (including vocational tracks and programs) on the other, for which no or very little previous knowledge and experience existed in relation to an international survey of teaching and learning.

Further challenges noted by the participating countries were the concurrence of the pilot collection with the school holidays in many countries and the tight timelines remaining for further development of the instruments, especially given that stakeholders needed sufficient time to provide constructive feedback. The change to the pilot study methodology and subsequent changes to the timeline made it possible to gather feedback from teachers and principals and for the BPC and National Project Managers to conduct further instrument reviews.

The IDEG argued that focussed and structured group discussions would be more a more helpful way than the previously planned quantitative data collection of obtaining meaningful feedback and suggestions. Under the proposed approach, one or more groups of teachers and principals for each level would first complete the questionnaires and then discuss them in a structured session. The IDEG stressed the importance, given the international options taken up by each country, of involving participants from ISCED Levels 1, 2 and 3 as well as mathematics teachers and those teaching in vocational education and training programs in this process.

In summary, the aim of the pilot was to collect information on a number of instrument-related aspects. These included applicability of concepts, level of complexity, overall organisation of topics and questions, applicability of questions and items across ISCED levels and programmes (especially academic/vocational), wording and definition of terms, appropriateness and cultural relevance, mandatory national adaptations, foreseen adaptation and translation issues, flow of questions (overall and specifically with respect to skip instructions), overall length and overall “feel” of the questions and questionnaires.

To facilitate this process, the IDEG members provided the TALIS Consortium with key “probing” questions designed to evaluate the quality of the respective sections of instrument content. The consortium incorporated these key questions into detailed annotated questionnaires that group discussion moderators could use during their sessions. In addition, the consortium developed easy to implement guidelines for the pilot implementation and revised the survey timeline to reflect the new approach.

Twenty-one countries (out of the total 31 enrolled in the TALIS survey at that stage) volunteered to participate in the pilot. National teams in these countries collected rich feedback and comments from teachers and principals at all ISCED levels during this stage of the study.

Field trial phase

The main tasks of this phase of instrument development were based on the rich set of feedback and comments collected from respondents during the pilot phase. These tasks included revising and finalising the instrument design and content for the field trial, advising on possibilities for linking the TALIS 2008 and the TALIS 2013 data, planning for translation and verification procedures, and eventually analysing the field trial data. Time was also put aside for reflecting on issues related to socially desirable responding and other response style issues, and on possible ways of addressing these.

The TALIS Consortium organised two on-line meetings prior to the third IDEG meeting. The first meeting focused on pilot outcomes and on applicable sources and inputs to the instrument revision in general. The second meeting focussed on the teaching beliefs and practices sections in the instruments as well as their connection to the mathematics teacher module for the TALIS-PISA Link.

Before the meetings, IDEG members individually reviewed (according to their expertise) the questionnaire sections and glossary items and submitted their revisions to the group. During the meetings, the IDEG jointly discussed possible changes on the basis of the submitted reviews. The IDEG members also reviewed and endorsed the proposed procedure for adaptation and translation verification, needed in order to maintain, where appropriate, continuity across the two consecutive TALIS surveys.

During this work, general methodological issues emerged that required IDEG consideration: instructions related to “target class” selection in the teacher questionnaires, a possible instrument modularisation/rotation and the inclusion of measures of pro-social responding. The next three sections describe these aspects; the last section describes the key areas of content revision.

Selection of a target class and the TALIS-PISA Link

As described earlier, the teacher questionnaires directed teachers to identify a “target class” that would serve as their reference for responding to questions about their practices and beliefs. This requirement was brought in so as to avoid bias potentially resulting from teachers being free to select a specific or favourite class. The pilot results indicated that respondents found the instructions for selecting the target class somewhat unclear, so the IDEG developed instructions that were more straightforward. The TALIS-PISA Link instruments used in the pilot referred to a student population of “15-year-olds”. Some countries suggested replacing this term with a “grade” perspective, particularly in relation to the mathematics teacher module. The IDEG observed that this perspective would violate PISA assumptions, parameters and protocols because it would set the focus on an age-based group rather than a grade-based one. However, because students are taught in groups, an introduction in the instruments explaining the composition of and reference to the target class was necessary, although technically the Link was only targeting the portion of PISA-eligible students in the class.

Instrument modularisation/rotation

By the end of the post-pilot revision work, the teacher questionnaire had extended to 6 200 words in length, which was deemed too long. However, because all themes, questions and items were based on BPC priorities and their requests for data, there were no straightforward possibilities for making further reductions. In addition, the deliberations with respect to the cross-cultural validity and comparability of measures

resulted in the inclusion of a dedicated social desirability scale based on a reduced and adapted set of items from the Marlow-Crowne inventory. (For more information about this concept, see the later section in this chapter on social desirability.) The overall length and this addition to the teacher questionnaire led to proposals and discussions on options for rotating and/or modularising this instrument.

One of the options discussed was a section-based rotation in which all versions of the teacher questionnaire would have all sections but these would be presented in varying order, except for the initial background section. Placing sections (themes) in different locations would, it was argued, help balance expected drop-out due to fatigue or disengagement, which usually increases towards the end of a questionnaire. However, this practice would also disrupt the overall logic and flow of the instrument, potentially introduce administration effects (similar to position effects in rotated test booklets) and require special handling during analysis. Because of the uncertainties involved, the IDEG rejected this option.

The second option discussed was to modularise the instrument on the premise that this would reduce individual response burden and further allow for the trialling of alternatives, mainly for the teaching practices themes. The first alternative was a reduced set of items (structuring, student orientation, enhanced practices) based on the set in the 2008 instruments. The second was a newly developed set of questions and items.

However, a modular approach would have several disadvantages. Most importantly, within-school sample sizes would have to be increased and sophisticated imputation and analytical methods would be required. These methods would not only contribute measurement uncertainty to the error estimates, additional costs to the BPC and countries and increased processing time due to imputation runs and the like but also limit possibilities for modelling data in hierarchical frameworks.

Further, any approach to alternative/rotated versions would add another layer of complexity to the extant international options, which in some countries required up to four different versions of the teacher questionnaires. The IDEG in agreement with the Consortium therefore dismissed this approach in order to keep the survey as simple as possible operationally under fixed time and budget constraints.

In summary, the BPC, OECD and IDEG decided against a rotation/alternation of sections because of the assumed complexities, associated costs and risk of operational errors. The IDEG then discussed the operational feasibility of using a teacher instrument of about 6 000 words in size. During their discussion, they agreed that because of early encouraging feedback wherein many teachers said they found the instrument relevant to their situation, teachers would be more likely to engage with a questionnaire substantially longer than the 2008 one. The IDEG and BPC acknowledged, however, the risk of an increase in item-level non-response towards the end of the teacher questionnaire. They estimated on the basis of the 2008 average item-level non-response of 2% across countries that the level of item non-response in the TALIS 2013 field trial questionnaire would be between 3 and 10%.

Inclusion of a scale measuring social desirability

“Social desirability” (sometimes also called “pro-social” responding) is a response style assumed to function as a filter during respondents’ interaction with the questionnaires. Given concerns expressed about the validity, reliability and comparability of the TALIS 2008 data, the IDEG discussed the possibility of developing a social

desirability scale by including a separate, dedicated set of (brief) items in the teacher questionnaire in addition to implicit ways of gauging other response styles such as extremity and acquiescence. This scale, based on the original Marlowe-Crowne Social Desirability Scale (Marlowe and Crowne, 1960), would provide data that could then be used to help describe or even adjust for responses affected by socially desirable styling. The proposed measure would focus on both positive and negative impression management.

Some IDEG members and country representatives were concerned that inclusion of a social desirability scale could jeopardise the overall data collection because the items forming the scale would stand out very clearly from other items due to not being directly related to framework dimensions and domains. Teachers might therefore be confused about the purpose of these items and so discouraged from answering them and/or other parts of the questionnaire. In addition, the scale-based data might be misused and any self-reported data would still have limitations.

The IDEG concluded that use of the social desirability scale should initially be limited to the field trial because data from this phase would not be made publically available. However, data could still be used to estimate the social desirability impact at the country level and thereby inform the analysis. The IDEG asked for further work on items, directed particularly at producing a better alignment between them and teachers' work context, and so helping ensure that inclusion of these items would not compromise or complicate the field trial data collection.

Key areas of instrument revision and development

As described earlier, most of the IDEG's work at this stage centred on providing the BPC with proposals on maximising survey instrument manageability during the field trial. The IDEG's target was a 6 000-word teacher questionnaire that would take 60 minutes or fewer on average to complete and exhibiting improvements with respect to relevance, validity, consistency, comparability and clarity. The IDEG based these criteria on the substantial data and feedback received and on corresponding advice on making the wording of question stems, items, response categories, instructions and explanatory notes clearer and more consistent.

Given the volume of exchange and communication between IDEG members individually and as a group (with these activities often supported through virtual meetings), detailing the genesis of specific instrument-development aspects is not possible. However, the section that follows provides insight into the development of a number of key themes and areas.

Teacher appraisal and feedback

The main areas of consortium discussion in regard to this matter were whether or not appraisal and feedback could be validly combined (given that many countries consider these separate activities) and whether or not a distinction should be drawn between formal and informal approaches to the two. According to feedback from participating countries, school principals' interpretations of this theme, along both formal and informal lines, differed considerably. Several options were discussed:

- follow the combinatory approach set in TALIS 2008 and thus allow for a more direct link to its data;

- keep the approach but provide clear interpretation/guidance (disadvantages: questionable linkage potential and much longer questions given the expanded instructions); or
- split the focus across the teacher (feedback) and principal (appraisal) questionnaires (disadvantage: strong adverse impact on data comparability).

The IDEG considered the advantages and disadvantages of the above as well as additional options, eventually opting for a clearer, more targeted and relevant focus for respondents – on feedback in the case of teachers (both formal and informal, because both influence their work), and on formal appraisal (systems) with respect to principals.

For the IDEG, this approach to developing the 2013 instruments was the exemplary one because it made a relatively strong link to TALIS possible. The IDEG presented the proposed alternatives to the BPC, which, in the majority of such cases, voted for improvement over consistency with 2008.

Background and demographics

Key discussions on this section related to the terminology and explanatory notes for respondents used across the background sections of both questionnaires. These deliberations therefore concerned concepts such as “special education”, “community”, and the like or whether to collect information on the basis of head counts or full-time equivalents.

The review process paid attention to, among other matters, aligning terms in the OECD’s *Education at a Glance* publications and other UNESCO, OECD, IEA and European Commission publications and manuals with the terms used in TALIS.

When possible, questions were combined in order to decrease the reading and response burden on respondents. However, explanatory notes were added when necessary to facilitate consistency in comprehension and responses.

Teacher professional development

Pilot feedback and a proposal from a European Commission expert group led to the professional development sections being significantly changed and improved. IDEG discussion focused on consistency and connections to other themes relevant for cross-theme analysis.

The field trial design also included an analytical component designed to establish whether a changed reference period for professional development activities (18 months in 2008; 12 months proposed for TALIS 2013) would allow valid reporting of changes in the type and intensity of such activities.

School management

Questions for this theme were mainly shortened and reworded to align them more closely with the realities of distributed leadership in many participating countries.

After some discussion, the IDEG agreed to omit questions in the teacher questionnaire relating to school management because these mirrored questions in the principal questionnaire. The IDEG also deemed these questions, initially included to allow triangulation of data across respondents, unnecessary because teachers do not need

to know about all principal actions to accurately perceive overall school function. In addition, reductions from 2008 were necessary so that response time could be allocated to new questions and items.

School climate

Changes were made to the order of this section in the principal questionnaire in order to avoid the negative impression given by the previous initial position of items relating to factors hindering effective school functioning. New scales were proposed for this section; extensive discussions focused on the most suitable wording and on question/item construction.

Teacher beliefs and practices

This section was shortened significantly. Experts considered that the remaining scales, already tested internationally, would work as expected.

Mathematics teacher module

Discussion in relation to the module focused mostly on opportunities to align and synchronise the questions in it with questions related to teachers' beliefs and practices in the main teacher questionnaire (e.g. harmonisation of response categories, etc.). The instructions guiding respondents through the instrument also attracted attention.

Teacher mobility indicator

The IDEG, aware of the work on learning mobility carried out at this time by the European Commission's Education Committee, considered proposals on how to measure the mobility of teachers as part of the TALIS programme, given that teachers have an important "multiplier" effect on their students and that mobility can help improve the quality of institutions.

The IDEG discussed two proposals. The first was to ask all participating countries to answer a single general question. The second was to include a module for the European countries that would contain additional questions on different types, durations and qualities of mobility.

The IDEG pointed out three main disadvantages of these proposed means of generating data on teacher mobility: the absence of a clear link to the current TALIS framework that could justify inclusion of these questions or items, the regionally limited importance of this indicator, and the already excessive length of the teacher questionnaire.

The IDEG eventually proposed development of a small number of questions (one or two) and recommended that the European countries include these as a coordinated national option at the end of the teacher questionnaire.

Main survey phase

IDEG work and discussion after collection of the field trial data were dedicated to revising and fine-tuning the instruments on the basis of that information. The overall aim was to produce instruments that were not only better but also manageable in terms of implementation and answering. Matters and information taken into account during this process included the translation and adaptation results, basic descriptive statistics,

Analysis Expert Group scaling reports, country feedback and any other challenges related to data at the national level.

After a series of virtual meetings, the Analysis Expert Group met in Frankfurt, Germany, in May 2012 to discuss several analytical matters. They agreed to largely follow the standards established for TALIS 2008 and to use the guidelines for reporting results to IDEG members (e.g. level of detail, prior knowledge and the technical skills required).

The TALIS Consortium organised a preparatory online meeting before the fourth and final IDEG meeting. This meeting focused on presenting the outcomes of the field trial, other sources/inputs to instrument finalisation and the timeline to be followed. More specifically, the materials considered included:

- an analytic decisions document detailing approaches to and standardisation of psychometric analysis and available outputs (provided by the Analysis Expert Group);
- scaling results for designated IDEG experts (provided by the Analysis Expert Group);
- summary tables of countries' feedback (provided by the TALIS Consortium);
- descriptive summary statistics for all instruments, countries and levels, including information on missing data due to drop-out (provided by the TALIS Consortium);
- an extensive, item-level timing analysis (provided by the TALIS Consortium); and
- a complete set of raw data and all accompanying documentation (provided by the TALIS Consortium).

During this phase, IDEG experts worked closely with appropriate consortium representatives with respect to access to and use of the data and feedback. Each IDEG expert also “paired” with a corresponding quantitative expert in the Analysis Expert Group so as to support him or her review and interpret the psychometric results and outputs relating to his or her area of expertise.

The IDEG members then reviewed the collective evidence, sections and glossary items according to their expertise and submitted their proposed revisions in advance of the fourth and last IDEG meeting. The individuals from the BPC, OECD, IEA and Statistics Canada attending this meeting discussed the instruments on the basis of this updated/annotated version of the field trial instruments with IDEG experts.

Those attending the meeting recorded the recommended changes and accompanied them with notes justifying the proposed action (retention, deletion and/or rewording). Given the by now advanced stage of instrument development, new questions or items could not be accepted. However, substantial changes were made to questions related to teaching practices because the scaling result indicated that it would not be meaningful to include them in their current form in the main survey. Instead, the meeting participants salvaged and combined a reduced set of questions and items from the 2008 and 2013 field trial materials. Other changes were generally aimed at improving the wording, clarity and coherence of questions, items, definitions, instructions and response categories.

At its thirteenth meeting in May 2012, the BPC decided that the social desirability scale could only be included in the main survey if the scale showed scalar invariance. As expected, and evident in many other measures (see Chapter 10), the scale did not show the required scalar invariance (i.e. the equivalence of measurement units and the metric's origin/anchor across groups). The set of items was consequently not included as part of the international core teacher questionnaire. However, several individuals who had been at the fourth IDEG meeting maintained that the scale could provide useful information for interpreting cross-cultural differences and advance knowledge about the mechanism at play in cross-cultural survey research. The BPC hence agreed to retain a nine-item version of the scale as a shared/coordinated national option, which 21 of the participating countries eventually adopted.

Annex H provides copies of the final main survey instruments (English master version).

References

- Crowne, D.P. and D. Marlowe (1960), “A New Scale of Social Desirability Independent of Psychopathology”, *Journal of Consulting Psychology*, Vol. 24, No. 4, American Psychological Association, Washington DC, pp. 349-354..
- OECD (2012), *TALIS 2013 Sampling Manual*, OECD (prepared by Statistics Canada), OECD, Paris.

Chapter 4: Preparation of National Survey Instruments

Abstract

This chapter describes the review process implemented to align the national translations and adaptations of the TALIS questionnaires and cover letters with the international source versions (ISCED Level 2) of the TALIS instruments. Full translation and layout verification, which took place during the field trial and the main survey stages of TALIS 2013, involved all specified instruments and identified target languages. National adaptation forms supported adaptation of the generic national instruments based on the international source version for all the surveyed populations chosen by the participating countries. This chapter provides a description of the translation verification procedure and a summary of its outcomes, as well as information about the process of layout verification.

Overview

Reviews of the TALIS 2013 survey instruments, which occurred at several stages of instrument preparation, focused on approving national modifications to questionnaires and cover letters, language translations, questionnaire layouts, on-line data collection (ODC) versions, and codebooks. The survey instruments, which included an international version in English and a version translated into French (the other working language of the OECD), were released to national teams at three key times. During the pilot phase, countries were free to either culturally adapt the English or French source version of the instruments or produce a thorough translation. However, these instruments were not verified by external experts because they were not used to collect quantitative, internationally comparable data, but rather solely within expert groups.

Each version of the TALIS questionnaires was subject to a stringent independent translation and layout verification process before both the field trial and the main survey. During translation verification, independent language experts at cApStAn Linguistic Quality Control (an agency specialising in validating translations of international survey instruments) compared the translated instruments side by side with the international version. The verified instruments, accompanied by the verifiers' comments and suggestions, were then returned to the National Project Managers (NPMs) for review and improvements to the translation or adaptation. From there, questionnaires were sent to the International Study Centre (ISC) for verification of the layout, after which they were finalised for data collection. The individuals involved in instrument preparation had to meet *TALIS 2013 Technical Standards* 5.1-5.26 (OECD, 2012a) during all steps of this process. The *TALIS 2013 Main Survey Translation and Adaptation Guidelines* (OECD, 2012b) provided detailed instructions on how to produce national survey instruments.

Instruments requiring translation

The following materials needed to be translated or adapted:

- one principal questionnaire template, requiring adjustments for the different ISCED levels/TALIS-PISA Link;
- one teacher questionnaire template, requiring adjustments for the different ISCED levels/TALIS-PISA Link;
- one mathematics teacher module for the TALIS-PISA Link option, applicable to the mathematics teachers of 15-year-old students in the PISA 2012 school sample;
- one principal cover letter template for on-line administration, requiring adjustments for the different ISCED levels/TALIS-PISA Link;
- one teacher cover letter template for on-line administration, requiring adjustments for the different ISCED levels/TALIS-PISA Link; and
- one mathematics teacher cover letter template for on-line administration, applicable only to the mathematics teachers of 15-year-olds.

The *TALIS 2013 Main Survey Manual for School Coordinators* (OECD, 2012c) also had to be adapted and translated into the language(s) used by the School Coordinators, who were not necessarily fluent in English. Although the manual was not subject to international verification procedures, it was included in a translation verification report prepared by the International Quality Control Monitors (for details, see Chapter 7).

Identifying the target language

In the majority of countries participating in TALIS 2013, one predominant language is used throughout the entire education system or is at least understood by all teachers and principals. In these countries, translating the survey instruments was relatively straightforward. Of the 34 participating countries, 5 administered the survey in more than 1 language (ranging from 2 languages to 5 languages). These countries were advised to involve professionals familiar with more than one of these languages to review the translations and ensure equivalency across versions.

Participating countries translated the principal and teacher questionnaires into the languages listed in Table 4.1. The countries participating in on-line data collection (ODC) also translated cover letters for ODC administration. In general, each set of instruments underwent two rounds of translation verification, once for the field trial and once for the main survey. However, there were a few languages that were used only for the main survey. These included Basque, Catalan, Galician and Valencian in Spain because Spanish (Castilian) was the only language used in the regions participating in the field trial. These four languages consequently underwent only one round of translation verification for the main survey. The Swedish instruments that Finland used only for the main survey were based on the translation-verified Swedish instruments that Sweden used in the main survey. These instruments required only cultural adaptations for the Finnish context.

Table 4.1 List of Languages used in the TALIS 2013 Survey

Country name	Field trial language(s)	Main survey language(s) ¹
Australia	English	English
Brazil	Portuguese	Portuguese
Bulgaria	Bulgarian	Bulgarian
Chile	Spanish	Spanish
Croatia	Croatian	Croatian
Czech Republic	Czech	Czech1
Cyprus ^{2,3}	Greek & English	Greek & English
Denmark	Danish	Danish
Estonia	Estonian	Estonian
Finland	Finnish	Finnish and Swedish
France	French	French
Iceland	Icelandic	Icelandic
Israel	Hebrew & Arabic	Hebrew & Arabic
Italy	Italian	Italian
Japan	Japanese	Japanese
Korea	Korean	Korean
Latvia	Latvian	Latvian
Malaysia	Malay	Malay
Mexico	Spanish	Spanish
Netherlands	Dutch	Dutch
Norway	Bokmål	Bokmål
Poland	Polish	Polish
Portugal	Portuguese	Portuguese
Romania	Romanian	Romanian
Serbia	Serbian	Serbian
Singapore	English	English
Slovak Republic	Slovakian	Slovakian
Spain	Spanish (Castilian)	Spanish (Castilian), Catalan, Galician, Valencian & Basque
Sweden	Swedish	Swedish
United States	English	English
Sub-national entities		
Abu Dhabi (United Arab Emirates)	Arabic & English	Arabic & English
Alberta (Canada)	English	English
England (United Kingdom)	English	English
Flanders (Belgium)	Flemish (Dutch)	Flemish (Dutch)

Source: OECD *TALIS Database*

1. Few respondents used the English version of the instruments. This version underwent the national adaptation and layout verification only.

2. Footnote by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

3. Footnote by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Cultural and national adaptations

The objective of cultural and national adaptations was to adjust the data collection instruments to suit each participating country. Adaptations were kept to a minimum, but some were needed in order to ensure that principals and teachers in each country responded to questions equivalent to those received by principals and teachers in all other countries.

To facilitate the adaptation process, the international (English and French) versions of the questionnaires included square brackets, curly brackets, angle brackets and yellow highlighting to indicate places where adaptations were always required. Required national adaptations included the following:

- In the text, the square and curly brackets indicated that a choice was required to adjust specific questionnaire content so that it would be suitable for a specific audience. Square brackets required NPMs to add some national-specific information such as that relating to procedures on how to return questionnaires and specification of deadlines. The curly brackets signalled the possibility of omitting optional text if not applicable to the local context, e.g. “{a church}” in the principal questionnaire, Questions 10 and 24.
- The angle brackets marked essential adaptations, with additional advice and instruction provided in the TALIS 2013 Main Survey Translation and Adaptation Guidelines and/or the glossary of terms. Any words in the angle brackets had to be replaced with the country-appropriate term. Some of these words related to the target population (respondents). For example, <ISCED Level x> needed to be replaced with the appropriate educational level according to the International Standard Classification of Education 1997 (UNESCO-UIS, 2006), such as “lower secondary”.

The ISC required countries to provide their rationale for any optional adaptation and to have all such changes approved. Additional acceptable adaptations included valid ranges (if necessary), removing non-applicable questions or dimensions, and adding categories (if absolutely necessary). Countries could add national questions at the very end of the questionnaire. Every national adaptation had to be carefully documented on the National Adaptation Form in the national survey language and in an English translation of it. Adaptations that involved collapsing or removing international categories or changing the international question stem were not acceptable.

National Adaptation Forms

The only document on which NPMs could record all adaptations to the survey instruments was the National Adaptation Form (NAF) in Microsoft™ Excel® format. NPMs received training in how to fill the form in correctly. If a country intended to administer the survey in more than one international option or more than one language, one NAF had to be completed per option and language. Finland, for example, filled in a set of eight NAFs because it administered the survey in Finnish and Swedish and at ISCED Level 2, ISCED Level 1, ISCED Level 3 and the TALIS-PISA Link. Spain completed 10 different NAFs because of its decision to administer the survey in five official languages at ISCED Level 2 and the TALIS-PISA Link.

During national instrument preparation, the ISC asked NPMs to submit the adaptation forms at five key times (project “milestones”):

- Step I, NAF approval: The ISC reviewed the proposed adaptations entered on the NAFs. Terms and items used in TALIS 2008 had to be translated identically to allow for trend analysis. The ISC released the TALIS 2008 main survey adaptations as a reference for those countries that had participated in TALIS 2008. For the other countries, the ISC uploaded the International Standard Classification of Education 1997 (UNESCO-UIS, 2006) mapping to be used for referencing the ISCED levels.
- Step II, translation verification: External language experts (from cApStAn) reviewed the translated (updated) ISCED Level 2 core instruments and the mathematics teacher module, referring to the NAFs when relevant and commenting on any implemented adaptations. Subsequently, the experts also verified the translation of the cover letters and the NAFs for the other international options.
- Step III, layout verification: During this stage of verifying the final instrument layout, the ISC reviewed the NAFs to assess possible deviations from the source version.
- Step IV, ODC verification: When verifying the ODC resource files, the ISC used the NAF to document any deviations from the approved paper versions. Verifiers also checked that structural adaptations had been correctly implemented, that is, whether added national variables aligned with the variable naming convention, as set down in the TALIS 2013 Main Survey Manual for Data Managers (OECD, 2012d).
- Step V, codebook verification: The ISC checked that the national codebooks had been appropriately adapted, commented on these changes if required and approved them.

The *TALIS 2013 User Guide* (OECD, 2014) documents the national adaptations.

Hierarchy of international options during instrument preparation

TALIS 2013 offered the opportunity to survey the ISCED Level 2 core as well as ISCED Level 1, ISCED Level 3 and the TALIS-PISA Link. Countries that chose to survey teachers and their principals via more than one of the international options needed to ensure that the different survey instruments matched across the different international options.

As a further means of quality control, the ISC asked countries to first produce the ISCED Level 2 core version of the instruments in the predominant survey language. This version then served as the new master version for either further international options or minority language(s). This process was put in place to ensure quality and consistency across the different instruments used within one country. The procedure applied to all steps of national instrument production outlined in this chapter.

Adaptation of the generic international instruments for surveyed populations

For the ISCED Levels 1 and 3 administrations, the questionnaires needed to be adapted based on the approved ISCED Level 2 core instruments and their NAFs. The ISCED Levels 1 and 3 NAFs were then compared against the approved ISCED Level 2 core NAF, and adaptation of the instruments had to mirror, to the greatest extent possible,

the adaptations to the ISCED Level 2 core instruments. Translation verification was not performed for the ISCED Level 1 and 3 instruments, but it was carried out for their NAFs. A thorough consistency check undertaken during layout verification ensured that only agreed upon adaptations in the ISCED Levels 1 and 3 or TALIS-PISA Link instruments had been implemented and that the rest of the instruments matched the ISCED Level 2 core instrument.

Participants administering the TALIS-PISA Link had to adapt the principal and teacher questionnaires and replace the ISCED-level information in them with the notion of “15-year-olds”. For this reason they had to produce an extra set of questionnaires, even if they were also administering the survey at an ISCED level where 15-year-olds were part of this population. Preparation of the principal and teacher questionnaires for the TALIS-PISA Link followed the same procedure used for preparing the ISCED Levels 1 and 3 questionnaires. Only the mathematics teacher module underwent full translation verification and was provided exclusively to the mathematics teachers in the TALIS-PISA Link schools. These teachers were also asked to fill in the teacher questionnaire.

Table 4.2 lists the participation of these optional target populations by country. All 34 participants implemented the survey at the ISCED Level 2 core, 6 at ISCED Level 1, and 10 at ISCED Level 3. Eight participating countries also took part in the TALIS-PISA Link option.

Table 4.2 List of the teacher target populations in TALIS 2013

	ISCED Level 1	ISCED Level 2 (Core)	ISCED Level 3	TALIS-PISA Link
Australia		Yes	Yes	Yes
Brazil		Yes		
Bulgaria		Yes		
Chile		Yes		
Croatia		Yes		
Czech Republic		Yes		
Cyprus ^{1,2}		Yes		
Denmark	Yes	Yes	Yes	
Estonia		Yes		
Finland	Yes	Yes	Yes	Yes
France		Yes		
Iceland		Yes	Yes	
Israel		Yes		
Italy		Yes	Yes	
Japan		Yes		
Korea		Yes		
Latvia		Yes		Yes
Malaysia		Yes		
Mexico	Yes	Yes	Yes	Yes
Netherlands		Yes		
Norway	Yes	Yes	Yes	
Poland	Yes	Yes	Yes	
Portugal		Yes		Yes
Romania		Yes		Yes
Serbia		Yes		
Singapore		Yes	Yes	Yes
Slovak Republic		Yes		
Spain		Yes		Yes
Sweden		Yes		
USA		Yes		
Sub-national entities				
Abu Dhabi (United Arab Emirates)		Yes	Yes	
Alberta (Canada)		Yes		
England (United Kingdom)		Yes		
Flanders (Belgium)	Yes	Yes		

Source: OECD *TALIS Database*

1. Footnote by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

2. Footnote by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Engaging translators

NPMs engaged at least two translators for each language of the survey administration, both of whom were native speakers in the language in which the survey was administered, had an excellent knowledge of English and were familiar with survey instruments.

The first of these translators, who was expected to be a language specialist with an excellent understanding of the country's cultural context, translated the international English text of the instruments and manuals into the national language. The second translator, known as the reviewer, was expected to have experience in the national educational context and be familiar with the subject of the study. This person reviewed and commented on how appropriate the initial translation was in terms of the national educational context. He or she also checked the translation's accuracy and readability. The NPM then reviewed the translation together with the reviewer's comments, incorporating changes as appropriate into the final document. This method meant that three independent people compared the translated document against the original international English version.

Representatives from countries planning to divide up the translation work or to prepare translations for more than one language were reminded of the importance of ensuring consistency within and across documents. In the latter case, they were encouraged to engage professionals familiar with all the languages as special reviewers to make sure that the translations were equivalent.

Producing translations

For English-speaking or French-speaking countries, the instrument preparation process involved adapting language, terminology and classifications to local requirements; for countries administering the survey in languages other than English or French, all materials had to be translated and adapted into the local language(s).

Due to extensive rewording of the TALIS 2008 instruments, the TALIS 2013 instruments did not contain many "intact" questions from TALIS 2008. However, some items, question stems, instructions and response categories were preserved so that they could provide a basis for possible comparisons in the countries participating in both TALIS cycles. If a country participated in TALIS 2008, the NPM was asked to prepare the TALIS 2013 instruments on the basis of the previous study's instruments in order to ensure consistency and comparability across the two surveys. NPMs were also asked to pay attention to this issue when updating the field trial instruments for the main survey. The ISC made sure that the NPMs had access to the approved TALIS 2008 main survey instruments for reference.

The IEA Secretariat provided translators and internal reviewers at the National Study Centres with all materials necessary for their tasks. These included the following:

- international version and translated text of the ISCED Level 2 principal and teacher questionnaires in Microsoft™ Word© 2010 format;
- international version and translated text of the mathematics teacher module (if applicable) in Microsoft™ Word© 2010 format;
- all approved NAFs (one set for each language);

- the ISCED Level 2 on-line data collection cover letters in Microsoft™ Word© 2010 format for those countries electing to collect data this way (the teacher cover letter was replaced by the mathematics teacher cover letter if the TALIS-PISA Link was administered);
- the national version of the TALIS 2013 field trial teacher questionnaire, principal questionnaire and mathematics teacher module (if applicable);
- the national version of the TALIS 2008 teacher questionnaire and principal questionnaire (if applicable);
- a glossary document containing explanations of vocabulary/constructs from instruments, to be used for translation and adaptation purposes at the national level;
- translator's Briefing & Check List (Annex I of the Translation and Adaptation Guidelines);
- reviewer's Briefing & Check List (Annex II of the Translation and Adaptation Guidelines);
- links to the TALIS 2013 field trial instruments (Annex III of the Translation and Adaptation Guidelines);
- links between the principal and teacher questionnaires used in the TALIS 2013 field trial (Annex IV of the Translation and Adaptation Guidelines);
- links to the TALIS 2008 instruments, if applicable (Annex IV of the Translation and Adaptation Guidelines); and
- list of the tasks to be carried out by the verifiers and a list of the NPMs' final responsibilities.

The *TALIS 2013 Main Survey Translation and Adaptation Guidelines* emphasised the need to follow the target language rules and the country or cultural context, while ensuring that the translated text had the same meaning as the source text. A glossary document containing definitions and explanations of the most critical terms was designed to help translators prepare a set of instruments that captured the meaning and intent of the international instruments, while safeguarding against inaccuracies or word-for-word translations that were not appropriate in the national language and context.

The translator's role was to prepare a full translation of each of the core questionnaires, the mathematics teacher module and the cover letters (when applicable). Translators also introduced the mandatory adaptations for the international options and documented them in the NAFs.

For the purposes of international comparison, questionnaires had to be equivalent (as far as possible) across languages. Translated texts needed to flow naturally so that it was not obvious that the document originated in another language. Guidance on language use during translation (as outlined in the *TALIS 2013 Main Survey Translation and Adaptation Guidelines*) comprised the following:

- Translations should have the same register (language level, degree of formality) as the source text.
- Translated passages should employ correct grammar and usage (e.g. subject-verb agreement, prepositions, verb tenses).

- Translated passages should not clarify, omit or add information.
- Translated passages should employ equivalent qualifiers and modifiers, in the order appropriate for the target language.
- Idiomatic expressions should be translated appropriately, not necessarily word for word.
- Spelling, punctuation and capitalisation in the target text should be appropriate for the target language and the country or cultural context.

Once the translators had completed their translations, the reviewers read the translated instruments. Reviewers had to make sure that the translations were appropriate for respondents, consistent with the field trial version of instruments and met the requirements of the survey. After the reviewer had commented on the consistency and quality of the translations, the translator was expected to incorporate the necessary changes into the instruments. If the translator and reviewer disagreed on the most appropriate translation, the NPM served as arbitrator and could make a decision.

International translation verification

International translation verification was an important part of the *TALIS 2013 Technical Standards* (specifically, Standards 5.18-5.22). TALIS 2013 instruments underwent rigorous independent verification to ensure, to the greatest extent possible, that the instruments used in each country asked the same questions using the same concepts and thus were internationally comparable.

The IEA Secretariat co-ordinated the translation verification process, engaging the services of native-speaking linguistic verifiers through cApStAn Linguistic Quality Control, based in Brussels, Belgium. These verifiers were experienced in balancing the cultural and national “appropriateness” of the target version with “faithfulness” to the source version. Verifiers gave expert feedback on the translations and adaptations. The IEA Secretariat asked NPMs to carefully consider all verifier recommendations and to ensure that the original meaning of the phrases was retained in their translations; however, it was emphasised that the final decision regarding document content rested with the NPM. NPMs were asked to explain any major differences of opinions between themselves and verifiers.

The ISCED Level 2 core instruments and cover letters as well as the mathematics teacher module (when applicable) were subject to full translation verification. NPMs were asked to derive the optional instruments from the verified core instruments and only make the approved adaptations to the questionnaires. Therefore, for the international options – ISCED Level 1, ISCED Level 3 and the TALIS-PISA Link – only the additional entries in the NAFs were verified. The international translation verifiers received the same materials that the NPMs used when producing their translations.

Process of translation verification

Translation verifiers received the international (English or French) questionnaires in PDF format, which gave them an accurate preview of the intended format. The translated ISCED Level 2 core questionnaires, ODC cover letters, mathematics teacher module and all relevant NAFs were received as Word files. Verifiers inserted their comments and changes directly into the translations using the “track changes” feature of Word.

A compendium of the verified documents, complete with annotations and comments, became known as the Translation Verification Report.

Further to this, verifiers could make comments in the NAF using five different codes ranging from Code 1, indicating a major change or error that must be addressed, to Code 4, indicating an acceptable change. If unsure of which code to use, verifiers used a fifth code, “1?”.

Codes were categorised as follows:

- Code 1, major change or error. Examples included incorrect order of choices in a multiple-choice question; omission of a question; incorrect translation resulting in the question biasing respondents towards an answer; an incorrect translation that changed the meaning or difficulty of the question; and incorrect order of questions.
- “Code 1?” uncertain as to which code to use. Verifiers used this code to draw NPMs’ attention to unknown or unclassifiable irregularities.
- Code 2, minor change or error. Examples included spelling errors that did not affect comprehension.
- Code 3, suggestion for alternative. Although the translation might be adequate, the verifier suggested different wording.
- Code 4, acceptable and appropriate change. An example would be the capitalisation or date format conventions used in the language of translation.

Verifiers were instructed to check the accuracy and comparability of the translations of the instruments in order to ensure that the translation had not affected the meaning or difficulty of the text, that the questions had been made neither easier nor more difficult when translated and that no information had been omitted from or added to the translated text. Verifiers were also required to document *all* deviations in the participating country’s translation, including additions, deletions and mistranslations, according to specific guidelines. Verifiers knew that, where necessary, they could suggest alternative translations that would improve comparability.

Feedback from NPMs on translation and translation verification

The ISC used the survey activities questionnaire to collect feedback from NPMs on the translation and international translation verification process after the main survey data had been collected.

Nearly all (97%) of the NPMs said they used the English source version to produce their national survey instruments; 88% found the *TALIS 2013 Main Survey Translation and Adaptation Guidelines* useful. NPMs also considered the glossary a helpful tool when they encountered difficult concepts.

Thirty-five percent of the NPMs said the complex process of translation and adaptation was “not difficult at all” and 62% found the process “somewhat difficult”. Only one country found it “very difficult”.

Documenting national adaptations in the NAFs was not at all difficult for 71% of the NPMs, while 29% considered it to be somewhat difficult. Reasons for the difficulties were the complex and time-consuming process, the challenges involved in finding appropriate (nuanced) translations for local systems and the number of cycles for review

and improvement. However, in the latter case, countries recognised that this procedure led to high-quality survey questionnaires.

Almost 62% of the NPMs considered the translation verification feedback to be “very useful”, and 32% found it “somewhat useful”. Among the positive aspects of the feedback were: another perspective from an experienced translator, the familiarity of the verifier with the subject of the survey, gaining more confidence in one’s own translation and adaptation ability after the external review and the improved clarity of some items.

Layout verification: paper and on-line data collection

As a final step during production of the national instruments, the ISC verified the layout of both the paper and the on-line versions of the instruments after completion of the translation verification process. The ISC carefully checked the national versions of the instruments against the international English version and the documentation on the corresponding NAF. The aim of layout verification was to ensure that the national versions of the TALIS instruments looked as much as possible like the international source version and that the paper and on-line versions were also, to the greatest extent possible, equivalent.

The process used to verify the layout of the paper version was similar to the NAF approval process. ISCED Level 2 core instruments, the cover letters for countries using on-line data collection and the mathematics teacher module for the TALIS-PISA Link had to be approved before submission of the questionnaires for the international options. However, the ISCED Levels 1 and 3 questionnaires as well as the teacher and principal questionnaires for the TALIS-PISA Link could then be submitted simultaneously because they were compared against the approved ISCED Level 2 questionnaires that served as the new master versions.

ISC staff checked each questionnaire for font size, font changes, adjustment of cells, response options, blank pages, word emphasis, tracked changes and comments. They listed all deviations from the source version in the NAF and reported these back to the NPMs for their review. Another staff member at the ISC then verified the revised version of the instruments. This procedure was repeated until the instruments looked as much as possible like the international source. For the majority of languages, two to four rounds were needed before the ISC approved the layout of the instruments.

In a few rare cases, NPMs detected some minor inconsistencies regarding spelling or punctuation after layout approval and prior to printing. The NPMs changed these inconsistencies and sent the updated version to the ISC for documentation. However, these instruments were checked once more to ensure that the overall layout had not been affected.

The ODC instruments were checked against the national paper version after paper layout verification. This practice helped ensure that the instruments within one country were the same regardless of whether they were administered on paper or on line. Visual checks were run using the same standards and procedures as for verification of the paper layout. For most of the languages, up to two rounds were needed before the ODC instruments received final approval.

The process involved in verifying the different international options was time consuming, and many countries were operating under a tight schedule. For these reasons, countries that had elected to administer one or more of the international options or to

collect data on line were invited to work simultaneously on finalising the paper layout for the international options and on the OSS resource files for ISCED Level 2 based on the approved ISCED Level 2 paper instruments.

The majority of NPMs (91%) found the instructions for layout verification provided by the ISC helpful for preparing their national survey instruments. Among the 6% who said they did not benefit from the support documents was an NPM from an English-speaking country who was able to prepare the national survey instruments without experiencing major deviations in layout from the original source.

Summary

All participating countries produced national survey instruments of a high quality. Several steps of quality control during national instrument production helped ensure the collection of internationally comparable, high-quality data. Due to careful cross-checks for countries that had participated in TALIS 2008, intact items, instructions, question stems and response categories from the 2008 instruments that were also used in TALIS 2013 were identically translated in the majority of cases. There were only a few instances where the TALIS 2008 translations needed slight rewording in order to make the national version more fluent or to replace outdated expressions.

Overall, the approach of producing different survey instruments for the four international options based on one generic source version was successful, helping ensure consistency across the national survey instruments used within countries.

References

- OECD (2014), *TALIS 2013 User Guide* (prepared by IEA Data Processing and Research Center, Hamburg, Statistics Canada, Ottawa), OECD, Paris.
- OECD (2012a), *TALIS 2013 Technical Standards* (prepared by the IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, Statistics Canada, Ottawa), OECD, Paris.
- OECD (2012b), *TALIS 2013 Main Survey Translation and Adaptation Guidelines* (prepared by IEA Secretariat, Amsterdam, and IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012c), *TALIS 2013 Main Survey Manual for School Coordinators* (prepared by IEA Secretariat, Amsterdam, and IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012d), *TALIS 2013 Main Survey Manual for Data Managers* (prepared by IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012e), *TALIS 2013 Translation Verification Guidelines* (prepared by IEA Secretariat, Amsterdam), OECD, Paris.
- UNESCO-UIS (UNESCO Institute for Statistics) (2006), *International Standard Classification of Education: ISCED 1997*, UNESCO-UIS, Montreal.

Chapter 5: Sample Design

Abstract

The international target population for TALIS 2013 (called the core population) consisted of schools providing ISCED Level 2 education as defined by the International Standard Classification of Education 1997 (UNESCO-UIS, 2006), as well as their principals and their teachers. TALIS 2013 countries that had also taken part in PISA 2012 had the option of implementing TALIS in the schools that participated in PISA 2012. This international option was called the TALIS-PISA Link. Participating countries could also opt to survey primary (ISCED Level 1) and upper secondary (ISCED Level 3) teachers. This chapter covers the sample design prepared for the TALIS 2013 countries. It also reviews the sampling strategies and the nominal sample sizes.

Overview

This chapter covers the sample design prepared for the countries that participated in TALIS 2013 and gives accounts of the sampling strategies used and the sample sizes. The chapter focuses only on the standard international (“core” survey) sampling plan. Chapter 9 provides detailed coverage of the strategies used to estimate population characteristics and their sampling error, while Annex E provides the characteristics of each national sampling plan.

A more detailed description of the survey design and its recommended implementation can be found in the *TALIS 2013 Sampling Manual* (OECD 2012b). The salient points of the survey design appear later in the section of this chapter on the participating countries’ core survey (ISCED Level 2) samples.

As an international option, TALIS 2013 countries that had also participated in PISA 2012 could choose to implement TALIS in their PISA 2012 schools (the TALIS-PISA Link). Australia, Finland, Latvia, Mexico, Portugal, Romania, Singapore and Spain agreed to do so.¹ Participating countries could also opt to survey primary (ISCED Level 1) and upper secondary (ISCED Level 3) teachers. Belgium (Flanders), Denmark, Finland, Mexico, Norway and Poland chose to survey ISCED Level 1 teachers and school principals. Abu Dhabi (United Arab Emirates), Australia, Denmark, Finland, Iceland, Italy, Mexico, Norway, Poland and Singapore chose to survey ISCED Level 3 (see Chapter 4 for more details).

International sampling plan

The international sampling plan prepared for each of the TALIS 2013 populations was a stratified two-stage probability sampling design. This meant that teachers (second-stage units or secondary sampling units, abbreviated as SSUs) were randomly selected from the list of in-scope teachers for each of the randomly selected schools (first-stage or primary sampling units, abbreviated as PSUs).

The populations of interest comprised schools providing ISCED Level 2 education and also their principals and teachers. TALIS adheres, for sampling purposes, to the OECD Indicators of Education Systems (INES) data collection definition of a teacher: “The formal definition of a classroom teacher is a person whose professional activity involves the planning, organising and conducting of group activities whereby students’ knowledge, skills and attitudes develop as stipulated by educational programmes. In short, it is one whose main activity is teaching” (OECD, 2004, p. 47).

Target population and survey population: international requirements and national implementations

The TALIS programme of surveys aims to cover all teachers of a given ISCED level in a participating country. The programme’s identification of policy issues encompassing the classroom, the teacher, the school and school management means that all subjects being taught in a school are within TALIS’s scope. As such, the programme’s sampling coverage extends to all teachers of an ISCED level and to the principals of the schools in which these teachers are working.

Teachers at a given ISCED level are those who, as part of their regular duties in a target school, provide instruction in programmes at that ISCED level. Teachers who teach a mixture of subjects at different levels in a sampled school are also included in the TALIS populations of interest. The same consideration applies no matter how much or how little teaching these teachers are engaged in.

The *international target population* of TALIS restricts the survey to those teachers who teach in ordinary schools and to the principals of those schools. Teachers teaching adults are not part of the international target population and are therefore deemed “out of scope”. Teachers working with children with special needs are in scope if they are teaching in “regular schools”. However, if a school is comprised exclusively of these teachers, the school itself is said to be out of scope. Teacher aides, pedagogical support staff (e.g. guidance counsellors, librarians) and health and social support staff (e.g. doctors, nurses, psychiatrists, psychologists, occupational therapists and social workers) are not considered to be teachers and therefore cannot be part of TALIS.

For national reasons, participating countries can choose to restrict the coverage of their national implementation of TALIS to parts of the country. For example, a province or state experiencing civil unrest or an area struck by a natural disaster could be removed from the international target population to create a *national target population*. Participating countries are invited to restrict these exclusions to the greatest extent possible: “So as to maintain comparability and unbiasedness, exclusions should be kept to the strict minimum and be justifiable. With only broad guidelines to help them, countries that participated in the first round of TALIS successfully managed to keep the proportion of excluded teachers to less than 5% . A 5% threshold was thus adopted for this second round of TALIS as an upper limit for the exclusion of teachers from the survey population” (OECD, 2012a, paragraph 45).

Ideally, all the members of a target population should be admissible to sampling and data collection. This is the option that TALIS chose. As a consequence, the international survey population (those who can be surveyed) is identical to the international target population (those who should be surveyed).

TALIS recognises that attempting to survey teachers in very small schools, that is, schools with no more than three teachers at the ISCED level of interest, and those

teaching in schools located in geographically remote areas tends to be costly, time consuming and statistically inefficient. Therefore, participating countries can excuse those teachers from the TALIS data collection, thus creating a *national survey population* different from the national target population. TALIS 2013 therefore required the National Project Manager (NPM) for each country to document the reasons for exclusion as well as the size, location and clientele of each excluded school.

Ultimately, samples of schools and teachers were selected from the national survey population. Figure 5.1 illustrates how the international and national survey populations relate to one another.

Figure 5.1 Establishing the effective sample size for TALIS 2013

ISCED Level X Universe			
TALIS 2013 <i>out-of-scope</i>	TALIS 2013 international <i>target</i> population = TALIS 2013 international <i>survey</i> population = All schools where at least one ISCED Level X class is found		
	NATIONAL <i>target</i> population		
<ul style="list-style-type: none"> Schools exclusively for adult education Schools exclusively for students with special needs Substitute or emergency teachers Teachers on long-term leave Teachers exclusively for adult education in regular schools 	NATIONAL exclusions	NATIONAL <i>survey</i> population	
	<ul style="list-style-type: none"> Remote, small schools Entire province, state, or sub-population 	Not Sampled	<i>In Sample</i>
	Not more than 5% of teachers	At least 95% of teachers	

Source: OECD *TALIS Database*

Annex D presents the national definitions of the TALIS 2013 target and survey populations for each of the concerned ISCED levels. NPMs provided this information on TALIS Sampling Forms, templates of which can be found in Annex C (Figures 5.1-5.9).

During TALIS 2013, some teachers within a selected in-scope school were excluded from the sample. They included:

- teachers who were also acting as principals (no teacher data collected, but principal data collected –labelled NEXCL5 in Chapter 9);
- substitute, emergency or occasional teachers (out of scope);
- teachers on long-term leave (out of scope);
- teachers teaching exclusively to adults (out of scope); and
- teachers in Abu Dhabi and Iceland who took part in the TALIS 2013 field trial but for whom no teacher data were collected (labelled NEXCL6 in Chapter 9).

NPMs received detailed guidelines on how to apply these exclusion categories. Guidelines could be found in the *TALIS 2013 Sampling Manual* or provided during

correspondence between Statistics Canada, the ISC and the interested participating countries. In addition, the *TALIS 2013 Main Survey Manual for School Coordinators* (OECD, 2012b) provided School Coordinators with additional information on how to recognise different types of exclusion and apply the adequate codes.

NPMs were reminded that they were not to exclude teachers teaching at more than one school. Instead, they were to record the number of schools in which these teachers were working (see “weight adjustments” in Chapter 9).

Sample size requirements²

To allow for reliable estimation and modelling while permitting some amount of non-response, TALIS 2013 set the minimum sample size at 20 teachers within each participating school. The minimum sample size to be drawn from the population of in-scope schools was set at 200. Thus, the nominal international sample was a minimum of 4 000 teachers.

TALIS recognised that teachers from one of the 200 schools would be likely to share opinions and behave in similar ways, more so than teachers from different schools, cities or provinces in a given country. This tendency for two teachers from the same school to be “more alike” than two teachers from different schools is called a “clustering effect”. It is measured in single-stage sampling designs by the intra-cluster correlation. In essence, the stronger the intra-cluster correlation, the smaller the sample needs to be from one school. This is because one responding teacher tends to be a good predictor of the other teachers in his or her school. Therefore, in a sample of 20 teachers from the same school, there are, in a sense, fewer than 20 original data points. This also is a manifestation of the clustering effect or design effect, and the larger the cluster, the larger the loss.

Those engaged in the preparation work for TALIS 2013 used as a working hypothesis an intra-cluster correlation value of 0.30, on the assumption that teachers are as homogeneous as their students. The loss in sample size due to clustering when added to the losses due to non-response reduced the nominal sample of 4 000 teachers to an effective sample of approximately 400, as depicted in Table 5.1. Thus, the nominal sample of 4 000 teachers obtained by the complex sampling design was equivalent to a simple random sample of 433 teachers.

Table 5.1 Establishing the effective sample size for TALIS 2013

Schools	a	200
Teachers per school	b	20
Total number of teachers	$c = a \times b$	4 000
School response rate	d	75%
Teacher response within school	e	75%
Overall response rate	$f = d \times e$	56%
Net number of responding teachers	$g = c \times f$	2 250
Intra-cluster correlation	h	0.3
Design effect (deff)	$deff = 1 + \{(e \times b) - 1\} \times h$	5.2
Effective sample	$= g / deff$	433

Source: OECD *TALIS Database*

The precision expected from the sample of 20 teachers in 200 schools is equivalent to that of a simple random sample of 433 teachers selected from the (often unavailable) national list of teachers. The expected margin of error for a simple random sample of this size is $\pm (1.96) \times (1/\sqrt{433}) = \pm 9.4\%$. Evidence from TALIS 2008 showed that in most of the participating countries clustering was not as great as anticipated. Hence, the achieved precision was, in most countries and for most statistics, better than the expected 9.4%. However, while the requirements for the nominal sample could have been reduced for 2013, the sampling team decided to retain the 2008 levels to allow for easier tabulations at sub-national levels and more robust secondary analyses.

Participating countries could choose to augment their national sample by selecting more schools, or by selecting more teachers within each selected school, or by increasing both. Some countries were asked to increase the within-school sample so as to counterbalance the effect of selecting too many schools with too few teachers.

The sampling team reduced the sample size requirement for some participating countries because of the smaller number of schools available for sampling (see Annex E, which presents the characteristics of the national samples). In a few cases, because the average number of teachers in the schools was less than expected in the international plan, the number of schools to be sampled was increased so as to maintain a minimum total number of participating teachers.

National sampling strategies

Participating countries could suggest variations to or adaptations of the international sampling plan to better suit their national needs or conditions. All changes to the international sampling plan had to be reviewed and approved by the sampling team.

Sampling frames

Participating countries were asked to provide Statistics Canada with a current and complete list of schools providing education at the ISCED level of interest. This list constituted the school sampling frame for TALIS and was expected to correspond to the survey population as defined and described on the Sampling Forms.

The sampling frame had to contain certain key variables: a national school identifier, a measure of size (preferably the number of teachers at the ISCED level of interest) and values for those variables to be used for stratification. Whenever possible, the frame also included the type of funding (private or public) and the type of education stream (academic or vocational).

Additional sampling frames were required for the sampling of teachers, namely, the list of admissible teachers at the ISCED level of interest in each selected school.

Stratification

The international sampling plan did not anticipate any stratification of the schools nor of the teachers within the selected schools. The sampling team invited participating countries that chose to implement some form of stratification in order to answer national requirements to discuss their strategy with them.

Stratification could be done explicitly (whereby a fixed portion of the total sample is allocated to the stratum) or implicitly (whereby the variable is used to sort the sampling

frame before sample selection, thus giving, on average, a proportional representation of the implicit strata in the sample).

In instances where explicit stratification was used, the participating country and the sampling team together determined the sample allocation scheme.

In most cases, stratification resulted in a combination of some or all of the details relating to geography, source of financing, type of educational programme and school size. Annex D (Tables 5.7-5.9) provides details for each participating country and each ISCED level in which they participated.

Sample selection

The method used to select the school samples was systematic random sampling with probability proportional to size (PPS) within explicit strata, according to the national sampling plans. When implicit stratification was used, schools in explicit strata were sorted by implicit strata and measure of size (MOS) prior to sampling. MOS was always used to sort sampling frames before sampling, whether or not stratification was applied. Sorting by MOS was done in a serpentine manner, alternating increasing order and decreasing order so that adjacent schools would be of similar sizes, even across strata. This method is a useful one to use when creating replication zones for estimation of sampling error (see Chapter 9).

The mechanics of systematic random sampling with PPS can be described as follows. Let M be the total MOS in an explicit stratum, let m_i be the MOS for school i in the explicit stratum and M_i be the cumulative sum of the school sizes up to and including school i , and let n be the number of schools to be sampled from that explicit stratum. From here, the sampling step k is computed as the integer part of $M \div n$, and a random starting point d is drawn at random from the interval $[1, \dots, k]$. The sample is selected by walking steps of fixed length k along the (ordered) sampling frame. Where the step lands points to the school to be added to the sample. The procedure is illustrated below.

Whenever possible, TALIS 2013 selected two replacement schools for each sampled school. These schools were the school just above and the school just below the selected school on the sampling frame sorted by MOS. The replacement schools also had to come from the same explicit stratum as the sampled school. This strategy was expected to help maintain the sample size and minimise non-response biases by using schools with characteristics similar to those of the non-responding schools. Schools selected for the original sample could not also be selected as a replacement school.

Although participating countries had the option of selecting the samples of schools themselves, the sampling team eventually selected them all.

At the end of the school selection process, the sampling team sent back to each participating country a copy of its school sampling frame, with the selected schools identified on it (marked “S” for the original sample and “R1” and “R2” for the replacement schools) and given a standardised TALIS school identification number.

Table 5.2 illustrates how systematic random sampling with PPS can be implemented using an ordinary spreadsheet. In this illustration, explicit stratum “A” consists of 12 schools, and a sample of $n = 3$ schools is needed from this stratum. The sampling step $k = (209 \div 3) = 69.7$. Suppose that the random start is $d = 49$. Accordingly, the j^{th} school selected is such that $M_{j-1} < d + (j-1) \times k \leq M_j$, with $M_0 = 0$ and $j = 1, 2, 3$. Here, for the first selection, $j = 1$ and the pointer is $49 + (1-1) \times 69.7 = 49$. If $j = 2$, the pointer is at $49 +$

$(2-1) \times 69.7 = 118.7$ (rounded to 118). Finally, the pointer is at $118.7 + 69.7 = 188.4$ (rounded to 188). Replacement schools are automatically selected as the schools immediately before and after a selected school, if available; note that School 12 has no second replacement.

Table 5.2 Illustration of systematic random sampling with PPS

National school id	Explicit stratum	Implicit stratum	MOS <i>M_i</i>	Cumulative MOS	Sampling step	Pointer	Selections and replacements
1	A	1	10	10			
2	A	1	12	22			
3	A	1	15	37			R1
4	A	1	17	54	1	49	S
5	A	2	20	74			R2
6	A	2	18	92			
7	A	2	16	108			R1
8	A	2	16	124	2	118	S
9	A	3	15	139			R2
10	A	3	17	156			
11	A	3	26	182			R1
12	A	3	27	M = 209	3	188	S

Source: OECD TALIS Database

The IEA Data Processing and Research Center (IEA DPC) provided each participating country with Windows Within-School Sampling Software (WinW3S) to facilitate creation of the sampling frames and selection of teachers, thus ensuring compliance with the sample design and furnishing complete documentation.

The sizes of the schools and teacher samples for each participating country are presented in Annex D.

Sampling for the field trial

During March and April 2012 and prior to the main data collection, a field trial was conducted in each participating country. For that purpose, a sample of 20 schools (plus their one replacement³) was selected at the time of sample selection for the main survey. The simultaneous selection of the school samples for the field trial and the main survey allowed some control over sample overlap and helped reduce the response burden on participating schools. When the number of schools in an explicit stratum was such that overlapping the field trial and main survey samples was unavoidable, the teachers who took part in the field trial could be excused from participating in the main survey (see Chapter 9).

ISCED Levels 2, 1 and 3 samples by participating country

The following three tables provide overviews of the sampling plans for each TALIS country. Table 5.3 covers the countries that participated in the ISCED Level 2 (core) survey, Table 5.4 those countries that participated in the ISCED Level 1 survey and Table 5.5 the countries that took part in the OSCE Level 3 survey. The country reports in Annex E provide more details of each set of plans.

Table 5.3 Overview of the core samples

	Explicit Stratification	Number of ISCED 2 Schools	Number of ISCED 2 Teachers	School Sample Size	Teacher Sample Expected Size
Australia	6 states, 2 territories × 3 sectors	2 869	84 474	154	3 080
Brazil	type of school and state	62 676	881 540	1 142	22 840
Bulgaria	3 school types	2 189	27 998	200	4 000
Chile	3 sources of funding	6 041	58 374	200	4 000
Croatia	6 regions	971	19 906	201	4 020
Cyprus	n/a	100	4 138	100	2 000
Czech Republic	2 types of funding	2 639	30 831	200	4 000
Denmark	school level	1 789	52 652	198	3 600
Estonia	2 location × 2 type	425	8 437	200	4 000
Finland	2 school levels × region	734	unknown	152	3 040
France	3 school types	7 160	217 368	250	5 000
Iceland	n/a	145	1 350	145	1 350
Israel	2 eligibility status × 5 school orientations	2 139	140 744	154	3 080
Italy	4 regions × 2 sources of funding	7 917	178 385	200	4 000
Japan	public schools × 4 city sizes and 1 stratum for private schools	10 863	289 125	200	4 000
Korea	2 sources of funding	3 183	110 658	200	4 000
Latvia	3 school types × 3 urbanisations	750	88 775	150	3 000
Malaysia	5 regions	2 138	132 578	200	4 000
Mexico	2 sources of funding × 2 streams	15 881	315 829	200	4 000
Netherlands	n/a	542	78 263	150	3 000
Norway	2 school levels × 2 city sizes	1 226	22 997	200	4 000
Poland	2 school types × 2 urbanisations	6 532	172 326	200	4 000
Portugal	2 sources of funding and public × 5 regions	1 318	46 088	200	4 000
Romania	2 urbanisations	5 865	70 807	200	4 000
Serbia	5 regions	1 083	47 833	200	4 000
Singapore	n/a	197	10 383	197	3 940
Slovak Republic	2 school types × 2 urbanisations	1 642	27 271	200	4 000
Spain	18 autonomous communities	7 322	241 177	200	4 000
Sweden	2 sources of funding	1 731	301 907	200	4 000
United States	2 sources of funding × 3 school levels	68 030	815 840	200	4 000
Sub-national entities					
Abu Dhabi (United Arab Emirates)	School level ("2 only" or "2 and 3")	268	86 726	200	4 000
Alberta (Canada)	5 school authorities	1 174	134 527	200	4 000
England (United Kingdom)	(private, state) × 2 sizes and state × 4 regions	4 347	1 773 534	205	4 100
Flanders (Belgium)	3 educational networks	726	19 557	200	4 000

Source: OECD TALIS Database

Table 5.4 Overview of the ISCED Level 1 Samples

	Explicit Stratification	Number of ISCED 1 Schools	Number of ISCED 1 Teachers	School Sample Size	Teacher Sample Expected Size
Denmark	school level	1 692	58 528	198	3 960
Finland	5 regions	2 435	unknown	199	4 000
Mexico	2 sources of funding and public ×2 streams	76 738	549 986	200	4 000
Norway	2 school levels × 2 city sizes	2 485	41 845	200	4 000
Poland	2 school types and public × 2 urbanisations	13 017	282 711	200	4 000
Sub-national entities					
Flanders (Belgium)	3 educational networks	2 193	29 989	240	4 800

Source: OECD *TALIS Database***Table 5.5 Overview of the ISCED Level 3 Samples**

	Explicit Stratification	Number of ISCED 3 Schools	Number of ISCED 3 Teachers	School Sample Size	Teacher Sample Expected Size
Australia	6 states, 2 territories × 3 sectors	2 346	39 837	156	3 120
Denmark	2 streams	345	22 000	150	3 000
Finland	2 school types ×5 regions	620	unknown	150	3 000
Iceland	n/a	31	1 774	31	1 774
Italy	4 regions × 2 streams	6 982	260 788	218	4 360
Mexico	3 streams × 2 sources of funding	12 209	274 506	200	4 000
Norway	3 streams	421	24 910	150	3 000
Poland	2 sources of funding and public × 2 urbanisations	6 952	210 806	200	4 000
Singapore	n/a	198	13 009	198	4 000
Sub-national entities					
Abu Dhabi (United Arab Emirates)	2 school levels	214	54 999	200	4 000

Source: OECD *TALIS Database****TALIS-PISA Link samples by participating country***

The sampling strategy used for the TALIS-PISA Link differed from the approaches used for the ISCED levels. The sample of schools invited to participate in the TALIS-PISA Link had to be selected from an existing sample. In order to carry most of the structure of the original PISA 2012 sample of schools, the sampling team drew a systematic equiprobable random sample of schools from the PISA 2012 sample, within the original explicit strata and original frame order. Table 5.6 gives an overview of the sample sizes for each country that participated in the TALIS-PISA Link option.

Table 5.6 Overview of the TALIS-PISA samples

	Number of Schools Sampled for PISA 2012*	Number of Schools Sampled for TALIS-PISA Link	Expected Size of the Teacher Sample
Australia	773	154	3 080
Finland	298	150	3 000
Latvia	221	150	3 000
Mexico	1 602	158	3 160
Portugal	199	154	3 080
Romania	201	150	3 000
Singapore	166	166	3 320
Spain	910	316	6 320

Source: OECD *TALIS Database*

References

- OECD (2012a), TALIS 2013 Sampling Manual, OECD (prepared by Statistics Canada), OECD, Paris.
- OECD (2012b), TALIS 2013 Main Survey Manual for School Coordinators (prepared by IEA Secretariat, Amsterdam, and IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2004), *OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications*, OECD Publishing. doi: [10.1787/9789264104112-en](https://doi.org/10.1787/9789264104112-en)
- UNESCO-UIS (Institute for Statistics) (2006), International Standard Classification of Education: ISCED 1997, UNESCO-UIS, Montreal.

Notes

- 1 Note that this link does not provide a possible linkage between the teachers and the students at the classroom level; the only such linkage is at the school level.
- 2 Requirements for ISCED Level 1 and ISCED Level 3 were identical to those imposed for ISCED Level 2; the nominal sample size for the TALIS-PISA Link was set at 150 schools, which is the PISA requirement.
- 3 Only one replacement school was selected for the field trial in order to minimise the overlap with the sample for the main survey. Schools for the field trial of the TALIS-PISA Link component were selected by convenience.

Chapter 6: Survey Operations Procedures

Abstract

This chapter focuses on the survey operation procedures implemented for the TALIS 2013 main survey and references the materials and software that the International Study Centre provided to all National Project Managers.¹ Although the procedures described in this chapter focus on the administration of the ISCED Level 2 core survey, they apply also to the international ISCED Level 1, ISCED Level 3 and the TALIS-PISA Link options. None of the participating countries was allowed to deviate from these procedures.

TALIS 2013 mandated all countries that opted to administer the survey at the optional ISCED levels or to participate in the TALIS-PISA Link to give priority to the ISCED Level 2 core survey. This mandate applied to national instrument production as well as to data collection and data processing. If, at some point, a country participating in one or more of the options found itself struggling with low participation rates, its NMPs knew their first focus was always the core survey.

Administering the different international options for TALIS

All participating countries in TALIS 2013 agreed to administer the ISCED Level 2 core survey of teachers and their principals. In addition, countries could participate in one or more of the international options. Table 4.2 in Chapter 4 provides an overview of the distribution of options across countries. Chapter 4 also outlines the development of the national survey instruments for the different options.

Due to the increased complexity of national instrument production facing the countries that agreed to participate in more than the international ISCED Level 2 core survey, the ISC asked each of these countries to do this development work before the main survey and according to a mutually agreed on individualised survey preparation schedule. These schedules made it possible to monitor progress, plan for staff resources and ensure a smooth workflow between the National Study Centres and the International Study Centre (ISC).

Unlike the Northern Hemisphere countries, the Southern Hemisphere ones had only about six to eight weeks to get all survey instruments and materials ready in time for the start of survey administration in mid-September 2012. The ISC therefore treated Australia, Brazil, Chile, Malaysia and Singapore as high-priority countries and scheduled exclusive time during August and September 2012 for verifying their survey instruments.

In the Northern Hemisphere countries, schedules and procedures for Finland and Spain were particularly complex. Finland, having chosen to conduct all international survey options, administered them on line in Finnish and Swedish, resulting in 18 different paper questionnaires, 18 different on-line questionnaires and 18 different on-line data collection cover letters. All of these materials had to progress through all quality

control steps during their production. Spain administered ISCED Level 2 (two questionnaires) and the TALIS-PISA Link (three questionnaires). However, administering the surveys on line and presenting them in five official languages meant that Spain had to prepare 25 paper instruments, 25 on-line questionnaires and five versions of cover letters, resulting in an enormous amount of preparatory work.

Then there were the countries for which instrument preparation was relatively straightforward. These countries, which included Croatia, Japan and Serbia, opted for exclusive paper administration of the ISCED Level 2 core survey in one national language. (Chapter 4 provides more details on preparation of the national instruments.)

Technical standards, manuals and software

During all phases of the survey, the National Project Managers (NPMs) followed the standardised procedures prepared by the ISC and its consortium partners:

- The final version of the TALIS 2013 Technical Standards (OECD, 2012a) was released prior to the main survey, after approval by the TALIS Board of Participating Countries (BPC) during its thirteenth meeting in May 2012. The technical standards covered 11 main topics ranging from survey ethics, confidentiality and survey operations to quality control and data management. All participants were requested to follow these standards.
- The TALIS 2013 Manual for National Project Managers (OECD, 2011) was released in June 2011 before the field trial. Unlike the practice in TALIS 2008, which updated its corresponding manual prior to the main survey, there was only one release for TALIS 2013. The purpose of the manual was to provide NPMs with an overview of TALIS, detail the tasks to be carried out by the NPMs and the National Study Centres and give information about key milestones and deliveries. Detailed information about national instrument production and survey operations were provided in separate guideline documents.
- Statistics Canada prepared the TALIS 2013 Sampling Manual (OECD, 2012b), which defined the target population of ISCED Level 2 teachers. The manual also described how to prepare and implement a national sampling plan, how to prepare the school sampling frame and how to select the school sample. The manual's annexes provided thorough instruction on how to handle the samples for the different international options.
- As indicated by its title, the TALIS 2013 Main Survey Manual for School Coordinators (OECD, 2012c) addressed the School Coordinators, who played a key role within each school. Given the complexity of the survey, the ISC released six different templates and asked countries to choose the one(s) that best fitted their situation.² There was thus one template for each of the following:
 - paper administration at one of the three ISCED levels,
 - on-line administration at one of the three ISCED levels,
 - mixed-mode administration at one of the three ISCED levels,
 - paper administration of the TALIS-PISA Link,
 - on-line administration of the TALIS-PISA Link, and

- mixed-mode administration of the TALIS-PISA Link.

The manual described in detail the steps for listing and tracking teachers and for organising the survey administration on site. NPMs were responsible for translating the manual into their survey administration language(s) and for adding national information where necessary. Responsibility for translations and adaptations rested solely with the NPMs. The ISC asked International Quality Control Monitors to make sure the NPMs used the correct template (see Chapter 7 for more details on quality assurance):

- The TALIS 2013 Main Survey Manual for Data Managers (OECD, 2012d) provided the National Data Managers with instructions on how to use the software for collecting, capturing and verifying the data. The ISC also held a three-day seminar before the field trial. It focused on training the data managers to use the software correctly.
- The TALIS 2013 Main Survey Manual for International Quality Control Monitors (OECD, 2012e), prepared by the IEA Secretariat and delivered directly to the International Quality Control Monitors contracted by IEA. The manual outlined the tasks the monitors needed to do in order to check the quality of the survey operation procedures within participating countries. The monitors visited the National Study Centres and schools in order to interview the NPMs and national teams as well as the School Coordinators. Monitors documented the results of their visits in an on-line survey, which was sent to the IEA Secretariat.
- The TALIS 2013 Main Survey Manual for National Quality Control Monitors (OECD, 2013) guided NPMs in how to conduct an optional national quality control programme. The procedures were closely related to those for the international monitors. However, NPMs were free to adapt the manual and procedures according to their needs.
- The TALIS 2013 Main Survey Translation and Adaptation Guidelines (OECD, 2012f) helped NPMs prepare internationally comparable national instruments, a process that started with cultural adaption of the questionnaires and ended with ensuring the internationally verified questionnaires were correctly laid out.
- The TALIS 2013 Main Survey Guidelines (OECD, 2012g) instructed NPMs on how to produce and ship the survey instruments to the various required destinations, and on how they could use public relations strategies to improve school participation rates. These suggestions were based on best practices as reported by the TALIS 2008 NPMs and also as an outcome of the TALIS 2013 field trial. The guidelines also provided information on how to work with Microsoft SharePoint, which provided the platform for the official website of the TALIS 2013 survey, and how to adapt the School Coordinator Manual.

The ISC also supplied NPMs with three software packages to assist with data collection:

- The IEA Windows Within-School Sampling Software (WinW3S) helped the National Data Managers prepare the survey listing forms, qualify and randomly sample teachers in selected schools and produce tracking forms for the sampled individuals. The software stored all tracking data in a single database so that this information could later be used to verify the integrity of the sampling procedures, to verify the completeness of the response data and, eventually, to compute sampling weights and participation rates.

- The IEA Data Management Expert (DME) enabled national centre staff to capture the data through keyboard data entry and to perform a range of validity checks on the entered data. The DME databases included codebooks for each of the questionnaires, thus providing all the information necessary for producing data files for each instrument in a standard international format (see Chapter 8).
- The IEA SurveySystem enabled the conversion of text passages in paper questionnaires into electronic form for on-line administration (see Chapter 8) and delivered these to respondents via the Internet. National centres performed the conversion. The on-line questionnaires were then sent to the ISC for technical and optical checks.

Contacting schools and within-school sampling procedures

Statistics Canada sent each NPM a selected school sample based on the sampling frame the NPM had already submitted.² In order to achieve the highest possible participation rates at the school level, two replacement schools, where available, were sampled in addition to each originally sampled school.

Once NPMs received this sample, the national centres began contacting the designated schools to secure their participation. The national centres only contacted their first replacement school if one of the sampled schools declined participation. If this replacement school also refused participation, NPMs approached their second replacement school.

Seventy percent of the participating countries reported difficulties in convincing schools to participate. Most often the reason given was a general survey overload, survey fatigue and problematic timing at the end of the school year.

NPMs in countries that elected to participate in one or more of the international options (ISCED Level 1, ISCED Level 3 and TALIS-PISA Link) generally had to handle, in parallel, up to 750 schools (including the 200 for the core survey).³ National centres had to plan their resources carefully to meet the requirements of the multiple tasks associated with this complex survey design.

Each participating school nominated a School Coordinator to be responsible for carrying out all TALIS-related tasks within the school. Due to confidentiality concerns, some countries preferred the coordinator be a person other than the principal, but still a member of the school. Seventy-nine percent of participating countries reported that the principal or another school management team member filled the coordinator role. Five percent of the countries appointed external agencies to act as School Coordinators and nine percent nominated teachers.

Twenty-four percent of the participating countries experienced difficulties in identifying, appointing and contacting School Coordinators and had to invest continuous effort to manage successful survey administration. As the results of TALIS 2013 show, the National Study Centres solved these problems for the majority of schools and countries, so helping secure high participation rates.

All School Coordinators were asked to carefully follow the instructions in the *Manual for School Coordinators*. Because the coordinators played a key role within the survey, 32% of the NPMs provided them with additional formal training, while 68% made use of different communication channels such as webinars, presentations and short videos.

Close co-operation between School Coordinator and NPM was crucial during all steps of teacher listing, teacher sampling and survey administration. To facilitate smooth communication, several countries established hotlines, special e-mail accounts or websites.

Identification numbers, Teacher Listing Forms and Teacher Tracking Forms

Teacher Listing Forms and Teacher Tracking Forms were needed to record information about ISCED Level 2 teachers.⁴ The National Study Centres used the IEA WinW3S software to produce these forms. WinW3S created hierarchical four-digit identification numbers that uniquely identified the sampled schools and teachers within each participating country. This number was also the identification code assigned to the person answering the principal questionnaire.

In accordance with the instructions in the *TALIS 2013 Manual for School Coordinators*, School Coordinators listed each eligible ISCED Level 2 teacher and his or her name, followed by a sequential number, exemption information, year of birth, gender and main subject domain.

Eight NPMs reported that data protection/confidentiality laws and rules prevented them from providing teachers' names. These countries therefore used only numbers or codes. The main subject domain was divided into five groups: language, human sciences, mathematics and science, other and not specified. The classification of teachers into the appropriate groups was sometimes a demanding task, requiring close co-operation between the School Coordinators and the NPM. Although the TALIS core survey targeted ISCED Level 2 teachers, not every teacher teaching at this level was within scope. Out-of-scope teachers included substitute, emergency or occasional teachers; teachers teaching exclusively to adults; teachers on long-term leave; teacher aides; pedagogical support staff; and health and social support staff. Teachers who were also the school principal and teachers who took part in the TALIS 2013 field study were exempted from participation but still had to be included on the Teacher Listing Form.⁵

Due to the complexity of the listing procedure, 53% of National Study Centres reported some difficulties during the listing process. Twenty-four percent of them experienced difficulty explaining either the definition of the teacher population or the assignment of exemption codes to the teachers, 18% struggled with the main subject domains, 8% with the assignment of the correct teacher questionnaire to the sampled teachers, and 9% had other difficulties. However, nearly all of these issues were solved before the beginning of survey administration.

The National Study Centres entered information from the Teacher Listing Forms into WinW3S and then drew the random within-school teacher sample of 20 teachers per school.⁶ A slightly different sampling technique was used for the TALIS-PISA Link. Here, a sample of 20 non-mathematics teachers was drawn, after which all the mathematics teachers in that school were added to the sample. After completion of the within-school sampling, WinW3S was used to create Teacher Tracking Forms that listed all sampled teachers. The national centres sent these to schools so that School Coordinators knew which teachers should receive the instruments.

The Teacher Tracking Forms monitored the participation status of the sampled teachers and included teacher names, teacher ID, year of birth, gender, main subject domain, teacher questionnaire mode (on line or paper) and the teacher questionnaire return status. The form was also useful with respect to following up teachers within

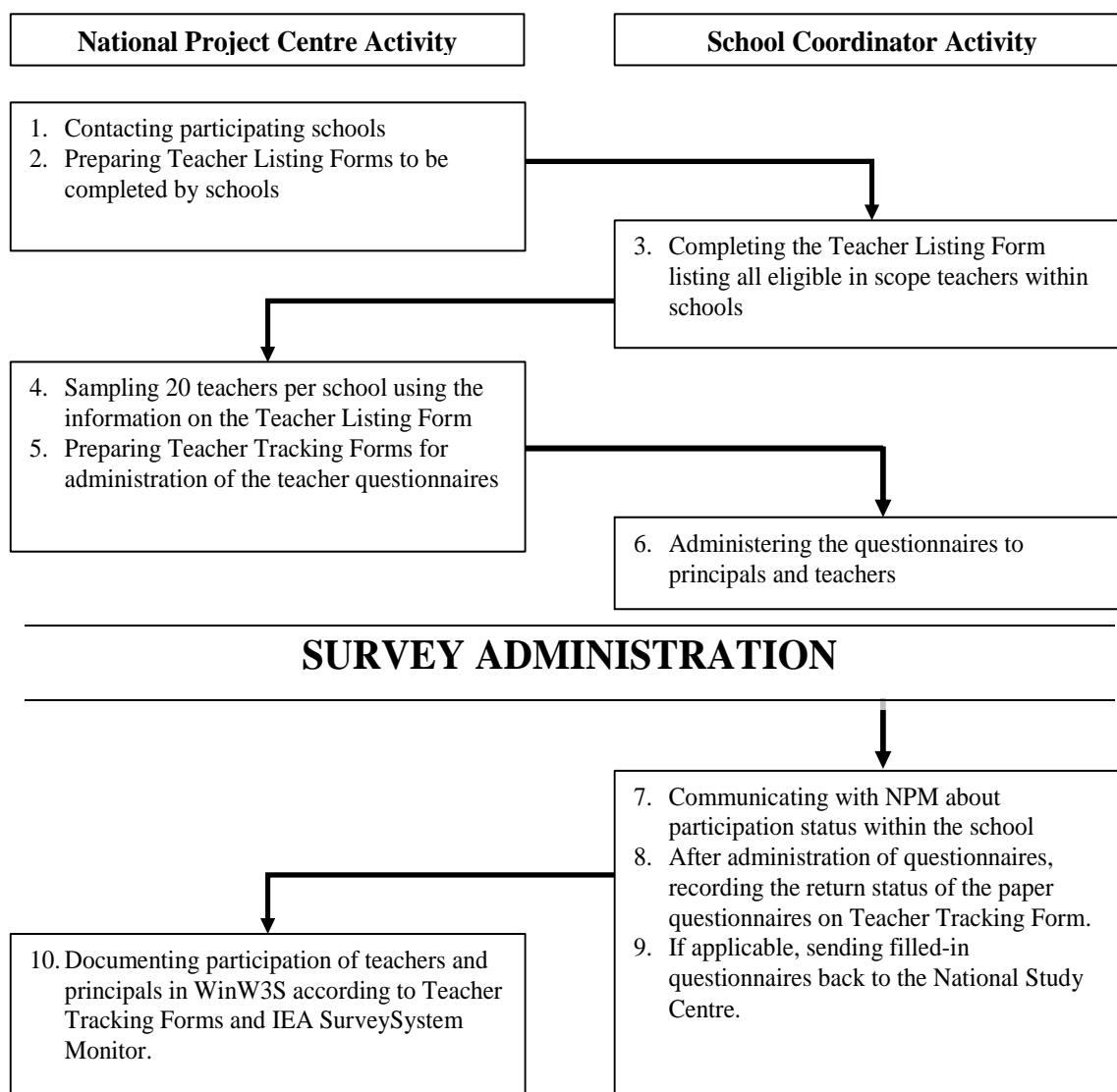
schools via e-mail or telephone, as it provided the School Coordinator with a roster of selected teachers.

The return status information was relevant only for the countries administering the survey on paper. Copies of the Teacher Tracking Forms, with teacher IDs but without teacher names, were sent to the ISC together with the survey data. Because the names on the Teacher Tracking Forms could be cut off the form, all names were kept confidential. Annex F (Table 6.2 and 6.3) contains a blank Teacher Listing Form and Teacher Tracking Form.

Assigning materials to teachers and school principals

Each school principal was asked to complete one principal questionnaire. The School Coordinator assigned a teacher questionnaire to each teacher listed on the Teacher Tracking Forms.⁷

The NPM sent the School Coordinator of each school a package containing all paper questionnaires or cover letters for online administration, the Teacher Tracking Forms and any other relevant materials prepared for briefing the coordinators. To address confidentiality concerns, several countries chose to provide teachers with pre-paid envelopes that could be sent directly to their respective national centre rather than to the School Coordinator. Figure 6.1 outlines the different responsibilities of the NPM and the School Coordinator with regard to correct assignment of questionnaires to teachers.

Figure 6.1 Responsibilities of NPM and the School Coordinator during survey administration.

Source: OECD

Administering the questionnaires and conducting national quality control

Each country selected its own timeframe for survey administration, ranging from 12 days to 4 months, within the internationally prescribed time period of the end of the school year. The end of the school year was purposefully selected to guarantee comparability of collected data. During this period, principals and teachers were free to fill in the questionnaires whenever they chose. The overall target was 100% within-school participation. A school was considered to be a participating school if at least 50% of the sampled teachers returned their filled-in questionnaires.

Monitoring the administration of the survey was a demanding task for the School Coordinators, especially if teachers could send the completed paper questionnaires directly to the National Study Centre. In these instances, School Coordinators relied on national centres informing them of the need to follow up on pending questionnaires.

National centres monitored completion of the on-line questionnaires, and NPMs communicated completion status to School Coordinators. Countries were free to manage this procedure according to their needs. Some preferred regular e-mail and/or telephone exchange between the National Study Centre and the School Coordinators; others created national TALIS websites where School Coordinators could log on individually to access all necessary information.

Countries were asked to run a National Quality Control Monitoring (NQCM) programme in order to maintain high survey standards. The ISC provided a manual template for this purpose; however, NPMs could elect to arrange for their own programme. In these cases, national quality control could be performed either on the phone or during school visits. In some countries, National Study Centre staff carried out the NQCM programme, whereas other countries appointed external agencies. After administration of the TALIS main survey, NPMs reported the outcomes of the national quality control work in the survey activities questionnaire. These outcomes are discussed in Chapter 7.

Monitoring the on-line questionnaires

The School Coordinators recorded the return status of the paper questionnaires on the Teacher Tracking Forms. Naturally, the tracking procedure for on-line questionnaires was different from the paper procedure because the coordinators did not have access enabling them to monitor the return status of the on-line instruments. School Coordinators indicated on the Teacher Tracking Forms whether a teacher was assigned an on-line questionnaire. National centres used the IEA SurveySystem Monitor module to track the completion status of all on-line questionnaires (see Chapter 8). Each NPM used a secured Internet website only available to him or her to monitor the real-time status of all respondents filling in the questionnaire. If a teacher or school principal who was expected to participate was not listed in the SurveySystem Monitor, the NPM asked the School Coordinator to find out why and follow up that person if necessary.

After survey administration, National Study Centre staff imported the participation information from the IEA SurveySystem Monitor reports into WinW3S.

Material receipt and preparing for data entry

The major tasks for NPMs immediately after administration of the TALIS main survey included retrieving and collating the materials from schools and verifying their integrity. On receiving survey materials from the schools, NPMs:

- checked that complete and appropriate questionnaires were received for every teacher listed on the Teacher Tracking Form;
- verified that all identification numbers on all paper instruments were accurate and legible;
- checked that the participation status recorded on the Teacher Tracking Forms matched the availability of questionnaires, the information on the paper questionnaires and the information in the on-line monitor; and

- followed up with schools that did not return all the survey materials or for which forms were missing, incomplete or otherwise inconsistent.

At the national centres, all necessary information about schools, principals and teachers as well as the return status of the questionnaires was recorded in WinW3S. NPMs then organised the paper questionnaires and corresponding forms for data entry (see Chapter 8).

Survey activities questionnaire

The TALIS SharePoint platform was used to make this questionnaire available on line to NPMs. The questionnaire collected valuable feedback on all of the tasks national centres had to complete during TALIS implementation.

The survey activities questionnaire was built of nine content sections with 79 item blocks and a total of 138 items. The questions pertained to problems or unusual occurrences with respect to within-school sampling, establishing school contact, preparing paper and on-line materials, administering paper and on-line materials, manual data entry and submission, and the NQCM programme.

NPMs used the survey activities questionnaire to report their experiences during all steps of survey preparation and administration. The ISC set up the questionnaire on SharePoint and administered it on line once data collection activities were completed. All data went to the ISC, and findings were taken into consideration during data adjudication. These results are reported throughout this technical report, for example in the chapters dedicated to quality control and data collection.

Summary

All but one participating country followed the survey operation procedures as outlined in the manuals and guidelines and in line with the TALIS technical standards. In Malaysia, the listing procedure for teachers was not followed in all schools, which as a result of the data adjudication process led to a later exclusion of those schools from the international dataset. Data were collected towards the end of the school year in all countries, which was a demanding exercise for some of them because that timing often collided with end of the year examinations or national surveys.

Countries administering the survey at different international options had to deal simultaneously with a huge number of preparatory, organisational, administrative and monitoring tasks. However, all countries but one managed to meet the critical benchmarks of 50% school participation of original sampled schools and 75% after replacement. Only one country had to perform a non-response bias assessment exercise at ISCED Level 1 before being included in the international report on TALIS 2013 data.

All National Study Centre staff were well organised. Smooth communication between the national centres and the ISC allowed for efficient workflows during data collection, thus generating data of a high quality.

References

- OECD (2013), *TALIS 2013 Main Survey Manual for National Quality Control Monitors* (prepared by the IEA Secretariat, Amsterdam, and the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012a), *TALIS 2013 Technical Standards* (prepared by the IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.
- OECD (2012b), *TALIS 2013 Sampling Manual* (prepared by Statistics Canada, Ottawa), OECD, Paris.
- OECD (2012c), *TALIS 2013 Main Survey Manual for School Coordinators* (prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012d), *TALIS 2013 Main Survey Manual for Data Managers* (prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012e), *TALIS 2013 Main Survey Manual for International Quality Control Monitors* (prepared by the IEA Secretariat, Amsterdam), OECD, Paris.
- OECD (2012f), *TALIS 2013 Main Survey Translation and Adaptation Guidelines* (prepared by the IEA Secretariat, Amsterdam, and the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012g), *TALIS 2013 Main Survey Guidelines* (prepared by IEA Data Processing and Research Center, Hamburg, IEA Secretariat., Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.
- OECD (2011), *TALIS 2013 Manual for National Project Managers* (prepared by IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.

Notes

- 1 The IEA DPC had prepared software packages for sampling, online data collection, data entry and data processing to fit the needs of TALIS. All participating countries were requested to solely use the IEA software to perform the survey; no exceptions were allowed.
- 2 See Chapter 5 for more details on school sampling.
- 3 Exceptions occurred for small countries where the sample size was reduced due to local circumstances.
- 4 Similar listing forms were also used for listing teachers of the international options.
- 5 For more details, see Chapter 5.

- 6 Countries were given the opportunity to sample more than the recommended 20 eligible teachers per school if desired.
- 7 Chapter 5 gives detailed information on the sampling algorithm and linkage of teacher lists.

Chapter 7: Quality Assurance

Abstract

This chapter describes the quality control programme developed and implemented for the TALIS survey administration. Assuring the quality of the TALIS 2013 data collection was a three-part process, comprising an international quality control monitoring programme overseen by the IEA Secretariat and designed to document the procedures for survey preparation and administration during the main survey data collection; national quality control programmes carried out by National Project Managers; and an on-line survey activities questionnaire that asked National Project Managers about aspects of the survey administration.

Overview of quality control for the TALIS survey administration

Considerable effort was taken to standardise the materials and procedures developed for administering the TALIS survey. This effort was necessary to ensure, as far as possible, that participants received comparable survey materials under comparable survey conditions, across all countries and languages and for each mode of the data collection (i.e. paper and on line). To assure the high quality of the TALIS data, quality control was implemented at different levels and stages during instrument production, administration and data entry/processing. The main purpose of the TALIS quality control programme was to document the extent to which each country implemented the standard operating procedures.

The information given in this chapter pertains to the outcomes of the quality control activities during the main survey. Quality control of the data collection in TALIS comprised three major parts:

- The IEA Secretariat organised and oversaw a standardised, international quality control programme of school and national centre visits by International Quality Control Monitors (IQCMs). This programme applied only to the main survey.
- The National Project Managers (NPMs) operated an additional national quality control programme of school visits during the field trial and main survey. The TALIS International Consortium provided a quality control manual template that countries could adapt to their needs and use as a basis for training the National Quality Control Monitors (NQCMs).
- Information from these activities was augmented by NPM responses to an on-line survey activities questionnaire conducted after administration of the main survey. The questionnaire asked NPMs about their respective national centre's implementation of the TALIS procedures at each stage of the project. The outcomes of the national quality control programme were also reported in the survey activities questionnaire and are presented later in this chapter.

TALIS 2013's different international options for the survey population (i.e. in addition to the core ISCED Level 2 population) also featured in the design of the quality control programme.

International quality control monitoring programme

NPMs and members of the TALIS 2013 Board of Participating Countries were asked to nominate suitably qualified individuals to carry out the international quality monitoring programme, which was conducted externally to the national centre. The IQCMs had to be familiar with survey-based research, familiar with the school environment and have good English-language skills. The IEA Secretariat selected and appointed one IQCM in each country. This person reported directly to the IEA Secretariat to ensure independence. IQCMs were permitted to recruit and share their duties with assistants in order to efficiently cover the territory and comply with the survey timeframe.

Prior to administration of the main survey, the IQCMs from the TALIS countries participated in a one-day training seminar on their role and responsibilities. The training sessions were held in Amsterdam, the Netherlands, in September 2012 for Southern Hemisphere countries and January 2013 for Northern Hemisphere countries (one IQCM received training remotely). During the training, IQCMs were introduced to the TALIS survey design and operating procedures, and received the following materials:

- TALIS 2013 Main Survey Manual for International Quality Control Monitors (OECD, 2012a) outlining the IQCM's role and responsibilities;
- TALIS 2013 School Visit Record Template, which provided a standardised, structured format for interviewing the School Coordinator (SC) on administration of the survey;
- TALIS 2013 Translation Verification Report Template, international survey instruments, and translation verification files/documentation; and
- USB stick containing all TALIS manuals and forms to be used during the data collection.
- In addition to these materials, IQCMs were required to collect the following documents from the national centre in their country:
 - National version of the *TALIS 2013 Main Survey Manual(s) for School Coordinators* (OECD, 2012b-g) – one for each surveyed population, administration mode and language.
 - National survey instruments.
 - Teacher Listing Form and Teacher Tracking Form for each school selected for observation.

IQCMs had three major duties with respect to the international quality control monitoring programme. Their first task involved visiting their country's NPM to collect national TALIS materials and select the 20 schools to be visited. During the school visits, IQCMs conducted standardised interviews on administering the survey with the SC. Responses to each interview were recorded in the School Visit Record. The third duty required IQCMs to prepare a translation verification report. Each country had to translate and/or adapt the TALIS materials to its situation and submit national instruments to the IEA Secretariat for translation verification. IQCMs were asked to review the national

instruments and document the use made of the translation verification results. They also were asked to compare the national version of the *Manual(s) for School Coordinators* with the international templates, in order to determine if the guidelines of the TALIS 2013 International Study Centre (ISC) had been followed. They confirmed that the manuals were in all cases correctly adapted and faithful to the international study design.¹

School visit design

In co-operation with the NPM, IQCMs in each country selected 20 of the sampled TALIS schools from a subset of schools meeting specific criteria.² For countries participating in one or more of the international options (ISCED Level 1, ISCED Level 3 and the TALIS-PISA Link³), the number of school visits was to be distributed according to the plan indicated in Table 7.1. This plan was designed to yield sufficient evidence of the quality of the data collection sessions across the surveyed populations.

Table 7.1 Planned distribution of school visits across international options

Participant	Surveyed population(s)	Number of planned school visits			TALIS-PISA LINK
		ISCED 1	ISCED 2	ISCED 3	
Brazil, Bulgaria, Chile, Croatia, Cyprus, Czech Republic, Estonia, France, Israel, Japan, Korea, Malaysia, Netherlands, Serbia, Slovak Republic, Sweden, United States, Alberta (Canada), England (United Kingdom)	ISCED 2		20 SCHOOLS		
Flanders (Belgium)	ISCED 1 AND ISCED 2	10 SCHOOLS	10 SCHOOLS		
Iceland, Italy, Abu Dhabi (United Arab Emirates)	ISCED 2 AND ISCED 3		10 SCHOOLS	10 SCHOOLS (5 VOC.)	
Denmark, Norway, Poland	ISCED 1, ISCED 2 AND ISCED 3	5 SCHOOLS	5 SCHOOLS	10 SCHOOLS (5 VOC.)	
Latvia, Portugal, Romania, Spain	ISCED 2 AND PISA LINK		10 SCHOOLS		10 SCHOOLS (5 VOC. IF INCLUDED)
Australia, Singapore	ISCED 2, ISCED 3 AND PISA LINK		5 SCHOOLS	10 SCHOOLS (5 VOC.)	5 SCHOOLS (NOT VOC. IF INCLUDED)
Finland, Mexico	ISCED 1, ISCED 2, ISCED 3 AND PISA LINK	5 SCHOOLS	5 SCHOOLS	5 SCHOOLS (VOC. ONLY)	5 SCHOOLS (NOT VOC. IF INCLUDED)

Source: OECD *TALIS Database*

The IEA Secretariat received documentation of the international quality control visits to schools from all but one of the countries (the Republic of Korea). Some IQCMs experienced difficulties in collecting information from the schools (affecting two school visits in England) or completing the interview with the School Coordinator (affecting one school visit in the United States). IQCMs successfully conducted 657 school visits in 33 countries. The data from the school visit records presented in this chapter are based on these visits.

During the school visits, IQCMs asked the SCs if the teacher population being surveyed at the school comprised ISCED Level 1, ISCED Level 2, ISCED Level 3 or TALIS-PISA Link teachers. Table 7.2 compares the expected distribution of school visits across the surveyed populations against the realised distribution, as reported by the coordinators. In about six percent of cases, the coordinators either did not know or did not provide the requested information. The data show that, overall, the intended distribution of school visits was well followed.

Table 7.2 Comparison of the planned and realised school visit design

School visits	ISCED 1 (%)	ISCED 2 (%)	ISCED 3 (%)	TALIS-PISA Link (%)	Total (%)	Missing (%)
Planned	5.2	72.8	13.2	8.8	100.0	0
Realised	5.8	67.9	13.5	7.2	94.4	5.6

Source: OECD *TALIS Database*

The results of the IQCMs' school visits across the different surveyed teacher populations are presented together, not separately by population.

School Coordinator interviews

Data collected for the School Visit Record came from a structured interview with the SC. The interview covered four topics: background information on the coordinator and the general context of the TALIS survey in the school, the coordinator's initial preparations for administering the survey, survey administration activities (including issues of confidentiality and security) and the coordinator's and IQCM's general impressions of the survey operations.

School Coordinators and the general school context

In all countries but one, the SCs were members of the school staff: about 25% of them were principals, 40% were other members of the school management, 11% were teachers and 9% were pedagogical support personnel. Approximately 98% of coordinators were responsible for one TALIS school only.

The coordinators in Mexico came from an external agency. In some other countries (e.g. from Latin America), the coordinator's duties (as outlined in the *Manual(s) for School Coordinators*) were shared by several people, some of whom were external to the schools. However, in order to get first-hand experience from the field, the IQCM interviews were targeted at coordinators in schools where the surveyed teacher populations were located. Subsequently some coordinators were unable to provide all requested information.

When coordinators were asked for their general impressions of the attitudes of other school staff towards TALIS 2013, most rated these attitudes as generally positive (49%) or neutral (46%); fewer than 5% reported negative attitudes. Coordinators most commonly characterised the negative attitudes as a product of the survey coinciding with busy periods in the school year, heavy staff workloads or a lack of understanding about the purpose and relevance of the survey.

Nearly half (49%) of the coordinators reported that sampled teachers received special instructions, motivational talks or incentives to encourage them to participate. This effort

tended to relate to a specific school culture rather than a country-wide arrangement. When motivational or instructional talks did take place, they were usually held during staff meetings or at a group session on survey distribution.

Nearly all SCs described teachers as co-operative, with the majority of them (56%) considering teachers “very co-operative”. Fewer than seven percent of the coordinators were aware of teachers refusing to participate in the survey; when this occurred, reasons for refusal included lack of time or motivation, absence, illness, and advice from the teachers’ union not to co-operate.

School Coordinators’ initial preparation work

The School Visit Record asked SCs about the training and other preparations they had completed in order to ready themselves for their role in TALIS. Table 7.3 presents the coordinators’ responses to these questions.

Approximately 32% of the coordinators interviewed reported attending a training session to prepare them for their role in TALIS, and about 38% stated they had previous experience serving as the SC for an international or national survey. Seven percent or fewer reported having doubts about or difficulties understanding the survey’s purpose, the teacher listing, teacher tracking and administration procedures and the security/confidentiality arrangements. The two most common areas of misunderstanding related to the teacher listing procedure (about 7%) and purpose of the survey (about 5%). Most coordinators reported that their respective *Manual for School Coordinators* was sufficient and helpful, and that NPMs were responsive to their questions and concerns.

Prior to the process of within-school sampling, coordinators completed the Teacher Listing Form. The *Manual(s) for School Coordinators* provided detailed information about whom to include on the form. About 10% of the coordinators said they had some difficulty completing the Teacher Listing Form, mainly because of uncertainty about listing certain teachers (e.g. special education, minority language or part-time teachers), lack of access to some of the information requested on the form and difficulties entering codes/dates. As occurred in TALIS 2008, some coordinators reported that locating and listing all the required information was a lengthy and time-consuming process, especially with respect to large schools. In approximately 11% of schools visited by IQCMs, the number of teachers appearing on the Teacher Listing Form was not the same as the number of teachers present in the classroom schedule. The reason for this discrepancy was almost always clarified as being due to recent staff changes, teacher absences and sabbaticals.

Table 7.3 Experiences, training, and initial preparations of the School Coordinator

Question	Yes (%)	No (%)	Missing (%)
Has the SC served as a school coordinator for any other survey or assessment (national or international)?	38.1	61.3	0.6
Has the SC attended a training session for the TALIS main survey school coordinators?	31.7	68.0	0.3
Did the SC have any doubts or problems understanding any of the following?			
Purpose of the survey	5.3	94.7	0
Teacher listing	6.8	93.2	0
Teacher tracking	3.4	96.3	0.3
Survey administration procedures	4.0	96.0	0
Security/confidentiality arrangements	2.9	97.1	0
Did the SC experience any difficulties completing the Teacher Listing Form?	9.7	89.5	0.8
Is the number of teachers in the Teacher Listing Form the same as the number of teachers present in the classroom schedule?	85.8	10.8	3.4

Source: OECD *TALIS Database**Survey administration activities*

The third section of the School Visit Record focused on survey administration activities. Table 7.4 gives an overview of these activities. Among the SCs interviewed, 82% to 91% reported that they explained to teachers the purpose of the survey, estimated time to completion, confidentiality arrangements and survey return procedures.

Approximately 70% of schools visited by IQCMs used on-line survey questionnaires exclusively, about 24% administered only paper-based questionnaires and another 6% of schools used both delivery modes.

In regard to distributing the TALIS questionnaires and/or cover letters, 88% of the SCs stated that they handed the materials one at a time to each teacher. About 91% of the coordinators reported that they distributed the questionnaires and cover letters in exact accordance with the Teacher Tracking Form. In cases where this was not done, often due to recent school staff changes or absences, the problem could usually be rectified or flagged in co-operation with the NPM. Completion of the Teacher Tracking Form went smoothly in just over 94% of cases.

Table 7.4 Questionnaire distribution and returns

Question	Yes (%)	No (%)	Missing (%)
Did the SC explain the following to each teacher?			
Purpose of the survey	91.2	8.2	0.6
Estimated time to complete	82.5	17.0	0.5
Confidentiality arrangements	86.6	12.9	0.5
Survey return procedures	83.4	16.1	0.5
Did the SC distribute questionnaires and/or cover letters one-at-a-time to each teacher?	88.0	11.4	0.6
Were the questionnaires and/or cover letters distributed exactly according to the Teacher Tracking Form?	90.7	8.4	0.9
Did the SC experience any difficulties completing the Teacher Tracking Form?	4.6	94.5	0.9

Source: OECD *TALIS Database*

The importance of respondent confidentiality and anonymity was impressed upon both the SCs and IQCMs. When coordinators were asked about provisions for keeping the information on the Teacher Tracking Form secure, 80% of them said that only they had access to the form. Fewer than two percent of the coordinators reported that anyone had access to the completed questionnaires, indicating that security and confidentiality measures were taken very seriously at the school level.⁴ When coordinators were asked to give their impressions of teachers' perceptions of the safety and security of the questionnaire data, only about four percent of them judged teachers as not confident about providing the information requested.

Table 7.5 Security and anonymity

Question	Yes (%)	No (%)	Do not know (%)	Missing (%)
Did anyone but the SC have access to the Teacher Tracking Form?	19.8	79.9		0.3
Did anyone have access to the completed questionnaires?	1.7	97.6		0.7
Did teachers feel confident (safe, secure) in providing the information requested by the questionnaire?	86.8	4.4	8.4	0.4

Source: OECD *TALIS Database*

General observations

The last section of the School Visit Record collected information on the SCs' and IQCMs' more general observations on the TALIS implementation. SCs were asked to indicate whether any principals or teachers had approached them to discuss or ask questions about the survey. When questions did arise, they covered various aspects. About 16% of SCs were asked to clarify items, 11% were approached about the purpose of the survey, 4% were asked about the survey return procedures, 3% were approached about an error spotted, and 10% received other questions about the survey (e.g. queries about confidentiality or requests for assistance in accessing the on-line questionnaire). Overall, 97% of the coordinators commented that the survey went "very well" or "satisfactorily", and a number of them expressed interest – also on behalf of the school principal and teachers – in the TALIS results.

IQCMs' overall impressions about the implementation of TALIS were positive. In their concluding remarks, many IQCMs praised the professionalism and cooperativeness of the SCs in assuring the success of survey operations at the school level. Feedback from the SCs and IQCMs also suggests that, despite concerns about lack of time, teachers were generally motivated to complete the questionnaire, particularly when they received clear communication about the purpose and benefit of the survey.

Survey activities questionnaire

The survey activities questionnaire covered all aspects of survey administration. The ISC prepared this questionnaire on line and delivered it to NPMs after all data had arrived at the ISC. The questionnaire, which contained nine content sections, 79 item blocks and 138 items, obtained information from the National Study Centres about all survey-related activities and the extent to which procedures and guidelines were followed. It also gave NPMs an opportunity to provide valuable feedback about all aspects of survey administration, including survey procedures, manuals, guidelines, support materials and software. The questionnaire was completed by all TALIS participants between February and September 2013. The following sections present the results of this survey.

Within-school sampling

The national centres in all countries used the Windows Within-School Sampling Software (WinW3S) provided by the ISC. NPMs in 29 TALIS countries reported that the Teacher Listing and Tracking Forms were easy to work with. NPMs in the other five countries found these forms somewhat challenging to work with. NPMs provided additional support to SCs to complete the forms at schools. Twenty-one percent of countries also used means other than the paper listing and tracking forms (i.e. Excel sheets, Word documents, e-mail, personal communication) to list and track teachers, compared to 62% in the first round of TALIS.

In general, 85% of the countries (83% in 2008) regarded the within-school sampling process with WinW3S as “not difficult at all”. Those countries that found the sampling procedure “somewhat difficult” mentioned the following reasons: the time-consuming nature of collecting information about teachers from schools and communicating with schools, the need for sampling procedures to be simpler and the need to improve software speed.

With regard to data protection and confidentiality laws, 11 countries reported restrictions on using teacher names on the listing and tracking forms as well as on the national questionnaires. In these cases, countries used numbers or codes on the forms.

Contacting schools

First contact with sampled schools was typically made by the NPM (23 countries), often together with other members of the national team (10 countries). In seven countries, the Ministry of Education made first contact, sometimes in conjunction with the national centre or with an external agency.

Although overall participation rates for TALIS 2013 were high, 24 NPMs reported difficulties in convincing schools to participate. Several national centres reported spending considerable time following up with school contacts. In some cases, schools did not respond definitively until it was too late to replace them. Strategies to overcome school reluctance to participate included multiple follow-up attempts and

co-operation with teacher unions or regional, state or national education authorities in requests to participate. About half of the participating countries successfully extended the internal survey deadline in order to improve the overall response rate. Reasons given for this initial reluctance included schools feeling “surveyed out”, the survey occurring at a difficult time of year, concern about confidentiality provisions or principals not wishing to place an extra burden on teachers. However, the international deadline for data submission was not affected by these internal extensions.

Eight NPMs reported difficulty in identifying or contacting SCs. Difficulties were generally associated with the lengthy process involved in appointing coordinators, coordinators being overloaded with work or the prospective coordinator being difficult to reach by telephone or e-mail.

Eleven countries held formal training sessions for their SCs. The remaining countries ensured that SCs were equipped with adequate written instructions and contact details in case of difficulties. In most cases, the written material consisted of the translated *TALIS 2013 Main Survey Manual(s) for School Coordinators*. For 22 NPMs, the adaptation and translation of this manual was “not difficult at all”. Eleven NPMs found the process “somewhat difficult”. Only one said the exercise was “very difficult” because of cultural customs requiring a different approach to introduce SCs.

Although the NPMs received full explanations about the terms and procedures to be used and applied in TALIS 2013, eight countries reported “some difficulties” in explaining important elements of the survey such as the teacher population definition or the assignment of exemption codes to teachers; six countries experienced some difficulties in explaining the main subject domains; and two countries experienced some difficulties when assigning the correct teacher questionnaire to the sampled teacher.

The ISC provided the National Study Centres with a software tool (IEA Participation Rate Estimator) to help NPMs keep track of the participation rates during data collection. Thirty TALIS participants made use of this tool for either the Online Survey System import, the Data Management Expert import or both.

Preparing paper questionnaires

The preparation of the paper questionnaires involved several steps outlined in the TALIS 2013 Manual for National Project Managers (OECD, 2011), TALIS 2013 Main Survey Guidelines (OECD, 2012h) and the TALIS 2013 Main Survey Translation and Adaptation Guidelines (OECD, 2012i). National centres first prepared all national adaptations, received approval from the ISC and continued to engage in the translation process. International translation verifiers, whose work was coordinated by the IEA Secretariat, then verified the translated ISCED Level 2 instruments. For ISCED Level 1 and 3 instruments, translation verification was only applied to the required adaptations specific for these instruments compared to ISCED Level 2. After completion of the translation verification process, the NPMs revised and finalised the paper instruments, taking into account the verifiers’ suggestions. The ISC verified the layout of all submitted instruments and gave their final approval for launching the printing process at national centres or, if on-line data collection had been selected, for preparing the on-line instruments.

Acknowledging that translation and adaptation of survey instruments is a difficult exercise in any cross-national study, the ISC supported the process by providing a structured approach for the instrument preparation process, which included individualised

translation verification schedules, additional support materials (e.g. glossary of terms) and documentation guidelines. When countries were asked after completion of the instrument adaptation and translation work about their experience of the process, 12 reported that it was “not difficult at all”, 21 found it “somewhat difficult” and one country “very difficult”. Suggestions for further improvements included using terminology in the source versions of the instruments that could be easily applied and translated by all countries, further elaborating the definitions and descriptions of terms and concepts provided in the glossary and reducing the number of review cycles during layout verification.

Overall, 24 countries reported that the documentation of the national adaptations was a straightforward task. Only 10 countries characterised it as “somewhat difficult”. Almost all countries considered the translation and adaptation guidelines as useful for facilitating completion of the task.

Preparing on-line questionnaires

After completion of the adaptation and translation/verification process of the paper instruments, 27 countries that had selected the on-line data collection mode prepared on-line instruments using the Online Survey Designer, a software tool provided by the ISC.

Sixteen countries experienced no difficulties during on-line instrument preparation whereas 10 countries found this task “somewhat difficult”, mostly because it was time-consuming and because implementing the national options was not entirely straightforward. Countries suggested that a coherent on-line system for adaptation, translation and verification would simplify and improve the instrument preparation process.

In summary, all countries followed the agreed upon timeline and completed the instrument preparation work on schedule and to a high quality.

Paper administration

Eighteen TALIS participants administered paper instruments in schools. Four countries completed data collection in paper mode as scheduled; one country completed this work earlier than planned. Thirteen countries faced challenges during paper questionnaire administration and requested an extension of the planned survey window so they could meet the necessary minimum participation-rate requirements at school and teacher level. Sixteen countries did not respond to this question in the survey activities questionnaire. Except for one country, all TALIS participants completed their data collection period before the end of May and submitted their national survey data and documentation on 31 May 2013 (i.e. on time) and to a high standard.

On-line administration

The on-line data collection (administered by 27 countries) was a highly appreciated option that helped to reduce data-entry and data-processing time once all data had been collected. The majority of countries did not report any problems during data collection. Although not critical for participation rates, in some countries (e.g. Australia), teachers were not able to complete the on-line questionnaires due to technical difficulties (ODC server maintenance, local firewall settings, incorrect log-in details). Twelve countries provided valuable feedback on how to improve this mode of data collection, including improving log-in procedures. Countries that experienced difficulty with local firewall settings requested help to resolve this problem. Some teachers in some countries found it

difficult to activate the correct URL to open the pre-defined ISCED level questionnaire, mostly due to them not correctly entering the web address or log-in information. TALIS ISC staff members co-operated closely with the National Study Centres, providing technical support as needed.

To monitor the on-line data collection process and participation progress on a daily basis, the ISC provided a software tool called the Survey System Monitor. This tool proved to be very helpful and was used several times per week or daily by 23 countries and about once a week by three countries. Twenty-four countries characterised the System Monitor listing as useful.

Manual data entry and submission

All countries received training in how to perform manual data entry according to the rules and standards outlined in the *TALIS 2013 Main Survey Manual for Data Managers* (OECD, 2012j) and the *TALIS 2013 Technical Standards* (OECD, 2012k) and using IEA's Data Management Expert (DME) software. Eighteen countries achieved manual data entry and submitted their data and documentation by 31 May 2013. As an important quality control measure, countries were required to perform double entry of a sampled set of teacher and principal questionnaires to ensure high-quality data entry.

National quality control monitoring programme

Most of the NPMs organised and directed a national quality control monitoring programme during the main data collection with the aim of receiving structured feedback about the survey administration in their country. NPMs were asked about their national quality control programme in the final section of the survey activities questionnaire, but were not required to submit data collected by NQCMs to the ISC.

The TALIS Consortium developed a manual template to assist NPMs to conduct their national quality control programme and train the NQCMs. National centres could use the *TALIS 2013 Main Survey Manual for National Quality Control Monitors* (OECD, 2013) in its original version or adapt it to fit the country's needs (e.g. to accommodate national options or cover aspects important for the national centres, such as communication and publicity at the national level or on-line resources for the School Coordinators).

Altogether, 21 countries reported running a national quality control programme for the main survey, and 14 countries used the supplied manual template. NPMs in six countries said they made significant adaptations to the template (e.g. adding questions or adapting it to suit on-line administration). NQCMs were most commonly appointed from among national centre personnel (including the NPM in two countries) and external research agencies. Three countries engaged IQCMs also for their national quality control monitoring. The NQCMs visited an average of 26 schools per country.⁵

NPMs were asked to report any major problems that NQCMs observed. Relatively few problems were reported. Those that were included errors in the Teacher Listing and/or Tracking Forms, logistical difficulties with accessing the on-line questionnaires, unmotivated teachers (attributed to teachers' high workload and/or anonymity concerns) and concerns about the length and complexity of the questionnaires.

NPMs were also asked whether their respective country carried out specific national monitoring activities. NPMs in 13 countries reported that the number of teachers in the Teacher Listing Form had been checked for correspondence with the number of teachers present in the classroom schedule for the target population. In 17 countries, NPMs said

they had monitored whether the School Coordinators distributed the teacher questionnaires (or cover letters) in exact accordance with the information on the Teacher Tracking Form.

Summary

The TALIS quality control programme was an integral part of the study at both the international and national levels. The documentary record of school visits as well as the feedback received from NPMs provided important documentation of participating countries' adherence to the standardised survey administration guidelines and procedures.

The School Visit Record and the survey activities questionnaire provided information on major aspects of the survey activities and experiences from the individuals involved in the TALIS administration – information that can be used to improve the procedures for subsequent cycles. The results from these records indicate that, in the great majority of cases, the survey procedures were well followed and the overall impressions of the survey were positive. When difficulties were encountered, these were generally resolved in consultation with the operational manuals or flagged in co-operation with members of the national centres and the TALIS International Consortium. Such findings from the TALIS quality control programme reflect the high quality of the TALIS procedures and underscored the importance of good communication and support at all stages of the project.

References

- OECD (2013), *TALIS 2013 Main Survey Manual for National Quality Control Monitors* (prepared by the IEA Secretariat, Amsterdam, and the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012a), *TALIS 2013 Main Survey Manual for International Quality Control Monitors* (prepared by the IEA Secretariat, Amsterdam), OECD, Paris.
- OECD (2012b), *TALIS 2013 Main Survey Manual for School Coordinators* (mixed mode, ISCEDx template, prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012c), *TALIS 2013 Main Survey Manual for School Coordinators* (mixed mode, TALIS-PISA Link template, prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012d), *TALIS 2013 Main Survey Manual for School Coordinators* (on-line data collection, ISCEDx template, prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012e), *TALIS 2013 Main Survey Manual for School Coordinators* (on-line data collection, TALIS-PISA Link template, prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012f), *TALIS 2013 Main Survey Manual for School Coordinators* (paper, ISCEDx template, prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012g), *TALIS 2013 Main Survey Manual for School Coordinators* (paper, TALIS-PISA Link template, prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012h), *TALIS 2013 Main Survey Guidelines* (prepared by the IEA Data Processing and Research Center, Hamburg, IEA Secretariat., Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.
- OECD (2012i), *TALIS 2013 Main Survey Translation and Adaptation Guidelines* (prepared by the IEA Secretariat, Amsterdam, and the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012j), *TALIS 2013 Main Survey Manual for Data Managers* (prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2012k), *TALIS 2013 Technical Standards* (prepared by the IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.
- OECD (2011), *TALIS 2013 Manual for National Project Managers* (prepared by the IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.

Notes

- 1 Malaysia did not use the School Coordinator Manual.
- 2 Schools had to be located within reasonable driving distance to allow IQCMs to visit two schools per working day, on average. The schools selected for the international quality control monitoring programme should not have been part of the national quality control programme. For more details about the school selection process, see Section 4.3 of the TALIS 2013 Main Survey Manual for International Quality Control Monitors (OECD, 2012a).
- 3 See Chapter 5 for more information on the sampling design.
- 4 Chapter 8 describes provisions for preserving the anonymity of responses in the international database.
- 5 The total number of school visits per country ranged from 0 to 80 schools. Three countries administered an on-line questionnaire to School Coordinators in lieu of school visits.

Chapter 8: Creating and Checking International Database

Abstract

This chapter offers an overview of the strategy used to create the TALIS 2013 International Database. It describes the data entry and verification tasks employed by the National Study Centres and the exchange of data and documentation between these centres and the International Study Centre. It further describes the integration of data from the paper and on-line administration modes at the International Study Centre and the individual steps of the data editing and database creation procedures implemented there, including the detection and resolution of inconsistencies in the data. Finally, it gives an overview of the interim data produced and the steps that all involved centres took to confirm the integrity of the International Database.

Overview

Creating the TALIS 2013 International Database (IDB) and ensuring its integrity required close co-ordination and co-operation among the International Study Centre (ISC), Statistics Canada, the OECD Secretariat and the National Project Managers (NPMs). This chapter describes the data entry and verification tasks undertaken by the national centres, the integration of data from the paper and on-line administration modes, the data-editing and database creation procedures implemented by the ISC, and the steps taken by all involved centres to confirm the integrity of the IDB.

The primary goals of this work were directed towards ensuring that:

- all national adaptations to questionnaires were reflected appropriately in the codebooks and corresponding documentation;
- all national information eventually conformed to the international data structure and coding scheme; and
- any errors, such as logical inconsistencies or implausible values given by respondents or those occurring during data entry, were minimised as much as possible.

The quality control measures applied throughout the process were identical for all four target populations (the ISCED Level 2 core, ISCED Level 1, ISCED Level 3 and the TALIS-PISA Link).

The IEA'S Data Processing and Research Center (IEA DPC) supplied the national centres with the Online Survey System software (OSS), the Data Management Expert software (DME) and supporting documentation in the *TALIS 2013 Main Survey Manual for Data Managers* (OECD, 2012).

The IEA DPC also held a three-day data-management training session in Cancun, Mexico, November 2011, covering software usage, procedures for national adaptations,

and rules and procedures for data entry. The seminar was specifically targeted at the national team member(s) responsible for data management and liaising with the IEA DPC. In addition, after the TALIS 2013 field trial, NPMs were informed of software improvements at the third NPM meeting in Reykjavik, Iceland, July 2012.

On-line data collection mode and evaluation

TALIS offered on-line data collection as an international option conducted using a mixed-mode design. This design meant that participating countries could adopt the option as a default means of data collection for all schools and respondents, for selected schools only or for a particular ISCED level or population, that is, school principals or teachers. National centres had to ensure that individual respondents who refused to participate in the on-line mode or did not have access to the Internet were provided with a paper questionnaire, thereby ruling out non-response as a result of a forced administration mode.

Data from different collection modes were merged to a single set per ISCED level and country. Potential sources of error originating from the use of the two parallel modes had to be controlled for and reduced as much as possible to ensure uniform and comparable conditions across modes as well as countries. The design established several general similarities to achieve this: questionnaires in both modes were self-administered and in layout and appearance comparable; the same sample design and procedures were used to identify respondents; the same methods were used to contact respondents and to validate their participation; and data collection by both modes occurred over the same period of time.

The electronic versions of the TALIS questionnaires could only be filled in via the Internet. No other options were permissible, such as sending PDF documents by e-mail or printing out the on-line questionnaires and mailing them to the national centres. Because the on-line data collection option for TALIS was designed specifically with respect to educational surveys and specific operations, successful administration of electronic questionnaires relied on the mandate that countries use only software provided by the TALIS 2013 International Consortium.

To properly sequence preparation tasks and processes and to ensure comparability of data, the paper versions of the three questionnaire types (i.e. principal, teacher and mathematics teacher module) had first to be finalised in terms of their translation and layout verification, even if the expectation was that all or nearly all of the data would be collected on line. These final paper versions of the questionnaires were converted for the on-line mode, followed by final verification of their structure, text and layout.

In addition to these considerations, the design ensured that on-line respondents needed only an Internet connection and a standard Internet browser. No additional software or particular operating system was required.

The navigational concept for the on-line questionnaire had to be as similar as possible to that of the paper questionnaires. Respondents could use “next” and “previous” buttons to navigate to an adjacent page, as if they were flipping physical pages. In addition, a hypertext “table of contents” mirrored the experience of opening a specific page or question of a paper questionnaire. While most respondents followed the sequence of questions directly, these two features allowed respondents to skip or omit questions just as if they were answering a self-administered paper questionnaire.

To further ensure the similarity of the two sets of questionnaires, responses to the on-line questionnaires were not made mandatory, evaluated or enforced in detail (e.g. using hard validations). Instead, some questions used soft validation, such as respondents being asked to give several percentage numbers that would supposedly add up to 100%. For these questions, the sum was constantly updated according to the respondent's entries and was highlighted in red as long as it differed from 100%. Even if a response remained red, respondents could proceed to the next question.

Certain differences in the representation of the two modes remained, however. To reduce response burden and complexity, the on-line survey automatically skipped questions not applicable to the respondent, in contrast to the paper questionnaire, which instructed respondents to proceed to the next applicable question. Rather than presenting multiple questions per page, the on-line questionnaire proceeded question by question. While vertical scrolling was required for a few questions, particularly the longer questions with multiple “yes/no” or Likert-type items, horizontal scrolling was not. Because respondents can easily estimate through visual cues the length and burden of a paper questionnaire, the on-line questionnaires attempted to offer this feature through progress counters and a “table of contents” that listed each question and its response status. Multiple-choice questions were implemented with standard HTML radio buttons.

National centres were provided with a tool to monitor on-line participation. Due to confidentiality concerns, this tool was not provided to the School Coordinators, many of whom were colleagues of the respondents.

Data entry and verification of paper questionnaires at national centres

Each national centre was responsible for transcribing into computer data files the information from the principal questionnaire, the teacher questionnaire and, if applicable, the mathematics teacher module.

National centres entered responses from the paper questionnaires into data files created from an internationally predefined codebook, which contained information about the names, lengths, labels, valid ranges (for continuous measures or counts) or valid values (for nominal or ordinal questions) and missing codes for each variable in each of the three questionnaire types. Before data entry commenced, National Data Managers were required to adapt the codebook structure to reflect any approved adaptations made to the national questionnaire versions (e.g. a nationally added response category). The IEA DPC verified these adapted codebooks, which then served as templates for creating the corresponding data set.

In general, national centres were instructed to discard any questionnaires that were unused or returned completely empty, but to enter any questionnaire that contained at least one valid response. To ensure consistency across participating countries, the basic rule for data entry in DME required national staff to enter data “as is” without any interpretation, correction, truncation, imputation or cleaning. The resolution of any inconsistencies remaining after this data-entry stage was delayed until data cleaning (see below).

The rules for data entry meant that:

- Responses to categorical questions were generally coded as “1” if the first option (checkbox) was used, “2” if the second option was marked, and so on.
- Responses to “check-all-that-apply” questions were coded as either “1” (marked) or “9” (not marked/omitted).
- Responses to numerical or scale questions (e.g. school enrolment) were entered “as is”, that is, without any correction or truncation, even if the value was outside the originally expected range (e.g. if a teacher reported that he or she spent 80 hours a week on teaching students in school). If countries needed to enter values that exceeded the defined variable width, they submitted these few values using an Excel sheet, and the values were later included during data processing at the IEA DPC.
- Likewise, responses to filter questions and filter-dependent questions were entered exactly as filled in by the respondent, even if the information provided was logically inconsistent.
- If responses were not given at all, not given in the expected format, ambiguous or in any other way conflicting (e.g. selection of two options in a multiple-choice question), the corresponding variable was coded as “omitted or invalid”.
- During data capture, TALIS did not use a separate code to identify “not administered” questions, such as those that were misprinted. In these highly infrequent cases, the “omitted or invalid” code was used.

Data entered with DME were automatically validated. First, the entered respondent ID had to be validated with a three-digit code – the checksum (generated by WinW3S). A mistype in either the ID or the checksum resulted in an error message that prompted the data-entry person to check the entered values. The data-verification module of DME also enabled identification of a range of problems such as inconsistencies in identification codes and out-of-range or otherwise invalid codes. These potential problems had to be resolved or confirmed in order to resume data entry.

To check the reliability of the data entry within the participating countries, their national centres were required to have at least 100 completed principal questionnaires and 5% of the total number of completed teacher questionnaires (or at least a minimum of 100 teacher questionnaires) entered twice by different staff members as early as possible during the data-capture period. This procedure allowed data managers and the IEA DPC to identify possible systematic or incidental misunderstandings or mishandlings of data-entry rules and to initiate appropriate remedial actions, for example, re-training national centre staff. The acceptable level of disagreement between the originally entered and double-entered data was established at one percent or less; any value above this level required a complete re-entry of data. This restriction guaranteed that the margin of error observed for processed data remained well below the required threshold.

Before sending the data to the IEA DPC for further processing, national centres carried out mandatory verification steps on all entered data and undertook corrections as necessary. The corresponding routines were included in the DME software, and the data files were systematically checked for duplicate identification codes and data outside the expected valid range or values defined as valid. Data managers reviewed the corresponding reports, resolved any inconsistencies and, where possible, corrected

problems by looking up the original survey questionnaires. Data managers also verified that all returned non-empty questionnaires were in fact entered and that the availability of data corresponded to the participation indicator variables and entries on the tracking forms.

In addition to the data files described above, national centres provided the ISC with detailed data documentation, including hard copies or electronic scans of all original Teacher Tracking Forms and a report on data-capture activities collected as part of the on-line survey activities questionnaire. The DPC already had access to electronic copies of the national versions of all questionnaires and the final national adaptation forms as part of the layout verification process.

While the questionnaire data were being entered, the data manager at each national centre used the information from the Teacher Tracking Forms to verify the completeness of the materials. Participation information (e.g. whether the concerned teacher had left the school permanently between the time of sampling and the time of administration) was entered in the WinW3S within-school sampling software.

Data checking, editing and quality control at the IEA DPC

Once the data were submitted to the ISC, data processing commenced. The objective of the process was to ensure that the data adhered to international formats, that information from principals and teachers could be linked across different survey files and that the data accurately and consistently reflected the information collected within each participating country. The IEA DPC went to great lengths to ensure that the data received from participating countries were internationally comparable and of high quality. The foundation for quality assurance was laid before the data first arrived at the IEA DPC through the provision of manuals, training and software designed to standardise a range of operational and data-related tasks, and through verification of the content and layout of the national adaption forms, paper questionnaires, on-line questionnaires and codebooks.

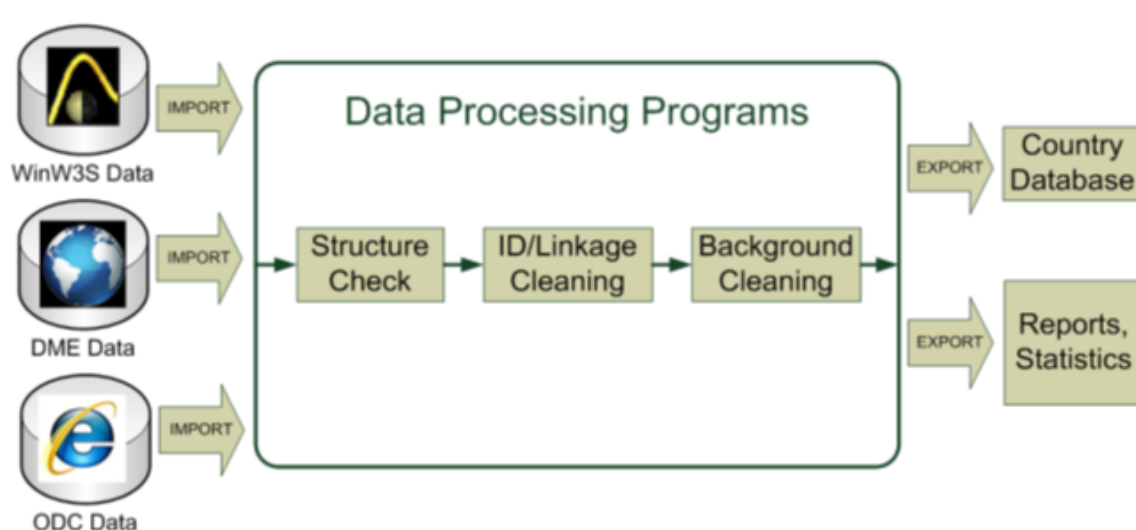
- The WinW3S software performed the within-school sampling operations, strictly adhering to the sampling rules defined by TALIS. The software also created all necessary listing and tracking forms and stored school- and teacher-specific information, such as gender and participation status. In addition, it included a participation rate estimation tool that kept data managers up to date on their current participation rate according to the already returned paper questionnaires or submitted on-line questionnaires.
- The DME software enabled entry of all questionnaire data in a standard, internationally defined format. The software also included a range of checks for data verification. If countries wanted to use different tools to enter their data, the DME provided them with the possibility of importing these data and verifying them with the same range of checks as countries entering the data directly via the DME software.

A complex study such as TALIS requires a correspondingly complex data-cleaning design. The IEA DPC accordingly developed processing tools in Structured Query Language (SQL) and, where necessary, in Statistical Package for the Social Sciences (SPSS). The DPC took the following steps to ensure that programs ran in the correct sequence, that no special requirements were overlooked and that the cleaning process was implemented independently of the persons in charge.

- Before being used with real data, all data-cleaning programs were thoroughly tested using simulated data sets containing all the expected problems or inconsistencies.
- To document versions and updates, all incoming data and documents were registered in a specific material receipt database. The date of arrival was recorded, along with any specific issues meriting attention.
- All national adaptations and all detected deviations from the international data structure were recorded in a “national adaptation database” and verified against the national instruments, the codebooks and the contents of the data itself. The reports from this process are available for data analysts in the TALIS 2013 User Guide (OECD, 2014).
- The cleaning was organised according to rules strictly and consistently applied to all national data sets, making deviations in the cleaning sequence impossible.
- All systematic or manual corrections made to data files were implemented and recorded in specific cleaning reports for TALIS Consortium and NPM review and approval.
- On completion of the data cleaning for a participating country, all cleaning checks were repeated from the beginning to detect any problems that might have been inadvertently introduced during the cleaning process itself.

Figure 8.1 provides a schematic overview of this iterative process conducted in co-operation with the national centres. The sequential data-cleaning steps displayed in the exhibit are described in more detail in the following sections.

Figure 8.1 Iterative data-cleaning process



Source: OECD

Import, documentation and structure check

Data cleaning began with an analysis of the submitted data-file structures and a review of data documentation, that is, on the Teacher Tracking Forms. Most countries submitted all required documentation along with their data, which greatly facilitated the data checking. The IEA DPC contacted those countries returning incomplete data or documentation to obtain any missing material. As soon as all required material was received, further data processing began.

Next, all available codebooks and data were imported from the source files and combined in the SQL database. During this step, both the data originating from the paper questionnaires and the on-line questionnaires were combined and checked for structural agreement. In all cases, the data from both administration modes were structurally equivalent and made use of the same valid and missing codes. The early combination of these data in the import stage ensured that data resulting from both administration modes were fed through the same data-processing steps and checks as described in the remainder of this chapter.

Because the international structure of the files did not differ, data from all ISCED levels were processed with the same checks in the same database.

The structure check implemented at the IEA DPC looked for differences between the international and the national file structures. As described above, some countries made structural adaptations to the questionnaires, the extent and nature of which differed greatly across participating countries. Whereas some countries administered the questionnaires without any changes, except for translations and necessary cultural adaptations, others inserted or removed questions or options within existing international variables or added entirely new national variables.

Given the associated risk of deviating from the international data structure, NPMs wishing to make such changes had to follow certain strict rules to allow unequivocal integration of nationally adapted variables for international comparison. Where necessary, the IEA DPC modified the data according to the international design to ensure that the resulting data were internationally comparable. For instance, additional national options in multiple-choice questions were recoded (mapped) in such a way that they adhered to the international code scheme. National variables were created to hold the original values for later use in national reports.

NPMs and data managers received detailed reports on structural deviations together with documentation on how the DPC resolved them. In a few cases, data were not available for certain variables because the corresponding question was not administered nationally (see the *TALIS 2013 User Guide*, OECD 2014). There was no instance of data having to be removed from the IDB because of information not being internationally comparable.

Identification variable and linkage cleaning

To uniquely identify, track and document each participant and each corresponding questionnaire in a survey, each record in a data file needs to have an identification number specific to it. The existence of records with duplicate identification (ID) numbers in a file implies an error. In TALIS, if two records shared the same ID number and contained exactly the same data, one of the records was deleted and the other left in the database. If the records contained different data (apart from the ID numbers), and it was impossible to identify which record contained the “authentic” data, NPMs were consulted

to resolve the matter. On occasion, respondents from countries participating in the additional TALIS options (ISCED Level 1, ISCED Level 3 or TALIS-PISA Link) answered the wrong ISCED-level questionnaire. When this happened, the data for all ISCED-level-dependent questions were copied over to the correct ISCED level.

In TALIS, data collected at the school level were recorded in the principal file. It was crucial that the records from these files could be linked to the multiple teacher-level records for that school, that is, 1:n. In both cases, the linkage was implemented through a hierarchical ID numbering system, was cross-checked against the tracking forms and corrected if necessary.

Further ID cleaning focused on consistent tracking of information between the data used for listing, sampling and tracking in WinW3S and the actual responses in the questionnaire. When necessary, variables pertaining to teachers' gender, year of birth, exclusion status and participation status were verified and checked against the original paper Teacher Tracking Forms.

Where possible, the DPC sought close co-operation with the national centres in order to resolve ID or linkage inconsistencies. For this purpose, NPMs and data managers received standardised reports containing each identified inconsistency. Once the ID, linkage, participation and exclusion information was finalised, data were transferred to Statistics Canada and used to calculate participation rates, exclusion rates and, finally, sampling weights.

Resolving inconsistencies in questionnaire data

After the national data structure had been matched to the international as specified in the international codebooks, and all ID and linkage issues resolved, a series of standard cleaning rules was applied to the files. The process, conducted through the SQL programs developed at the IEA DPC, identified and in many cases automatically corrected inconsistencies in the data. The DPC documented details about all cleaning checks, procedures and actions applied to the data, sent these to the national centres and explained them during the fourth NPM meeting in October 2013.

Filter questions, which appeared in certain positions in the TALIS 2013 questionnaires, were used to direct respondents to a particular question or section of the questionnaire. Filter questions and their dependent questions were treated automatically in most cases. If the filter question contained a value and the dependent questions were validly skipped, dependent variables were coded as “logically not applicable”. If a response to a filter question was equivalent to “no”, meaning that the dependent questions were not applicable, and yet the dependent questions were answered in an ambiguous pattern, the dependent variables were set to “logically not applicable” regardless of the value originally recorded in the dependent variable. Questions 7, 8, 28 and 48 in the teacher questionnaire and Question 28 in the principal questionnaire were exceptions to this general rule.

Split-variable checks were applied to “yes/no” lists and “check-all-that-apply” questions for which the responses needed to be coded into several variables. For example, Question 15 in the teacher questionnaire listed a number of subjects and asked teachers to mark whether they taught them with “yes”. Occasionally, teachers marked some yes or no boxes or just the yes boxes but also left some of the no boxes unchecked, resulting in “omitted” values in the data file. Because, in these cases, it could be assumed that the unmarked boxes actually meant no, the corresponding variables were imputed.

The individual responses to percentage questions were summed. If these values fell outside the 90 to 110 range (PQ-19), or the 45 to 110 range (TQ-39) or if any of them were larger than 100, they were set to omitted.

Variables with implausible numerical values were also set to omitted. For example, Question 38 in the teacher questionnaire asked respondents to give the average number of students in the target class. Values exceeding 100 were set to omitted.

Finally, inconsistencies between the listing information in the Teacher Tracking Forms and the actual responses of the teachers regarding their age and gender were resolved in such manner wherein the teacher-supplied information was given precedence.

The number of inconsistent or implausible responses in the data files varied from one country to another, but no national data were completely free of inconsistent responses. Each problem was recorded in a database, identified by a unique problem number and including a description of the problem and of the automatic action taken by the program or the manual action taken by DPC staff. Staff referred issues that could not be corrected using systematic rules to the relevant NPM so that original data-collection instruments and tracking forms could be checked to trace the source of the inconsistency. Whenever possible, staff at the IEA DPC suggested a solution and asked the NPMs either to accept it or to propose an alternative. Data files were then updated to reflect the agreed-upon solutions. Both systematic corrections and those apparent on a case-by-case level were applied directly in SQL program syntax and carried out automatically for each cleaning run.

Where a NPM could not solve problems by inspecting the instruments and forms or could not suggest a satisfying solution or explanation, the TALIS Consortium defined the final cleaning rules. Any systematic content edits were agreed upon by the IEA DPC and OECD and documented for use by the NPM.

Final action for yes/no lists or check-all-that-apply questions with two or more items

PQ-7, PQ-11, PQ-13, PQ-17, PQ-18, PQ-20, PQ-24, PQ-25, PQ-28, PQ-33, PQ-35, TQ-14, TQ-15, TQ-19, TQ-20, TQ-21, TQ-22, TQ-24, TQ-28, TQ-48, and TQ-49: for lists that were partially answered with “yes”, “no” and “omitted”, all omitted responses were recoded to no.

Final action for logically inconsistent filter/dependent responses

PQ-7 (part a vs. b), PQ-13 (Part A vs. B), PQ-16/17, PQ-23/24, PQ-27/28 and 29, PQ-33/34 and 35, PQ-36/37, TQ-3/4, TQ-7/8, TQ-21 (Part A vs. B), TQ-21/22 to 25, TQ-22 (Part A vs. B), TQ-28/29 and 30, TQ-36/37 to 43, TQ-48/49, MTM-8/9: if, for all affected questions but TQ-7/8, the filter question was answered negatively (“no”), the dependent variables were set to “logically not applicable” regardless of the originally recorded value in the dependent variable.

A special treatment for PQ-28 (“not used in this school” vs. all other categories of this question), TQ-28 (“I have never received this feedback in this school” vs. all other categories of this question) and TQ-48 (“No” vs. all other categories of this question) was implemented. All other categories within a dimension were set to “not marked” to resolve logical inconsistencies that appeared within the dimension. For example, if the “I have never received this feedback in this school” option TQ-A1-A6 was marked, all other options (“External individuals or bodies”, “School principal”) would be unmarked.

A special treatment for TQ-7/8 was previously agreed with Statistics Canada for weighting purposes and calculation of the teacher multiplicity factor (WGTADJ4) (see Chapter 9 for more details).

If TQ-7 is “yes” (1) and TQ-8 is omitted or zero (0) → recode TQ-7 to “no” (2) and TQ-8 to “logically not applicable”.

If TQ-7 is “no” (2) and TQ-8 is zero (0) or one (1) → recode TQ-8 to “logically not applicable”.

If TQ-7 is “no” (2) but TQ-8 is two (2) or more → recode TQ-7 to “yes” (1).

Final action for out-of-range percentage sums

PQ-19: set entire set of variables to “omitted” if the sum of percentages falls outside of 90-110. If any individual variable is larger than 100 → set this variable to “omitted”.

TQ-39: set entire set of variables to “omitted” if the sum of percentages falls outside of 45-110. If any individual variable is larger than 100 → set this variable to “omitted”.

Final action for out-of-range/improbable numerical variables

PQ-4a/b: if value is higher than 50 → set to omitted.

PQ-4c/d/e: if value is higher than 49 → set to omitted.

PQ-7(Part B): if number of days is higher than a plausible maximum within 12 months (i.e., 365) → set to omitted.

PQ-12A: if value is zero (0) in the questionnaire → set to omitted.

PQ-12a-e: if value is higher than 500 → set to omitted.

PQ-12d: if value is zero (0) in the questionnaire → set to omitted.

TQ-5a/b: if value is higher than 58 → set to omitted.

TQ-5c/d: if value is higher than 57 → set to omitted.

TQ-16/17/18: if value is higher than 120 → set to omitted.

TQ-21 (Part B): if number of days is higher than a plausible maximum within 12 months (i.e., 365) → set affected value to omitted.

TQ-38: if enrolment is zero (0) or larger than 100 → set to omitted.

MTM-5: if value is outside of range of 1-10 → set to omitted.

MTM-6: if value is outside of range of 30-240 → set to omitted.

Final recoding for inconsistent teacher age and gender in listing and questionnaire information

PQ-1, TQ-1, TQ-2, GENDER (gender on listing form), ITBIRTHY (birth year on listing form):

Limit ITBIRTHY to plausible values: 1936-1995, set to omitted if outside of range.

Gender (TQ-1 vs. GENDER): (a) believe questionnaire information and substitute listing information gender in case it is missing or inconsistent; (b) impute missing questionnaire value from listing if questionnaire variable was omitted.

Age teacher (TQ-2, ITBIRTHY): (a) believe questionnaire information and delete listing information if inconsistent; (b) impute missing questionnaire value from listing form.

Age principal (PQ-2): set to omitted if outside of range of 23-73.

Handling of missing data

During the TALIS data entry at the national centres using DME, two types of entries were possible: valid data values and missing data values. Data-entry staff could assign either the valid values or a value for “omitted/invalid”. Later at the IEA DPC, additional missing values were applied to the data for further analyses and to differentiate response behaviour.

In the international database, four missing codes were used:

- Omitted/invalid (9): the respondent had the opportunity to respond to the question, but did not do so or provided an invalid response. The value was also assigned in extremely rare cases where questions were misprinted or otherwise not legible.
- Not administered (8): If the returned questionnaire was empty, all variables referring to that instrument were coded as not administered (unit non-response). In addition, a country may have chosen not to administer a certain question in their national questionnaire as documented in the NAF. The variables corresponding to the question that was not administered were coded as “not administered”. The same rule applied if all respondents for a questionnaire left out a particular variable.
- Not reached (7): A special missing code was assigned to questions that were deemed “not reached” to distinguish them from “omitted” responses. Omitted questions were those that a respondent most probably read but either consciously decided not to answer or accidentally skipped. In other words, the respondent started answering the questions but stopped answering before the end of the questionnaire, probably because of a lack of time, interest or willingness to co-operate. Not reached variables were exclusively located towards the end of the questionnaires.
- Logically not applicable (6): the respondent answered a preceding filter question in a way that made the following dependent questions not applicable to him or her. This value was assigned during data processing only.

Interim data products

Building the TALIS International Database was an iterative process during which the IEA DPC provided the OECD Secretariat and NPMs with a new version of data files whenever a major step in data processing was completed. This process guaranteed that NPMs had a chance to review their data and run additional plausibility and statistical checks to validate the data. The data products that the IEA DPC sent to the OECD Secretariat and each NPM included the teacher and principal data file as well as data summaries. All interim data were made available to the OECD in full whereas each participating country received its own data only.

The IEA DPC sent the first version of cleaned and weighted data to the OECD Secretariat at the end of September 2013. All known identification, linkage and content

issues in this data had been resolved. Estimation weights and variables facilitating variance estimation were also included. The OECD used these data to produce the first set of draft tables for the international report and presented them at the fourth NPM meeting in Bucharest, Romania, in October 2013. Prior to this meeting, all NPMs received a version of their own cleaned and weighted data, giving them a chance to review their data and the tables produced by the OECD.

During the fourth NPM meeting and for one week following it, NPMs were able to raise any issues concerning their data that had thus far gone unnoticed. This resulted in a second, updated data version that concluded the field work and included scale scores. The DPC sent it to the OECD Secretariat and NPMs in November 2013.

In January 2014, NPMs received an update of their data, reflecting minor issues that had been raised after the November 2013 data release and a new computation of the scale scores. The OECD and its partners used this version of the data to produce the updated, final tables for the international report.

All interim data products were accompanied by detailed data-processing and weighting documentation and summary statistics. The latter contained weighted univariate statistics and frequencies for all questionnaire variables for each country. For categorical variables, which represent the majority of variables in TALIS, the percentages of respondents choosing each of the response options were displayed. For numeric or count variables, various descriptive measures were reported. These included the minimum, the maximum, the mean, the standard deviation, the median, the mode, percentiles and quartiles. For both types of variables, the percentages of missing information due to respondents omitting or not reaching a particular question were reported. These summaries were used for a more in-depth review of the data at the international and national levels in terms of plausibility, unexpected response patterns, suspicious profiles and so on.

Building the international database

For the draft and final IDB, data cleaning at the IEA DPC ensured that information coded in each variable was in fact internationally comparable, that national adaptations were reflected appropriately in all concerned variables and that all records could be successfully linked across the two levels. In addition, a variable was included (PISASCHOOLID) that enabled later linkage to schools in the PISA 2012 database for countries participating in the TALIS-PISA Link.

The interim data products described above and the draft and final (public-use) international databases had two key differences:

- All interim products included one record for each sampled unit (school or teacher) even if the corresponding questionnaire was not returned or returned empty. The draft and final IDB, by contrast, included only records that satisfied the sampling standards. Data from those units that either did not participate or did not pass adjudication (e.g. because within-school participation was insufficient) were removed.
- To protect the confidentiality of respondents, disclosure avoidance measures were applied at the international level; (i) consistently for all countries; (ii) concerning only specific national data sets. These measures were implemented for all data versions and exports of the IDB for use by all other countries and public users.

The measures applied to all international-level data sets involved the following:

- The teacher (IDTEACH) and school identifiers (IDSCHOOL) were scrambled and therefore did not match those used during data collection; however, the structural link between the school and teacher level (the variable IDSCHOOL in the teacher file and the first four digits of any IDTEACH) was maintained. For each country, unique matching tables were created and made available to authorised individuals.
- Variables used purely for the stratification of the teacher sample, that is, birth year (ITBIRTHY) and gender (ITSEX), were removed. Only the gender (TT2G01) and age (TT2G02) variables as collected in the questionnaire were retained.
- Variables used purely for stratification of schools were removed (IDSTRATE and IDSTRATI) to avoid the identification of geographical or organisational groups. Because the stratum information is mostly of interest for national-level analysis, it was of course made available to the concerned country. Experience shows that researchers from other countries might also wish to conduct analysis by stratification, in which case the stratification variables have to be requested directly from the country.
- Information used in the calculation of final sample and replicate weights was removed (for the school level, WGTFACT1 and WGTADJ1; for the teacher level, WGTFACT1, WGTADJ1, WGTFACT2, WGTADJ2, WGTADJ3 and WGTADJ4), as these could allow identification of stratification cells.
- Replication zone and unit variables (BRRSZONE, BRRSREP, BRRTZONE and BRRTREP), which could cause indirect identification of schools, were also dropped from public-use micro-data.
- Data for Question 47 (TT2G47A-J) in the teacher questionnaire were removed on OECD request.

To protect its respondents' privacy, Iceland decided to withdraw all data from the IDB. This information is available directly from the country only¹.

After each NPM and the OECD had agreed on data-release policy and confidentiality agreements, a draft IDB that included data from all participating countries was made available. This occurred in March 2014, prior to publication of the international report in June 2014. This release enabled countries to replicate the results presented in the draft chapters of the international report. This data version was also used in an international database training session held by IEA DPC staff in Hamburg, Germany, in March 2014.

The final, public-use international database was scheduled for release in June 2014 and was supplemented by full documentation in the *TALIS 2014 User Guide*. The database, which contains data from schools and teachers from 56 different samples in 33 countries across four continents, provides a unique resource for policy-makers and analysts.

Although data for the USA are included as part of the IDB, the sample adjudication process determined that the data cannot reliably represent the population from which the sample was drawn. The sampling adjudication variable INTAL13 was therefore set to zero. In any analysis including data from the USA, database users need to ensure that they use only cases where INTAL13 equals 1.

References

OECD (2014, forthcoming), *TALIS 2013 User Guide*, OECD, Paris.

OECD (2012), *TALIS 2013 Main Survey Manual for Data Managers* (prepared by IEA Data Processing and Research Center, Hamburg), OECD, Paris.

Notes

- 1 Please contact the TALIS team at the OECD to be put in contact with Iceland.

Chapter 9: Estimation Weights, Participation Rates, and Sampling Error

Abstract

This chapter covers three important aspects of the quality of the TALIS 2013 outcomes. The first is the weighting of the data to produce the estimates. Descriptions are provided of how each component of the final estimation weight was defined and how those components were assembled into the final estimation weight. The second aspect, participation rates, is also described. Finally, the Balanced Repeated Replication (BRR) weights for the estimation of the sampling error (the third aspect) are detailed.

Overview

This chapter covers three important aspects of the quality of the TALIS 2013 outcomes: the weighting of the data to produce the estimates, participation rates and estimation of sampling error.

Although the international sampling plan was prepared as a self-weighting design (whereby each individual ultimately had the same final estimation weight), the actual conditions in the field, school and teacher non-response and the coordination of multiple samples made that ideal plan impossible to materialise. In the end, in most participating countries, the national sampling plan was a stratified multi-stage probability sampling plan with unequal probabilities of selection. In a few participating countries, Abu Dhabi (United Arab Emirates), Iceland, the Netherlands and Singapore, the canonical plan was modified to better suit local conditions. How each component of the final estimation weight was defined and how those components were assembled into the final estimation weight are detailed below.

The section of this chapter covering the second aspect presents a description of the participation rates and how they were computed. Annex E provides the results for each participating country and each survey in which they participated. Because of the unequal weights and because of the structure of the samples, sampling error must be estimated using the design and weights. Failing to do so can translate into severely biased estimates of sampling error.

Correctly estimating sampling error is often a daunting task, but simple and approximately unbiased methods are available. TALIS 2013 opted for Balanced Repeated Replication (BRR) for its statistical properties (consistency, asymptotic unbiasedness) and its portability (one formula that fits all types of parameter estimates) and also because it is comparatively easy to compute. The last section of this chapter explains how the replicates were created and how the BRR estimates of sampling error were computed. These estimates of the sampling error are another key element of the statistical quality of survey outcomes.

A more detailed description of the survey design and its implementation can be found in Chapter 2 of this report, in the *TALIS 2013 Sampling Manual* (OECD, 2012a), in the *TALIS 2013 Main Survey Manual for National Project Managers* (OECD, 2011) and in the *TALIS 2013 Main Survey Manual for School Coordinators* (OECD, 2012b).

Estimation weights

Elements of the estimation weight (final weight)

The statistics produced for TALIS 2013 were derived from data obtained through samples of schools, school principals and teachers. For these statistics to be meaningful for a country, they needed to reflect the whole population from which they were drawn and not merely the sample used to collect them. The process of going from the sample data to information about the parent population is called estimation. When the sample is equiprobable, unstratified and unclustered, simple sample averages may suffice as estimates of population averages (e.g. the average number of ISCED Level 2 teachers per school). However, sample counts do not suffice as estimates of population totals (e.g. the total number of ISCED Level 2 teachers in a country).

The estimation weight or final weight is the device that allows the production of country-level estimates from the observed sample data. The estimation weight indicates how many population units are represented by a sampled unit. The final weight is the combination of many factors reflecting the probabilities of selection at the various stages of sampling and the response obtained at each stage. Other factors may also come into play as dictated by special conditions so as to maintain unbiasedness of the estimates (e.g. adjustment for teachers working in more than one school). Because TALIS 2013 consisted of a compulsory core segment (ISCED Level 2) and three optional segments (ISCED Level 1, ISCED Level 3 and TALIS-PISA Link), estimation weights had to be computed independently for each segment and were meant to speak to the segment for which they were computed. This requirement held true even if samples were coordinated across TALIS segments (ISCED Levels 2 and 3, for example) or across survey programmes (TALIS and ICILS,¹ for example).

Basically, final weights are the product of a design or base weight and of one or many adjustment factors; the former is the inverse of the selection probability, the latter compensates for non-response and other random occurrences that could – if not accounted for – induce biases in the estimates. These design weights and adjustment factors are specific to each stage of the sample design and to each explicit stratum used by the design. Clearly, in instances where the participating countries adapted the general sample design of TALIS 2013 to their own conditions, the estimation weights had to conform to these national adaptations.

The following are the conventional notations that will be used in this chapter. As usual, the letters h , i , and j are used as subscripts, the lower-case letters k , l , m , n , r , t refer to the sample, and the upper-case letters H , M , N refer to the population:

- In each participating country, there are H explicit strata; the index $h=1, \dots, H$ points to the explicit stratum; if no explicit strata were defined, then $H = 1$.
- In each explicit stratum, a sample of size nh schools was drawn from the Nh schools comprising stratum h ; the index $i = 1, \dots, nh$ points to the i th sampled school in stratum h .

- Each school $i=1, \dots, n_h$ within the explicit stratum h has a measure of size (MOS) noted M_{hi} ; the sum of the individual measures of size is noted as M_h .
- In each responding school, a sample of m_{hi} teachers was drawn; if the selected school was large enough, $m_{hi} = 20$ by design; the index $j=1, \dots, m_{hi}$ points to the teachers; and m_{hi} may be different from 20 if local conditions dictated that the sample size should be different (e.g. if the MOS is $M_{hi} = 18$, all teachers are selected and $m_{hi} = 18$).

School base weight (school design weight)

The first stage of sampling in TALIS 2013 was drawing the sample of schools. In most of the participating countries, the sample of schools followed a systematic random sampling scheme with probability proportional to size (PPS). Thus, a school base weight is needed to represent this first stage of sampling. If a census sample of schools was implemented in a country or an explicit stratum of a country, then the school base weight is set to 1.

Using the notation given above, for each school $i=1, \dots, n_h$ and each explicit stratum $h=1, \dots, H$, the school base weight is given by:

$$WGTFAC1_{hi} = \frac{M_h}{n_h \times M_{hi}}.$$

In Iceland, because all schools were selected (i.e. $n=N$), there was only one stratum and $WGTFAC1_i = 1$, for all $i=1, \dots, N$.

School non-response adjustment factor

Despite all efforts to secure the participation of all selected schools, some may have been unable or unwilling to participate. The schools represented by the non-participating schools therefore needed to be somehow represented by those that did participate. Assuming that non-response happened for reasons unrelated to the topic of the study (also referred to as “missing completely at random”), a non-response adjustment factor was required within each explicit stratum.

For each explicit stratum $h=1, \dots, H$, if r_h schools participated in TALIS 2013 out of the n_h selected schools, and if d_h schools were found closed or out of scope, then the non-response adjustment factor was given by:

$$WGTADJ1_h = \begin{cases} \frac{n_h - d_h}{r_h}, & \text{for participating schools} \\ 1, & \text{for closed or out-of-scope schools} \\ 0, & \text{for in-scope non-participating schools.} \end{cases}$$

In Iceland and Singapore, the school non-response adjustment factor $WGTADJ1_i = (N-d)/r$, for all schools $i = 1, \dots, N$, where N is the total number of schools on the sampling frame, d is the number of sampled units found to be closed or out of scope and r is the number of participating schools.

Final school weight

As described earlier, the school estimation weight is the product of the school base weight and the school non-response adjustment factor; it should be used for estimation of school-related parameters.

The final school weight (school estimation weight) for each participating school $i=1, \dots, r_h$ and each explicit stratum $h=1, \dots, H$ was given by:

$$\begin{aligned} SCHWGT_{hi} &= WGTFAC1_{hi} \times WGTADJ1_h \\ &= \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h}. \end{aligned}$$

In Iceland and Singapore, the final school weight was $SCHWGT_i = 1 \times (N-d) / r = (N-d) / r$.

Final school weight for TALIS-PISA Link

As described in Chapter 5, the sample of schools for the TALIS-PISA Link was a sub-sample of the original PISA 2012 sample of schools. Therefore, the school base weight was that of the PISA 2012 design, adjusted for sub-sampling. Where school non-response occurred, a non-response adjustment was computed similarly to what is described above. Again, the (TALIS-PISA Link) school estimation weight was the product of the (TALIS-PISA Link) school base weight and the (TALIS-PISA Link) school non-response adjustment factor; it should also be used for estimation of the TALIS-PISA school-related parameters.

Teacher base weight (teacher design weight)

In some countries, or in some smaller schools, school principals also had teaching duties. In an effort to maintain the response burden to a tolerable level, those individuals were considered incidental exclusions while remaining in scope for the survey. In Abu Dhabi (United Arab Emirates) and Iceland, given the number of teachers in those countries, the teachers who had participated in the TALIS field trial could be excused for the same reason. These groups of teachers were given special exclusion codes (noted NEXCL5 and NEXCL6 respectively) at the time of compiling the school list in Windows Within-School Sampling Software (WinW3S). Both groups needed to be accounted for in the estimates.

In a school where this did happen, the measure of size for that school, M_{hi} , was not the size of the list from which the sample was drawn. Let $M_{hi}^- = M_{hi} - NEXCL5_{hi} - NEXCL6_{hi}$ be the reduced size of the list used for teacher sampling.

In each participating school, a systematic random sample with equal probability of in-scope teachers was selected. The nominal sample size within each school was set at $m_{hi}=20$, but the number of in-scope teachers of each selected school could require that the size of the teacher sample be modified. In this instance, the teacher base weight (or design weight) was used to bring the individual teachers' information to the level of their school.

For each selected teacher $j=1, \dots, m_{hi}$ of school $i=1, \dots, n_h$ in explicit stratum $h=1, \dots, H$, the teacher base weight was given by:

$$WGTFAC2_{hij} = \frac{M_{hi}^-}{m_{hi}}.$$

Teacher non-response adjustment factor

Unfortunately, because not all selected teachers were able or willing to participate in TALIS, the teachers represented by the non-participating teachers needed to be represented by the participating ones. Under the assumption of missing at random, representation was achieved by way of the teacher non-response adjustment factor.

In each participating school $i=1, \dots, r_h$ of each explicit stratum $h=1, \dots, H$, there were three kinds of teachers: those who responded (noted t_{hi}), those who left the school permanently after the sample had been selected, and those who did not respond but who were still at the selected school (noted q_{hi}). Here, the teacher non-response adjustment factor was given by:

$$WGTADJ2_{hij} = \begin{cases} \frac{t_{hi} + q_{hi}}{t_{hi}}, & \text{for responding teachers} \\ 1, & \text{for those who left school permanently and those who should have been marked as out of scope} \\ 0, & \text{for in-scope non-responding teachers and those who should have been exempted.} \end{cases}$$

While “teachers who had left school permanently” did not provide data to most of the estimates of interest, they still carried a positive weight because they represented those other “teachers who had left school permanently” who were not in the sample.

Teacher adjustment factor for incidental exclusions

Because some teachers were excluded from sampling while they were in scope (see preceding discussion), they needed to be represented by the sample. An adjustment factor was required to account for these so-called incidental exclusions.

In each participating school $i=1, \dots, r_h$ in explicit stratum $h=1, \dots, H$, the teacher adjustment factor for incidental exclusions was given by:

$$WGTADJ3_{hij} = \frac{M_{hi}}{M_{hi}^-}.$$

In this adjustment factor, the numerator is the full school measure of size and the denominator is the size of the reduced list from which the sample was actually selected.

Teacher multiplicity adjustment factor

Some teachers were working in more than one school. Because the measure of size of each school was taken independently, these teachers happened to be counted more than once. Also, given that the samples of teachers were independent from one school to the next, selecting the same teacher more than once was possible (though in practice not very likely). An adjustment was needed to account for the number of schools in which a given teacher worked. In TALIS, this information was collected through the teacher questionnaire. For most teachers, the adjustment factor was 1; for the others, it was the reciprocal of the number of schools in which they taught.

For each responding teacher $j=1, \dots, t_{hj}$, in each participating school $i=1, \dots, r_h$, in explicit stratum $h=1, \dots, H$, the teacher adjustment factor for multiplicity was given by:

$$WGTADJ4_{hij} = \begin{cases} \frac{1}{nb_schools_{hij}}, & \text{for teachers teaching in more than one school} \\ 1, & \text{for teachers teaching in one school} \end{cases}$$

This factor was set to 1 for teachers who had left the school permanently.

Final teacher weight

The final teacher weight (estimation weight) was the product of the teacher base weight, the three adjustment factors associated with each participating teacher, and the final school weight. All estimates pertaining to the populations of teachers therefore needed to use the final teacher weight.

For each participating teacher $j=1, \dots, t_{hij}$, in each participating school $i=1, \dots, r_h$, in explicit stratum $h=1, \dots, H$, the final teacher weight was given by:

$$\begin{aligned} TCHWGT_{hij} &= \{SCHWGT_{hi}\} \times \{WGTFAC2_{hi} \times WGTADJ2_{hi} \times WGTADJ3_{hij} \times WGTADJ4_{hij}\} \\ &= \left\{ \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h} \right\} \times \left\{ \frac{M_{hi}^-}{m_{hi}} \times \frac{M_{hi}}{M_{hi}^-} \times \frac{t_{hi} + q_{hi}}{t_{hi}} \times \frac{1}{nb_schools_{hij}} \right\} \end{aligned}$$

For each teacher who has left the school permanently, the final weight was given by:

$$\begin{aligned} TCHWGT_{hij} &= \{SCHWGT_{hi}\} \times \{WGTFAC2_{hi} \times WGTADJ2_{hi} \times WGTADJ3_{hij} \times WGTADJ4_{hij}\} \\ &= \left\{ \frac{M_h}{n_h \times M_{hi}} \times \frac{n_h - d_h}{r_h} \right\} \times \left\{ \frac{M_{hi}^-}{m_{hi}} \times \frac{M_{hi}}{M_{hi}^-} \times 1 \times 1 \right\}. \end{aligned}$$

In the simplest of cases, the sampling design prepared for TALIS 2013 would have yielded equal weights for all teachers. If we assume that the sample size of schools was distributed among the explicit strata proportionally to the number of teachers in each stratum, that samples of 20 teachers could be selected from every selected school, that the school listings contained nobody but in-scope teachers, that no incidental exclusion occurred, that each selected school and teacher participated, and that each teacher was teaching in only one school, then the final teacher weight would effectively have been the same for all the teachers in the sample:

$$\begin{aligned} TCHWGT_{hij} &= \{SCHWGT_{hi}\} \times \{WGTFAC2_{hi} \times WGTADJ2_{hi} \times WGTADJ3_{hij} \times WGTADJ4_{hij}\} \\ &= \left\{ \frac{M_h}{n_h \times M_{hi}} \right\} \times \left\{ \frac{M_{hi}}{20} \times 1 \times 1 \times 1 \right\} = \frac{M_h}{n_h \times 20} \\ &= \frac{M}{200 \times M_h} \times \frac{M_h}{20} = \frac{M}{4000}, \end{aligned}$$

for $h=1, \dots, H$; $i=1, \dots, n_h$; $j=1, \dots, m_{hi}$ and where M is the total number of teachers in the population of interest.

Final teacher weight for TALIS-PISA Link

Because teacher sampling for the TALIS-PISA Link followed the same rules as for the ISCED levels, the construction of the “PISA teacher” weight followed the same steps: base weight within a TALIS-PISA school, non-response adjustment within the school, and multiplicity and exclusion adjustments. The final TALIS-PISA-teacher weight

(estimation weight) was thus the product of the teacher base weight, the three adjustment factors associated with each participating teacher, and the final TALIS-PISA Link school weight. All estimates pertaining to the populations of PISA teachers therefore needed to use the (TALIS-PISA Link) final teacher weight.

Participation rates

The quality requirements for TALIS 2013 translated into participation rates (response rates) for schools and for teachers. Reaching required levels of participation does not preclude some amount of error in the results but should minimise the negative impact of non-response biases. Experience and knowledge gained from TALIS 2008 showed that the targets set for TALIS 2008 participation were realistic and so could be reiterated for the 2013 cycle.

Participation rate for schools

The minimum school participation rate in TALIS was set at 75% after replacement. Although replacement schools could be called upon as substitutes for non-responding schools, the study's National Project Managers were encouraged to do all they could to obtain the participation of the schools in the original sample. As the number of replacement schools increased, the sample would have lost its probabilistic features and become increasingly "purposive". This turn of events could have undermined the reliability, validity and interpretability of a country's results.

Responding schools that reached at least 50% of responding teachers were considered to be "participating" schools. Schools that failed to meet this threshold were considered to be "non-participating" even though the number of responding teachers may have been enough to contribute to some of the analyses.

Countries that experienced less than 75% school participation after replacement had to demonstrate convincingly that their sample was not significantly biased.

The unweighted school participation rate was computed as:

$$UNWSCPART = \frac{\sum_{h=1}^H \sum_{i=1}^{r_h} 1}{\sum_{h=1}^H \sum_{i=1}^{n_h - d_h} 1} = \frac{\sum_{h=1}^H r_h}{\sum_{h=1}^H (n_h - d_h)}$$

where, r_h , n_h and d_h are as defined above. This formula represents the crude proportion of schools that achieved a response of at least 50% from their sample of teachers.

The weighted school participation rate was computed as follows:

$$WTDSCPART = \frac{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} WGT_{hi} \times TCHWGT_{hij}}{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} SCHWGT_{hi} \times TCHWGT_{hij}}$$

This formula represents the proportion of the population of teachers accounted for by the participating schools.

Both rates were computed once over the complete set of participating schools (after replacement) and once over the subset of participating schools in the original selection (before replacement).

Participation rate for teachers

TALIS 2013 also expected at least 75% of the selected teachers in participating schools (original sample or replacement school) to take part in the assessment.

Teachers' participation was calculated over all participating schools, whether the schools were in the original sample or used as a replacement, and thus the participation rate for the teachers was only a requirement at the national level not at the school level.

The unweighted teacher participation rate was defined as:

$$UNWTPART = \frac{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} 1}{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{m_{hi}} 1} = \frac{\sum_{h=1}^H \sum_{i=1}^{r_h} t_{hi}}{\sum_{h=1}^H \sum_{i=1}^{r_h} m_{hi}}.$$

This formula gives the crude ratio of the number of responding teachers in participating schools with respect to the expected sample size from the participating schools.

The weighted teacher participation rate was given by:

$$WTDTPART = \frac{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} WGT FAC1_{hi} \times (WGT FAC2_{hij} \times WGT ADJ3_{hij} \times WGT ADJ4_{hij})}{\sum_{h=1}^H \sum_{i=1}^{r_h} \sum_{j=1}^{t_{hi}} WGT FAC1_{hi} \times TCHWGT_{hij}}.$$

Overall participation rates

The overall unweighted and weighted participation rates were the product of the respective school and teacher participation rates.

Reporting participation rates

Both weighted and unweighted participation rates, with and without replacement schools, were produced. The weighted and unweighted participation rates for teachers were also computed.

The analytical results for each country were annotated according to whether or not the response rate requirements were adequately met.

Meeting participation rates standard for TALIS

Each country's data received one of three response ratings: good, fair and poor.

The rating "GOOD" meant that the country's data would be included in international comparisons. The rating "FAIR" meant either that the country's data were a candidate for not being reported in international comparisons because the participation rate after replacement was less than 75%, or that the participating countries concerned provided evidence showing that non-response bias was negligible. The rating "POOR" meant that

the country's data should probably not be included in comparisons. Finally, the rating "INSUFFICIENT" was assigned to data sets from countries and TALIS segments where participation did not reach 50%. The TALIS Board of Participating Countries made the final decision on whether or not to include the country's data in international comparisons while taking into account various other factors.

The final ratings thus depended on participation rates before and after replacements and on the apparent severity of the non-response biases. Table 9.1 provides a summary of these ratings. Annex E to this report provides charts detailing the unweighted school participation rates before and after replacement of non-participating schools, the unweighted teacher participation rate and the unweighted overall participation rates by country. Annex G Tables 9.6 (ISCED Level 1), 9.7 (Level 2), 9.8 (Level 3), and 9.9 (TALIS-PISA) provide the weighted school participation rates before and after replacement of non-participating schools, the teacher participation rate in participating schools and the overall participation rate for each participating country.

Table 9.1 Assigned response rating after data adjudication

School participation		After replacement		
		At least 75%	At least 50% but less than 75%	
			Low response bias	High response bias
Before replacement	At least 75%	Good		
	At least 50% but less than 75%	Fair	Fair	Poor
	Less than 50%	Insufficient		

Source: OECD

Sampling error with Balanced Repeated Replication (BRR)

Estimation, especially estimation of sampling error for surveys with complex designs such as TALIS, requires special attention. Both the survey design and the unequal weights are needed to obtain (approximately) unbiased estimates of sampling error. Failure to do so can lead to severe underestimation of the sampling error. While exact formulae exist in theory for stratified PPS sample designs, the required computations become practically impossible as soon as the number of primary units selected per stratum exceeds two.

Approximate solutions for this problem have been proposed over the years. An important class of solutions is that of *resampling* or *replication*. *Interpenetrating sub-samples* (Mahalanobis), *Balanced Half-Samples* or *Balanced Repeated Replication* (McCarthy, Fay), the *Jackknife* (Quenouille, Tukey, Durbin, Frankel), and the *Bootstrap* (Efrom) are the best known examples of replication methods (for a review of these methods, see, for example, Lohr 1999; Rust and Rao, 1996; Wolter 2007).

In similar vein to what was done for PISA (e.g. OECD, 2008), TALIS adopted the Balanced Repeated Replication (BRR) for estimation of the sampling error of the estimates. BRR is a replication method suited to sample designs where exactly two primary sampling units (PSUs) are selected in each stratum.

The principle of BRR is the following: each of the two PSUs can provide an unbiased estimate of the total (or other parameter of interest) of its stratum. If the sampling design comprises H strata, there are then 2^H possible unbiased estimates of the parameter of

interest by combining either PSU from each of the H strata. The sampling error of the estimate of the parameter of interest can be directly computed by comparing each of the 2^H estimates with their mean, as is usually done in simple basic statistics. Even with moderate values of H , the number of unbiased estimates may be quite large (e.g. $2^5=32$, $2^{10}=1\,024$, $2^{20}=1\,048\,576$). BRR provides a way to extract from the complete set of 2^H possible replicates a much smaller subset that gives the very same measure of sampling error as would the full set.

Creating replicates for BRR

BRR was developed for sample designs using only two PSUs per stratum. Clearly, none of the countries participating in TALIS 2013 implemented such a sample design. Fortunately, the implemented sample design could be approximated by a superimposed “BRR-ready” sample plan. The participating schools (of the original sample or the replacements), listed in the order in which they appear on the sampling frame, were paired within explicit strata, and each pair was dubbed “pseudo stratum” or “zone”. If the number of participating schools in an explicit stratum was odd, then a triplet was formed with the last three schools. The pairs (or triplets) were then numbered sequentially from 1 to G , spanning the whole sample; within each pseudo stratum or zone, each school was assigned a random pseudo PSU number 1 or 2 (or 3 for a triplet) as depicted in Table 9.2.

Table 9.2 Example of BRR-ready sample design and random assignment of pseudo PSUs

Explicit stratum	School ID	Zone = pseudo stratum	Pseudo PSU	Other variables of interest...	
1	1001	1	1
1	1002	1	2		
1	1003	2	1		
1	1004	2	2		
2	1005	3	2		
2	1006	3	1		
2	1007	4	1		
2	1008	4	2		
...		...			
H	...	$G-1$	2		
H	...	$G-1$	1		
H	...	G	1		
H	...	G	2		

Source: OECD TALIS Database

As with the jackknife repeated replication, one of the two pseudo PSUs will be dropped, and the remaining PSU will see its weight doubled and used to compute an estimate of the parameter of interest. Rather than randomising which PSU will be dropped, we can use a special matrix (of order $4t$) of +1's and -1's – the so-called Hadamard matrix – to indicate which PSU is to be kept (+1) and which is to be dropped (-1) from each pseudo stratum in BRR, thereby associating the +1's with the PSUs numbered 1 and the -1's with the PSUs numbered 2. For example, the Hadamard matrix of order 8 can be written as:

$$Hadamard_8 = \begin{pmatrix} +1 & +1 & +1 & -1 & +1 & -1 & -1 & -1 \\ -1 & +1 & +1 & +1 & -1 & +1 & -1 & -1 \\ -1 & -1 & +1 & +1 & +1 & -1 & +1 & -1 \\ +1 & -1 & -1 & +1 & +1 & +1 & -1 & -1 \\ -1 & +1 & -1 & -1 & +1 & +1 & +1 & -1 \\ +1 & -1 & +1 & -1 & -1 & +1 & +1 & -1 \\ +1 & +1 & -1 & -1 & -1 & -1 & +1 & -1 \\ -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}.$$

In this matrix, each column is a BRR replicate and each line is a pseudo stratum or zone; the matrix entry indicates which pseudo PSU should be kept from each pseudo stratum to create the BRR replicate. For example, the previous matrix translates into:

	BRR 1	BRR 2	BRR 3	BRR 4	BRR 5	BRR 6	BRR 7	BRR 8
ZONE 1	PSU1	PSU1	PSU1	PSU2	PSU1	PSU2	PSU2	PSU2
ZONE 2	PSU2	PSU1	PSU1	PSU1	PSU2	PSU1	PSU2	PSU2
ZONE 3	PSU2	PSU2	PSU1	PSU1	PSU1	PSU2	PSU1	PSU2
ZONE 4	PSU1	PSU2	PSU2	PSU1	PSU1	PSU1	PSU2	PSU2
ZONE 5	PSU2	PSU1	PSU2	PSU2	PSU1	PSU1	PSU1	PSU2
ZONE 6	PSU1	PSU2	PSU1	PSU2	PSU2	PSU1	PSU1	PSU2
ZONE 7	PSU1	PSU1	PSU2	PSU2	PSU2	PSU2	PSU1	PSU2
ZONE 8	PSU2	PSU2	PSU2	PSU2	PSU2	PSU2	PSU2	PSU2

In the case of TALIS 2013, and as was also done in TALIS 2008 and PISA, a variation of the BRR attributable to Fay (1989) was implemented. Rather than completely dropping a PSU and doubling the weight of the other one, the weight of the PSU indicated by the Hadamard matrix is multiplied by 1.5 and the weight of the remaining PSU is multiplied by 0.5. This strategy removes the risk of completely deleting some domain.

In cases where there was an odd number of PSUs in an explicit stratum, the last three PSUs were treated as a zone in the following manner: one of the PSUs was randomly designated as “+1” while the remaining two were both designated as “-1”. For each replicate, as indicated by the Hadamard matrix, the weight of the selected unit was multiplied by 1.7071 if it was the single unit, and the weights of the remaining pair were multiplied by 0.6464. If the matrix indicated that the pair should be selected, then the weights of the paired units were multiplied by 1.3536, and the weight of the single unit was multiplied by 0.2929. This strategy, due to Judkins (OECD, 2002), ensures that the sum of the factors is three.

Because the nominal sample size for TALIS 2013 was $n = 200$ schools, a maximum of $G = 100$ zones or pseudo strata were created for each participating country and a series of $G=100$ BRR replicate weights are also computed and stored.

Estimating the sampling error

Let θ be the population parameter of interest. Let $\hat{\theta}^*$ be the full sample estimate for θ obtained by using the final weight, and let $\hat{\theta}_g$, $g=1, \dots, 100$, be the $G = 100$ BRR replicate

estimates of the same parameter of interest obtained by using the BRR weights described earlier. Then, with k set to equal 0.5, Fay's BRR estimate of the sampling variance and sampling error of $\hat{\theta}^*$ are respectively given by:

$$\hat{V}_{FAY}(\hat{\theta}^*) = \frac{1}{G(1-k)^2} \sum_{g=1}^{100} (\hat{\theta}_g - \hat{\theta}^*)^2 = 0.04 \sum_{g=1}^{100} (\hat{\theta}_g - \hat{\theta}^*)^2$$

$$se_{FAY}(\hat{\theta}^*) = \sqrt{\hat{V}_{FAY}(\hat{\theta}^*)}.$$

Reporting sampling error

Estimates are routinely compared in large surveys such as TALIS 2013 that are conducted in a number of regions or countries. Availability of sampling errors – for example, variances, standard errors – for a large number of parameters of interest is crucial. In the case of TALIS 2013, these were obtained by Fay's variant of the BRR.

The measure of precision itself also becomes the object of much attention: comparing imprecise estimates has little interest. If the sampling error is a measure of the precision of the parameter estimates, gauging whether or not the sampling error is important is not as easy a task, mostly because the measure of precision is influenced by what is being estimated. For example, the sampling error for estimates of annual income (in thousands of euros) will be expressed in thousands of euros, while the sampling error for the number of students per class is likely to be in the order of ten.

To resolve the apparent scale effect in the appreciation of sampling errors, *coefficients of variation* (cv) were reported for TALIS 2013. The coefficient of variation of an estimate is a measure of the relative error rather than of the absolute error. The cv is expressed as a percentage and is defined as this estimate:

$$cv(\hat{\theta}) = \frac{\sqrt{\hat{V}(\hat{\theta})}}{\hat{\theta}} \times 100\%.$$

Table 9.3 shows coefficients of variation for a selection of key TALIS 2013 variables by participating country and for TALIS 2013 as a whole **Participation and Estimated Size of Teacher Population, ISCED Level 2, by Participating country, 2013**. The variables used below are the closest to those presented in the *TALIS 2008 Technical Report* (OECD, 2010).

Table 9.3 Coefficients of variation (in %) for selected key variables by participating country, ISCED Level 2 only

Participant	TT2G17 (Hours spent teaching last calendar week)	TT2G21 (total number of days of professional development)	TT2G46J ("Agree" with "satisfied with my job")	TC2G04B (total number of years working as principal)	TC2G19A (Proportion of time spent on administrative and leadership tasks)
Australia	1.472	2.695	0.589	7.049	5.159
Brazil	0.983	4.682	0.353	5.552	2.621
Bulgaria	1.204	7.126	0.427	5.909	2.508
Chile	1.504	9.664	0.586	8.490	4.142
Croatia	0.608	3.129	0.396	5.811	3.188
Cyprus	1.019	6.474	0.489	11.974	3.469
Czech Republic	0.792	5.598	0.407	5.371	2.137
Denmark	0.777	6.489	0.744	4.354	2.446
Estonia	0.987	4.228	0.353	5.532	2.366
Finland	0.822	4.261	0.386	5.368	2.776
France	0.444	4.923	0.387	6.074	3.007
Iceland	1.111	4.525	0.592	7.950	3.458
Israel	1.257	3.361	0.415	9.146	6.813
Italy	0.623	5.964	0.377	7.281	3.217
Japan	0.627	3.631	0.446	4.489	2.844
Korea	0.839	4.001	0.506	5.981	3.800
Latvia	1.642	5.204	0.468	5.964	3.039
Malaysia	1.475	2.820	0.334	6.835	2.918
Mexico	1.818	4.485	0.408	7.158	3.396
Netherlands	1.189	6.085	0.659	14.039	4.305
Norway	1.087	4.838	0.688	13.359	4.342
Poland	1.130	4.217	0.406	8.523	3.018
Portugal	0.550	5.192	0.367	10.934	4.032
Romania	1.206	5.251	0.558	8.187	2.822
Serbia	0.967	4.589	0.444	5.364	3.138
Singapore	0.814	2.964	0.351	5.182	3.189
Slovak Republic	0.816	6.745	0.334	5.405	2.635
Spain	0.869	4.091	0.333	9.608	3.121
Sweden	0.733	4.629	0.495	7.355	2.587
Sub-national entities					
Abu Dhabi (United Arab Emirates)	1.384	6.143	0.701	6.915	3.917
Alberta (Canada)	1.067	4.947	0.642	7.041	3.237
England (United Kingdom)	0.954	3.164	0.530	7.024	3.228
Flanders (Belgium)	0.838	5.178	0.480	5.436	3.035

Source: OECD *TALIS Database***TT2G17** Of this total, how many 60-minute hours did you spend on teaching during the most recent calendar week?**TT2G21** During the last 12 months, did you participate in any of the following professional development activities, and if yes, for how many days did they last? (sum of five components)**TT2G46J** Finally, we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements? (j) All in all, I am satisfied with my job (3) agree**TC2G04B** How many years of work experience do you have? (b) years working as principal in total**TC2G19A** On average throughout the school year, what percentage of time in your role as a principal do you spend on the following tasks in this school? (a) % administrative and leadership tasks and meetings

Using sampling error when comparing estimates

When comparing estimates (either variables or groups within a country) across two countries, or a country value to the international average, this comparison must be scaled using the appropriate estimate of sampling error.

The standard error for the difference of two estimates from one country, say $\hat{\theta}_1$ and $\hat{\theta}_2$, is given by:

$$\begin{aligned} se(\hat{\theta}_1 - \hat{\theta}_2) &= \sqrt{\hat{V}_{FAY}(\hat{\theta}_1) + \hat{V}_{FAY}(\hat{\theta}_2) - 2C\hat{v}_{FAY}(\hat{\theta}_1, \hat{\theta}_2)} \\ &= \sqrt{\hat{V}_{FAY}(\hat{\zeta})} \end{aligned}$$

where $\hat{\zeta} = \hat{\theta}_1 - \hat{\theta}_2$ is the difference between the two characteristics of interest (e.g. hours paid and hours worked) measured within each participating school.

The standard error for the difference of the estimates for two countries, say $\hat{\theta}_c$ and $\hat{\theta}_d$, is given by

$$se(\hat{\theta}_c - \hat{\theta}_d) = \sqrt{\hat{V}_{FAY}(\hat{\theta}_c) + \hat{V}_{FAY}(\hat{\theta}_d)}$$

The standard error for the difference of an estimate for a given country, say $\hat{\theta}_c$ and the international average $\hat{\bar{\theta}}$, is given by:

$$se(\hat{\theta}_c - \hat{\bar{\theta}}) = \sqrt{\frac{(N^2 - 2N)\hat{V}_{FAY}(\hat{\theta}_c) + \sum_{k=1}^N \hat{V}_{FAY}(\hat{\theta}_k)}{N^2}}$$

where $\hat{\bar{\theta}} = \sum_k \hat{\theta}_k / N$, N is the number of countries contributing to the mean $\hat{\bar{\theta}}$, and $\hat{\theta}_c$ is the estimate for country “c”.

Comparing sub-populations within a country should be done with a regression on a dummy variable as illustrated by the following example.

Suppose that the difference between male and female teachers for some characteristic (e.g. hours of class management per week) is of interest. We can set a dummy variable $Gender = 0$ if male, $Gender = 1$ if female. A regression model can then be written as $Score = a_0 + a_1 Gender$. Clearly, if $Gender = 0$, then $Score_{male} = a_0$. Likewise, by setting $Gender = 1$, we obtain $Score_{female} = a_0 + a_1$. Design-based estimation of the regression parameters a_0 and a_1 can be done using appropriate software. If the test of significance on a_1 cannot reject the null hypothesis $H_0: a_1 = 0$, then we must conclude that scores for male and female teachers are not significantly different.

If $\hat{\theta}$ is one of the statistics described above and $se(\hat{\theta})$ is the standard error of $\hat{\theta}$, then confidence intervals about zero can easily be obtained by computing the following boundaries:

$$\begin{aligned} lower_{\alpha} &= \hat{\theta} - t_{\frac{\alpha}{2}, df} se(\hat{\theta}) & upper_{\alpha} &= \hat{\theta} + t_{\frac{\alpha}{2}, df} se(\hat{\theta}) \\ &\text{and} & & \end{aligned}$$

where $1-\alpha$ is the pre-set confidence level (e.g. $1-\alpha = 0.95$) and $t_{\frac{\alpha}{2}, df}$ is $1-\alpha/2$ percentile of the Student's distribution with df degrees of freedom. In most applications, df will be large enough to allow the use of the standard normal deviate $z_{1-\frac{\alpha}{2}}$ (e.g. $z_{1-\frac{\alpha}{2}} = 1.96$ for $\alpha = 0.05$). However, in order to confirm the number of degrees of freedom, we still need to verify how many zones actually contribute to the statistic $\hat{\theta}$ and how many BRR replicates contribute to the computation of $se(\hat{\theta})$.

Design effect (deff) and effective sample size

Complex surveys such as TALIS are known to be “less efficient” than simple random samples of the same size. Usual explanations include the fact that respondents are selected in groups of individuals sharing many characteristics – school environment, professional training, classroom equipment, textbooks and so on. The loss in efficiency is often summarised in a statistic called “design effect” or *deff* (Kish, 1965). The design effect, for a statistic and a sampling plan, is the ratio of the variance of the estimate under the sampling plan to the variance of the same estimate under simple random sampling of the same size. In the case of TALIS, the true design effect was approximated by:

$$deff(\hat{\theta}, BRR) = \frac{\hat{V}_{BRR}(\hat{\theta})}{\hat{V}_{SRS}(\hat{\theta})}.$$

Alternatively, the design effect can be regarded as the ratio of sample sizes. We can then speak of “effective sample size” to describe the sample size of the complex survey adjusted for the design effect:

$$n_{effective} = \frac{n_{BRR}}{deff}.$$

Tables 9.4. and 9.5 give the estimated design effect for selected key variables from the teacher and from the principal questionnaires, the actual and effective sample sizes, by participating country and for TALIS (ISCED Level 2) as a whole.

Table 9.4 Estimated design effects and effective sample size for selected key variables, their average and the original and effective sample sizes, by participating country (Teacher Questionnaire variables)

	TT2G17	TT2G21	TT2G46J	Participating Teachers	Approximate effective sample size
	(Hours spent teaching last calendar week)	(total number of days of professional development)	("Agree" with "satisfied with my job")		
Australia	1.880	0.869	1.659	1 874	1 275
Brazil	4.883	4.127	3.544	12 759	3 049
Bulgaria	2.462	1.603	1.944	2 833	1 414
Chile	1.472	1.264	1.440	1 420	1 020
Croatia	1.385	0.970	1.683	3 515	2 611
Cyprus	1.049	1.310	1.158	1 698	1460
Czech Republic	1.705	1.024	1.742	3 170	2 127
Denmark	1.142	1.485	2.550	1 567	908
Estonia	1.575	1.598	1.432	3 025	1 971
Finland	1.845	1.160	1.149	2 661	1 922
France	1.530	1.348	1.041	2 773	2 123
Iceland	0.992	1.163	1.315	1 175	1 016
Israel	2.090	1.026	1.640	3 162	1 995
Italy	2.059	1.038	1.568	3 245	2 087
Japan	1.064	1.412	1.679	3 424	2 472
Korea	1.342	1.523	1.766	2 796	1 811
Latvia	2.216	1.758	1.881	2 058	1 054
Malaysia	2.021	1.396	1.231	2 949	1 903
Mexico	3.262	1.697	2.174	3 032	1 275
Netherlands	1.827	1.491	2.309	1 774	946
Norway	2.683	1.649	4.493	2 695	916
Poland	2.505	1.809	2.134	3 767	1 753
Portugal	1.328	1.284	1.534	3 547	2 567
Romania	2.404	1.833	3.076	3 234	1 327
Serbia	1.528	1.130	1.798	3 652	2 459
Singapore	0.969	1.072	1.110	3 076	2 929
Slovak Republic	1.275	1.463	1.421	3 410	2 460
Spain	2.229	1.295	1.206	3 230	2 049
Sweden	1.807	1.212	1.709	3 115	1 977
Sub-national entities					
Abu Dhabi (United Arab Emirates)	2.264	2.293	2.020	2 159	985
Alberta (Canada)	1.356	0.953	1.943	1 705	1 203
England (United Kingdom)	2.102	1.344	1.261	2 320	1 479
Flanders (Belgium)	2.419	1.321	2.302	3 014	1 497
TALIS				49 917	58 026

Source: OECD TALIS Database

TT2G17 Of this total, how many 60-minute hours did you spend on teaching during the most recent calendar week?**TT2G21** During the last 12 months, did you participate in any of the following professional development activities, and if yes, for how many days did they last? (sum of five components)**TT2G46J** Finally, we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements? (j) All in all, I am satisfied with my job (3) agree

Table 9.5 Estimated design effects and effective sample size for selected key variables, their average and the original and effective sample sizes, by participating country

Participant	TC2G04B	TC2G19A	Participating schools	Approximate effective sample size
	(total number of years working as principal)	(Proportion of time spent on administrative and leadership tasks)		
Australia	0.977	2.527	107	61
Brazil	2.552	2.575	731	285
Bulgaria	1.287	1.364	182	137
Chile	1.190	1.004	119	108
Croatia	1.115	1.222	177	151
Cyprus	0.861	0.924	90	101
Czech Republic	1.147	1.229	216	182
Denmark	0.855	0.945	120	133
Estonia	0.992	1.031	195	193
Finland	0.916	1.293	144	130
France	0.971	1.427	172	143
Iceland	1.098	1.006	102	97
Israel	2.274	4.256	169	52
Italy	1.562	1.658	188	117
Japan	0.931	1.153	191	183
Korea	1.306	1.373	157	117
Latvia	1.010	0.996	109	109
Malaysia	1.069	0.920	144	145
Mexico	1.250	1.092	162	138
Netherlands	3.844	2.505	114	36
Norway	2.424	1.571	102	51
Poland	2.889	1.583	181	81
Portugal	1.409	1.800	153	95
Romania	1.657	1.153	191	136
Serbia	1.101	1.013	164	155
Singapore	0.987	1.270	141	125
Slovak Republic	1.143	1.074	184	166
Spain	2.494	1.253	188	100
Sweden	1.825	1.239	165	108
Sub-national entities				
Abu Dhabi (United Arab Emirates)	1.144	1.162	111	96
Participant	TC2G04B	TC2G19A	Participating schools	Approximate effective sample size
Alberta (Canada)	1.162	1.110	165	145
England (United Kingdom)	1.296	1.267	144	112
Flanders (Belgium)	1.009	1.086	152	145
TALIS			5 630	4 136

Source: OECD *TALIS Database***TC2G04B** How many years of work experience do you have? (b) years working as principal in total**TC2G19A** On average throughout the school year, what percentage of time in your role as a principal do you spend on the following tasks in this school? (a) % administrative and leadership tasks and meetings

In Chapter 5 (Table 5.1), the expected effective sample size for teachers was derived using a hypothesised *deff* of 5.2. Table 9.2 above shows how the actual sample designs implemented in the various participating countries outperformed the design hypotheses, thus resulting in effective samples that are much larger than the expected nominal 400 teachers. However, Table 9.3 (also above) shows that the various samples are not as efficient as simple random samples of schools, despite stratification. In all cases, stratification was implemented to obtain reliable estimates for domains of interest.

References

- Fay, R.E. (1989), “Theoretical Application of Weighting for Variance Calculation”, *Proceedings of the Section on Survey Research Methods of the American Statistical Association*, pp. 212-217.
- Kish, L. (1965), *Survey Sampling*, Wiley, New York.
- Lohr, S. (1999), *Sampling: Design and Analysis*, Duxbury Press, New York.
- OECD (2012a), *TALIS 2013 Sampling Manual*, OECD (prepared by Statistics Canada), OECD, Paris.
- OECD (2012b), *TALIS 2013 Main Survey Manual for School Coordinators* (prepared by the IEA Data Processing and Research Center, Hamburg), OECD, Paris.
- OECD (2011), *TALIS 2013 Manual for National Project Managers* (prepared by IEA Data Processing and Research Center, Hamburg, IEA Secretariat, Amsterdam, and Statistics Canada, Ottawa), OECD, Paris.
- OECD (2010), *TALIS 2008 Technical Report*, OECD Publishing. doi: [10.1787/9789264079861-en](https://doi.org/10.1787/9789264079861-en)
- OECD (2009), *PISA 2006 Technical Report*, PISA, OECD Publishing. doi: [10.1787/9789264048096-en](https://doi.org/10.1787/9789264048096-en)
- OECD (2002), *PISA 2000 Technical Report*, PISA, OECD Publishing. doi: [10.1787/9789264199521-en](https://doi.org/10.1787/9789264199521-en)
- Rust, K. and J.N.K. Rao (1996), “Variance Estimation for Complex Estimators in Sample Surveys”, *Statistics in Medical Research*, Vol. 5, pp. 381-397.
- Statistics Canada (2003), *Survey Methods and Practices*, Catalogue Number 12-587-XPE, Statistics Canada, Ottawa.
- Wolter, K. (2007). *Introduction to Variance Estimation*, 2nd ed., Springer Verlag, New York.

Notes

- 1 ICILS : International Computer and Information Literacy Study, http://www.iea.nl/icils_2013.html.

Chapter 10: Construction of Scales and Indices

Abstract

This chapter outlines the scaling and validation of complex items in TALIS. The TALIS teacher, principal and TALIS-PISA Link questionnaires were comprised of many items. While some were intended to be used in analysis as single items, others were intended to be combined to represent and measure latent constructs. This chapter describes the methodology used for construct validation and scaling. It also details the construction, validation and computation of each scaled index and its characteristics.

Overview

The TALIS questionnaires included numerous items on school characteristics, school background and principals' and teachers' perceptions. While some of the questionnaire items were designed to be used in analyses as single items (e.g. teachers' professional development), a large number were designed to be combined into factors representing latent constructs. For these items, transformations or scaling procedures were needed to construct meaningful indices.

As in previous surveys of this kind, two different types of indices can be distinguished:

- Simple indices (ratios, averages and binary indicators): These indices were constructed through the arithmetical transformation or recoding of one or more items.
- Complex scale indices: The underlying variables are supposed to measure the indices that are unobserved. These indices were operationally defined by observable items and constructed using complex procedures that involved scaling the items. Typically, scale scores for these indices are estimates of latent traits derived through scaling of dichotomous or polytomous (e.g. Likert scale) items using latent trait methodology.

Some TALIS 2013 indices had already been used in previous surveys and were constructed on the basis of a scaling approach similar to the one used in those surveys, whereas others were based on the elaboration of a questionnaire framework (see Chapters 2 and 3).

Construction and validation of complex questionnaire scale indices

For TALIS 2013, complex scale-item statistics such as item frequencies and item-total correlations were used to initially evaluate the quality of the scale items across all countries. Scale items with poor item statistics can be discarded from the scale. The reliability coefficient alpha (i.e. Cronbach's alpha) was used as the measure of scale reliability, and this coefficient is reported for each scale for all populations.

The complex scales were first evaluated with exploratory factor analysis; confirmatory factor analysis (CFA) was used to construct the scales, and CFA with multiple comparison groups was used to validate the constructed scales. This section describes the procedures for constructing the scales using CFA, validating the scales across countries using multiple-group CFA, and scaling and scoring the scales based on teachers' and principals' responses to the survey questionnaires. Subsequent sections describe the procedures used to construct and validate each scale. Other details pertaining to the scales can be found in Annex B of the *TALIS 2013 Results: An International Perspective on Teaching and Learning* (OECD, 2014).

Indices developed through confirmatory factor analysis (CFA)

The TALIS programme uses questionnaires containing single items that are combined (reduced) to form scales to measure teachers' beliefs, attitudes and practices and principals' leadership styles. The basic advantage of developing scales is that each combines items covering the different characteristics of the items that make up the scale of interest, so providing measures of higher reliability and validity than single items. Another advantage is that they can alleviate issues of multicollinearity in models.

The first cycle of TALIS used confirmatory factor analysis (CFA) to confirm and, where necessary, re-specify the expected dimensional structure of the scales. An empirical study employing two different approaches (continuous and categorical CFA) was performed at the 2013 TALIS Analysis Expert Group (AEG) meeting to help inform decisions regarding the scaling procedures to be used for the 2013 main survey data. This study for the AEG, carried out using the 2008 TALIS complex scales (Desa, 2014), compared the levels of invariance established with the continuous versus the categorical methods. The software Mplus, Version 7.1 (Muthén and Muthén, 1998-2012) was used to carry out the analysis.

The study showed that the highest level of invariance achieved from the continuous approach was at the metric level, whereas promising findings for some of the scales were observed indicated using the categorical approach to establish the scalar level of invariance. The AEG agreed that further research directed towards comparing the robustness of the two approaches (continuous and categorical) would be necessary to justify changing the methodology that had been used not only to validate the scales in TALIS 2008 but also to support the application of a categorical approach to validating the scales for large-scale surveys.

CFA treats the constructs of interest as latent response variables. Latent variables are variables that cannot be directly observed but are inferred from other variables that can be measured directly. The CFA model makes it possible to predict the responses to a set of items (or indicators) \mathbf{y} from the latent factor η . In addition to the observed variables \mathbf{y} and the latent factor η , the model contains a matrix of factor loadings Λ , a vector of intercepts $\boldsymbol{\tau}$ and a vector of residuals $\boldsymbol{\varepsilon}$. The CFA model is written as:

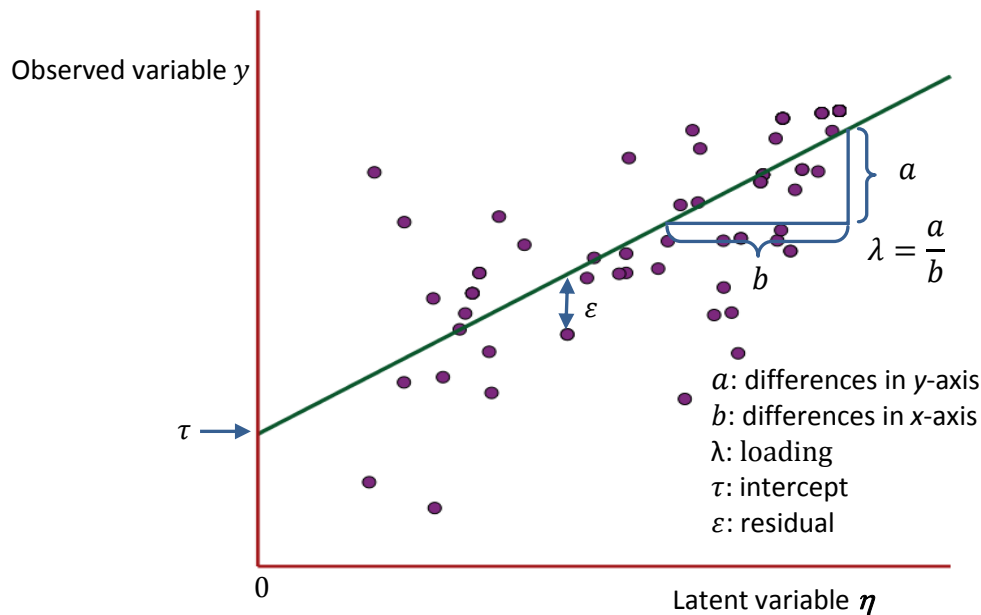
$$\mathbf{y} = \boldsymbol{\tau}_y + \Lambda_y \eta + \boldsymbol{\varepsilon}.$$

The vector of factor loadings for p number of items $\Lambda = (\lambda_1, \lambda_2, \dots, \lambda_p)$ is the vector of regression slopes for predicting items y_1 to y_p to form the latent factor. The vector of intercepts $\boldsymbol{\tau}$ is the predicted values for the items when the value for the latent trait η is zero. The vector of residuals $\boldsymbol{\varepsilon}$ is a unique contributor to the variances in the items that are not explained by the latent variable η . The unexplained variance of the item is a

combination of variances that is specific to the indicators and random error variances. Figure 10.1 illustrates the meaning of these parameters.

The association of each item y and the latent factor η is described with a regression line. The factor loading λ is the regression slope, defined as the ratio of the “rise” divided by the “run” between two points on a line or, in other words, the ratio of the altitude change to the horizontal distance between any two points on the line, for predicting the item y from the latent factor η . The intercept τ is the value for item y where the regression line crosses the y -axis. It is the predicted value on the observed variable when the value of the latent variable has a value of zero. Finally, the deviation of each observed value from the regression line is the residual ε and its variance across all observations is the residual variance denoted as θ .

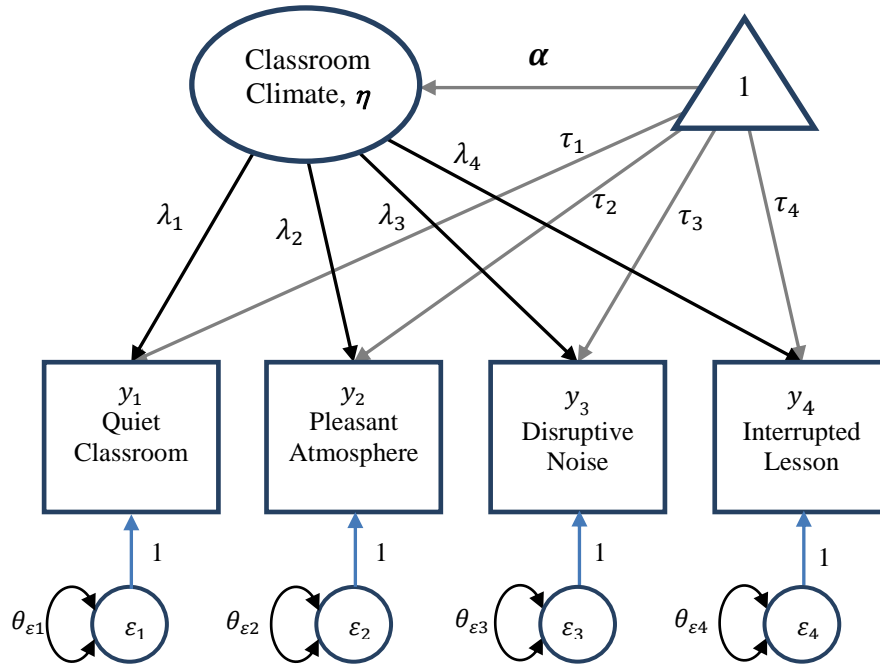
Figure 10.1: CFA Model Parameters



Source: OECD

Figure 10.2 illustrates the relationships between the latent variable η with the observed variables and the residual variances of the variables for a CFA model.¹ Here, the latent variable η is depicted as an oval; the boxes represent the manifest variables y_1 to y_4 . The factor loadings λ_1 to λ_4 , represented by the single-headed lines, describe the relationships between the latent variable η and the observed variables y_1 to y_4 . ε_1 to ε_4 in circles are the residuals, and the four θ s ($\theta_{\varepsilon 1}$ to $\theta_{\varepsilon 4}$) are the residual variances represented by the double-headed lines. The triangle represents a mean structure, where the mean vector is α and the intercepts are τ_1 to τ_4 .

Figure 10.2 Path Diagram for a One-Factor CFA Model



Source: OECD

The model can also be rewritten in a matrix form as follows:

$$\Sigma = \Lambda_y \Psi \Lambda_y^T + \Theta_\epsilon.$$

Here, Σ represents the covariance matrix of the observed items \mathbf{y} . Λ_y is the matrix of factor loadings $\lambda_1, \lambda_2, \lambda_3$ and λ_4 ; Λ_y^T is the transposed matrix of factor loadings. Ψ is the symmetric matrix of the factor covariances, and Θ is the diagonal matrix of residual variances $\theta_{\epsilon_1}, \theta_{\epsilon_2}, \theta_{\epsilon_3}$ and θ_{ϵ_4} . The mean vector μ of \mathbf{y} equals a vector of intercepts τ plus a matrix of factor loadings Λ multiplied by the mean vector α of η .

$$\mu = \tau + \Lambda\alpha$$

The goal in CFA models is to find a set of parameters that yields an estimated mean vector μ and a variance-covariance matrix Σ that best reproduces the observed matrix. A fitting function is used to minimise the discrepancy between the observed and the predicted matrix. The most common such function is maximum likelihood estimation (MLE), which generally requires large samples and assumes continuous data and a multivariate normal distribution of the observed variables. However, as Muthén and Kaplan (1985) have shown, the use of Likert-type response and skewed response distributions do not significantly influence the probability of incorrect conclusions in CFA.

Alternatively, the robust standard errors procedure for the maximum likelihood estimation (MLR) (Kline, 2011; Muthén and Muthén, 1998-2012) can be used to avoid the bias resulting from the MLE estimator for non-normal outcomes. MLR is assumed to be robust against violations of normality. The estimation is an iterative numerical integration procedure, in which the first step involves selecting an initial set of starting values for the parameters, and the second requires computation of the difference between input and the estimated variance-covariance matrices. The parameters are then refined, with the difference between observed and estimated matrices again being computed. And so on, until a set of parameters that cannot be substantially improved is found (see, for example, Brown, 2006; Muthén and Muthén, 1998-2012).

For the estimation of parameters in models with missing data, the model-based and data-based approaches for categorical and continuous data implemented in Mplus are used to produce unbiased parameter estimates (Graham, 2012). In the model-based and data-based approaches, missing data are treated using the algorithms in maximum likelihood with the robust standard errors procedure (MLR) for the continuous variable and the robust weighted least squares procedure (WLSM) for the categorical variable. Both estimators are employed to maximise the likelihood of the relationships between variables before the vector of means and variance-covariance matrix are produced and used in the latent variable modelling.

Mplus uses a sandwich estimator (Huber, 1967; White, 1980) to compute robust standard errors, and the expectation-maximisation (EM) algorithm (Dempster et al., 1977; Rubin and Thayer, 1982) is used to optimise the MLR parameter estimates of the model. The procedure assumes that the data are missing at random (MAR). MAR means that the probability of a missing observation does not depend on the true score of a person with regard to the variable of interest, but can be correlated with other covariates and may depend on non-missing observed data (Schafer and Graham, 2002).

As described in Chapter 5, TALIS 2013 used a two-stage stratified sampling design, wherein schools were sampled within countries and teachers within schools. With this type of design, the variance and standard errors are underestimated if the calculation is done on the assumption of simple random sampling procedures (Hox, 2002; Raudenbush and Bryk, 2002; Snijders and Bosker, 1994). To avoid this outcome, the Mplus “type is complex” with “stratification” and “cluster” options were used in TALIS 2013 for CFA and multiple-group CFA (MGCFA) because these take into account stratification and cluster effects (Muthén and Muthén, 1998-2012).

It is generally desirable to give participating countries equal impact and contribution during estimation of model parameters. Accordingly, sampling weights were used to account for the unequal selection probabilities of the observations in the TALIS 2013 samples. Sampling weights were rescaled for each country within each ISCED 1, ISCED 2 (core survey), ISCED 3 and TALIS-PISA Link level to add up the cases to 3 000 for teachers, 200 for school principals for the ISCED Levels 1, 2, and 3 populations, and 500 in the case of the mathematics teachers in the TALIS-PISA Link sample. These rescaled sampling weights ensured that, despite the different population sizes, each country made an equal contribution to the parameter estimation. A pooled sample, using only cases from ISCED Level 2, was used to estimate the overall item parameters, such as international reliability coefficients of the scale as well as the item loadings and intercepts for computation of the factor scores. In the pooled sample, the data from all ISCED Level 2 countries were pooled together.

To determine whether the theoretically expected model fitted the data, different fit indices were used. They included the Comparative Fit Index (*CFI*), Tucker-Lewis Index (*TLI*), Root Mean Square Error Approximation (*RMSEA*) and the Standardized Root Mean Square Residual (*SRMR*). These indices all evaluated the correspondence between the observed data with the data pattern that would be expected based on the estimated model. (For a more detailed description of the model-data fit indices, see, for example, Brown, 2006.) In accordance with scientific conventions, $CFI \geq 0.90$, $TLI \geq 0.90$, $RMSEA \leq 0.08$ and $SRMR \leq 0.10$ were seen as indicative of an acceptably adequate model fit (Hu and Bentler, 1999; Steiger, 1990; Schermelleh-Engel et al., 2003; Yu, 2002).

Analysis of cross-national invariance and validity

Cross-national data allow countries to compare themselves with other countries facing similar challenges, and to learn from their policy approaches. But comparison also entails special challenges. Cross-national differences in the handling of questionnaires, different meanings ascribed to certain aspects of a construct in different nations and other factors can threaten the validity of intra-national differences or cross-cultural comparisons. Countries can only be validly compared if the scales used have an equivalent meaning across all countries (van de Vijver and Leung, 1997). To ensure accurate translation of the TALIS instruments across all countries, the translation process was closely monitored, and psychometric methods were used to examine the cross-cultural equivalence of the measured variables and the measured constructs.

Tests of invariance were carried out with MGCFA. The MGCFA model's factor loadings, intercepts, residual variances, means and standard deviations were estimated for each country separately, and constraints on these parameters were then examined simultaneously across countries. However, depending on the level of invariance being investigated, parameters can be restricted so they are equal or they can be allowed to vary across groups. The MGCFA model allows parameters to be constrained to the mean and covariances of the observed variables instead of the raw simple scores (Sörbom, 1974). The notation of the mean structure of the CFA model can be extended to the MGCFA model and summarised in matrix form as:

$$\mu_g = \tau_g + \Lambda_g \alpha_g.$$

The subscript g is added to indicate the group g ; $g = 1, 2, 3, \dots, G$, with G being the total number of groups compared, in our case, countries. The variances and covariances structure of the MGCFA for country g can be similarly derived, that is, as:

$$\Sigma_g = \Lambda_{y_g} \Psi_g \Lambda_{y_g}^T + \Theta_{\varepsilon_g}.$$

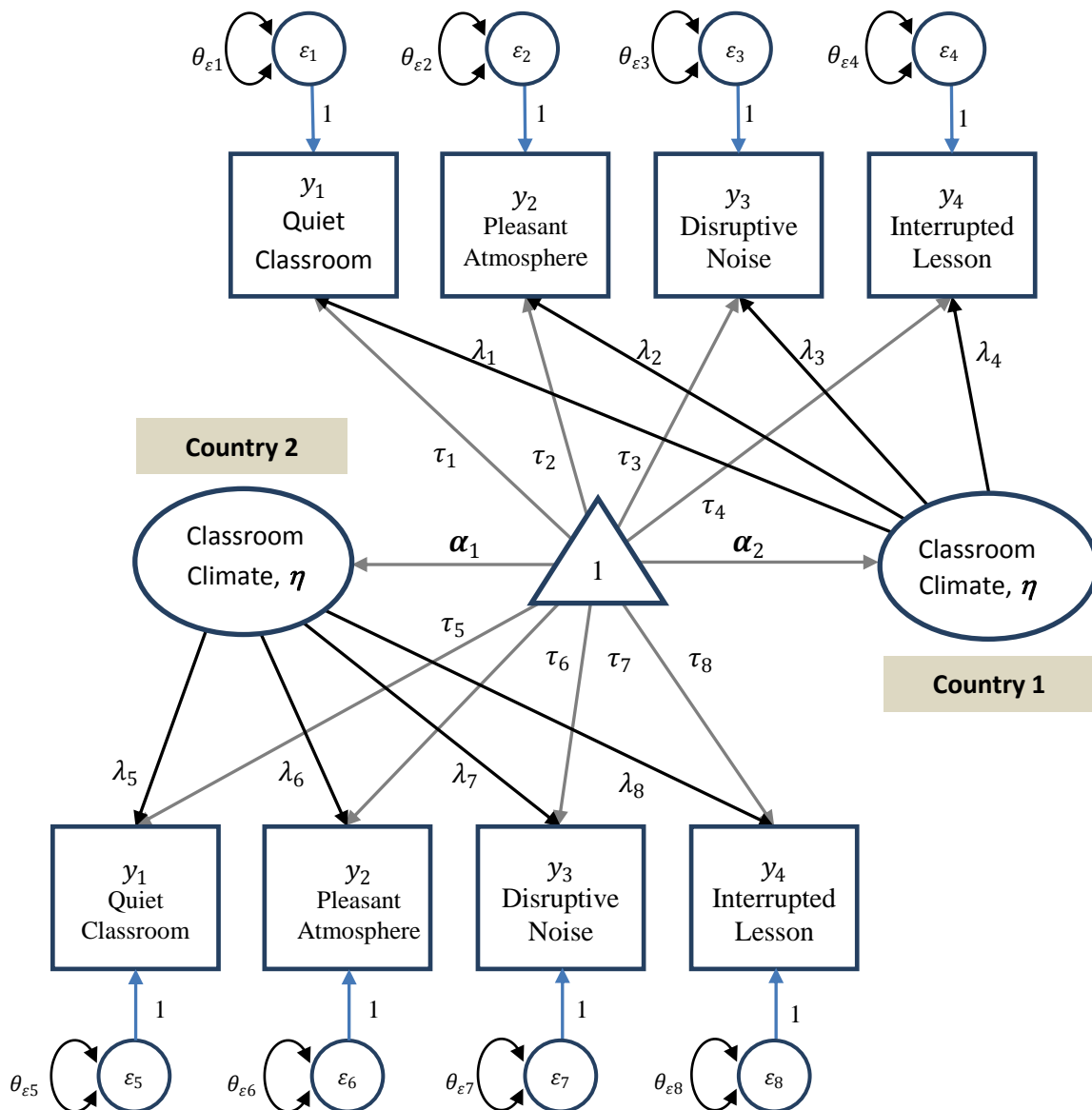
The notations for the means and covariances derive from the same regression model in CFA modelling.

Three levels of invariance were examined for TALIS 2013 – configural, metric and scalar (Cheung and Rensvold, 1999, 2002; Davidov, 2008; Steenkamp and Baumgartner, 1998). For TALIS, *configural invariance* would hold if the same factor structure was found in all the countries where the same variables were associated with each of the underlying common factors (Bollen, 1989; Meredith, 1993). In this instance, the same pattern of zero loadings, loadings different from zero, free and fixed parameters would be found in all countries, while the exact value of the loadings would be allowed to vary (i.e. different variables weights). Thus, configural invariance requires an adequate model-

data fit (i.e. $CFI \geq 0.90$, $TLI \geq 0.90$, $RMSEA \leq 0.08$ and $SRMR \leq 0.10$) when models for all groups (countries) are being estimated simultaneously using the same factor structure. However, the model parameters do not have to be equal across countries. Only one factor loading and one intercept need to be restricted to be equal for model identification.²

Figure 10.3 illustrates configural invariance of the scale *classroom disciplinary climate*. Here, we can see that in both Countries 1 and 2, the same four variables belong to this scale and that the factor loadings λ s, the intercepts τ s and the residual variances θ s have been allowed to vary.

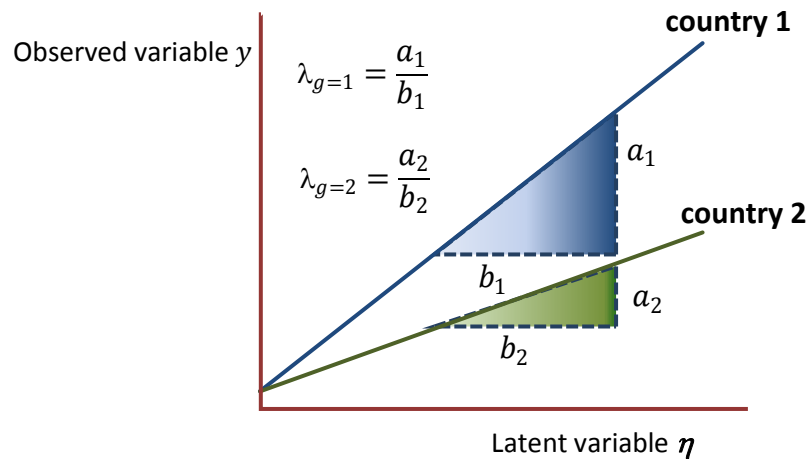
Figure 10.3 Configural Invariance across Two Countries for Classroom Disciplinary Climate



Source: OECD

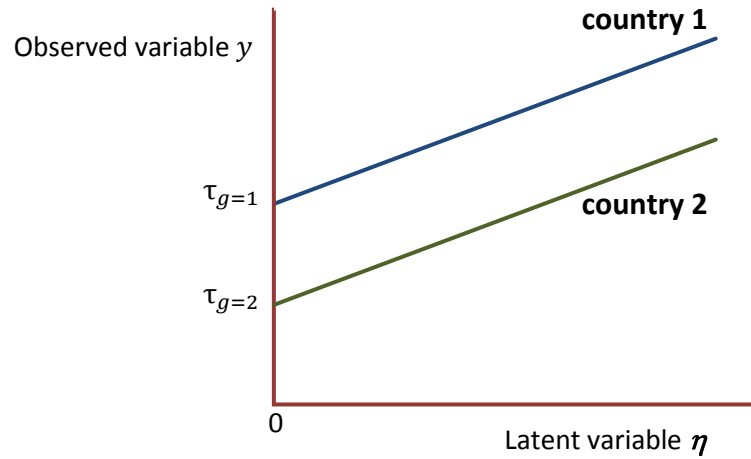
Metric invariance would be achieved if the same dimensional structure was found across countries and if the strength of the associations between the variables and the factor they constituted were also equal for all participating countries. Only in the case of equal factor loadings would a change in one unit in the latent construct η be associated with the same change in the observed variable for all countries (Meredith, 1993; Steenkamp and Baumgartner, 1998). Figure 10.4 shows a case of metric non-invariance. Here, variable y has a steeper slope (i.e. larger factor loading) in Country 1 than in Country 2 ($\lambda_{g=1} > \lambda_{g=2}$). If only the mean scores of the latent constructs of these two countries were compared, it would be impossible to separate the real behavioural differences from those due only to differences in the relative importance of the single responses (Cheung and Rensvold, 1998).

Figure 10.4 Metric Non-invariance for Two Countries



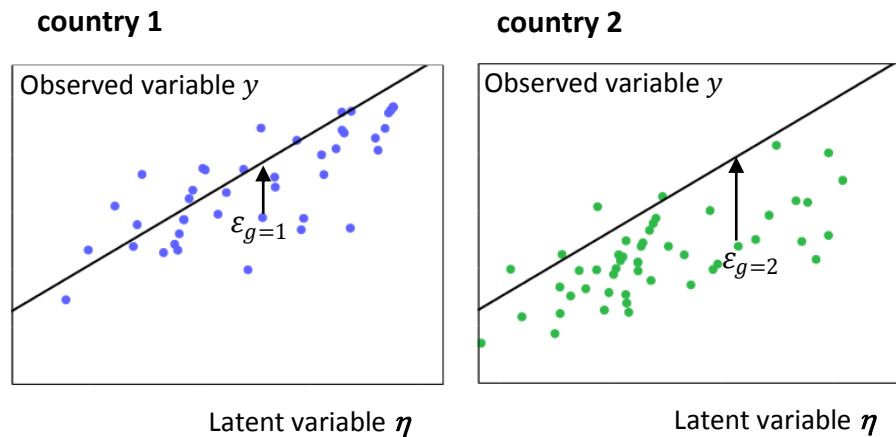
Source: OECD

Scalar invariance would be achieved when, in addition to the conditions of metric invariance being met, equivalent intercepts were observed for all countries. Thus, equal values for each item y would be predicted for participants from different countries who had a value of zero on the underlying trait η , meaning that all variables would indicate the same cross-cultural differences in the means of the latent construct (Cheung and Rensvold, 2002; Davidov, 2008; Steenkamp and Baumgartner, 1998). illustrates scalar non-invariance. Here, the same slopes are found for both countries (i.e. $\lambda_{g=1} = \lambda_{g=2}$), but Country 1 has a higher intercept than Country 2 (i.e. $\tau_{g=1} > \tau_{g=2}$). With scalar non-invariance it is impossible to decide whether mean score differences between groups are due to differences in the latent construct or to measurement differences in one or more observed variables.

Figure 10.5 Scalar Non-invariance for Two Countries

Source: OECD

Equality of residual variances, which is called *strict invariance*, implies that the portion of item variance not attributable to variance in the latent variable is also the same across countries. This means, with respect to TALIS, that the variables would have the same quality as measures of the latent variable in all countries (Cheung and Rensvold, 2002). For illustration purposes, Figure 10.6 shows the non-invariance of residual variances for Countries 1 and 2. The residual variance for Country 2 is larger, while for Country 1 the observed values are scattered closer to the regression line. This level of invariance was a prerequisite for comparing manifest means across the participating TALIS countries (Davidov, 2008).

Figure 10.6 Non-invariance of Residual Variances for Two Countries

Source: OECD

Whenever equality of residual variances fails to be established, the conclusion is that some of the groups compared differ with respect to means, variances and/or correlations among the measured variables. This is due to unwanted influences other than the common factors. As Meredith (1993) has argued, strict invariance is a necessary condition for a fair and equitable comparison. However, since the 1990s, the governing belief reflected in research practice is that metric (or weak) invariance, or scalar (strong) invariance at best, constitutes sufficient evidence for measurement invariance (Horn and McArdle, 1992; Little, 1997; Meredith, 1993; Steenkamp and Baumgartner, 1998). For this reason, TALIS 2013 decided not to test the complex scales for evidence of strict invariance.

The different levels of invariance form a hierarchy from the least restrictive to the most restrictive models. Metric invariance requires configural invariance, while scalar invariance requires metric invariance (Meredith, 1993). Therefore, models testing the three levels of invariance are nested so that fit indices can be compared across models. To determine whether the model fit significantly decreased when loadings and intercepts were restricted, TALIS compared differences in *CFI*, *TLI*, *RMSEA* and *SRMR* for the nested models. The χ^2 difference test was not employed because of its strong sensitivity to sample size and to the number of model parameters (Brown, 2006; Cheung and Rensvold, 1998).

While we could expect at this point a certain level of cross-cultural variation of the parameters, the research community remains unclear as to which magnitude of difference in model fit and between model parameters is indicative of serious bias and to what extent variations are acceptable (Schulz, 2005). Based on simulation studies, Chen (2007) and Cheung and Rensvold (2002) recommend viewing models as invariant if the absolute difference in *CFI* is less than 0.01 (i.e. $\Delta CFI \leq 0.010$), in *TLI* is less than 0.01 (i.e. $\Delta TLI \leq 0.010$), in *RMSEA* is less than 0.01 (i.e. $\Delta RMSEA \leq 0.010$) and in *SRMR* is less than 0.005 (i.e. $\Delta SRMR \leq 0.005$). However, their studies were applied to two-group comparisons only and therefore do not offer golden rules. Rutkowski and Svetina (2013)

suggest using a more lenient criterion when comparing a large number of groups (say 10 or 20), namely relaxing the more stringent cut-offs for the fit indices (e.g. when *CFI* or *RMSEA* change to < 0.020). Given that TALIS examined 32 countries in the measurement invariance evaluation,³ the recommendation from the studies were taken only as approximate cut-offs when endeavouring to establish measurement invariance.

Generally, the MGCFA baseline models were similar to the simple CFA models, as described above. In addition to fixing the mean of the latent scale to zero and the factor loading of one item to one for identification purposes, TALIS applied the same number of factors and the same patterns of zero-factor loadings in all groups as well as free factor variances across groups (Muthén and Muthén, 1998-2012). When applicable, latent correlations between scales of a construct were also compared across countries. Note, however, that differences in the strength of the relationships might be due to real cross-national differences and not necessarily indicative of bias or inconsistency. For the estimation of parameters, TALIS used maximum likelihood with robust standard errors (MLR) and the EM-algorithm (see above).

To summarise: invariance tests for configural, metric and scalar invariance were carried out, using the ISCED Level 2 samples, for the 2013 TALIS complex scales. The three different settings in the MODEL statement in Mplus 7.1 were therefore CONFIGURAL, METRIC, or SCALAR. This model specification was used to avoid model misspecification across the existing different literatures, and to appropriately use the “convenience” features of multiple-group factor analysis from the latest development of Mplus.

A report of the measurement invariance using the MGCFA approach in Mplus for each scale appears later in this chapter. A report on CFA parameters (i.e., loadings and intercepts) for all scales is provided for the countries in the reference group of the ISCED Level 2 and the TALIS-PISA populations (see Annex I Table 10.103 to Table 10.118).

Scaling procedures

This section describes the procedure for computation of the scale scores using confirmatory factor analysis, transformation of the estimated scores and computation of the composite scores for scales derived from more than one component.

Scale scores

The program Mplus Version 7.1 was used to compute factor scores as representations of the latent constructs. Using factor scores minimises measurement error in the variables contributing to each of the scales even though – as opposed to latent variables in SEM – factor scores are not completely free of measurement error (Hansen et al., 2006). Another advantage of factor scores is that (compared to simple sum scores) they account for differences in the relative strength of the relationships between the latent construct and the variables (Cheung and Rensvold, 1998).

Factor scores are based on the general structural equation modelling framework and specified as continuous normally distributed. As described above, the variables \mathbf{y} are predicted from the latent factor $\boldsymbol{\eta}$, which is multiplied with the factor loadings $\boldsymbol{\Lambda}$. The vector of item intercepts $\boldsymbol{\tau}$ and the vector of residuals $\boldsymbol{\varepsilon}$ are both added to the product. This is written as

$$\mathbf{y} = \boldsymbol{\tau}_y + \boldsymbol{\Lambda}_y \boldsymbol{\eta} + \boldsymbol{\varepsilon} .$$

To estimate factor scores from the MLR continuous procedure, Mplus uses the maximum of the posterior distribution of the factor, which is also called the maximum a posteriori (MAP) method (Muthén, 1998-2012). MAP is similar to the latent regression approach (Skrondal and Laake, 2001). If \mathbf{y} variables are continuous, the usual factor score estimates based on the regression method with correlated factors are the outcome (Muthén, 1977). For continuous variables, the factor score for individual i is computed from the mean vector of \mathbf{y} variables, $\boldsymbol{\mu}$, the factor score coefficient matrix \mathbf{C} , the vector of observations \mathbf{v}_i , the vector of intercepts $\boldsymbol{\tau}$, and the matrix of factor loadings $\boldsymbol{\Lambda}$ multiplied by the mean vector $\boldsymbol{\mu}$:

$$\hat{\eta}_i = \boldsymbol{\mu}_y + \mathbf{C}(\mathbf{v}_i - \boldsymbol{\tau}_y - \boldsymbol{\Lambda}_y \boldsymbol{\mu}_y).$$

The score coefficient matrix, in turn, is based on the item covariance matrix $\boldsymbol{\Sigma}$, the matrix of factor loadings $\boldsymbol{\Lambda}$ and the matrix of residual variances and covariances $\boldsymbol{\Theta}$:

$$\mathbf{C} = \boldsymbol{\Sigma}_y \boldsymbol{\Lambda}_y^T (\boldsymbol{\Lambda}_y \boldsymbol{\Sigma}_y \boldsymbol{\Lambda}_y^T + \boldsymbol{\Theta}_y)^{-1}.$$

These formulas imply that higher factor loadings on an item are associated with a stronger influence of this item on the factor score estimate. Likewise, the larger the residual variance of an item, the smaller is its influence on the factor score estimate. The item intercepts, the mean vector, and the variance of the latent variable affect the estimated scores for different countries in multiple group models.

For each TALIS scale, a score was computed (using the EM algorithm as described above to deal with missing data) for respondents who answered at least one of the variables belonging to the respective scale.

As the result of the scalar non-invariance for all scales, the scaling procedure for TALIS took a pooled sample with data from all ISCED Level 2 countries and conducted a CFA using this pooled sample. Weights were rescaled so that each country would contribute equally to the estimates.⁴ Estimated intercepts and loadings from the CFA employing the pooled sample were used as fixed parameters to calculate factor scores for each of the samples separately (ISCED Levels 1, 2 and 3, as well as the TALIS-PISA Link sample). Latent means of the scale were estimated separately for each country per ISCED level during calculation of the factor scores.

For a given factor analysis, there is an infinite number of sets of factor scores that are equally consistent with the factor loadings. This phenomenon is called “factor score indeterminacy” (see, for example, Grice, 2001; Schönemann and Steiger, 1976). The degree of indeterminacy varies in different CFA models depending on several factors such as the observed covariances, general model fit and the number of variables included in the model. As an indicator of the quality of factor scores, the degree of indeterminacy can be estimated for the continuous dependent variables in the CFA model. For TALIS, Mplus calculates factor scores coefficients that provide information about the correlation between the factor score estimates and their respective factors (Muthén and Muthén, 1998-2012). Table 10.1 presents factor score determinacy as well as the mean and standard deviation of the estimated factor scores for the pooled sample used to estimate the factor loadings and intercepts. The factor score determinacy for the complete-data pattern for each country will be reported later for each operationalised scale. According to Gorsuch (1983), determinacy coefficients of > 0.80 indicate an acceptably small magnitude of indeterminacy.

Once factor scores had been computed for each country, they were rescaled to a convenience metric that had a standard deviation of 2.0 on the pooled sample used for estimating the factor loadings and intercepts (ISCED Level 2 countries). The value 10 on the scale was made to coincide with the mid-point of the response options for the questions making up the scale. This transformation was done such that:

$$Y_i = 10 + 2 \left(\frac{FS_i - \overline{FS}}{SD_{FS}} \right) + c,$$

where Y_i is the scaled scores for individual i , FS_i is the factor score for individual i , \overline{FS} is the mean of the factor score, SD_{FS} is the standard deviation of the factor scores and c is the mid-point constant.

As a result from this transformation, consider, for example, that a score of 10 for a scale corresponds to cases where the average answer to the items making up this scale is 2.5, assuming a 1 was assigned to “strongly disagree”, a 2 to “disagree”, a 3 to “agree” and a 4 to “strongly agree”. Therefore, a score higher than 10, even if below the scale average, indicates average agreement with the items in the scale. A score below 10 indicates average disagreement with the items in the scale. Figure 10.7 illustrates the empirical mid-point for the classroom disciplinary climate scale, and Table 10.2 presents an example for the associated scale items mean-scaled score equivalent. The overall means, standard deviations and other descriptive statistics of the scaled scores for the entire dataset of TALIS 2013 are presented in Table 10.3.

Figure 10.7 Example of Empirical Mid-Point for a Scale

How strongly do you agree or disagree with the following statements about this <target class>?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) When the lesson begins, I have to wait quite a long time for students to quiet down.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Students in this class take care to create a pleasant learning atmosphere.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) I lose quite a lot of time because of students interrupting the lesson.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) There is much disruptive noise in this classroom.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note. Items a), c), and d) were reverse coded.

Disagreement

Agreement

Source: OECD

Table 10.1 International mean, standard deviations and factor scored determinacy of school- and teacher-level factor score estimates for the calibration sample

Principal Indices*	FSD	Mean (sd)
PSCDELIQS	0.893	.052(.189)
PSCMUTRS	0.904	-.006(.203)
PDISLEADS	0.866	.034(.232)
PJSENV5	0.908	-.002(.193)
PJSPROS	0.9	-.026(.250)
PINSLEADS	0.928	.018(.175)
Teacher Indices*	FSD	Mean (sd)
SECLSS	0.934	.001(.194)
SEINSS	0.92	.008(.171)
SEENG5	0.924	.015(.191)
TJSENV5	0.92	-.010(.221)
TJSPROS	0.92	-.028(.265)
TSCSTAKES	0.926	-.005(.181)
TSCTSTUDS	0.907	-.026(.148)
TCDISCS	0.943	-.044(.236)
TCONSBS	0.858	-.008(.183)
TCEXCHS	0.88	-.048(.441)
TCCOLLS	0.825	-.037(.507)
TEFFPROS	0.867	-.004(.239)
TPDPEDS	0.94	.012(.258)
TPDDIVS	0.925	.062(.273)
TMSELEFFS	0.847	-.017(.226)

Source: OECD, *TALIS Database*.

Note:* The list of items that make-up the scales is provided in each section describing the scales, FSD: Factor Scores Determinacy, sd: standard deviation

Table 10.2 Items mean-scaled score equivalent table

Items Mean Score	Scaled Score
1.00	5.8793
1.25	6.3209
1.33	7.3169
1.50	7.1103
1.67	7.7499
1.75	7.9044
2.00	8.6275
2.25	9.1898
2.33	9.9250
2.50	10.0000
2.67	10.4725
2.75	10.7826
3.00	11.3366
3.25	12.0633
3.33	12.4935
3.50	12.8681
3.67	13.3675
3.75	13.5946
4.00	14.0489

Source: OECD, *TALIS Database***Table 10.3 Descriptive statistics of the scaled scores for the calibration sample**

Principal Indices	Mean	Standard Deviation	Lowest Score	Highest Score
PSCDELIQS	6.33	1.63	3.45	12.66
PSCMUTRS	13.50	1.95	6.83	16.94
PDISLEADS	12.21	1.68	7.25	15.94
PJSENV5	14.11	1.92	6.60	16.53
PJSPROS	12.14	1.78	6.07	14.46
PINSLEADS	13.13	1.75	6.90	15.50
Teacher Indices	Mean	Standard Deviation	Lowest Score	Highest Score
SECLSS	12.87	1.81	5.35	15.51
SEINS	12.10	1.66	5.44	14.98
SEENG5	12.56	1.72	5.21	15.51
TJSENV5	12.23	1.92	4.47	15.25
TJSPROS	12.01	1.85	5.25	14.85
TSCSTAKES	11.06	1.99	4.53	15.43
TSCSTUDS	13.34	1.93	3.65	16.48
TCDISCS	11.25	1.90	5.78	14.35
TCONSBS	11.42	1.78	5.83	15.45
TCEXCHS	11.42	1.78	5.83	15.45
TCCOLLS	8.69	1.85	3.93	14.49
TEFFPROS	8.87	1.93	5.57	14.31
TPDPEDS	9.27	1.67	6.28	13.71
TPDDIVS	9.45	1.72	6.05	13.84
TMSELEFS	11.34	1.85	5.02	16.34

Source: OECD, *TALIS Database*

Note.*The list of items that make-up the scales is provided in each section describing the scales

Composite scale scores

For TALIS scales defined as the combination of two or more components (e.g. teacher job satisfaction was composed from two scales – *satisfaction with current work environment* and *satisfaction with profession*), the scores were computed by taking a simple average of the corresponding scaled scores of the components. The computation of the composite scores for individual i can be summarised as:

$$Y_i = \frac{\sum_{j=1}^N X_{ij}}{N},$$

where Y_i are the composite scaled scores for an individual, X_{ij} are the scaled scores of individual i from the scale component j , and N is the number of the scale components.

Description of complex scale indices and their parameters

This section describes the construction and computation of the scale scores used in TALIS and their characteristics. The indices described take into account the indices derived for the following:

- the principal-based complex scales: school delinquency and violence, school climate, distributed leadership, job satisfaction, instructional leadership;
- The principal-based simple categorisation: pedagogical personnel, school material resources, and school autonomy; and
- the teacher complex scales: self-efficacy, job satisfaction, stakeholders participation, teacher-student relationship, disciplinary climate, beliefs, teacher co-operation, and professional development.

An index derived exclusively for the TALIS-PISA Link data, that is, mathematic teachers' self-efficacy scale, is also described in this section.

School climate: School delinquency and violence (PSCDELIQS) and mutual respect (PSCMUTRS)

Two scales were formed separately to represent school climate – *school delinquency and violence* (PSCDELIQS) and *mutual respect* (PSCMUTRS). Both of these scales were measured by four items. PSCDELIQS was measured by TC2G32D, TC2G32E, TC2G32F and TC2G32G; PSCMUTRS by TC2G30C, TC2G30D, TC2G30E and TC2G30F. Table 10.4 describes the items for each scale.

Table 10.4 Measured items for school climate

In this school, how often do the following occur?		
Scale	Variable	Item Wording
School Delinquency And Violence	TC2G32D	Vandalism and theft
	TC2G32E	Intimidation or verbal abuse among students (or other forms of non-physical bullying)
	TC2G32F	Physical injury caused by violence among students
	TC2G32G	Intimidation or verbal abuse of teachers or staff

Table 10.4 Measured items for school climate (continued)

	TC2G32C*	Cheating
	TC2G32H*	Use/possession of drugs and/or alcohol
How strongly do you agree or disagree with these statements as applied to this school?		
Scale	Variable	Item Wording
Mutual Respect	TC2G30C	School staff have an open discussion about difficulties
	TC2G30D	There is mutual respect for colleagues' ideas
	TC2G30E	There is a culture of sharing success
	TC2G30F	The relationships between teachers and students are good

Source: OECD, *TALIS Database*

Note. *Items were not included in the scale but can be used as single items in analysis.

Items TC2G32H and TC2G32C were not included in the school delinquency and violence scale because they either did not show a clear loading pattern or had low item statistics across countries. They can therefore be used in single item analysis. All items in the school delinquency and violence scale were answered on a six-point scale. Response categories were 1 for “never”, 2 for “rarely”, 3 for “monthly”, 4 for “weekly” and 5 for “daily”. Items in the mutual respect scale were answered on a four-point scale. The response categories were 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree” and 4 for “strongly agree”.

The alpha reliability coefficient in both of the school climate scales for most of the participating countries was above 0.70. Only Norway from the ISCED Level 2 population had a lower scale reliability value for the school delinquency and violence scale ($\alpha = 0.547$). For the index of mutual respect, the scale had slightly lower reliabilities in the ISCED Level 2 population for the Czech Republic ($\alpha = 0.679$), Estonia ($\alpha = 0.673$), the Slovak Republic ($\alpha = 0.671$), Norway ($\alpha = 0.596$) and Israel ($\alpha = 0.554$).

Table 10.5 presents the reliabilities for all countries for these two scales in all populations. Overall, the reliability from the international pooled samples was above 0.70 in all populations not only for PSCDELIQS (i.e. $\alpha = 0.781$ for ISCED Levels 2 and 1, $\alpha = 0.795$ for ISCED Level 3, and $\alpha = 0.799$ for the TALIS-PISA sample) but also for PSCMUTRS (i.e. $\alpha = 0.786$ for ISCED Level 2, $\alpha = 0.852$ for ISCED Level 1, $\alpha = 0.795$ for ISCED Level 3 and $\alpha = 0.789$ for TALIS-PISA).

The interrelationships between the items of PSCDELIQS and between the items of PSCMUTRS were examined within the CFA modelling. The CFA modelling of PSCDELIQS proposed a zero residual variance for item TC2G32D to improve model-data convergence. CFAs for all countries exhibited an acceptable fit. Only the CFA model for Singapore showed a lack of acceptable model-data fit. For PSCMUTRS, the CFA modelling suggested the residual variances for TC2G30D, TC2G30E or TC2G30F should be fixed at small values (e.g. close to the observed variances) or be fixed at zero for the non-significant residual variance in some countries. This was undertaken so as to improve the estimation convergence. Details of the CFA model-data fit results for each population can be found in Table 10.6.

Table 10.5 Reliability coefficient alpha for the school delinquency and violence (PSCDELIQS) and mutual respect (PSCMUTRS) scales for all countries across populations

	PSCDELIQS	PSCMUTRS
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha
Australia	0.789	0.832
Brazil	0.786	0.797
Bulgaria	0.831	0.757
Chile	0.842	0.846
Croatia	0.733	0.725
Czech Republic	0.718	0.679
Denmark	0.768	0.780
Estonia	0.778	0.673
Finland	0.655	0.776
France	0.752	0.773
Iceland	0.819	0.752
Israel	0.778	0.554
Italy	0.770	0.799
Japan	0.891	0.771
Korea	0.801	0.846
Latvia	0.718	0.810
Malaysia	0.705	0.832
Mexico	0.809	0.815
Netherlands	0.723	0.816
Norway	0.547	0.596
Poland	0.760	0.782
Portugal	0.844	0.735
Romania	0.757	0.819
Serbia	0.789	0.800
Singapore	0.761	0.848
Slovak Republic	0.712	0.671
Spain	0.775	0.747
Sweden	0.744	0.787
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.731	0.860
Alberta (Canada)	0.772	0.861

Table 10.5 Reliability coefficient alpha for the school delinquency and violence (PSCDELIQS) and mutual respect (PSCMUTRS) scales for all countries across populations (continued)

	PSCDELIQS	PSCMUTRS
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha
England (United Kingdom)	0.798	0.797
Flanders (Belgium)	0.719	0.724
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha
Denmark	0.729	0.793
Finland	0.745	0.887
Mexico	0.850	0.840
Norway	0.669	0.872
Poland	0.724	0.862
Sub-national entities		
Flanders (Belgium)	0.700	0.851
	PSCDELIQS	PSCMUTRS
Countries ISCED 3	Coefficient Alpha	Coefficient Alpha
Australia	0.788	0.781
Denmark	0.830	0.705
Finland	0.824	0.764
Iceland	0.364	0.707
Italy	0.797	0.799
Mexico	0.761	0.807
Norway	0.750	0.793
Poland	0.684	0.758
Singapore	0.745	0.822
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.758	0.884
	PSCDELIQS	PSCMUTRS
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha
Australia	0.788	0.752
Finland	0.689	0.758
Latvia	0.701	0.812
Mexico	0.741	0.825
Portugal	0.794	0.825
Romania	0.728	0.795
Singapore	0.743	0.839
Spain	0.834	0.749

Source: OECD, *TALIS Database*

Table 10.6 Confirmatory factor analysis model-data fit for all countries across populations in the school climate scale

	PSCDELIQS				PSCMUTRS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR	CFI	TLI	RMSEA	SRMR
Australia	0.949	0.846	0.151	0.044	1.000	1.068	0.000	0.008
Brazil	0.963	0.889	0.078	0.030	1.000	1.007	0.000	0.009
Bulgaria	1.000	1.025	0.000	0.005	0.952	0.857	0.108	0.035
Chile	0.974	0.922	0.111	0.027	1.000	1.017	0.000	0.013
Croatia	0.960	0.880	0.123	0.033	1.000	1.024	0.000	0.016
Czech Republic	0.925	0.775	0.147	0.038	1.000	1.063	0.000	0.011
Denmark	1.000	1.002	0.000	0.017	1.000	1.053	0.000	0.005
Estonia	0.966	0.899	0.125	0.034	0.989	0.966	0.044	0.024
Finland	1.000	1.014	0.000	0.018	0.993	0.979	0.057	0.022
France	1.000	1.048	0.000	0.008	0.986	0.958	0.070	0.023
Iceland	0.971	0.913	0.135	0.031	0.935	0.870	0.125	0.050
Israel	0.978	0.934	0.074	0.027	1.000	1.316	0.000	0.032
Italy	0.985	0.955	0.063	0.023	1.000	1.038	0.000	0.008
Japan	1.000	1.008	0.000	0.006	0.980	0.940	0.083	0.028
Korea	0.991	0.972	0.063	0.020	0.998	0.995	0.025	0.022
Latvia	1.000	1.015	0.000	0.018	1.000	1.013	0.000	0.019
Malaysia	0.999	0.998	0.016	0.020	0.932	0.796	0.170	0.038
Mexico	1.000	1.034	0.000	0.010	1.000	1.057	0.000	0.005
Netherlands	0.946	0.838	0.103	0.034	1.000	1.045	0.000	0.012
Norway	1.000	1.103	0.000	0.019	0.718	0.437	0.131	0.064
Poland	0.890	0.670	0.173	0.045	0.999	0.997	0.015	0.032
Portugal	0.931	0.794	0.182	0.040	1.000	1.041	0.000	0.007
Romania	1.000	1.022	0.000	0.014	1.000	1.019	0.000	0.018
Serbia	1.000	1.002	0.000	0.014	1.000	1.010	0.000	0.011
Singapore	0.848	0.697	0.222	0.079	0.950	0.849	0.160	0.034
Slovak Republic	1.000	1.054	0.000	0.006	0.982	0.946	0.058	0.025
Spain	1.000	1.061	0.000	0.002	0.891	0.782	0.137	0.056
Sweden	0.955	0.864	0.136	0.037	1.000	1.014	0.000	0.018
Sub-national entities								
Abu Dhabi (United Arab Emirates)	0.991	0.973	0.060	0.024	1.000	1.022	0.000	0.009
Alberta (Canada)	1.000	1.015	0.000	0.010	0.998	0.995	0.029	0.013
England (United Kingdom)	0.995	0.985	0.049	0.025	0.966	0.898	0.111	0.028
Flanders (Belgium)	1.000	1.027	0.000	0.019	0.981	0.943	0.078	0.038
	PSCDELIQS				PSCMUTRS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR	CFI	TLI	RMSEA	SRMR
Denmark	1.000	1.006	0.000	0.020	1.000	1.040	0.000	0.009
Finland	1.000	1.024	0.000	0.011	0.995	0.986	0.074	0.021
Mexico	0.981	0.942	0.128	0.023	1.000	1.006	0.000	0.015
Norway	1.000	1.153	0.000	0.011	1.000	1.002	0.000	0.116
Poland	1.000	1.064	0.000	0.007	1.000	1.026	0.000	0.014
Sub-national entities								
Flanders (Belgium)	1.000	1.068	0.000	0.004	1.000	0.999	0.012	0.016

Table 10.6 Confirmatory factor analysis model-data fit for all countries across populations in the school climate scale (*continued*)

	PSCDELIQS				PSCMUTRS			
Countries ISCED 3	CFI	TLI	RMSEA	SRMR	CFI	TLI	RMSEA	SRMR
Australia	0.941	0.823	0.152	0.047	1.000	1.028	0.000	0.023
Denmark	0.992	0.977	0.116	0.028	1.000	1.059	0.000	0.030
Finland	0.979	0.936	0.102	0.023	1.000	1.060	0.000	0.002
Iceland	0.913	0.825	0.074	0.079	1.000	1.054	0.000	0.045
Italy	0.998	0.995	0.028	0.017	1.000	1.023	0.000	0.013
Mexico	1.000	1.057	0.000	0.005	1.000	1.076	0.000	0.009
Norway	1.000	1.090	0.000	0.008	0.972	0.945	0.095	0.148
Poland	0.988	0.964	0.041	0.034	0.898	0.695	0.163	0.036
Singapore	0.854	0.708	0.213	0.065	0.914	0.741	0.200	0.042
Sub-national entities								
Abu Dhabi (United Arab Emirates)	0.967	0.901	0.126	0.031	1.000	1.015	0.000	0.013
	PSCDELIQS				PSCMUTRS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR	CFI	TLI	RMSEA	SRMR
Australia	0.933	0.800	0.197	0.048	0.873	0.620	0.186	0.059
Finland	1.000	1.046	0.000	0.015	0.920	0.760	0.139	0.041
Latvia	1.000	1.125	0.000	0.008	1.000	1.075	0.000	0.021
Mexico	1.000	1.070	0.000	0.011	0.994	0.983	0.032	0.035
Portugal	1.000	1.037	0.000	0.015	0.985	0.971	0.053	0.171
Romania	0.956	0.869	0.053	0.042	1.000	1.360	0.000	0.006
Singapore	0.859	0.718	0.207	0.058	0.963	0.888	0.134	0.034
Spain	0.972	0.916	0.098	0.028	0.886	0.659	0.147	0.046

Source: OECD, *TALIS Database*

The analysis in the reference population of the ISCED Level 2 sample was followed-up by cross-national invariance testing of the scales. Overall, the PSCDELIQS scale functioned in a satisfactory way in most of the participating countries from the reference population. Convergence issues emerged for a few countries when the common item-factor structure was applied. This led to the need to fix the residual variance for TC2G32D to zero in the modelling of the configural level of invariance. The fit of the model beyond configural invariance was marginal.

The differences between the models examining metric and configural invariance were considered small, with $\Delta RMSEA = 0.016$ and $\Delta TLI = 0.025$ considered close enough to establish the criteria for metric invariance in a comparison such as this, involving a large number of countries. However, the changes in *CFI* and *SRMR* deteriorated when the factor loadings of the items were restricted to be equal. An analysis with equal factor loadings and item intercepts (i.e. scalar invariance) was then examined. This restriction led to a noticeable change in model-data fit (see Table 10.7). This change meant that while the strength of the relationships between the scale and each of the items was equal for all countries, subjects from different countries differed with regards to the relative tendency to endorse each of the single items given the same level of the underlying trait. The results confirmed the validity of cross-cultural comparisons of correlations of PSCDELIQS with other constructs across countries. Mean score comparisons of

PSCDELIQS should be interpreted carefully, however, as the mean scores may have a slightly different meaning for each country.

Table 10.8 presents the analysis of measurement invariance for PSCMUTRS. Convergence and identification issues were evident for a few countries. Residual variance for TC2G30E, TC2G30F or TC2G30D was fixed to small values for some countries in order to improve model-data convergence and to solve identification problem in modelling the invariance of the items at the configural level across countries. This development yielded a common item-factor structure as well as equal factor loadings across countries.

The difference between the configural and metric models was small ($\Delta CFI = 0.015$, $\Delta TLI = 0.003$ and $\Delta RMSEA = 0.003$), but there was a large drop in *SRMR* (i.e. $\Delta SRMR = 0.116$). The scalar level of invariance was followed up by constraining the factor loadings and item intercepts to be equal across countries. Because the difference between the scalar and metric levels of invariance was considered large, the restriction of equal intercepts of the items scale could not be deemed acceptable. The results from the configural and metric level of invariance for PSCMUTRS therefore allow cross-country comparisons of correlations of PSCMUTRS with other constructs, but mean score comparisons should be interpreted carefully, as the mean scores may have a slightly different meaning in each country.

Table 10.7 Measurement invariance model-data fit for PSCDELIQS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.978	0.934	0.089	0.027	-	-	-	-
Metric	0.926	0.909	0.105	0.131	0.052	0.025	0.016	0.104
Scalar	0.726	0.790	0.160	0.178	0.200	0.119	0.055	0.047

Source: OECD, *TALIS Database*

Table 10.8 Measurement invariance model-data fit for PSCMUTRS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.992	0.975	0.048	0.024	-	-	-	-
Metric	0.977	0.972	0.051	0.140	0.015	0.003	0.003	0.116
Scalar	0.836	0.874	0.108	0.186	0.141	0.098	0.057	0.046

Source: OECD, *TALIS Database*

Testing scalar non-invariance for PSCDELIQS and PSCMUTRS involved computing factor scores from a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. These loadings and intercepts were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA Link populations. Latent means of PSCDELIQS and PSCMUTRS were estimated separately for each country per population, and unique variances were allowed to vary. The fixed parameters (i.e. item loadings and intercepts) used for factor score computation are detailed in Table 10.9. The factor score determinacy is provided in Table 10.10.

The estimated factor score determinacies showed an acceptable magnitude of indeterminacy for all countries (i.e. ≥ 0.80 ; see the explanation earlier in this chapter on factor score determinacy). Only Norway from the ISCED Level 2 and Iceland from the ISCED Level 3 populations showed a large magnitude of indeterminacy in the

PSCDELIQS factor scores; Israel from the ISCED Level 2 population for the PSCMUTRS scale showed the same magnitude.

The factors scores were next transformed to a convenience metric. The index of PSCDELIQS was calculated to have a standard deviation of 2.0, and the mid-point of 10 to coincide with the mid-point of the scale, meaning that a score of 10 for the PSCDELIQS scale corresponds with the average answer of 3.0 on items TC2G32D, TC2G32E, TC2G32F and TC2G32G (see Figure 10.8). A score above 10 indicates consistent repetition with the items in the PSCDELIQS scale. For PSCMUTRS, the index was calculated to have a standard deviation of 2.0. The mid-point of 10 on the index coincides with the average response of 2.5 on items TC2G30C, TC2G30D, TC2G30E and TC2G30F (see Figure 10.9). A score below 10 indicates disagreement with the items in the PSCMUTRS scale.

Figure 10.8 Scale Mid-Point for PSCDELIQS

In this school, how often do the following occur?
Please mark one choice in each row.

By students in this school:

	Never	Rarely	Monthly	Weekly	Daily
Vandalism and theft	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input checked="" type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Intimidation or verbal abuse among students (or other forms of non-physical bullying)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input checked="" type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Physical injury caused by violence among students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input checked="" type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Intimidation or verbal abuse of teachers or staff	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input checked="" type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

Mid-Point = 3.0

Inconsistent
Consistent

Source: OECD

Figure 10.9 Scale Mid-Point for PSCMUTRS

How strongly do you agree or disagree with these statements as applied to this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	<div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
School staff have an open discussion about difficulties.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
There is mutual respect for colleagues' ideas.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
There is a culture of sharing success.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
The relationships between teachers and students are good.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Disagreement</div>		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Agreement</div>	

Source: OECD

Table 10.9 Item loadings and intercepts for PSCDELIQS and PSCMUTRS

Scale	Item	Loading	Intercept
School Delinquency and Violence	TC2G32D	1.000	2.022
	TC2G32E	1.718	2.446
	TC2G32F	1.066	1.792
	TC2G32G	1.232	1.760
Mutual Respect	TC2G30C	0.731	3.194
	TC2G30D	0.916	3.172
	TC2G30E	1.000	3.167
	TC2G30F	0.617	3.307

Source: OECD, *TALIS Database*

Table 10.10 Factor score determinacies for the PSCDELIQS and PSCMUTRS scales

Countries (ISCED 2)	PSCDELIQS	PSCMUTRS
Australia	0.891	0.916
Brazil	0.892	0.905
Bulgaria	0.914	0.893
Chile	0.918	0.935
Croatia	0.869	0.864
Czech Republic	0.863	0.855
Denmark	0.862	0.894
Estonia	0.858	0.842
Finland	0.813	0.888
France	0.869	0.892
Iceland	0.897	0.907
Israel	0.882	0.777
Italy	0.880	0.908
Japan	0.929	0.889
Korea	0.900	0.940
Latvia	0.844	0.935
Malaysia	0.865	0.923
Mexico	0.905	0.913
Netherlands	0.847	0.901
Norway	0.722	0.828
Poland	0.862	0.918
Portugal	0.914	0.887
Romania	0.872	0.909
Serbia	0.890	0.917
Singapore	0.862	0.925
Slovak Republic	0.862	0.830
Spain	0.881	0.894
Sweden	0.862	0.904
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.880	0.932
Alberta (Canada)	0.895	0.939
England (United Kingdom)	0.901	0.913
Flanders (Belgium)	0.851	0.890
Countries (ISCED 1)	PSCDELIQS	PSCMUTRS
Denmark	0.851	0.926
Finland	0.867	0.949
Mexico	0.911	0.918
Norway	0.814	0.940
Poland	0.845	0.939
Sub-national entities		
Flanders (Belgium)	0.818	0.932
Countries (ISCED 3)	PSCDELIQS	PSCMUTRS
Australia	0.897	0.891

Table 10.10 Factor score determinacies for the PSCDELIQS and PSCMUTRS scales (*continued*)

Countries (ISCED 3)	PSCDELIQS	PSCMUTRS
Denmark	0.923	0.891
Finland	0.908	0.881
Iceland	0.356	0.873
Italy	0.885	0.904
Mexico	0.884	0.913
Norway	0.824	0.884
Poland	0.825	0.873
Singapore	0.851	0.919
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.889	0.941
Countries (TALIS-PISA)	PSCDELIQS	PSCMUTRS
Australia	0.891	0.883
Finland	0.833	0.869
Latvia	0.840	0.902
Mexico	0.851	0.916
Portugal	0.877	0.912
Romania	0.833	0.906
Singapore	0.851	0.922
Spain	0.919	0.875

Source: OECD, *TALIS Database****Distributed leadership (PDISLEADS)***

The degree of distributed leadership (PDISLEADS) was measured by three items – TC2G22A, TC2G22B and TC2G22C. Items TC2G22D and TC2G22E were not included in the *distributed leadership scale* because they either did not show a clear loading pattern with other items in the scale or had poor item statistics across countries. Items TC2G22D and TC2G22E can be used in single item analysis. Table 10.11 lists the items making up the PDISLEADS scale. All items in the distributed leadership scale were answered on a four-point scale, where the response categories were 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree” and 4 for “strongly agree”.

The alpha reliability coefficient was above 0.70 for most of the participating countries; the remaining countries showed a reliability value below 0.70 in the items of the distributed leadership scale. Table 10.12 presents the reliabilities for all countries for PDISLEADS in all populations. Overall, the international reliability was above 0.70 or 0.60 for the ISCED Levels 2, 1 and TALIS-PISA populations but below 0.60 for the ISCED Level 3 population ($\alpha = 0.623$ for ISCED 2, $\alpha = 0.717$ for ISCED 1, $\alpha = 0.563$ for ISCED 3 and $\alpha = 0.738$ for TALIS-PISA).

The internal consistency of PDISLEADS was evaluated using CFA modelling, which proposed a zero residual variance for item TC2G22B or TC2G22C to improve the estimation convergence. CFAs for most of the participating countries in the reference population exhibited reasonably good fit. CFAs for some countries (e.g. Chile, the Czech Republic, England, Estonia, France, Iceland and Sweden) were outside the range of acceptable fit values in the model-data agreement. Table 10.13 provides the CFA results for all ISCED Levels 1, 2, 3 and TALIS-PISA Link populations.

Table 10.11 Measured items for distributed leadership

How strongly do you agree or disagree with these statements as applied to this school?		
Scale	Variable	Item Wording
Distributed Leadership	TC2G22A	This school provides staff with opportunities to actively participate in school decisions
	TC2G22B	This school provides parents or guardians with opportunities to actively participate in school decisions
	TC2G22C	This school provides students with opportunities to actively participate in school decisions
	TC2G22D*	I make the important decisions on my own
	TC2G22E*	There is a collaborative culture which is characterised by mutual support

Source: OECD, *TALIS Database*

Note. Items were not included in the scale but can be used as single items in analysis.

Table 10.12 Reliability coefficient alpha for the distributed leadership scale (PDISLEADS) for all countries across populations

	PDISLEADS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.464
Brazil	0.798
Bulgaria	0.707
Chile	0.787
Croatia	0.651
Czech Republic	0.730
Denmark	0.575
Estonia	0.681
Finland	0.535
France	0.750
Iceland	0.705
Israel	0.477
Italy	0.523
Japan	0.714
Korea	0.784
Latvia	0.707
Malaysia	0.620
Mexico	0.781
Netherlands	0.721
Norway	0.509
Poland	0.814
Portugal	0.731
Romania	0.759

Table 10.12 Reliability coefficient alpha for the distributed leadership scale (PDISLEADS) for all countries across populations (*continued*)

	PDISLEADS
Countries (ISCED 2)	Coefficient Alpha
Serbia	0.819
Singapore	0.672
Slovak Republic	0.630
Spain	0.825
Sweden	0.657
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.749
Alberta (Canada)	0.791
England (United Kingdom)	0.835
Flanders (Belgium)	0.763
	PDISLEADS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.501
Finland	0.519
Mexico	0.733
Norway	0.571
Poland	0.772
Sub-national entities	
Flanders (Belgium)	0.548
	PDISLEADS
Countries (ISCED 3)	Coefficient Alpha
Abu Dhabi (United Arab Emirates)	0.709
Australia	0.660
Denmark	0.551
Finland	0.574
Iceland	0.512
Italy	0.727
Mexico	0.702
Norway	0.555
Poland	0.817
Singapore	0.633
	PDISLEADS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.648
Finland	0.561
Latvia	0.743
Mexico	0.726
Portugal	0.661
Romania	0.817
Singapore	0.632
Spain	0.842

Source: OECD, *TALIS Database*

Table 10.13 Confirmatory factor analysis model-data fit for all countries across populations in the distributed leadership scale

Countries (ISCED 2)	PDISLEADS			
	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.239	0.000	0.012
Brazil	0.951	0.854	0.120	0.043
Bulgaria	0.909	0.727	0.179	0.049
Chile	0.853	0.558	0.274	0.054
Croatia	0.987	0.961	0.071	0.030
Czech Republic	0.861	0.583	0.277	0.057
Denmark	0.935	0.806	0.119	0.048
Estonia	0.839	0.516	0.243	0.077
Finland	0.812	0.435	0.195	0.061
France	0.990	0.971	0.077	0.025
Iceland	0.873	0.618	0.235	0.068
Israel	0.764	0.292	0.112	0.069
Italy	0.923	0.768	0.083	0.048
Japan	0.901	0.704	0.201	0.064
Korea	0.903	0.710	0.255	0.042
Latvia	0.969	0.908	0.089	0.040
Malaysia	0.961	0.884	0.105	0.038
Mexico	1.000	1.022	0.000	0.011
Netherlands	0.964	0.892	0.122	0.032
Norway	1.000	1.230	0.000	0.025
Poland	0.951	0.854	0.117	0.027
Portugal	1.000	1.025	0.000	0.013
Romania	1.000	1.000	0.007	0.019
Serbia	0.997	0.991	0.055	0.017
Singapore	1.000	1.006	0.000	0.033
Slovak Republic	0.977	0.930	0.079	0.036
Spain	0.968	0.904	0.140	0.037
Sweden	0.725	0.175	0.235	0.086
Sub-national entities				
Abu Dhabi (United Arab Emirates)	1.000	1.052	0.000	0.006
Alberta (Canada)	0.954	0.862	0.166	0.043
England (United Kingdom)	0.949	0.846	0.350	0.085
Flanders (Belgium)	0.944	0.831	0.120	0.064
	PDISLEADS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.835	0.504	0.148	0.056
Finland	0.870	0.609	0.114	0.047
Mexico	0.922	0.765	0.183	0.053
Norway	1.000	1.106	0.000	0.021
Poland	0.916	0.748	0.149	0.050
Sub-national entities				
Flanders (Belgium)	0.741	0.222	0.188	0.085

Source: OECD, *TALIS Database*

The cross-national invariance testing for PDISLEADS, examined on the basis of the reference population (the ISCED Level 2 sample), showed the scale functioning in a satisfactory way across countries in the reference population. There were convergence issues for some countries, however. The residual variance for item TC2G22B or item TC2G22C was therefore fixed to zero for these countries in order to improve model-data convergence in the configural CFA model. The analysis also led to the conclusion that any differences between the models examining metric and configural invariance were small ($\Delta RMSEA = 0.018$ and $\Delta TLI = 0.021$), thus making it relatively less complication to establish the criteria for metric invariance for this comparison of a large number of countries. However, the changes in *CFI* and *SRMR* deteriorated somewhat when the restriction of equal loadings of the items was imposed in all countries CFA models.

When the multiple-group CFA modelling with equal factor loadings and item intercepts (i.e. scalar invariance) was examined, it could be seen that this restriction had produced a large drop in the model fits, with the changes in *CFI*, *TLI*, *RMSEA*, and *SRMR* all showing scalar non-invariance (see Table 10.14). Generally, the highest level of invariance established for PDISLEADS was metric invariance, signifying that while mean score comparisons for PDISLEADS could not be unequivocally interpreted, it would be relatively instructive to compare relationships with other constructs across countries.

After completion of the invariance testing, factor scores were computed from a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. The loadings and intercepts were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations in order to produce the factor scores. Latent means of PDISLEADS were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.15 details the fixed item loadings and the intercepts used for the factor score computation.

The estimated factor score determinacies showed an acceptable magnitude of indeterminacy for some countries (i.e., ≥ 0.80 ; see earlier in this chapter for an explanation of factor score determinacy). Some countries in the ISCED Levels 2 (e.g. Finland, Italy and Norway), 1 (e.g. Denmark, Finland and Flanders (Belgium)), and 3 populations (e.g. Denmark, Finland and Iceland), and in the TALIS-PISA population (i.e. Finland and Singapore) showed a large magnitude of factor score indeterminacy. For reference, the factor score determinacy is provided in Table 10.16.

Factor scores were then transformed to a convenience metric. The index of PDISLEADS was calculated to have a standard deviation of 2.0, and the mid-point of 10 to coincide with the mid-point of the scale. This means that a score of 10 for PDISLEADS corresponds with the average answer of 2.5 on items TC2G22A, TC2G22B and TC2G22C (see Figure 10.10). A score below 10 indicates disagreement with the items in the PDISLEADS scale.

Figure 10.10 Scale Mid-Point for PDISLEADS

How strongly do you agree or disagree with these statements as applied to this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	<div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
a) This school provides staff with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) This school provides parents or guardians with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) This school provides students with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Disagreement</div>		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Agreement</div>	

Source: OECD

Table 10.14 Measurement invariance model-data fit for PDISLEADS

Invariance Level	CFI	TLI	Δ TLI	Δ RMSEA	Δ SRMR
Configural	0.999	0.967	-	-	-
Metric	0.965	0.946	0.021	0.018	0.123
Scalar	0.738	0.797	0.149	0.078	0.064

Source: OECD, *TALIS Database*

Table 10.15 Item loadings and intercepts for PDISLEADS

Scale	Item	Loading	Intercept
Distributed Leadership	TC2G22A	0.629	3.310
	TC2G22B	1.000	2.960
	TC2G22C	0.935	2.856

Source: OECD, *TALIS Database*

Table 10.16 Factor score determinacies for the PDISLEADS scale

Countries (ISCED 2)	PDISLEADS
Australia	0.723
Brazil	0.902
Bulgaria	0.860
Chile	0.913
Croatia	0.848
Czech Republic	0.883
Denmark	0.763
Estonia	0.825
Finland	0.702
France	0.891
Iceland	0.856
Israel	0.718
Italy	0.621
Japan	0.862
Korea	0.909
Latvia	0.851
Malaysia	0.763
Mexico	0.908
Netherlands	0.911
Norway	0.711
Poland	0.967
Portugal	0.876
Romania	0.889
Serbia	0.936
Singapore	0.807
Slovak Republic	0.781
Spain	0.936
Sweden	0.780
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.938
Alberta (Canada)	0.892
England (United Kingdom)	0.881
Flanders (Belgium)	0.878
Countries (ISCED 1)	PDISLEADS
Denmark	0.693
Finland	0.731
Mexico	0.867
Norway	0.811
Poland	0.873

Table 10.16 Factor score determinacies for the PDISLEADS scale (*continued*)

Countries (ISCED 1)	PDISLEADS
Sub-national entities	
Flanders (Belgium)	0.796
Countries (ISCED 3)	PDISLEADS
Australia	0.837
Denmark	0.656
Finland	0.575
Iceland	0.549
Italy	0.864
Mexico	0.858
Norway	0.801
Poland	0.952
Singapore	0.776
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.887
Countries (TALIS-PISA link)	PDISLEADS
Australia	0.870
Finland	0.716
Latvia	0.867
Mexico	0.878
Portugal	0.853
Romania	0.899
Singapore	0.775
Spain	0.951

Source: OECD, *TALIS Database*

Instructional leadership (PINSLEADS)

The list of the items for the *instructional leadership scale* (PINSLEADS), items TC2G21C, TC2G21D and TC2G21E, is presented in Table 10.17.

The items considered for deriving this scale were TC2G21B, TC2G21C, TC2G21D, TC2G21E and TC2G21F. Items TC2G21B and TC2G21F were found to have either a weak factor loading pattern or low item statistics. The excluded items can, however, be used in analyses involving single items. The items were answered on a four-point scale, with the response categories 1 for “never or rarely”, 2 for “sometimes”, 3 for “often” and 4 for “very often”.

The alpha reliability coefficient was above 0.70 for most of the countries in the reference population of ISCED Level 2. The analysis also showed that Bulgaria, Finland, Iceland, Latvia, Norway, Poland, and the Slovak Republic had a slightly lower reliability in PINSLEADS. Table 10.18 presents the reliabilities for all countries in all populations. The overall reliabilities from the international pooled samples were all greater than 0.70: where, $\alpha = 0.793$ for ISCED Level 2, $\alpha = 0.776$ for Level 1, $\alpha = 0.790$ for Level 3 and $\alpha = 0.788$ for the TALIS-PISA Link.

CFA modelling was used to analyse the internal relationship between the PDISLEADS items for each country. The residual variance of item TC2G21D was fixed to zero for the identification of the three-item factor model in the reference population (i.e. ISCED Level 2). Table 10.19 exhibits the CFA model-data fit for each country in all populations. The CFA model for Bulgaria, France, Poland, Portugal and Sweden showed a lack of model-data fit. All other countries in this reference population exhibited reasonably good fit. Table 10.19 also presents the CFA results for the other ISCED Levels (1 and 3) and the TALIS-PISA Link.

The multiple-group CFA for the invariance testing for PINSSLEADS was examined (using the ISCED Level 2 data) for cross-cultural differences. Testing of measurement invariance showed the scale functioning satisfactorily across countries in the reference population. However, identification difficulty was apparent for this three-item multiple-group factor model. Effort to solve this issue involved fixing the residual variance for item TC2G21D to zero for some countries. The comparison between the unrestricted multiple-group model and the model with equal factor loadings across countries revealed acceptable differences in the fit indices ($\Delta CFI = 0.028$, $\Delta TLI = 0.012$, and $\Delta RMSEA = 0.010$), and a slightly higher drop in *SRMR* (i.e. $\Delta SRMR = .133$).

Table 10.17 Measured items for instructional leadership

Please indicate how frequently you engaged in the following in this school during the last 12 months.		
Scale	Variable	Item Wording
Instructional Leadership	TC2G21C	I took actions to support co-operation among teachers to develop new teaching practices
	TC2G21D	I took actions to ensure that teachers take responsibility for improving their teaching skills
	TC2G21E	I took actions to ensure that teachers feel responsible for their students' learning outcomes
	TC2G21B*	I observed instruction in the classroom
	TC2G21F*	I provided parents or guardians with information on the school and student performance

Source: OECD, *TALIS Database*

Note. *Items were not included in the scale but can be used as single items in analysis.

Table 10.18 Reliability coefficient alpha for the instructional leadership scale (PINSLEADS) for all countries across populations

	PINSLEADS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.83
Brazil	0.781
Bulgaria	0.623
Chile	0.77
Croatia	0.709
Czech Republic	0.769
Denmark	0.715
Estonia	0.704
Finland	0.689
France	0.696
Iceland	0.751
Israel	0.81
Italy	0.72
Japan	0.757
Korea	0.731
Latvia	0.68
Malaysia	0.862
Mexico	0.756
Netherlands	0.706
Norway	0.828
Poland	0.671
Portugal	0.791
Romania	0.76
Serbia	0.694
Singapore	0.794
Slovak Republic	0.662
Spain	0.744
Sweden	0.777
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.868
Alberta (Canada)	0.85
England (United Kingdom)	0.779
Flanders (Belgium)	0.834
	PINSLEADS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.744
Finland	0.657
Mexico	0.789
Norway	0.747
Poland	0.713
Sub-national entities	
Flanders (Belgium)	0.751

Table 10.18 Reliability coefficient alpha for the instructional leadership scale (PINSLEADS) for all countries across populations (*continued*)

	PINSLEADS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.765
Denmark	0.829
Finland	0.793
Iceland	0.683
Italy	0.727
Mexico	0.8
Norway	0.676
Poland	0.62
Singapore	0.789
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.841
	PINSLEADS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.828
Finland	0.76
Latvia	0.763
Mexico	0.78
Portugal	0.702
Romania	0.654
Singapore	0.803
Spain	0.775

Source: OECD, *TALIS Database*

Table 10.19 Confirmatory factor analysis model-data fit for all countries across populations in the distributed leadership scale

Countries (ISCED 2)	PDISLEADS			
	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.043	0.000	0.003
Brazil	0.995	0.985	0.033	0.020
Bulgaria	0.746	0.238	0.210	0.059
Chile	0.971	0.912	0.134	0.039
Croatia	0.999	0.997	0.023	0.022
Czech Republic	1.000	1.004	0.000	0.017
Denmark	0.960	0.879	0.156	0.036
Estonia	1.000	1.004	0.000	0.015
Finland	1.000	1.033	0.000	0.011
France	0.876	0.628	0.208	0.067
Iceland	1.000	1.023	0.000	0.027
Israel	0.970	0.909	0.110	0.040
Italy	0.993	0.979	0.048	0.029
Japan	0.988	0.963	0.072	0.032
Korea	1.000	1.052	0.000	0.005
Latvia	0.997	0.991	0.040	0.020
Malaysia	0.956	0.867	0.168	0.025
Mexico	1.000	1.044	0.000	0.009
Netherlands	1.000	1.020	0.000	0.018
Norway	0.983	0.948	0.192	0.040
Poland	0.878	0.633	0.191	0.068
Portugal	0.880	0.640	0.237	0.068
Romania	0.975	0.924	0.115	0.034
Serbia	0.989	0.966	0.063	0.022
Singapore	1.000	1.007	0.000	0.015
Slovak Republic	0.973	0.919	0.096	0.029
Spain	1.000	1.054	0.000	0.000
Sweden	0.845	0.536	0.286	0.067
Sub-national entities				
Abu Dhabi (United Arab Emirates)	1.000	1.024	0.000	0.004
Alberta (Canada)	0.989	0.967	0.082	0.031
England (United Kingdom)	1.000	1.068	0.000	0.004
Flanders (Belgium)	0.967	0.902	0.181	0.032
	PDISLEADS			
Countries (ISCED 1)				
	CFI	TLI	RMSEA	SRMR
Denmark	0.947	0.841	0.182	0.041
Finland	1.000	1.004	0.000	0.022
Mexico	0.968	0.904	0.147	0.032
Norway	0.947	0.841	0.159	0.039
Poland	0.893	0.680	0.173	0.056
Sub-national entities				
Flanders (Belgium)	0.966	0.898	0.132	0.039

Table 10.19 Confirmatory factor analysis model-data fit for all countries across populations in the distributed leadership scale (continued)

	PDISLEADS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.982	0.945	0.067	0.045
Denmark	0.983	0.948	0.126	0.034
Finland	0.000	-2.900	0.967	0.070
Iceland	1.000	1.052	0.000	0.050
Italy	0.948	0.845	0.135	0.042
Mexico	0.982	0.945	0.083	0.042
Norway	1.000	1.020	0.000	0.032
Poland	1.000	1.059	0.000	0.027
Singapore	1.000	1.025	0.000	0.010
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.902	0.707	0.254	0.052
	PDISLEADS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.894	0.683	0.259	0.060
Finland	0.983	0.948	0.104	0.034
Latvia	1.000	1.041	0.000	0.003
Mexico	1.000	1.017	0.000	0.014
Portugal	0.960	0.881	0.105	0.046
Romania	1.000	1.130	0.000	0.005
Singapore	1.000	1.001	0.000	0.015
Spain	0.953	0.860	0.134	0.055

Source: OECD, *TALIS Database*

The fit of the model beyond metric invariance proved to be marginal when the results from the scalar invariance of PINSLEADS (i.e. a model with equal factor loadings and item intercepts) were examined across countries. All of the fit indices supported metric invariance and scalar non-invariance, implying the validity of cross-cultural comparisons of correlations of PINSLEADS with other constructs across countries. However, because the meaning ascribed to the mean scores of the scale will differ slightly across countries, comparisons need to be interpreted with considerable caution. Table 10.20 details the results of the invariance testing.

As a result of difficulty in establishing the scalar level of invariance for PINSLEADS, factor scores were computed from a CFA model of the pooled estimates of factor loadings and intercepts. The parameters were estimated on the basis of the ISCED 2 calibration sample. These loadings and intercepts were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Latent means of PINSLEADS were estimated separately for each country per population, and unique variances were allowed to vary. The fixed item loadings and intercepts parameters are presented in Table 10.21.

The factor score determinacy for all countries was acceptable (see Table 10.22) given the determinacy index of above 0.80 (see the explanation earlier in this chapter of factor score determinacy). Factor scores were then transformed to a convenience metric. The index of PINSLEADS was calculated to have a standard deviation of 2.0. The mid-point of 10 coincides with the mid-point of the scale, meaning that a score of 10 for

PINSLEADS corresponds with the average response of 2.5 on items TC2G21C, TC2G21D and TC2G21E (see Figure 10.11), and a score above 10 indicates consistent repetition of activities described by the items in this scale.

Table 10.20 Measurement invariance model-data fit for PINSLEADS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.980	0.939	0.097	0.034	-	-	-	-
Metric	0.952	0.951	0.087	0.167	0.028	0.012	0.010	0.133
Scalar	0.771	0.859	0.147	0.233	0.181	0.092	0.060	0.066

Source: OECD, *TALIS Database*

Table 10.21 Item loadings and intercepts for PINSLEADS

Scale	Item	Loading	Intercept
Instructional Leadership	TC2G21C	1.000	2.769
	TC2G21D	1.389	2.818
	TC2G21E	1.107	2.947

Source: OECD, *TALIS Database*

Table 10.22 Factor scores determinacies for the PINSLEADS scale

Countries (ISCED 2)	PINSLEADS
Australia	0.966
Brazil	0.905
Bulgaria	0.804
Chile	0.907
Croatia	0.899
Czech Republic	0.945
Denmark	0.849
Estonia	0.879
Finland	0.860
France	0.837
Iceland	0.898
Israel	0.946
Italy	0.868
Japan	0.853
Korea	0.929
Latvia	0.913
Malaysia	0.933
Mexico	0.906
Netherlands	0.890
Norway	0.927
Poland	0.809
Portugal	0.905
Romania	0.906
Serbia	0.876
Singapore	0.950
Slovak Republic	0.850
Spain	0.910
Sweden	0.890
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.993
Alberta (Canada)	0.973
England (United Kingdom)	0.955
Flanders (Belgium)	0.949
Countries (ISCED 1)	PINSLEADS
Denmark	0.861
Finland	0.901
Mexico	0.922
Norway	0.940
Poland	0.859
Sub-national entities	
Flanders (Belgium)	0.907

Table 10.22 Factor scores determinacies for the PINSLEADS scale (*continued*)

Countries (ISCED 3)	PINSLEADS
Australia	0.917
Denmark	0.945
Finland	0.901
Iceland	0.854
Italy	0.875
Mexico	0.924
Norway	0.876
Poland	0.836
Singapore	0.943
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.933
Countries (TALIS-PISA link)	PINSLEADS
Australia	0.914
Finland	0.924
Latvia	0.914
Mexico	0.918
Portugal	0.878
Romania	0.921
Singapore	0.952
Spain	0.881

Source: OECD, *TALIS Database*

Figure 10.11 Scale Mid-Point for PINSLEADS

Please indicate how frequently you engaged in the following in this school during the last 12 months.

Please mark one choice in each row.

	Never or rarely	Sometimes	Often	Very often
	<div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
I took actions to support co-operation among teachers to develop new teaching practices.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
I took actions to ensure that teachers take responsibility for improving their teaching skills.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
I took actions to ensure that teachers feel responsible for their students' learning outcomes. ..	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Inconsistent</div>		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">Consistent</div>	

Source: OECD

Principal job satisfaction (PJSENVs, PJSPROS and PJOBSATS)

The index of *principal job satisfaction* (PJOBSATS) was described by two scales formed separately – satisfaction with current work environment (PJSENVs) and satisfaction with profession (PJSPROS). The satisfaction with current work environment scale consists of four items, namely, TC2G39E, TC2G39F, TC2G39H and TC2G39I, and the scale of satisfaction with profession comprises three items – TC2G39A, TC2G39D and TC2G39B. Item TC2G39C was excluded from the PJSENVs scale due to its poor item statistics across countries and also because it did not show a clear loading pattern. Item TC2G39C can, however, be used in single item analysis. Table 10.23 describes the items for each scale. All items in the scales were measured on a four-point scale. Response categories were 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree”, and 4 for “strongly agree”. Item TC2G39D was reverse coded due to its negative statement about job satisfaction and so that it would have the same direction as the rest of the items.

Table 10.24 shows the reliabilities for PJSENVs and PJSPROS. The alpha reliability coefficient for the satisfaction with current work environment scale (PJSENVs) for the participating countries was above 0.70 or 0.60. For the satisfaction with profession scale (PJSPROS), items were intercorrelated, with reliability above 0.60 for the following countries from the reference population, ISCED Level 2: Australia ($\alpha = 0.651$), the Czech Republic ($\alpha = 0.662$), Denmark ($\alpha = 0.610$), Israel ($\alpha = 0.673$), Singapore ($\alpha = 0.640$) and the Slovak Republic ($\alpha = 0.642$). The intercorrelation was below 0.60 for Latvia ($\alpha = 0.395$), Poland ($\alpha = 0.451$), Portugal ($\alpha = 0.461$), Romania ($\alpha = 0.591$) and Spain ($\alpha = 0.579$).

Overall, the international reliability was above 0.70 in all populations for PJSENVs ($\alpha = 0.788$ for ISCED Level 2, $\alpha = 0.815$ for ISCED Level 1, 0.830 for ISCED Level 3, and 0.795 for the TALIS-PISA Link). It was above or close to 0.70 for PJSPROS ($\alpha = 0.721$ for ISCED Level 2, 0.695 for ISCED Level 1, 0.697 for ISCED Level 3 and 0.749 for TALIS-PISA).

Table 10.23 Measured items for principal job satisfaction

Finally, We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?		
Scale	Variable	Item Wording
Satisfaction with Current Work Environment	TC2G39E	I enjoy working at this school
	TC2G39F	I would recommend my school as a good place to work
	TC2G39H	I am satisfied with my performance in this school
	TC2G39I	All in all, I am satisfied with my job
	TC2G39C*	I would like to change to another school if that were possible
Satisfaction with Profession	TC2G39A	The advantages of this profession clearly outweigh the disadvantages
	TC2G39B	If I could decide again, I would still choose this job/position
	TC2G39D†	I regret that I decided to become a principal

Source: OECD, *TALIS Database*

Note. *Item was not included in the scale but can be used as single items in analysis. † Item was reverse coded

Table 10.24 Reliability coefficient alpha for the satisfaction with current work environment (PJSENVs) and satisfaction with profession (PJSPROS) scales for all countries across Populations

	PJSENVs	PJSPROS
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha
Australia	0.672	0.651
Brazil	0.773	0.682
Bulgaria	0.824	0.738
Chile	0.726	0.659
Croatia	0.746	0.734
Czech Republic	0.733	0.662
Denmark	0.782	0.610
Estonia	0.714	0.740
Finland	0.738	0.831
France	0.770	0.752
Iceland	0.812	0.765
Israel	0.777	0.673
Italy	0.762	0.769
Japan	0.797	0.670
Korea	0.902	0.705
Latvia	0.670	0.395
Malaysia	0.813	0.675
Mexico	0.746	0.352
Netherlands	0.782	0.812
Norway	0.662	0.705
Poland	0.775	0.451
Portugal	0.708	0.641
Romania	0.738	0.591
Serbia	0.716	0.786
Singapore	0.862	0.640
Slovak Republic	0.744	0.642
Spain	0.809	0.579
Sweden	0.695	0.742
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.853	0.769
Alberta (Canada)	0.778	0.704
England (United Kingdom)	0.806	0.815
Flanders (Belgium)	0.718	0.771
	PJSENVs	PJSPROS
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha
Denmark	0.845	0.799
Finland	0.839	0.814
Mexico	0.865	0.473
Norway	0.783	0.749
Poland	0.736	0.499
Sub-national entities		
Flanders (Belgium)	0.793	0.754

Table 10.24 Reliability coefficient alpha for the satisfaction with current work environment (PJSENVs) and satisfaction with profession (*continued*)

	PJSENVs	PJSPROS
Countries (ISCED 3)	Coefficient Alpha	Coefficient Alpha
Australia	0.839	0.705
Denmark	0.911	0.799
Finland	0.845	0.835
Iceland	0.706	0.380
Italy	0.736	0.560
Mexico	0.837	0.725
Norway	0.704	0.605
Poland	0.840	0.548
Singapore	0.839	0.673
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.775	0.705
	PJSENVs	PJSPROS
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha
Australia	0.773	0.740
Finland	0.739	0.805
Latvia	0.705	0.590
Mexico	0.800	0.824
Portugal	0.798	0.691
Romania	0.843	0.731
Singapore	0.861	0.644
Spain	0.756	0.736

Source: OECD, *TALIS Database*

A correlated PJSENVs and PJSPROS model was examined within the CFA modelling for each country. The CFA modelling with two correlated latent factors indicated the need to fix the residual variance at zero for items TC2G39B and/or TC2G39E for Norway and Sweden in order to improve model-data convergence. Table 10.25 presents the correlations between the latent factors of PJSENVs and PJSPROS. The correlations between the latent factors of PJSENVs and PJSPROS were all significant across many countries in the reference population (ISCED Level 2). The two latent scales were weakly positively related for all of the countries. Only England (United Kingdom) showed the presence of a moderate positive relationship between PJSENVs and PJSPROS. Israel, Norway and Romania showed an absence of a relationship between these two scales.

The CFA model for all countries exhibited an acceptable fit for many countries (e.g. Finland, Japan and the Netherlands in ISCED Level 2, Finland in ISCED Level 1, Poland in ISCED Level 3, and Mexico in the TALIS-PISA Link) as well as lack of model fit for other countries across populations (e.g. Latvia and Sweden in ISCED Level 2, Poland in ISCED Level 1, Iceland in ISCED Level 3 and Australia in the TALIS-PISA population). In general, the results of the CFA varied across the countries from the different populations. Table 10.26 details the full results of the CFA model-data fit.

Table 10.25 Correlation between the latent factors PJSENVs and PJSPROS

Countries (Reference Population)	$r_{PJSENVs, PJSPROS}$
----------------------------------	------------------------

Countries (Reference Population)	$r_{\text{PJSENVs,PJSPROS}}$
Australia	0.164
Brazil	0.156
Bulgaria	0.164
Chile	0.117
Croatia	0.139
Czech Republic	0.106
Denmark	0.156
Estonia	0.165
Finland	0.194
France	0.143
Iceland	0.193
Israel	0.017†
Italy	0.144
Japan	0.201
Korea	0.177
Latvia	0.095
Malaysia	0.136
Mexico	0.059
Netherlands	0.180
Norway	0.073†
Poland	0.166
Portugal	0.093
Romania	0.043†
Serbia	0.249
Singapore	0.112
Slovak Republic	0.167
Spain	0.176
Sweden	0.113
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.290
Alberta (Canada)	0.117
England (United Kingdom)	0.390
Flanders (Belgium)	0.108

Source: OECD, *TALIS Database*

Note. † Correlation was not significant at .05 level.

Table 10.26 Confirmatory factor analysis model-data fit for all countries across populations in the principal job satisfaction scale

	PJOBSATS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.773	0.603	0.138	0.107
Brazil	0.862	0.758	0.092	0.072
Bulgaria	1.000	1.008	0.000	0.030
Chile	1.000	1.027	0.000	0.043
Croatia	0.876	0.784	0.122	0.061
Czech Republic	0.906	0.836	0.103	0.060
Denmark	0.966	0.941	0.062	0.039
Estonia	0.883	0.794	0.121	0.062
Finland	0.977	0.960	0.064	0.033
France	0.794	0.640	0.190	0.096
Iceland	0.986	0.975	0.051	0.051
Israel	0.932	0.881	0.062	0.098
Italy	0.962	0.934	0.068	0.060
Japan	0.991	0.984	0.029	0.036
Korea	1.000	1.002	0.000	0.037
Latvia	0.744	0.551	0.161	0.065
Malaysia	1.000	1.019	0.000	0.047
Mexico	0.878	0.786	0.102	0.059
Netherlands	0.997	0.995	0.020	0.044
Norway	0.738	0.577	0.155	0.144
Poland	0.999	0.998	0.011	0.038
Portugal	0.838	0.716	0.128	0.078
Romania	0.892	0.810	0.100	0.124
Serbia	0.868	0.770	0.130	0.075
Singapore	0.962	0.934	0.078	0.067
Slovak Republic	0.966	0.940	0.061	0.054
Spain	0.905	0.834	0.106	0.057
Sweden	0.602	0.403	0.175	0.130
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.871	0.774	0.130	0.064
Alberta (Canada)	0.901	0.827	0.119	0.094
England (United Kingdom)	0.957	0.925	0.105	0.076
Flanders (Belgium)	0.850	0.738	0.153	0.067
	PJOBSATS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.825	0.694	0.189	0.063
Finland	0.976	0.959	0.052	0.043
Mexico	0.945	0.904	0.095	0.045
Norway	0.863	0.779	0.126	0.101
Poland	0.490	0.107	0.173	0.065

Table 10.26 Confirmatory factor analysis model-data fit for all countries across populations in the principal job satisfaction scale (*continued*)

	PJOBSATS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Flanders (Belgium)	0.883	0.795	0.145	0.055
	PJOBSATS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.937	0.890	0.109	0.094
Denmark	0.977	0.960	0.092	0.038
Finland	0.971	0.949	0.072	0.038
Iceland	0.551	0.326	0.245	0.158
Italy	0.870	0.772	0.106	0.078
Mexico	0.935	0.886	0.083	0.034
Norway	0.951	0.921	0.072	0.065
Poland	0.982	0.968	0.058	0.067
Singapore	0.961	0.932	0.075	0.063
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.867	0.766	0.123	0.058
	PJOBSATS			
Countries (TALIS-PISA link)	CFI	TLI		
Australia	0.728	0.524	0.212	0.112
Finland	0.961	0.932	0.067	0.034
Latvia	0.827	0.698	0.109	0.083
Mexico	0.998	0.997	0.013	0.039
Portugal	0.946	0.905	0.071	0.083
Romania	0.904	0.831	0.067	0.069
Singapore	0.963	0.935	0.077	0.067
Spain	0.928	0.873	0.092	0.096

Source: OECD, *TALIS Database*

Note. PJSENVs and PJSPROS are subscales of PJOBSATS, they do not possess their own fit indices, but their fit is measured through the overall scale. PJOBSATS does not possess its own reliability index, but is represented through the coefficient Alphas of the PJSENVs and PJSPROS.

A comparison between the unrestricted multiple-group two-factor model and the model with equal factor loadings showed an acceptable level of metric invariance regardless of the slightly lower than acceptable values of the fit indices in the model of equal factor loadings. Here, the $CFI = 0.889$, $TLI = 0.861$, $RMSEA = 0.095$ and $SRMR = 0.153$. Given the large number of countries being compared, the drop in these fit indices was considered relatively small, so making it acceptable to conclude the measurement of items at the metric level of invariance (i.e. $\Delta CFI = 0.020$, $\Delta TLI = 0.019$, $\Delta RMSEA = 0.007$ and $\Delta SRMR = 0.081$).

This analysis was followed by examination of a model with equal factor loadings and equal item intercepts. The restrictions imposed at the scalar level of invariance led to a noticeable decline in the fit indices, signifying that the strength of the positive relationships between PJSENVs and PJSPROS as well the strength of the relationships between the scale and each of the items were similar for all countries, even though

respondents from different countries would have differed with regards to their relative tendency to endorse each of the single items for PJSENVs or PJSPROS, given the same level of the underlying traits. While the results confirmed the validity of cross-cultural comparisons of correlations of PJSENVs and/or PJSPROS with other constructs across countries, mean score comparisons of these scales should be interpreted carefully, as the mean scores may have a slightly different meaning in each country. The results of the configural, metric and scalar level of invariance can be found in Table 10.27.

Where a lack of evidence for scalar invariance for the PJSOBSATS model operationalised from PJSENVs and PJSPROS could be discerned, factor scores for PJSENVs and PJSPROS were computed from a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. These loadings and intercepts were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Latent means of PJSENVs and PJSPROS were then estimated separately for each country per population, and unique variances were allowed to vary. Table 10.28 sets out the fixed item loadings and intercepts parameters used for the factor score computation, and Table 10.29 provides the factor score determinacy, which was above 0.80 or 0.90 (see the explanation earlier in this chapter on factor score determinacy). A very small magnitude of indeterminacy was therefore evident for all of the participating countries in regard to the quality of the relationship between the operationalized latent factors of PJSENVs or PJSPROS and their associated estimated factor scores.

Table 10.27 Measurement invariance model-data fit for PJSOBSATS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.909	0.842	0.102	0.072	-	-	-	-
Metric	0.889	0.861	0.095	0.153	0.020	0.019	0.007	0.081
Scalar	0.778	0.785	0.119	0.189	0.111	0.076	0.024	0.036

Source: OECD, *TALIS Database*

Table 10.28 Item loadings and intercepts for PJSENVs and PJSPROS

Scale	Item	Loading	Intercept
Satisfaction with Current Work Environment	TC2G39A	1.000	3.139
	TC2G39B	1.043	3.247
	TC2G39D	0.594	3.476
	TC2G39E	1.000	3.531
Satisfaction with Profession	TC2G39F	0.939	3.542
	TC2G39H	0.692	3.200
	TC2G39I	0.875	3.329

Source: OECD, *TALIS Database***Table 10.29 Factor scores determinacies for the PJSENVs and PJSPROS scales**

Countries (ISCED 2)	PJSENVs	PJSPROS
Australia	0.880	0.876
Brazil	0.898	0.880
Bulgaria	0.915	0.902
Chile	0.882	0.854
Croatia	0.887	0.882
Czech Republic	0.870	0.849
Denmark	0.912	0.893
Estonia	0.863	0.838
Finland	0.899	0.926
France	0.915	0.933
Iceland	0.947	0.907
Israel	0.886	0.832
Italy	0.902	0.884
Japan	0.909	0.879
Korea	0.946	0.919
Latvia	0.878	0.890
Malaysia	0.902	0.923
Mexico	0.869	0.826
Netherlands	0.929	0.925
Norway	0.955	0.892
Poland	0.905	0.884
Portugal	0.860	0.833
Romania	0.870	0.840
Serbia	0.881	0.913
Singapore	0.947	0.924
Slovak Republic	0.876	0.862
Spain	0.913	0.874
Sweden	0.873	0.902

Table 10.29 Factor scores determinacies for the PJSENVs and PJSPROS scales (*continued*)

Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.931	0.905
Alberta (Canada)	0.933	0.914
England (United Kingdom)	0.977	0.960
Flanders (Belgium)	0.883	0.901
Countries (ISCED 1)	PJSENVs	PJSPROS
Denmark	0.951	0.949
Finland	0.927	0.931
Mexico	0.945	0.799
Norway	0.917	0.900
Poland	0.881	0.846
Sub-national entities		
Flanders (Belgium)	0.914	0.905
Countries (ISCED 3)	PJSENVs	PJSPROS
Australia	0.955	0.908
Denmark	0.942	0.940
Finland	0.970	0.959
Countries (ISCED 3)	PJSENVs	PJSPROS
Iceland	0.934	0.854
Italy	0.867	0.829
Mexico	0.949	0.892
Norway	0.869	0.893
Poland	0.956	0.854
Singapore	0.937	0.926
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.893	0.901
Countries (TALIS-PISA link)	PJSENVs	PJSPROS
Australia	0.887	0.959
Finland	0.911	0.932
Latvia	0.837	0.808
Mexico	0.875	0.946
Portugal	0.877	0.865
Romania	0.915	0.909
Singapore	0.947	0.924
Spain	0.884	0.930

Source: OECD, *TALIS Database*

The next step was to transform the factor scores to a convenience metric. The index of PJSENVs was calculated to have a standard deviation of 2.0, and the mid-point of 10 to coincide with the mid-point of the scale. A score of 10 for PJSENVs therefore corresponds with the average answer of 2.5 on items TC2G39E, TC2G39F, TC2G39H and TC2G39I (see Figure 10.12). A score below 10 indicates disagreement with the items in the PJSENVs scale. The index of PJSPROS was computed similarly to have a standard deviation of 2.0, with the mid-point of 10 coinciding with the average answer of 2.5 on items TC2G39A, TC2G39D and TC2G39D (see Figure 10.13). A score below 10 thus indicates disagreement with the items in the PJSPROS scale. Finally, the scores for the index of PJSOBSATS were computed as composite scores by taking a simple average

of PJSENVs and PJSPROS, and summarising it from the factor scores and the transformed scores.

Figure 10.12 Scale Mid-Point for PJSENVs

Finally, we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	Mid-Point = 2.5			
I enjoy working at this school.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
I would recommend my school as a good place to work.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
I am satisfied with my performance in this school. .	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
All in all, I am satisfied with my job.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
	Disagreement		Agreement	

Source: OECD

Figure 10.13 Scale Mid-Point for PJSPROS

Finally, we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	Mid-Point = 2.5			
The advantages of this profession clearly outweigh the disadvantages.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
If I could decide again, I would still choose this job/position.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
† I regret that I decided to become a principal.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
	Disagreement		Agreement	

Note. † Item was reverse coded.

Source: OECD

Self-efficacy (SECLSS, SEINSS, SEENGs and TSELEFFS)

The *self-efficacy scale* (TSELEFFS) was defined from three scales – efficacy in classroom management (SECLSS), efficacy in instruction (SEINSS) and efficacy in student engagement (SEENGs). All three sub-scales were measured by four items (see Table 10.30): SECLSS by TT2G34D, TT2G34F, TT2G34H and TT2G34I; SEINSS by TT2G34C, TT2G34J, TT2G34K and TT2G34L; and SEENGs by TT2G34A, TT2G34B, TT2G34E and TT2G34G. All items in the scales were measured on a four-point scale. Response categories were 1 for “not at all”, 2 for “to some extent”, 3 for “quite a bit”, and 4 for “a lot”.

The index of self-efficacy reliability was evaluated from the reliabilities for the SECLSS, SEINSS and SEENGs scales. The resultant alpha reliability coefficients are provided in Table 10.31. The reliability for the efficacy in classroom management scale was above 0.70 for all countries from the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Only a few of the participating countries had lower scale reliability in the efficacy in instruction scale. They included France and the Netherlands from ISCED Level 2, Denmark and Flanders (Belgium) from ISCED Level 1 and Denmark from ISCED Level 3. Mexico from both ISCED Levels 2 and 1 showed a lower reliability coefficient for the efficacy in student engagement scale.

The overall international reliabilities were generally greater than 0.70 for these scales in all populations: for SECLSS, $\alpha = 0.843$ for ISCED Level 2, $\alpha = 0.821$ for Level 1 and $\alpha = 0.832$ for Level 3 and TALIS-PISA; for SEINSS, $\alpha = 0.794$ for ISCED Level 2 $\alpha = 0.738$ for Level 1, $\alpha = 0.800$ for Level 3 and $\alpha = 0.816$ for TALIS-PISA); and for SEENGs, $\alpha = 0.830$ for ISCED Level 2, $\alpha = 0.765$ for Level 1, $\alpha = 0.818$ for Level 3 and $\alpha = 0.792$ for TALIS-PISA.

Three scales representing teacher self-efficacy were examined with a CFA model for each of the participating countries in each population. Correlations of the latent factors between SECLSS, SEINSS and SEENGs for the reference population were estimated; the resultant correlations are presented in Table 10.32. The correlations were all significant at the 0.001 level across all countries in the reference population (ISCED 2). Korea and Singapore showed comparatively higher correlations than all other countries in all three scales. Weak positive correlations could be observed between each pair of the latent factors (i.e. SECLSS with SEINSS, SECLSS with SEENGs, and SEINSS with SEENGs) in all countries. The results of the analysis of the internal structure of the scales, carried out with a three-factor CFA modelling for all countries, were largely acceptable (see Table 10.33).

Table 10.30 Measured items for teacher self-efficacy

In your teaching, to what extent can you do the following?		
Scale	Variable	Item Wording
Efficacy in classroom management	TT2G34D	Control disruptive behaviour in the classroom
	TT2G34F	Make my expectations about student behaviour clear
	TT2G34H	Get students to follow classroom rules
	TT2G34I	Calm a student who is disruptive or noisy
Efficacy in instruction	TT2G34C	Craft good questions for my students
	TT2G34J	Use a variety of assessment strategies
	TT2G34K	Provide an alternative explanation for example when students are confused
	TT2G34L	Implement alternative instructional strategies in my classroom
Efficacy in student engagement	TT2G34A	Get students to believe they can do well in school work
	TT2G34B	Help my students value learning
	TT2G34E	Motivate students who show low interest in school work
	TT2G34G	Help students think critically

Source: OECD, *TALIS Database***Table 10.31 Reliability coefficient alpha for the efficacy in classroom management (SECLSS), efficacy in instruction (SEINSS), and Efficacy in student engagement (SEENGs) scales for all countries across populations**

	SEINSS	SEINSS	SEENGs
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Australia	0.847	0.787	0.842
Brazil	0.800	0.777	0.777
Bulgaria	0.724	0.763	0.720
Chile	0.828	0.809	0.784
Croatia	0.838	0.735	0.740
Czech Republic	0.832	0.721	0.766
Denmark	0.797	0.715	0.756
Estonia	0.785	0.738	0.726
Finland	0.845	0.768	0.818
France	0.803	0.634	0.753
Iceland	0.823	0.771	0.819
Israel	0.849	0.776	0.797
Italy	0.782	0.745	0.768
Japan	0.856	0.809	0.725

Table 10.31 Reliability coefficient alpha for the efficacy in classroom management (SECLSS), efficacy in instruction (SEINSS), and Efficacy in student engagement (SEENGs) scales for all countries across populations (*continued*)

Korea	0.876	0.850	0.847
Latvia	0.792	0.703	0.726
Malaysia	0.838	0.841	0.844
Mexico	0.777	0.767	0.687
Netherlands	0.852	0.646	0.740
Norway	0.833	0.738	0.737
Poland	0.817	0.758	0.770
Portugal	0.809	0.747	0.762
Romania	0.780	0.720	0.767
Serbia	0.801	0.724	0.779
Singapore	0.872	0.840	0.862
Slovak Republic	0.806	0.769	0.786
Spain	0.821	0.746	0.801
Sweden	0.836	0.725	0.741
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.791	0.789	0.779
Alberta (Canada)	0.848	0.791	0.839
England (United Kingdom)	0.841	0.768	0.818
Flanders (Belgium)	0.853	0.684	0.776
	SECLSS	SEINSS	SEENGs
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Denmark	0.814	0.698	0.752
Finland	0.846	0.783	0.814
Mexico	0.763	0.773	0.664
Norway	0.850	0.742	0.728
Poland	0.785	0.754	0.760
Sub-national entities			
Flanders (Belgium)	0.841	0.687	0.730
	SECLSS	SEINSS	SEENGs
Countries (ISCED 3)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Australia	0.836	0.759	0.842
Denmark	0.804	0.689	0.744
Finland	0.851	0.782	0.797
Iceland	0.814	0.770	0.819
Italy	0.770	0.739	0.760
Mexico	0.802	0.783	0.713
Norway	0.823	0.719	0.739
Poland	0.798	0.740	0.748
Singapore	0.872	0.841	0.863
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.829	0.769	0.783
	SECLSS	SEINSS	SEENGs
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Australia	0.847	0.790	0.843
Finland	0.834	0.766	0.804

Table 10.31 Reliability coefficient alpha for the efficacy in classroom management (SECLSS), efficacy in instruction (SEINSS), and Efficacy in student engagement (SEENGs) scales for all countries across populations (continued)

Latvia	0.782	0.708	0.738
Mexico	0.776	0.773	0.713
Portugal	0.810	0.751	0.757
Romania	0.768	0.709	0.782
Singapore	0.866	0.832	0.865
Spain	0.821	0.746	0.805

Source: OECD, *TALIS Database***Table 10.32 Correlation between the latent factors SECLSS, SEINSS and SEENGs**

Countries (Reference Population)	$r^{\text{SECLSS,SEENGs}}$	$r^{\text{SEINSS,SEENGs}}$	$r^{\text{SECLSS,SEINSS}}$
Australia	0.185	0.174	0.169
Brazil	0.136	0.096	0.097
Bulgaria	0.114	0.125	0.118
Chile	0.177	0.168	0.159
Croatia	0.151	0.105	0.123
Czech Republic	0.160	0.129	0.132
Denmark	0.100	0.113	0.099
Estonia	0.149	0.122	0.124
Finland	0.184	0.178	0.140
France	0.092	0.061	0.057
Iceland	0.189	0.137	0.131
Israel	0.176	0.132	0.131
Italy	0.121	0.095	0.096
Japan	0.125	0.115	0.161
Korea	0.258	0.224	0.237
Latvia	0.106	0.063	0.077
Malaysia	0.152	0.146	0.129
Mexico	0.133	0.132	0.118
Netherlands	0.134	0.087	0.091
Norway	0.133	0.100	0.093
Poland	0.158	0.154	0.130
Portugal	0.104	0.084	0.081
Romania	0.092	0.071	0.070
Serbia	0.151	0.112	0.111
Singapore	0.253	0.232	0.212
Slovak Republic	0.150	0.122	0.121
Spain	0.193	0.136	0.127
Sweden	0.146	0.113	0.102
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.131	0.114	0.116
Alberta (Canada)	0.179	0.165	0.153
England (United Kingdom)	0.175	0.155	0.158
Flanders (Belgium)	0.110	0.098	0.083

Source: OECD, *TALIS Database**Note.* All of the correlations were significant at .001 level.

Table 10.33 Confirmatory factor analysis model-data fit for all countries across populations in the teacher self-efficacy scale

	TSELEFFS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.942	0.925	0.060	0.048
Brazil	0.944	0.928	0.034	0.042
Bulgaria	0.920	0.897	0.056	0.040
Chile	0.935	0.916	0.072	0.043
Croatia	0.931	0.911	0.065	0.048
Czech Republic	0.937	0.919	0.061	0.047
Denmark	0.928	0.906	0.062	0.043
Estonia	0.915	0.890	0.064	0.050
Finland	0.914	0.889	0.079	0.056
France	0.922	0.900	0.064	0.046
Iceland	0.911	0.885	0.085	0.063
Israel	0.926	0.904	0.060	0.055
Italy	0.951	0.937	0.052	0.042
Japan	0.957	0.944	0.054	0.047
Korea	0.919	0.896	0.088	0.050
Latvia	0.909	0.882	0.061	0.051
Malaysia	0.911	0.885	0.080	0.060
Mexico	0.964	0.954	0.041	0.033
Netherlands	0.946	0.931	0.050	0.039
Norway	0.941	0.924	0.047	0.048
Poland	0.926	0.904	0.063	0.049
Portugal	0.924	0.901	0.063	0.052
Romania	0.934	0.914	0.049	0.043
Serbia	0.923	0.900	0.063	0.048
Singapore	0.933	0.913	0.077	0.048
Slovak Republic	0.911	0.885	0.070	0.048
Spain	0.926	0.904	0.071	0.056
Sweden	0.932	0.912	0.064	0.055
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.913	0.888	0.054	0.050
Alberta (Canada)	0.920	0.897	0.078	0.055
England (United Kingdom)	0.924	0.901	0.067	0.051
Flanders (Belgium)	0.927	0.905	0.065	0.052
	TSELEFFS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.925	0.903	0.067	0.043
Finland	0.907	0.879	0.068	0.055
Mexico	0.958	0.945	0.042	0.037
Norway	0.956	0.943	0.052	0.044
Poland	0.926	0.905	0.054	0.044
Sub-national entities				
Flanders (Belgium)	0.920	0.897	0.065	0.052

Table 10.33 Confirmatory factor analysis model-data fit for all countries across populations in the teacher self-efficacy scale (continued)

	TSELEFFS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.921	0.897	0.071	0.053
Denmark	0.933	0.914	0.055	0.047
Finland	0.901	0.872	0.058	0.062
Iceland	0.893	0.861	0.093	0.074
Italy	0.936	0.918	0.057	0.048
Mexico	0.959	0.946	0.042	0.037
Norway	0.941	0.923	0.050	0.049
Poland	0.919	0.895	0.057	0.054
Singapore	0.923	0.901	0.086	0.048
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.938	0.920	0.050	0.044
	TSELEFFS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.921	0.897	0.071	0.050
Finland	0.909	0.882	0.077	0.060
Latvia	0.909	0.882	0.054	0.055
Mexico	0.955	0.941	0.032	0.041
Portugal	0.913	0.888	0.063	0.053
Romania	0.913	0.887	0.035	0.051
Singapore	0.923	0.900	0.082	0.051
Spain	0.928	0.907	0.052	0.057

Source: OECD, *TALIS Database*

Note. SECLSS, SEENGs and SEINSS are subscales of TSELEFFS, they do not possess their own fit indices, but their fit is measured through the overall scale. TSELEFFS does not possess its own reliability index, but is represented through the coefficient Alphas of the SECLSS, SEENGs and SEINSS.

The analysis of cross-cultural invariance of TSELEFFS confirmed the validity of the scale for international comparisons because of its relationships with other constructs (see Table 10.34). The difference between the unrestricted multiple-group three-factor model and the model with equal factor loadings showed a very small drop in model fit that implied metric invariance of the scales for TSELEFFS ($\Delta CFI = 0.007$, $\Delta TLI = 0.006$, $\Delta RMSEA = 0.002$ and $\Delta SRMR = 0.015$). When a more restricted level of invariance was imposed on the model, that is a multiple-group model with equal loadings and intercepts, the drop in the fit indices was noticeable for *CFI* and *TLI* (0.079 and 0.065, respectively). However, the difference was relatively small for *RMSEA* and *SRMR* (0.020 and 0.028, respectively). This result could lead to meaningful mean score comparisons across countries, but these would need to be conducted with due care given the relative lack of model-data agreement at the scalar level of invariance. This finding suggests that the mean scores have a slightly different meaning in each country.

Table 10.34 Measurement invariance model-data fit for TSELEFFS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.930	0.909	0.061	0.048	-	-	-	-
Metric	0.923	0.915	0.059	0.063	0.007	0.006	0.002	0.015
Scalar	0.844	0.850	0.079	0.091	0.079	0.065	0.020	0.028

Source: OECD, *TALIS Database*

The scalar non-invariance of the scales evident from the cross-cultural analysis resulted in metric invariance being considered the highest level of invariance established for the teacher self-efficacy scales. Factor scores for SECLSS, SEINSS and SEENGs were therefore computed from a CFA model using estimates of factor loadings and intercepts based on the ISCED 2 calibration sample. Table 10.35 sets out the estimated loadings and intercepts used for the factor score computation. The same loadings and intercepts were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. The latent means of SECLSS, SEINSS and SEENGs were then estimated separately, and unique variances were allowed to vary in each country per population. The factor score determinacy is provided in Table 10.36. The estimated factor scores determinacies were all above 0.80 or 0.90 for all of the operationalised SECLSS, SEINSS and SEENGs scales in all countries across populations.

Table 10.35 Item loadings and intercepts for SECLSS, SEINSS and SEENGs

Scale	Item	Loading	Intercept
Efficacy in Classroom Management	TT2G34D	1.000	3.279
	TT2G34F	0.808	3.388
	TT2G34H	0.997	3.316
	TT2G34I	1.034	3.227
Efficacy in Instruction	TT2G34C	1.000	3.227
	TT2G34J	1.182	3.133
	TT2G34K	1.065	3.394
	TT2G34L	1.237	3.072
Efficacy in Student Engagement	TT2G34A	1.000	3.218
	TT2G34B	1.098	3.134
	TT2G34E	1.040	2.930
	TT2G34G	0.942	3.091

Source: OECD, *TALIS Database*

Table 10.36 Factor scores determinacies for the SECLSS, SEENGs and SEINSS scales

Countries (ISCED 2)	SECLSS	SEENGs	SEINSS
Australia	0.931	0.935	0.917
Brazil	0.915	0.914	0.907
Bulgaria	0.875	0.894	0.898
Chile	0.933	0.929	0.928
Croatia	0.926	0.886	0.884
Czech Republic	0.922	0.902	0.881
Denmark	0.903	0.909	0.891
Estonia	0.902	0.895	0.896
Finland	0.929	0.932	0.904
France	0.909	0.900	0.860
Iceland	0.930	0.924	0.901
Israel	0.937	0.923	0.913
Italy	0.911	0.913	0.899
Japan	0.942	0.897	0.915
Korea	0.953	0.949	0.948
Latvia	0.905	0.880	0.859
Malaysia	0.938	0.939	0.939
Mexico	0.902	0.895	0.903
Netherlands	0.930	0.890	0.860
Norway	0.924	0.898	0.889
Poland	0.919	0.906	0.900
Portugal	0.923	0.910	0.898
Romania	0.907	0.903	0.887
Serbia	0.917	0.909	0.885
Singapore	0.946	0.947	0.940
Slovak Republic	0.921	0.920	0.911
Spain	0.927	0.918	0.891
Sweden	0.933	0.900	0.890
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.913	0.915	0.914
Alberta (Canada)	0.932	0.932	0.912
England (United Kingdom)	0.928	0.926	0.905
Flanders (Belgium)	0.937	0.903	0.871
Countries (ISCED 1)	SECLSS	SEENGs	SEINSS
Denmark	0.912	0.910	0.886
Finland	0.927	0.932	0.909
Mexico	0.897	0.887	0.907
Norway	0.934	0.908	0.897
Poland	0.906	0.907	0.905
Sub-national entities			
Flanders (Belgium)	0.931	0.900	0.871
Countries (ISCED 3)	SECLSS	SEENGs	SEINSS
Australia	0.925	0.934	0.909
Denmark	0.896	0.898	0.868
Finland	0.926	0.921	0.902

Table 10.36 Factor scores determinacies for the SECLSS, SEENGs and SEINSS scales (*continued*)

Countries (ISCED 3)	SECLSS	SEENGs	SEINSS
Iceland	0.923	0.924	0.905
Italy	0.904	0.902	0.893
Mexico	0.913	0.904	0.916
Norway	0.918	0.895	0.878
Poland	0.908	0.899	0.890
Singapore	0.946	0.947	0.941
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.930	0.916	0.905
Countries (TALIS-PISA link)	SECLSS	SEENGs	SEINSS
Australia	0.932	0.934	0.916
Finland	0.921	0.924	0.894
Latvia	0.900	0.883	0.861
Mexico	0.900	0.883	0.909
Portugal	0.922	0.906	0.901
Romania	0.904	0.905	0.882
Singapore	0.941	0.946	0.935
Spain	0.929	0.919	0.894

Source: OECD, *TALIS Database*

The factor scores were then transformed to a convenience metric. The SECLSS, SEINSS and SEENGs indexes were calculated separately to have a standard deviation of 2.0, and the mid-point of 10 coincided with the mid-point of each of the scale. This means that a score of 10 for SECLSS corresponds with the average answer of 2.5 on items TT2G34D, TT2G34F, TT2G34H and TT2G34I, a score of 10 for SEINSS corresponds with the average answer of 2.5 on items TT2G34C, TT2G34J, TT2G34K and TT2G34L, and a score of 10 for SEENGs corresponds with the average answer of 2.5 on items TT2G34A, TT2G34B, TT2G34E and TT2G34G. The mid-points of these scales are illustrated in Figures 10.14, 10.15 and 10.16, where the degree of agreement with the items in the scales is indicated by a score above 10. These scaled scores were simply averaged up as composite scores to represent the index of TSELEFFS.

Figure 10.14 Scale Mid-Point for SECLSS

In your teaching, to what extent can you do the following?

Please mark one choice in each row.

	Not at all	To some extent	Quite a bit	A lot
	Mid-Point = 2.5			
Control disruptive behaviour in the classroom	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Make my expectations about student behaviour clear	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Get students to follow classroom rules	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Calm a student who is disruptive or noisy	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Source: OECD

Figure 10.15 Scale Mid-Point for SEINSS

In your teaching, to what extent can you do the following?

Please mark one choice in each row.

	Not at all	To some extent	Quite a bit	A lot
	Mid-Point = 2.5			
Craft good questions for my students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Use a variety of assessment strategies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Provide an alternative explanation for example when students are confused	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Implement alternative instructional strategies in my classroom	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Source: OECD

Figure 10.16 Scale Mid-Point for SEENGs

In your teaching, to what extent can you do the following?

Please mark one choice in each row.

	Not at all	To some extent	Quite a bit	A lot
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
Get students to believe they can do well in school work ...	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Help my students value learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Motivate students who show low interest in school work ..	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Help students think critically	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Disagreement</div>		<div style="border: 1px solid black; padding: 5px; display: inline-block;">Agreement</div>	

Source: OECD, *TALIS Database*

Teacher job satisfaction (TJSENVs, TJSPROS and TJOBSATS)

Two scales, formed separately, described the *teacher job satisfaction scale* (TJOBSATS) – satisfaction with current work environment (TJSENVs) and satisfaction with profession (TJSPROS). The first of these scales consists of four items – TT2G46C, TT2G46E, TT2G46G and TT2G46J. The second was measured by a different set of four items – TT2G46A, TT2G46B, TT2G46D and TT2G46F. Item TT2G46I was excluded from the work environment scale, and item TT2G46H was excluded from the satisfaction scale due to their poor item statistics across countries and also because they did not show a clear loading pattern. Items excluded from the scales can be used in analysis of single items, however. Table 10.37 describes the items for each scale. All items in the scales were measured on a four-point scale, for which the response categories were 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree”, and 4 for “strongly agree”. Items TT2G46C, TT2G46D and TT2G46F were reverse coded due to their negative statements about teacher job satisfaction and so they would have the same direction as the rest of the items.

The reliability of the TJOBSATS scale is represented by the reliabilities of the TJSENVs and TJSPROS scales, which are given for all countries in Table 10.38. Alpha reliability coefficients are above 0.70 for all countries for both scales. Only the reliability of the satisfaction with current work environment scale for Malaysia and Mexico, and the reliability of the satisfaction with profession scale for Mexico were lower than all other countries. Overall, the international reliability was above 0.70 in all populations for TJSENVs (i.e. $\alpha = 0.781$ for ISCED 2, $\alpha = 0.766$ for ISCED 1, $\alpha = 0.793$ for the ISCED Level 3 and $\alpha = 0.776$ for the TALIS-PISA samples). The same can be said of the TJSPROS scale (i.e., $\alpha = 0.815$ for ISCED Level 2, $\alpha = 0.778$ for ISCED Level 1, $\alpha = 0.805$ for ISCED Level 3 and $\alpha = 0.813$ for TALIS-PISA).

Table 10.37 Measured items for teacher job satisfaction

{Finally,} we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?		
Scale	Variable	Item Wording
Satisfaction with Current Work Environment	†TT2G46C	I would like to change to another school if that were possible
	TT2G46E	I enjoy working at this school
	TT2G46G	I would recommend my school as a good place to work
	TT2G46J	All in all, I am satisfied with my job
	*TT2G46I	I am satisfied with my performance in this school
Satisfaction with Profession	TT2G46A	The advantages of being a teacher clearly outweigh the disadvantages
	TT2G46B	If I could decide again, I would still choose to work as a teacher
	†TT2G46D	I regret that I decided to become a teacher
	†TT2G46F	I wonder whether it would have been better to choose another profession
	*TT2G46H	I think that the teaching profession is valued in society

Source: OECD, *TALIS Database*

Note. *Item was not included in the scale but can be used as single items in analysis. †Item was reverse coded.

Table 10.38 Reliability coefficient alpha for the satisfaction with current work environment (TJSENVs) and satisfaction with profession (TJSPROS) scales for all countries across populations

	TJSENVs	TJSPROS
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha
Australia	0.825	0.845
Brazil	0.743	0.808
Bulgaria	0.758	0.852
Chile	0.737	0.725
Croatia	0.801	0.810
Czech Republic	0.812	0.799
Denmark	0.834	0.826
Estonia	0.751	0.792
Finland	0.791	0.843
France	0.771	0.833
Iceland	0.781	0.815

Table 10.38 Reliability coefficient alpha for the satisfaction with current work environment (TJSENVs) and satisfaction with profession (*continued*)

Israel	0.823	0.804
Italy	0.764	0.799
Japan	0.759	0.809
Korea	0.790	0.824
Latvia	0.719	0.753
Malaysia	0.651	0.762
Mexico	0.683	0.580
Netherlands	0.803	0.853
Norway	0.807	0.831
Poland	0.787	0.829
Portugal	0.769	0.861
Romania	0.792	0.776
Serbia	0.775	0.826
Singapore	0.793	0.805
Slovak Republic	0.707	0.773
Spain	0.754	0.794
Sweden	0.768	0.854
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.780	0.811
Alberta (Canada)	0.801	0.853
England (United Kingdom)	0.848	0.863
Flanders (Belgium)	0.829	0.793
	TJSENVs	TJSPROS
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha
Denmark	0.822	0.829
Finland	0.800	0.831
Mexico	0.635	0.555
Norway	0.767	0.831
Poland	0.771	0.800
Sub-national entities		
Flanders (Belgium)	0.841	0.806
	TJSENVs	TJSPROS
Countries (ISCED 3)	Coefficient Alpha	Coefficient Alpha
Australia	0.798	0.844
Denmark	0.829	0.815
Finland	0.769	0.825
Iceland	0.776	0.793
Italy	0.776	0.798
Mexico	0.684	0.603
Norway	0.828	0.841
Poland	0.747	0.820
Singapore	0.794	0.814
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.793	0.820

Table 10.31 Reliability coefficient alpha for the efficacy in classroom management (SECLSS), efficacy in instruction (SEINSS), and Efficacy in student engagement (SEENGs) scales for all countries across populations (*continued*)

	TJSENVs	TJSPROS
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha
Australia	0.830	0.834
Finland	0.795	0.836
Latvia	0.750	0.734
Mexico	0.651	0.598
Portugal	0.767	0.862
Romania	0.824	0.828
Singapore	0.795	0.802
Spain	0.739	0.802

Source: OECD, *TALIS Database*

A CFA model with correlated TJSENVs and TJSPROS was examined for each participating country in each population. Table 10.39 presents the latent factor correlations between TJSENVs and TJSPROS for the reference population. The correlations were significant across all countries in the reference population (ISCED Level 2). The two latent scales had weak positive associations across countries. The CFA model for all countries exhibited an acceptable fit for most of the participating countries. Lack of model-data fit for some countries were observed in Chile, France, Iceland, Italy, Korea, Malaysia, Serbia and Singapore in ISCED Level 2, Finland in ISCED Level 1, half of the countries in ISCED Level 3 and Singapore in the TALIS-PISA population. The results of the CFA were largely satisfactory and varied from one country to another per population. The results are detailed in Table 10.40.

Table 10.39 Correlation between the latent factors TJSENVs and TJSPROS

Countries (Reference Population)	$r_{TJSENVs, TJSPROS}$
Australia	0.252
Brazil	0.184
Bulgaria	0.216
Chile	0.229
Croatia	0.241
Czech Republic	0.195
Denmark	0.226
Estonia	0.197
Finland	0.252
France	0.229
Iceland	0.189
Israel	0.265
Italy	0.159
Japan	0.262
Korea	0.247
Latvia	0.149
Malaysia	0.126
Mexico	0.132
Netherlands	0.200
Norway	0.196
Poland	0.230
Portugal	0.180
Romania	0.185
Serbia	0.281
Singapore	0.182
Slovak Republic	0.146
Spain	0.211
Sweden	0.218
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.235
Alberta (Canada)	0.232
England (United Kingdom)	0.279
Flanders (Belgium)	0.220

Source: OECD, *TALIS Database*

Note. All of the correlations significant at .05 level.

Table 10.40 Confirmatory factor analysis model-data fit for all countries across populations in the teacher job satisfaction scale

	TJOBSATS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.912	0.870	0.084	0.058
Brazil	0.894	0.844	0.061	0.075
Bulgaria	0.958	0.938	0.058	0.046
Chile	0.799	0.703	0.096	0.075
Croatia	0.915	0.874	0.094	0.071
Czech Republic	0.955	0.933	0.063	0.040
Denmark	0.943	0.916	0.082	0.054
Estonia	0.931	0.898	0.073	0.051
Finland	0.922	0.885	0.095	0.048
France	0.888	0.835	0.110	0.092
Iceland	0.881	0.825	0.105	0.081
Israel	0.899	0.852	0.088	0.060
Italy	0.898	0.849	0.086	0.086
Japan	0.902	0.855	0.104	0.058
Korea	0.749	0.630	0.171	0.085
Latvia	0.937	0.907	0.060	0.051
Malaysia	0.833	0.754	0.103	0.066
Mexic	0.894	0.844	0.066	0.051
Netherlands	0.949	0.925	0.075	0.044
Norway	0.920	0.883	0.070	0.060
Poland	0.924	0.888	0.070	0.049
Portugal	0.968	0.953	0.059	0.057
Romania	0.902	0.855	0.074	0.057
Serbia	0.884	0.829	0.099	0.065
Singapore	0.876	0.817	0.108	0.068
Slovak Republic	0.923	0.887	0.065	0.051
Spain	0.905	0.859	0.083	0.062
Sweden	0.902	0.855	0.110	0.082
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.854	0.785	0.104	0.085
Alberta (Canada)	0.906	0.861	0.114	0.072
England (United Kingdom)	0.926	0.891	0.095	0.058
Flanders (Belgium)	0.906	0.862	0.092	0.062
	TJOBSATS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.919	0.881	0.095	0.058
Finland	0.892	0.841	0.090	0.060
Mexico	0.904	0.859	0.059	0.049
Norway	0.909	0.865	0.072	0.060
Poland	0.954	0.932	0.049	0.044
Sub-national entities				
Flanders (Belgium)	0.912	0.870	0.099	0.074

Table 10.40 Confirmatory factor analysis model-data fit for all countries across populations in the teacher job satisfaction scale (*continued*)

	TJOBSATS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.883	0.828	0.097	0.063
Denmark	0.922	0.885	0.088	0.044
Finland	0.916	0.876	0.060	0.047
Iceland	0.854	0.785	0.113	0.076
Italy	0.894	0.843	0.087	0.086
Mexico	0.902	0.855	0.055	0.045
Norway	0.933	0.901	0.077	0.052
Poland	0.926	0.891	0.073	0.051
Singapore	0.883	0.827	0.109	0.071
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.885	0.830	0.095	0.079
	TJOBSATS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.926	0.891	0.083	0.057
Finland	0.931	0.899	0.081	0.049
Latvia	0.938	0.909	0.058	0.056
Mexico	0.895	0.846	0.037	0.042
Portugal	0.950	0.927	0.061	0.069
Romania	0.959	0.940	0.040	0.054
Singapore	0.897	0.849	0.100	0.062
Spain	0.907	0.863	0.062	0.059

Source: OECD, *TALIS Database*

Note. TJSENVs and TJSPROS are subscales of TJOBSATS, they do not possess their own fit indices, but their fit is measured through the overall scale. TJOBSATS does not possess its own reliability index, but is represented through the coefficient Alphas of the TJSENVs and TJSPROS.

The results of the configural, metric and scalar level of invariance for TJOBSATS are presented in Table 10.41. The cross-cultural invariance testing between the configural level of invariance model (i.e. the unrestricted multiple-group two-factor model) and the metric level of invariance model (the model with equal factor loadings) showed an acceptable level of metric invariance regardless of the slightly lower than acceptable values of the *CFI* and *TLI* for the model with equal factor loadings (*CFI* = 0.896, *TLI* = 0.883, *RMSEA* = 0.079 and *SRMR* = 0.091). Where a large number of countries was compared, the drop in these fit indices was relatively small (ΔCFI = 0.008, ΔTLI = 0.025, *RMSEA* = 0.008 and *SRMR* = 0.026).

Table 10.41 Measurement invariance model-data fit for TJOB SATS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.904	0.858	0.087	0.065	-	-	-	-
Metric	0.896	0.883	0.079	0.091	0.008	0.025	0.008	0.026
Scalar	0.802	0.819	0.098	0.124	0.094	0.064	0.019	0.033

Source: OECD, *TALIS Database*

The MGCFA at the scalar level of invariance showed the fit indices, the differences in which were outside the recommended criteria for measurement invariance, implying that the strength of the positive relationships between TJSENVs and TJSPROS as well the strength of the relationships between the scale and each of the items were comparatively similar across countries. This outcome also means that subjects from different countries differed with regard to the relative tendency to endorse each of the single items for TJSENVs or TJSPROS, given the same level of the underlying traits. The results confirm the validity of cross-cultural comparisons of correlations of TJSENVs and/or TJSPROS with other constructs across countries, but mean score comparisons should be interpreted with great care, as the mean scores may have a slightly different meaning in each country.

The invariance analysis showed scalar non-invariance for TJOB SATS. A CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample was used for computation of the factor scores for TJSENVs and TJSPROS. The item loadings and intercepts used are presented Table 10.42. The same loadings and intercepts were then fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Latent means of TJSENVs and TJSPROS were estimated separately, and unique variances were allowed to vary in each country per population. The estimated factor scores for TJSENVs and TJSPROS had a high degree of determinacy, with a magnitude of above 0.90 or 0.80 (see the explanation, given earlier in this chapter, of factor score determinacy. Table 10.43 sets out the factor scores determinacies for the scales across populations.

Table 10.42 Item loadings and intercepts for TJSENVs and TJSPROS

Scale	Item	Loading	Intercept
Satisfaction with Current Work Environment	TT2G46C	0.832	3.046
	TT2G46E	1.000	3.221
	TT2G46G	0.986	3.089
	TT2G46J	0.666	3.174
Satisfaction with Profession	TT2G46A	0.669	2.952
	TT2G46B	0.985	3.027
	TT2G46D	0.778	3.353
	TT2G46F	1.000	2.930

Source: OECD, *TALIS Database*

Table 10.43 Factor scores determinacies for the TJSENVs and TJSPROS scales

Countries (ISCED 2)	TJSENVs	TJSPROS
Australia	0.936	0.929
Brazil	0.908	0.910
Bulgaria	0.911	0.934
Chile	0.887	0.872
Croatia	0.917	0.923
Czech Republic	0.920	0.918
Denmark	0.943	0.921
Estonia	0.894	0.907
Finland	0.925	0.928
France	0.927	0.927
Iceland	0.919	0.911
Israel	0.932	0.916
Italy	0.924	0.916
Japan	0.905	0.915
Korea	0.922	0.916
Latvia	0.887	0.894
Malaysia	0.883	0.886
Mexico	0.887	0.823
Netherlands	0.919	0.934
Norway	0.928	0.922
Poland	0.915	0.926
Portugal	0.935	0.935
Romania	0.918	0.908
Serbia	0.915	0.929
Singapore	0.924	0.910
Slovak Republic	0.884	0.897
Spain	0.909	0.913
Sweden	0.917	0.927
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.928	0.911
Alberta (Canada)	0.942	0.930
England (United Kingdom)	0.948	0.940
Flanders (Belgium)	0.936	0.915
Countries (ISCED 1)	TJSENVs	TJSPROS
Denmark	0.935	0.911
Finland	0.930	0.908
Mexico	0.859	0.823
Norway	0.915	0.922
Poland	0.909	0.911
Sub-national entities		
Flanders (Belgium)	0.940	0.923

Table 10.43 Factor scores determinacies for the TJSENVs and TJSPROS scales (*continued*)

Countries (ISCED 3)	TJSENVs	TJSPROS
Australia	0.933	0.928
Denmark	0.938	0.923
Finland	0.916	0.919
Iceland	0.919	0.898
Italy	0.925	0.915
Mexico	0.870	0.835
Norway	0.940	0.930
Poland	0.898	0.924
Singapore	0.924	0.915
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.925	0.887
Countries (TALIS-PISA)	TJSENVs	TJSPROS
Australia	0.936	0.924
Finland	0.921	0.927
Latvia	0.904	0.888
Mexico	0.862	0.824
Portugal	0.937	0.933
Romania	0.926	0.927
Singapore	0.922	0.910
Spain	0.904	0.916

Source: OECD, *TALIS Database*

The factor scores were then transformed to a convenience metric. The index of TJSENVs was calculated to have a standard deviation of 2.0 and the mid-point of 10 to coincide with the mid-point of the scale. Thus, a score of 10 for TJSENVs corresponds with the average answer of 2.5 on items TT2G46C, TT2G46E, TT2G46G and TT2G46J (see Figure 10.17). A score below 10 indicates disagreement with the items in TJSENVs. The index of TJSPROS was computed similarly to have a standard deviation of 2.0, and the mid-point of 10 coinciding with the average answer of 2.5 on items TT2G46A, TT2G46B, TT2G46D and TT2G46F (see Figure 10.18). A score below 10 indicates disagreement with the items in the TJSPROS scale. In order to represent the index of TJSOBSATS, the scaled scores of satisfaction with current work environment and satisfaction with profession were simply averaged up as composite scores.

Figure 10.17 Scale Mid-Point for TJSENV5

{Finally, } we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	<div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
† I would like to change to another school if that were possible.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
I enjoy working at this school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
I would recommend my school as a good place to work.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
All in all, I am satisfied with my job.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Note. †Item was reverse coded.

Source: OECD

Figure 10.18 Scale Mid-Point for TJSPROS

{Finally, } we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	<div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
The advantages of being a teacher clearly outweigh the disadvantages.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
If I could decide again, I would still choose to work as a teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
† I regret that I decided to become a teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
† I wonder whether it would have been better to choose another profession.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Note. †Items were reverse coded.

Source: OECD, TALIS Database

Participation among stakeholders (TSCSTAKES)

Teachers were asked to answer five items measuring *participation among stakeholders* (TSCSTAKES) at school. These were TT2G44A, TT2G44B, TT2G44C, TT2G44D and TT2G44E (see Table 10.44). All items were answered on a four-point scale, with response categories of 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree” and 4 for “strongly agree”.

The reliability coefficient for TSCSTAKES was above either 0.80 or 0.70 for the participating countries (see Table 10.45). The overall international reliability was above 0.80 for all populations, with $\alpha = 0.853$ for ISCED Level 2, $\alpha = 0.822$ for ISCED Level 1, $\alpha = 0.857$ for ISCED Level 3 and $\alpha = 0.875$ for TALIS-PISA. The structural relationship between the measured items from the CFA modelling revealed good model-data fit for all countries (see Table 10.46).

Table 10.44 Measured items for participation among stakeholders

How strongly do you agree or disagree with these statements as applied to this school?		
Scale	Variable	Item Wording
Participation among Stakeholders	TT2G44A	This school provides staff with opportunities to actively participate in school decisions
	TT2G44B	This school provides parents or guardians with opportunities to actively participate in school decisions
	TT2G44C	This school provides students with opportunities to actively participate in school decisions
	TT2G44D	This school has a culture of shared responsibility for school issues
	TT2G44E	There is a collaborative school culture which is characterised by mutual support

Source: OECD, *TALIS Database*

Table 10.45 Reliability coefficient alpha for the participation among stakeholders (TSCSTAKES) scale for all countries across populations

	TSCSTAKES
Countries (ISCED 2)	Coefficient Alpha
Australia	0.884
Brazil	0.877
Bulgaria	0.850
Chile	0.899
Croatia	0.845
Czech Republic	0.837
Denmark	0.811
Estonia	0.852
Finland	0.815
France	0.785
Iceland	0.883

Table 10.45 Reliability coefficient alpha for the participation among stakeholders (TSCSTAKES) scale for all countries across populations (continued)

Israel	0.848
Italy	0.812
Japan	0.786
Korea	0.880
Latvia	0.875
Malaysia	0.774
Mexico	0.884
Netherlands	0.814
Norway	0.777
Poland	0.880
Portugal	0.876
Romania	0.844
Serbia	0.870
Singapore	0.857
Slovak Republic	0.795
Spain	0.899
Sweden	0.823
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.896
Alberta (Canada)	0.871
England (United Kingdom)	0.870
Flanders (Belgium)	0.860
	TSCSTAKES
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.827
Finland	0.813
Mexico	0.835
Norway	0.767
Poland	0.853
Sub-national entities	
Flanders (Belgium)	0.832
	TSCSTAKES
Countries (ISCED 3)	Coefficient Alpha
Australia	0.869
Denmark	0.802
Finland	0.830
Iceland	0.879
Italy	0.865
Mexico	0.890
Norway	0.811
Poland	0.879
Singapore	0.862
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.892

Table 10.45 Reliability coefficient alpha for the participation among stakeholders (TSCSTAKES) scale for all countries across populations (continued)

Countries (TALIS-PISA link)	TSCSTAKES
	Coefficient Alpha
Australia	0.888
Finland	0.806
Latvia	0.879
Mexico	0.869
Portugal	0.886
Romania	0.836
Singapore	0.859
Spain	0.910

Table 10.46 Confirmatory factor analysis model-data fit for all countries across populations in the participation among stakeholders scale

Countries (ISCED 2)	TSCSTAKES			
	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.006	0.000	0.003
Brazil	0.997	0.989	0.021	0.008
Bulgaria	0.995	0.983	0.043	0.013
Chile	0.997	0.990	0.044	0.010
Croatia	0.995	0.985	0.041	0.011
Czech Republic	0.994	0.980	0.056	0.016
Denmark	0.988	0.960	0.071	0.015
Estonia	0.995	0.983	0.040	0.010
Finland	0.996	0.985	0.042	0.011
France	0.980	0.935	0.079	0.020
Iceland	0.998	0.992	0.037	0.009
Israel	0.996	0.986	0.028	0.012
Italy	0.997	0.989	0.030	0.011
Japan	0.993	0.976	0.048	0.015
Korea	0.996	0.987	0.040	0.009
Latvia	0.990	0.968	0.061	0.013
Malaysia	0.999	0.998	0.013	0.006
Mexico	0.999	0.998	0.018	0.005
Netherlands	0.997	0.989	0.038	0.012
Norway	0.995	0.982	0.024	0.013
Poland	0.997	0.991	0.034	0.009
Portugal	0.997	0.992	0.036	0.007
Romania	0.989	0.963	0.058	0.015
Serbia	0.996	0.986	0.035	0.013
Singapore	0.997	0.991	0.030	0.008
Slovak Republic	0.970	0.900	0.076	0.027
Spain	0.996	0.988	0.038	0.007
Sweden	0.977	0.924	0.073	0.022
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.999	0.996	0.027	0.006
Alberta (Canada)	0.998	0.992	0.034	0.007

Table 10.46 Confirmatory factor analysis model-data fit for all countries across populations in the participation among stakeholders scale (*continued*)

England (United Kingdom)	0.997	0.990	0.027	0.012
Flanders (Belgium)	0.988	0.959	0.067	0.016
	TSCSTAKES			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	1.000	1.003	0.000	0.003
Finland	0.995	0.982	0.040	0.013
Mexico	0.997	0.990	0.032	0.012
Norway	0.981	0.936	0.051	0.021
Poland	0.996	0.985	0.030	0.011
Sub-national entities				
Flanders (Belgium)	0.985	0.950	0.066	0.020
	TSCSTAKES			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.993	0.976	0.055	0.013
Denmark	0.986	0.954	0.081	0.018
Finland	0.997	0.991	0.020	0.012
Iceland	0.995	0.983	0.053	0.011
Italy	0.991	0.971	0.054	0.011
Mexico	0.999	0.997	0.015	0.005
Norway	0.995	0.982	0.040	0.014
Poland	0.997	0.990	0.022	0.010
Singapore	0.999	0.995	0.022	0.006
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.999	0.995	0.025	0.005
	TSCSTAKES			
Countries (TALIS-PISA)	CFI	TLI	RMSEA	SRMR
Australia	0.989	0.964	0.058	0.012
Finland	0.991	0.971	0.044	0.013
Latvia	0.998	0.994	0.024	0.007
Mexico	0.986	0.953	0.045	0.013
Portugal	0.999	0.998	0.017	0.006
Romania	0.995	0.982	0.023	0.014
Singapore	0.997	0.989	0.033	0.008
Spain	0.997	0.988	0.035	0.007

Source: OECD, *TALIS Database*

Table 10.47 presents the results of the comparison across countries for the configural, metric and scalar levels of invariance for the participation among stakeholders scale. The invariance testing found the scale functioned well in all models of invariance across the countries in the reference population. The comparison between the unrestricted multiple-group model (i.e. configural invariance) and the model with equal factor loadings across countries (i.e. metric invariance) revealed good model-data fits, with a relatively small drop between the two models (i.e. $\Delta CFI = 0.009$, $\Delta TLI = 0.003$, $\Delta RMSEA = 0.004$ and $\Delta SRMR = 0.057$).

The fit of the model beyond metric invariance, that is, the model with equal factor loadings and item intercepts, was marginal for TSCSTAKES. The difference between the

scalar and metric levels of invariance was considered outside the acceptable range, despite the large number of countries in the analysis. Analysis for mean score comparisons across countries should be conducted with great care because the mean score may have a slightly different meaning in each country. However, the analysis confirmed the validity for cross-cultural comparisons of correlations of TSCSTAKES with other constructs.

Table 10.47 Measurement invariance model-data fit for TSCSTAKES

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
Configural	0.995	0.983	0.040	0.013	-	-	-	-
Metric	0.986	0.980	0.044	0.070	0.009	0.003	0.004	0.057
Scalar	0.913	0.919	0.088	0.127	0.073	0.061	0.044	0.057

Source: OECD, *TALIS Database*

Metric invariance was considered the highest level of invariance established for TSCSTAKES due to the large drop in model fit from the metric to scalar levels of invariance. Thus, factor scores were computed from a CFA model of the pooled estimates of factor loadings and intercepts, with the estimation of parameters based on the ISCED Level 2 calibration sample. The loadings and intercepts obtained from this calibration sample were then fixed and applied to the ISCED Level 2, 1, 3 and TALIS-PISA populations. Latent means of the TSCSTAKES scale were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.48 presents the fixed item loadings and intercepts parameters. The factor score determinacy for all countries was mostly above 0.90 or 0.80, indicating a large magnitude of determinacy between the operationalised latent factor TSCSTAKES and the estimated factor scores (see earlier in this chapter for an explanation of factor score determinacy). Table 10.49 reports the estimated factor score determinacy for all of the countries.

Table 10.48 Item loadings and intercepts for TSCSTAKES

Scale	Item	Loading	Intercept
Participation Among Stakeholders	TT2G44A	1.189	2.805
	TT2G44B	0.942	2.836
	TT2G44C	1.000	2.696
	TT2G44D	1.087	2.824
	TT2G44E	1.036	2.910

Source: OECD, *TALIS Database*

Table 10.49 Factor scores determinacies for the TSCSTAKES scale

Countries (ISCED 2)	TSCSTAKES
Australia	0.943
Brazil	0.935
Bulgaria	0.918
Chile	0.949
Croatia	0.919
Czech Republic	0.919
Denmark	0.903
Estonia	0.921
Finland	0.904
France	0.890
Iceland	0.942
Israel	0.922
Italy	0.906
Japan	0.883
Korea	0.939
Latvia	0.934
Malaysia	0.884
Mexico	0.938
Netherlands	0.912
Norway	0.888
Poland	0.935
Portugal	0.937
Romania	0.921
Serbia	0.931
Singapore	0.931
Slovak Republic	0.896
Spain	0.951
Sweden	0.909
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.944
Alberta (Canada)	0.936
England (United Kingdom)	0.934
Flanders (Belgium)	0.927
Countries (ISCED 1)	TSCSTAKES
Denmark	0.909
Finland	0.903
Mexico	0.916
Norway	0.880
Poland	0.923
Sub-national entities	
Flanders (Belgium)	0.916
Countries (ISCED 3)	TSCSTAKES
Australia	0.936
Denmark	0.910
Finland	0.916

Table 10.49 Factor scores determinacies for the TSCSTAKES scale (continued)

Countries (ISCED 3)	TSCSTAKES
Iceland	0.943
Italy	0.931
Mexico	0.940
Norway	0.940
Poland	0.935
Singapore	0.934
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.944
Countries (TALIS-PISA link)	TSCSTAKES
Australia	0.946
Finland	0.946
Latvia	0.936
Mexico	0.930
Portugal	0.943
Romania	0.915
Singapore	0.931
Spain	0.956

Source: OECD, *TALIS Database*

The factor scores for TSCSTAKES were transformed to a convenience metric with a standard deviation of 2.0 and the mid-point of 10 coinciding with the mid-point of the scale. A score of 10 for TSCSTAKES thus corresponds with the average response of 2.5 on items TT2G44A, TT2G44B, TT2G44C, TT2G44D and TT2G44E (see Figure 10.19). The degree of agreement with the items in the scale is indicated by a score above 10.

Figure 10.19 Scale Mid-Point for TSCSTAKES

How strongly do you agree or disagree with these statements as applied to this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	Mid-Point = 2.5			
This school provides staff with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
This school provides parents or guardians with opportunities to actively participate in school decisions. ..	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
This school provides students with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
This school has a culture of shared responsibility for school issues.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
There is a collaborative school culture which is characterised by mutual support.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Source: OECD, *TALIS Database*

Teacher-student relations (TSCTSTUDS)

The index of *teacher-student relations* (TSCTSTUDS) was measured by a set of four items, TT2G45A, TT2G45B, TT2G45C and TT2G45D, described in Table 10.50. Each item was answered on a four-point scale, the response categories of which were 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree” and 4 for “strongly agree”.

The alpha reliability coefficient was above 0.70 for all of the participating countries, although Sweden had a slightly lower reliability. These reliabilities are presented in Table 10.51. The overall international reliability was above 0.70 for all populations, with $\alpha = 0.781$ for ISCED Level 2, $\alpha = 0.768$ for ISCED Level 1, $\alpha = 0.793$ for ISCED Level 3, and $\alpha = 0.785$ for the TALIS-PISA Link. CFA modelling on the structural relationship between the measured items and the latent factor TSCTSTUDS revealed a substantially good model-data fit for all countries in each population (see Table 10.52).

Table 10.50 Measured items for teacher-student relations

How strongly do you agree or disagree with the following statements about what happens in this school?		
Scale	Variable	Item Wording
Teacher-Student Relations	TT2G45A	In this school, teachers and students usually get on well with each other
	TT2G45B	Most teachers in this school believe that the students' well-being is important
	TT2G45C	Most teachers in this school are interested in what students have to say
	TT2G45D	If a student from this school needs extra assistance, the school provides it

Source: OECD, *TALIS Database***Table 10.51 Reliability coefficient alpha for the teacher-student relations (TSCTSTUDS) scale for all countries across populations**

Countries (ISCED 2)	TSCTSTUDS Coefficient Alpha
Australia	0.796
Brazil	0.738
Bulgaria	0.832
Chile	0.784
Croatia	0.785
Czech Republic	0.797
Denmark	0.723
Estonia	0.755
Finland	0.802
France	0.770
Iceland	0.786
Israel	0.809
Italy	0.773
Japan	0.801
Korea	0.803
Latvia	0.749
Malaysia	0.789
Mexico	0.770
Netherlands	0.748
Norway	0.796
Poland	0.782
Portugal	0.775
Romania	0.814
Serbia	0.800
Singapore	0.814
Slovak Republic	0.781
Spain	0.783

Table 10.51 Reliability coefficient alpha for the teacher-student relations (TSCTSTUDS) scale for all countries across populations (*continued*)

Sweden	0.688
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.782
Alberta (Canada)	0.793
England (United Kingdom)	0.811
Flanders (Belgium)	0.793
	TSCTSTUDS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.739
Finland	0.795
Mexico	0.754
Norway	0.813
Poland	0.803
Sub-national entities	
Flanders (Belgium)	0.829
	TSCTSTUDS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.813
Denmark	0.753
Finland	0.758
Iceland	0.748
Italy	0.764
Mexico	0.791
Norway	0.800
Poland	0.803
Singapore	0.813
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.785
	TSCTSTUDS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.795
Finland	0.771
Latvia	0.765
Mexico	0.792
Portugal	0.786
Romania	0.788
Singapore	0.815
Spain	0.778

Source: OECD, *TALIS Database*

Table 10.52 Confirmatory factor analysis model-data fit for all countries across populations in the teacher-student relations scale

	TSCTSTUDS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.994	0.983	0.050	0.013
Brazil	0.982	0.947	0.045	0.019
Bulgaria	1.000	1.001	0.000	0.003
Chile	0.967	0.900	0.111	0.031
Croatia	1.000	1.002	0.000	0.001
Czech Republic	0.998	0.995	0.026	0.007
Denmark	0.970	0.911	0.094	0.025
Estonia	0.996	0.988	0.035	0.011
Finland	1.000	1.001	0.000	0.004
France	0.996	0.987	0.041	0.013
Iceland	0.990	0.970	0.077	0.017
Israel	0.984	0.953	0.060	0.023
Italy	0.998	0.995	0.026	0.008
Japan	0.991	0.972	0.058	0.017
Korea	0.999	0.996	0.024	0.007
Latvia	1.000	1.001	0.000	0.005
Malaysia	0.985	0.956	0.070	0.019
Mexico	0.991	0.973	0.054	0.015
Netherlands	1.000	1.010	0.000	0.004
Norway	0.994	0.983	0.044	0.014
Poland	0.995	0.984	0.044	0.011
Portugal	0.990	0.971	0.058	0.015
Romania	0.976	0.929	0.074	0.022
Serbia	0.983	0.949	0.078	0.019
Singapore	1.000	1.002	0.000	0.004
Slovak Republic	1.000	1.002	0.000	0.003
Spain	0.984	0.953	0.074	0.016
Sweden	0.990	0.970	0.050	0.015
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.997	0.991	0.025	0.009
Alberta (Canada)	1.000	1.000	0.002	0.007
England (United Kingdom)	0.998	0.995	0.023	0.008
Flanders (Belgium)	1.000	1.000	0.004	0.005
	TSCTSTUDS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.981	0.943	0.096	0.024
Finland	1.000	1.002	0.000	0.004
Mexico	0.955	0.866	0.098	0.027
Norway	0.985	0.954	0.072	0.015
Poland	0.999	0.997	0.013	0.006
Sub-national entities				
Flanders (Belgium)	1.000	1.002	0.000	0.002

Table 10.52 Confirmatory factor analysis model-data fit for all countries across populations in the teacher-student relations scale (*continued*)

Countries (ISCED 3)	TSCTSTUDS			
	CFI	TLI	RMSEA	SRMR
Australia	1.000	0.999	0.011	0.008
Denmark	0.973	0.918	0.097	0.030
Finland	0.989	0.967	0.036	0.018
Iceland	0.986	0.959	0.073	0.016
Italy	0.997	0.992	0.031	0.009
Mexico	0.991	0.974	0.053	0.014
Norway	0.989	0.966	0.065	0.016
Poland	0.975	0.926	0.074	0.019
Singapore	1.000	1.003	0.000	0.001
Sub-national entities				
Abu Dhabi (United Arab Emirates)	1.000	0.999	0.011	0.008
Countries (TALIS-PISA link)	TSCTSTUDS			
	CFI	TLI	RMSEA	SRMR
Australia	0.999	0.998	0.015	0.006
Finland	0.994	0.983	0.047	0.013
Latvia	1.000	1.005	0.000	0.003
Mexico	0.990	0.969	0.044	0.016
Portugal	0.992	0.975	0.046	0.014
Romania	0.934	0.803	0.084	0.031
Singapore	0.998	0.993	0.026	0.008
Spain	0.990	0.969	0.042	0.016

Source: OECD, *TALIS Database*

A comparison between the baseline or unrestricted multiple-group model and the model with equal factor loadings across countries showed a high degree of invariance for these parameters, with only a relatively small drop in the model-data fit (i.e. $\Delta CFI = 0.010$, $\Delta TLI = 0.002$, $\Delta RMSEA = 0.002$ and $\Delta SRMR = 0.069$). The scale functioned well at the configural and metric levels of invariance, providing support for the cross-country validity of the scale. The fit of the model beyond metric invariance when equal loadings and item intercepts were imposed on the model was somewhat outside the acceptable criteria. Although the analysis confirms the validity for cross-cultural comparisons of correlations of TSCTSTUDS with other constructs, mean score comparisons for the scale cannot be explicitly interpreted. Table 10.53 presents the results of the cross-cultural invariance analysis.

Table 10.53 Measurement invariance model-data fit for TSCTSTUDS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.992	0.976	0.049	0.014	-	-	-	-
Metric	0.982	0.978	0.047	0.083	0.010	0.002	0.002	0.069
Scalar	0.856	0.889	0.105	0.125	0.126	0.089	0.058	0.042

Source: OECD, *TALIS Database*

After the result of scalar non-invariance had been attained, the factor scores of the teacher-student relations scale were computed with a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED 2 calibration sample. The same parameters were fixed and used for the ISCED Levels 2, 1, 3 and TALIS-PISA populations. The latent means of TSCTSTUDS were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.54 presents the item loadings and intercepts used for the factor scores computation, and Table 10.55 provides the factor scores determinacy for all countries. The determinacy between the operationalised latent factor TSCTSTUDS and the estimated factor scores was above 0.90 or 0.80 across populations, signifying a high degree of quality of the estimated factor scores for all countries.

Table 10.54 Item loadings and intercepts for TSCTSTUDS

Scale	Item	Loading	Intercept
Teacher-Student Relations	TT2G45A	1.000	3.212
	TT2G45B	1.301	3.351
	TT2G45C	1.262	3.163
	TT2G45D	0.944	3.225

Source: OECD, *TALIS Database*

Table 10.55 Factor scores determinacies for the TSCTSTUDS scale

Countries (ISCED 2)	TSCTSTUDS
Australia	0.908
Brazil	0.892
Bulgaria	0.921
Chile	0.910
Croatia	0.891
Czech Republic	0.901
Denmark	0.897
Estonia	0.886
Finland	0.915
France	0.911
Iceland	0.920
Israel	0.919
Italy	0.901
Japan	0.907
Korea	0.909
Latvia	0.882
Malaysia	0.878
Mexico	0.890
Netherlands	0.882
Norway	0.924
Poland	0.885
Portugal	0.895
Romania	0.908

Table 10.55 Factor scores determinacies for the TSCTSTUDS scale (*continued*)

Countries (ISCED 2)	TSCTSTUDS
Serbia	0.906
Singapore	0.907
Slovak Republic	0.897
Spain	0.913
Sweden	0.890
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.889
Alberta (Canada)	0.913
England (United Kingdom)	0.914
Flanders (Belgium)	0.915
Countries (ISCED 1)	TSCTSTUDS
Denmark	0.899
Finland	0.914
Mexico	0.888
Norway	0.932
Poland	0.905
Sub-national entities	
Flanders (Belgium)	0.924
Countries (ISCED 3)	TSCTSTUD
Australia	0.917
Denmark	0.910
Finland	0.912
Iceland	0.906
Italy	0.902
Mexico	0.917
Norway	0.924
Poland	0.903
Singapore	0.904
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.888
Countries (TALIS-PISA link)	TSCTSTUD
Australia	0.910
Finland	0.905
Latvia	0.890
Mexico	0.904
Portugal	0.900
Romania	0.905
Singapore	0.906
Spain	0.914

Source: OECD, *TALIS Database*

The factor scores for TSCTSTUDS were transformed to a convenience metric with a standard deviation of 2.0 and a mid-point of 10, which coincided with the mid-point of the scale. This transformation means that a score of 10 for TSCTSTUDS corresponds with the average response of 2.5 on items TT2G45A, TT2G45B, TT2G45C and TT2G45D (Figure 10.20). A score below 10 indicates disagreement with the items in the TSCTSTUDS scale.

Figure 10.20 Scale Mid-Point for TSCTSTUDS

How strongly do you agree or disagree with the following statements about what happens in this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	<div style="border: 1px solid black; background-color: #4a86e8; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
In this school, teachers and students usually get on well with each other.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Most teachers in this school believe that the students' well-being is important.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Most teachers in this school are interested in what students have to say.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
If a student from this school needs extra assistance, the school provides it.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Disagreement</div>		<div style="border: 1px solid black; padding: 5px; display: inline-block;">Agreement</div>	

Source: OECD, *TALIS Database*

Classroom disciplinary climate: Need for discipline (TCDISCS)

Teachers answered four items measuring *classroom disciplinary climate* (TCDISCS). These were TT2G41A, TT2G41B, TT2G41C and TT2G41D. Each item (described in Table 10.56) had four response categories: 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree”, and 4 for “strongly agree”. Items TT2G41A, TT2G41C and TT2G41D were reverse coded due to their negative statement about classroom disciplinary climate and to ensure they had the same direction as the rest of the items.

The alpha reliability coefficients were above 0.80 or 0.70 for the participating countries. Only Mexico showed a slightly lower reliability. These reliabilities are presented in Table 10.57. The overall international reliability was above 0.80 for all populations, that is, $\alpha = 0.856$ for ISCED Level 2, $\alpha = 0.824$ for ISCED Level 1, $\alpha = 0.832$ for ISCED Level 3, and $\alpha = 0.868$ for TALIS-PISA. The CFA modelling of the structural relationship between the measured items and the latent factor of TCDISCS revealed a remarkably good model-data fit for all countries in each population (see Table 10.58).

Table 10.56 How strongly do you agree or disagree with the following statements about this <target class>?

How strongly do you agree or disagree with the following statements about this <target class>?		
Scale	Variable	Item Wording
Classroom Disciplinary Climate	†TT2G41A	When the lesson begins, I have to wait quite a long time for students to quiet down
	TT2G41B	Students in this class take care to create a pleasant learning atmosphere.
	†TT2G41C	I lose quite a lot of time because of students interrupting the lesson
	†TT2G41D	There is much disruptive noise in this classroom

Source: OECD, *TALIS Database*

Note. †Items were reverse coded.

Table 10.57 Reliability coefficient alpha for the classroom disciplinary climate scale (TCDISCS) for all countries across populations

	TCDISCS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.878
Brazil	0.864
Bulgaria	0.845
Chile	0.789
Croatia	0.865
Czech Republic	0.863
Denmark	0.821
Estonia	0.877
Finland	0.880
France	0.857
Iceland	0.846
Israel	0.860
Italy	0.839
Japan	0.846
Korea	0.808
Latvia	0.830
Malaysia	0.865
Mexico	0.769
Netherlands	0.828
Norway	0.819
Poland	0.854

Table 10.57 Reliability coefficient alpha for the classroom disciplinary climate scale (TCDISCS) for all countries across populations (*continued*)

	TCDISCS
Countries (ISCED 2)	Coefficient Alpha
Portugal	0.881
Romania	0.819
Serbia	0.863
Singapore	0.872
Slovak Republic	0.863
Spain	0.869
Sweden	0.864
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.810
Alberta (Canada)	0.853
England (United Kingdom)	0.882
Flanders (Belgium)	0.858
	TCDISCS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.831
Finland	0.869
Mexico	0.682
Norway	0.830
Poland	0.818
Sub-national entities	
Flanders (Belgium)	0.844
	TCDISCS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.844
Denmark	0.830
Finland	0.857
Iceland	0.821
Italy	0.865
Mexico	0.744
Norway	0.810
Poland	0.832
Singapore	0.869
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.822
	TCDISCS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.881
Finland	0.883
Latvia	0.849
Mexico	0.786
Portugal	0.887
Romania	0.840
Singapore	0.877
Spain	0.871

Source: OECD, *TALIS Database*

Table 10.58 Confirmatory factor analysis model-data fit for all countries across populations in the classroom disciplinary climate: need for discipline scale

	TCDISCS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.999	0.998	0.012	0.007
Brazil	0.999	0.998	0.012	0.005
Bulgaria	1.000	1.002	0.000	0.001
Chile	0.986	0.959	0.065	0.022
Croatia	1.000	1.001	0.000	0.003
Czech Republic	1.000	0.999	0.013	0.006
Denmark	0.995	0.985	0.041	0.012
Estonia	0.998	0.995	0.024	0.006
Finland	1.000	1.001	0.000	0.002
France	0.999	0.997	0.023	0.005
Iceland	1.000	1.005	0.000	0.003
Israel	0.999	0.998	0.020	0.006
Italy	1.000	1.000	0.000	0.005
Japan	0.999	0.997	0.032	0.006
Korea	0.998	0.993	0.035	0.009
Latvia	1.000	1.004	0.000	0.003
Malaysia	0.998	0.993	0.040	0.008
Mexico	0.995	0.984	0.034	0.014
Netherlands	1.000	1.003	0.000	0.004
Norway	1.000	1.004	0.000	0.002
Poland	0.998	0.993	0.029	0.008
Portugal	1.000	1.002	0.000	0.001
Romania	0.995	0.986	0.045	0.011
Serbia	1.000	1.001	0.000	0.001
Singapore	0.994	0.981	0.054	0.011
Slovak Republic	1.000	0.999	0.011	0.005
Spain	0.999	0.998	0.018	0.005
Sweden	1.000	1.002	0.000	0.002
Sub-national entities				
Abu Dhabi (United Arab Emirates)	1.000	1.007	0.000	0.003
Alberta (Canada)	0.998	0.993	0.035	0.011
England (United Kingdom)	0.996	0.989	0.049	0.011
Flanders (Belgium)	1.000	1.002	0.000	0.002
	TCDISCS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.992	0.975	0.059	0.013
Finland	1.000	1.001	0.000	0.005
Mexico	0.992	0.977	0.039	0.015
Norway	0.997	0.990	0.042	0.010
Poland	0.991	0.973	0.042	0.015
Sub-national entities				
Flanders (Belgium)	0.999	0.997	0.021	0.006

Table 10.58 Confirmatory factor analysis model-data fit for all countries across populations in the classroom disciplinary climate: need for discipline scale (continued)

	TCDISCS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.996	0.989	0.035	0.011
Denmark	0.997	0.990	0.033	0.009
Finland	0.997	0.992	0.019	0.009
Iceland	1.000	1.007	0.000	0.004
Italy	0.999	0.998	0.019	0.005
Mexico	0.995	0.984	0.033	0.012
Norway	1.000	1.005	0.000	0.003
Poland	0.996	0.988	0.038	0.014
Singapore	0.995	0.984	0.047	0.011
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.997	0.990	0.034	0.013
	TCDISCS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.000	0.002	0.006
Finland	1.000	1.001	0.000	0.003
Latvia	0.999	0.997	0.022	0.007
Mexico	1.000	1.005	0.000	0.005
Portugal	1.000	0.999	0.014	0.005
Romania	0.994	0.982	0.023	0.013
Singapore	0.991	0.974	0.061	0.013
Spain	0.996	0.989	0.032	0.009

Source: OECD, *TALIS Database*

During the invariance testing, the classroom disciplinary climate scale was evaluated simultaneously across all of the participating countries in the reference population. The difference between the model with equal factor loadings and the baseline model without the restriction showed a high level of metric invariance. The drop in the fit indices was comparatively small (i.e. $\Delta CFI = 0.008$, $\Delta TLI = 0.008$, $\Delta RMSEA = 0.020$ and $\Delta SRMR = 0.053$). The scale functioned well at the configural and metric levels of invariance, providing support for the cross-country validity of the scale. The fit of the model beyond metric invariance was marginal for TCDISCS, with acceptable model fit at the scalar level of invariance. This result, with further analysis, could lead to meaningful mean score comparisons across countries, but any such comparison should be interpreted carefully, as the underlying mean scores of the TCDISCS scale may have a slightly different meaning in each country. There are no objections to comparing the correlations of TCDISCS with other constructs across countries, however. Table 10.59 summarises the results of the measurement invariance.

Table 10.59 Measurement invariance model-data fit for TCDISCS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.999	0.997	0.020	0.007	-	-	-	-
Metric	0.991	0.989	0.040	0.060	0.008	0.008	0.020	0.053
Scalar	0.935	0.950	0.082	0.095	0.056	0.039	0.042	0.035

Source: OECD, *TALIS Database*

When scalar invariance could not be supported, the scores for the index of classroom disciplinary climate were computed with a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. The same parameters were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations to produce the factor scores. Latent means of TCDISCS were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.60 presents the item loadings and intercepts used for the factor scores computation; Table 10.61 provides the factor score determinacy for all countries. The estimated factor scores of the latent factor TCDISCS had a high magnitude of determinacy, with the factor scores determinacy above 0.90 for all countries except Mexico in ISCED Levels 1 and 3, and with the factor score determinacy above 0.80 (see earlier in this chapter for an explanation of the factor score determinacy).

The factor scores for TCDISCS were transformed to a convenience metric with a standard deviation of 2.0 and a mid-point of 10 that coincided with the mid-point of the scale. Thus, a score of 10 for TCDISCS corresponds with the average response of 2.5 on items TT2G41A, TT2G41B, TT2G41C and TT2G41D (see Figure 10.21). The degree of agreement with the items in the scale is indicated by a score above than 10.

Table 10.60 Item loadings and intercepts for TCDISCS

Scale	Item	Loading	Intercept
Classroom Disciplinary Climate: Need for Discipline	TT2G41A	0.875	2.882
	TT2G41B	0.603	2.789
	TT2G41C	1.000	2.865
	TT2G41D	0.949	2.939

Source: OECD, *TALIS Database*

Table 10.61 Factor scores determinacies for the TCDISCS scale

Countries (ISCED 2)	TCDISCS
Australia	0.949
Brazil	0.939
Bulgaria	0.926
Chile	0.932
Croatia	0.947
Czech Republic	0.949
Denmark	0.934
Estonia	0.953
Finland	0.952
France	0.936
Iceland	0.939
Israel	0.948
Italy	0.928
Japan	0.938
Korea	0.934
Latvia	0.924
Malaysia	0.946
Mexico	0.903
Netherlands	0.931
Norway	0.938
Poland	0.942
Portugal	0.945
Romania	0.939
Serbia	0.943
Singapore	0.955
Slovak Republic	0.946
Spain	0.944
Sweden	0.940
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.922
Alberta (Canada)	0.945
England (United Kingdom)	0.956
Flanders (Belgium)	0.947
Countries (ISCED 1)	TCDISCS
Denmark	0.929
Finland	0.949
Mexico	0.847
Norway	0.940
Poland	0.920
Sub-national entities	
Flanders (Belgium)	0.941

Table 10.61 Factor scores determinacies for the TCDISCS scale (*continued*)

Countries (ISCED 3)	TCDISCS
Australia	0.941
Denmark	0.931
Finland	0.945
Iceland	0.935
Italy	0.938
Mexico	0.893
Norway	0.932
Poland	0.933
Singapore	0.953
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.927
Countries (TALIS-PISA link)	TCDISCS
Australia	0.954
Finland	0.958
Latvia	0.930
Mexico	0.903
Portugal	0.951
Romania	0.938
Singapore	0.955
Spain	0.949

Source: OECD, *TALIS Database*

Figure 10.21 Scale Mid-Point for TCDISCS

How strongly do you agree or disagree with the following statements about this <target class>?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	Mid-Point = 2.5			
† When the lesson begins, I have to wait quite a long time for students to quiet down.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Students in this class take care to create a pleasant learning atmosphere.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
† I lose quite a lot of time because of students interrupting the lesson.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
† There is much disruptive noise in this classroom.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Note. † Items were reverse coded.

Source: OECD

Constructivist beliefs (TCONSBS)

The index of *constructivist beliefs* (TCONSBS) was measured by four items – TT2G32A, TT2G32B, TT2G32C and TT2G32D, which are detailed in Table 10.62. The items were administered to teachers and answered on a four-point scale, with response categories of 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree” and 4 for “strongly agree”.

The reliability coefficient was above 0.70 for most of the participating countries. Several countries (e.g. Bulgaria, Estonia, Sweden) from the ISCED Level 2 population had scale reliabilities lower than 0.70 or 0.60. Norway’s reliability coefficient was lower than 0.60 in the ISCED Levels 1, 2 and 3 populations, and Finland and Mexico had scale reliabilities below 0.70 in the TALIS-PISA population (see Table 10.63). The overall international reliability was above 0.70 or 0.60 ($\alpha = 0.708$ for ISCED Level 2, $\alpha = 0.686$ for ISCED Level 1, $\alpha = 0.706$ for ISCED Level 3 and $\alpha = 0.725$ for TALIS-PISA). The CFA modelling of the structural relationship between the measured items and the latent factor of TCDISCS revealed a substantially good model-data fit for all countries in each population (see Table 10.64).

Table 10.62 Measured items for constructivist beliefs

We would like to ask about your personal beliefs on teaching and learning. Please indicate how strongly you agree or disagree with each of the following statements.		
Scale	Variable	Item Wording
Constructivist Beliefs	TT2G32A	My role as a teacher is to facilitate students’ own inquiry
	TT2G32B	Students learn best by finding solutions to problems on their own
	TT2G32C	Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved
	TT2G32D	Thinking and reasoning processes are more important than specific curriculum content

Source: OECD, *TALIS Database*

Table 10.63 Reliability coefficient alpha for the constructivist beliefs scale (TCONSBS) for all countries across populations

	TCONSBS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.705
Brazil	0.685
Bulgaria	0.621
Chile	0.79
Croatia	0.73
Czech Republic	0.724
Denmark	0.669
Estonia	0.647
Finland	0.663
France	0.694
Iceland	0.778
Israel	0.758
Italy	0.659
Japan	0.685
Korea	0.843
Latvia	0.713
Malaysia	0.746
Mexico	0.681
Netherlands	0.724
Norway	0.541
Poland	0.707
Portugal	0.713
Romania	0.746
Serbia	0.687
Singapore	0.795
Slovak Republic	0.718
Spain	0.736
Sweden	0.577
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.745
Alberta (Canada)	0.73
England (United Kingdom)	0.718
Flanders (Belgium)	0.658
	TCONSBS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.696
Finland	0.701
Mexico	0.704
Norway	0.561
Poland	0.76
Sub-national entities	
Flanders (Belgium)	0.695

Table 10.63 Reliability coefficient alpha for the constructivist beliefs scale (TCONSBS) for all countries across populations (*continued*)

	TCONSBS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.696
Denmark	0.656
Finland	0.675
Iceland	0.742
Italy	0.651
Mexico	0.692
Norway	0.549
Poland	0.753
Singapore	0.784
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.765
	TCONSBS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.704
Finland	0.683
Latvia	0.745
Mexico	0.691
Portugal	0.733
Romania	0.748
Singapore	0.794
Spain	0.738

Source: OECD, *TALIS Database*

Table 10.64 Confirmatory factor analysis model-data fit for all countries across populations in the constructivist beliefs scale

	TCONSBS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.998	0.994	0.018	0.009
Brazil	0.957	0.871	0.054	0.029
Bulgaria	0.992	0.976	0.030	0.015
Chile	0.974	0.923	0.083	0.022
Croatia	0.981	0.942	0.067	0.020
Czech Republic	0.999	0.997	0.014	0.007
Denmark	0.998	0.994	0.018	0.009
Estonia	0.999	0.998	0.010	0.007
Finland	0.985	0.954	0.056	0.018
France	0.983	0.948	0.060	0.019
Iceland	0.960	0.880	0.122	0.027
Israel	0.981	0.943	0.058	0.019
Italy	0.953	0.859	0.089	0.031
Japan	0.974	0.923	0.073	0.024
Korea	0.996	0.987	0.040	0.010
Latvia	0.999	0.996	0.018	0.009
Malaysia	0.974	0.922	0.074	0.027
Mexico	0.999	0.997	0.014	0.009
Netherlands	0.995	0.986	0.035	0.010
Norway	0.992	0.975	0.022	0.013
Poland	0.984	0.952	0.056	0.018
Portugal	0.981	0.943	0.063	0.018
Romania	0.992	0.975	0.039	0.012
Serbia	0.998	0.995	0.017	0.006
Singapore	0.989	0.966	0.064	0.016
Slovak Republic	0.990	0.970	0.047	0.015
Spain	0.975	0.924	0.080	0.022
Sweden	0.916	0.747	0.095	0.030
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.983	0.950	0.057	0.020
Alberta (Canada)	0.986	0.957	0.056	0.018
England (United Kingdom)	0.998	0.995	0.021	0.008
Flanders (Belgium)	0.998	0.995	0.017	0.008
	TCONSBS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	1.000	1.005	0.000	0.003
Finland	0.989	0.966	0.044	0.016
Mexico	1.000	1.013	0.000	0.001
Norway	0.950	0.849	0.060	0.025
Poland	0.987	0.962	0.049	0.017
Sub-national entities				
Flanders (Belgium)	0.997	0.990	0.028	0.011

Table 10.64 Confirmatory factor analysis model-data fit for all countries across populations in the constructivist beliefs scale (*continued*)

	TCONSBS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.000	0.003	0.007
Denmark	1.000	0.999	0.007	0.010
Finland	1.000	1.022	0.000	0.004
Iceland	0.984	0.952	0.071	0.016
Italy	0.959	0.878	0.086	0.033
Mexico	1.000	1.004	0.000	0.004
Norway	0.966	0.898	0.054	0.022
Poland	0.988	0.964	0.046	0.018
Singapore	0.986	0.957	0.057	0.015
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.977	0.931	0.075	0.020
	TCONSBS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.984	0.951	0.057	0.020
Finland	0.998	0.994	0.018	0.009
Latvia	0.989	0.968	0.044	0.014
Mexico	1.000	1.001	0.000	0.012
Portugal	0.973	0.919	0.075	0.020
Romania	0.997	0.992	0.016	0.011
Singapore	0.995	0.986	0.038	0.010
Spain	0.983	0.949	0.050	0.021

Source: OECD, *TALIS Database*

The multiple-group CFA comparison of the measures of the constructivist beliefs scale observed satisfactory invariance when equal loadings of the measures were constrained across countries. The difference between the model of metric invariance and the unrestricted model showed a relatively small drop in model fit, with $\Delta CFI = 0.016$, $\Delta TLI = 0.012$, $\Delta RMSEA = 0.007$ and $\Delta SRMR = 0.049$ (see Table 10.65). Restricting the intercepts to be equal across countries led to a noticeable drop in model fit, indicating non-invariant measures. This outcome also signified the validity of the scale for cross-cultural comparisons of its correlations with other constructs. Mean score comparisons should be interpreted with considerable caution, however, as the mean scores may have a slightly different meaning in each country.

Due to the lack of invariance at the required level (i.e. scalar invariance), factor scores for the index of constructivist beliefs were computed with a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. The same parameters were fixed and applied to the three ISCED-level and TALIS-PISA populations. Latent means of the TCONSBS scale were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.66 presents the item loadings and intercepts used for the factor score computation.

Table 10.65 Measurement invariance model-data fit for TCONSBS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
Configural	0.982	0.947	0.058	0.019	-	-	-	-
Metric	0.966	0.959	0.051	0.065	0.016	0.012	0.007	0.046
Scalar	0.691	0.762	0.123	0.168	0.275	0.197	0.072	0.103

Source: OECD, *TALIS Database***Table 10.66 Item loadings and intercepts for TCONSBS**

Scale	Item	Loading	Intercept
Constructivist Beliefs	TT2G32A	0.916	3.322
	TT2G32B	1.383	3.102
	TT2G32C	1.226	3.257
	TT2G32D	1.000	3.115

Source: OECD, *TALIS Database*

The estimated factor scores for the latent factor TCONSBS had a high degree of determinacy for most of the countries across populations, with the factor score determinacy above 0.80 (see Table 10.67). Only Bulgaria and Sweden in the ISCED Level 2 population and Norway in the ISCED Levels 2, 1 and 3 populations had a lower factor score determinacy (see previously in this chapter for an explanation of the factor score determinacy). Table 10.67 details the factor score determinacy for all countries. Factor scores for TCONSBS were transformed to a convenience metric with a standard deviation of 2.0 and a mid-point of 10 that coincided with the mid-point of the scale (see Figure 10.22). A score of 10 for TCONSBS therefore corresponds with the average response of 2.5 on items TT2G32A, TT2G32B, TT2G32C and TT2G32D. The degree of agreement with the items in the TCONSBS scale is indicated by a score above ten.

Table 10.67 Factor scores determinacies for the TCONSBS scale

Countries (ISCED 2)	TCONSBS
Australia	0.849
Brazil	0.834
Bulgaria	0.781
Chile	0.904
Croatia	0.859
Czech Republic	0.867
Denmark	0.847
Estonia	0.819
Finland	0.827
France	0.832
Iceland	0.891
Israel	0.874
Italy	0.822
Japan	0.812
Korea	0.925
Latvia	0.857
Malaysia	0.864
Mexico	0.852
Netherlands	0.874
Norway	0.694
Poland	0.854
Portugal	0.856
Romania	0.875
Serbia	0.840
Singapore	0.895
Slovak Republic	0.866
Spain	0.866
Sweden	0.727
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.875
Alberta (Canada)	0.866
England (United Kingdom)	0.864
Flanders (Belgium)	0.842
Countries (ISCED 1)	TCONSBS
Denmark	0.862
Finland	0.854
Mexico	0.868
Norway	0.704
Poland	0.886
Sub-national entities	
Flanders (Belgium)	0.855
Countries (ISCED 3)	TCONSBS
Australia	0.845

Table 10.67 Factor scores determinacies for the TCONSBS scale (continued)

Countries (ISCED 3)	TCONSBS
Denmark	0.833
Finland	0.839
Iceland	0.871
Italy	0.822
Mexico	0.850
Norway	0.722
Poland	0.878
Singapore	0.893
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.884
Countries (TALIS-PISA link)	TCONSBS
Australia	0.849
Finland	0.842
Latvia	0.876
Mexico	0.840
Portugal	0.859
Romania	0.882
Singapore	0.896
Spain	0.869

Source: OECD, *TALIS Database*

Figure 10.22 Scale Mid-Point for TCONSBS

We would like to ask about your personal beliefs on teaching and learning. Please indicate how strongly you agree or disagree with each of the following statements.

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
My role as a teacher is to facilitate students' own inquiry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Students learn best by finding solutions to problems on their own.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thinking and reasoning processes are more important than specific curriculum content.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mid-Point = 2.5

Disagreement Agreement

Source: OECD

Teacher co-operation (TCEXCHS, TCCOLLS and TCOOPS)

The *co-operation among teaching staff scale* (TCOOPS) was measured by eight items that were composed from two scales: exchange and coordination for teaching (TCEXCHS) and professional collaboration (TCCOLLS). The measured items for TCEXCHS were items TT2G33D, TT2G33E, TT2G33F and TT2G33G, and the measured items for TCCOLLS were TT2G33A, TT2G33B, TT2G33C and TT2G33H. The wording of these items is presented in Table 10.68. All items in the scales were measured on a six-point scale, with response categories of 1 for “never”, 2 for “once a year or less”, 3 for “2-4 times a year”, 4 for “5-10 times a year”, 5 for “1-3 times a month” and 6 for “once a week or more”.

Table 10.68 Measured items for teacher co-operation

On average, how often do you do the following in this school?		
Scale	Variable	Item Wording
Exchange and Coordination for Teaching	TT2G33D	Exchange teaching materials with colleagues
	TT2G33E	Engage in discussions about the learning development of specific students
	TT2G33F	Work with other teachers in my school to ensure common standards in evaluations for assessing student progress
	TT2G33G	Attend team conferences
Professional Collaboration	TT2G33A	Teach jointly as a team in the same class
	TT2G33B	Observe other teachers' classes and provide feedback
	TT2G33C	Engage in joint activities across different classes and age groups (e.g. projects)
	TT2G33H	Take part in collaborative professional learning

Source: OECD, *TALIS Database*

The reliability for the co-operation among teaching staff scale was represented by the reliabilities of TCEXCHS and TCCOLLS, reported in Table 10.69. Reliabilities were above 0.70, 0.60 or 0.50 for the two scales. Flanders (Belgium), France, Japan and Poland from the ISCED Level 2 population and Latvia from the TALIS-PISA population had reliabilities below 0.50. The international reliability for TCEXCHS was above 0.70 ($\alpha = 0.713$ for the ISCED Level 2, $\alpha = 0.703$ for the ISCED Level 1, $\alpha = 0.724$ for the ISCED Level 3 and $\alpha = 0.715$ for the TALIS-PISA populations). Reliabilities above or close to 0.60 were observed for SEINSS ($\alpha = 0.599$ for ISCED Level 2, $\alpha = 0.609$ for ISCED Level 1, $\alpha = 0.666$ for ISCED Level 3 and $\alpha = 0.603$ for TALIS-PISA).

Table 10.69 Reliability coefficient alpha for the exchange and coordination for teaching (TCEXCHS) and professional collaboration (TCCOLLS) scales for all countries across populations

	TCEXCHS	TCCOLLS
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha
Australia	0.685	0.666
Brazil	0.774	0.676
Bulgaria	0.722	0.521
Chile	0.796	0.776
Croatia	0.762	0.522
Czech Republic	0.718	0.609
Denmark	0.718	0.633
Estonia	0.675	0.636
Finland	0.689	0.627
France	0.629	0.486
Iceland	0.729	0.569
Israel	0.736	0.565
Italy	0.702	0.603
Japan	0.686	0.499
Korea	0.781	0.674
Latvia	0.689	0.533
Malaysia	0.771	0.704
Mexico	0.802	0.645
Netherlands	0.636	0.576
Norway	0.707	0.639
Poland	0.746	0.487
Portugal	0.743	0.563
Romania	0.731	0.642
Serbia	0.764	0.654
Singapore	0.716	0.555
Slovak Republic	0.729	0.571
Spain	0.681	0.568
Sweden	0.642	0.556
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.766	0.742
Alberta (Canada)	0.744	0.638
England (United Kingdom)	0.691	0.604
Flanders (Belgium)	0.709	0.467
	TCEXCHS	TCCOLLS
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha
Denmark	0.680	0.618
Finland	0.675	0.636
Mexico	0.776	0.644
Norway	0.709	0.609
Poland	0.733	0.519
Sub-national entities		
Flanders (Belgium)	0.676	0.494

Table 10.69 Reliability coefficient alpha for the exchange and coordination for teaching (TCEXCHS) and professional collaboration (*continued*)

	TCEXCHS	TCCOLLS
Countries (ISCED 3)	Coefficient Alpha	Coefficient Alpha
Australia	0.714	0.661
Denmark	0.736	0.622
Finland	0.697	0.714
Iceland	0.652	0.608
Italy	0.728	0.623
Mexico	0.803	0.611
Norway	0.740	0.715
Poland	0.778	0.566
Singapore	0.711	0.511
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.743	0.719
	TCEXCHS	TCCOLLS
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha
Australia	0.754	0.689
Finland	0.684	0.645
Latvia	0.682	0.483
Mexico	0.825	0.653
Portugal	0.746	0.527
Romania	0.724	0.589
Singapore	0.729	0.512
Spain	0.691	0.553

Source: OECD, *TALIS Database*

The internal structure pattern of the scales was examined with a two-factor CFA modelling. The correlation between the latent factors TCEXCHS and TCCOLLS for each country is given in Table 10.70, and the results of the CFA are presented in Table 10.71. The analysis showed the correlations were all significant at the 0.001 level across all countries in the reference population (ISCED Level 2). Korea and Singapore showed comparatively higher reliabilities than the other countries for all three scales, while the correlations between each pair of the latent factors (i.e. SECLSS with SEINSS, SECLSS with SEENGs, and SEINSS with SEENGs) were positively but weakly related in all countries. The CFA model with two correlated factors exhibited an acceptable fit for all countries. Only Bulgaria and Chile from ISCED Level 2 and Spain from the TALIS-PISA population showed a slight lack of model-data fit.

Table 10.70 Correlation between the latent factors TCEXCHS and TCCOLLS

Countries (Reference Population)	$r_{TCEXCHS,TCCOLLS}$
Australia	0.537
Brazil	0.915
Bulgaria	0.290
Chile	1.199
Croatia	0.257
Czech Republic	0.343
Denmark	0.563
Estonia	0.531
Finland	0.666
France	0.490
Iceland	0.888
Israel	0.460
Italy	0.920
Japan	0.749
Korea	0.532
Latvia	0.432
Malaysia	0.515
Mexico	0.515
Netherlands	0.322
Norway	0.489
Poland	0.356
Portugal	0.445
Romania	0.691
Serbia	0.506
Singapore	0.544
Slovak Republic	0.440
Spain	0.401
Sweden	0.782
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.787
Alberta (Canada)	0.732
England (United Kingdom)	0.424
Flanders (Belgium)	0.300

Source: OECD, *TALIS Database*

Note. All of the correlations were significant at .001 level.

Table 10.71 Confirmatory factor analysis model-data fit for all countries across populations in the teacher co-operation scale

	TCOOPS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.945	0.914	0.054	0.056
Brazil	0.947	0.918	0.037	0.039
Bulgaria	0.884	0.820	0.067	0.049
Chile	0.891	0.831	0.111	0.058
Croatia	0.907	0.856	0.075	0.045
Czech Republic	0.916	0.870	0.070	0.048
Denmark	0.958	0.934	0.048	0.033
Estonia	0.911	0.861	0.076	0.047
Finland	0.962	0.940	0.048	0.029
France	0.959	0.936	0.040	0.024
Iceland	0.952	0.925	0.059	0.038
Israel	0.903	0.849	0.067	0.049
Italy	0.899	0.843	0.082	0.045
Japan	0.954	0.929	0.045	0.028
Korea	0.947	0.918	0.064	0.038
Latvia	0.939	0.905	0.055	0.040
Malaysia	0.912	0.864	0.088	0.072
Mexico	0.959	0.936	0.059	0.036
Netherlands	0.939	0.905	0.043	0.035
Norway	0.969	0.952	0.034	0.033
Poland	0.945	0.915	0.051	0.035
Portugal	0.921	0.877	0.070	0.048
Romania	0.979	0.968	0.031	0.025
Serbia	0.966	0.947	0.045	0.031
Singapore	0.942	0.910	0.061	0.043
Slovak Republic	0.965	0.946	0.048	0.033
Spain	0.917	0.871	0.062	0.045
Sweden	0.958	0.934	0.040	0.032
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.939	0.906	0.063	0.055
Alberta (Canada)	0.935	0.899	0.072	0.043
England (United Kingdom)	0.929	0.889	0.064	0.039
Flanders (Belgium)	0.938	0.904	0.050	0.034
	TCOOPS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.947	0.918	0.057	0.037
Finland	0.934	0.898	0.050	0.036
Mexico	0.984	0.976	0.034	0.025
Norway	0.953	0.927	0.051	0.038
Poland	0.935	0.899	0.051	0.040
Sub-national entities				
Flanders (Belgium)	0.970	0.954	0.039	0.025

Table 10.71 Confirmatory factor analysis model-data fit for all countries across populations in the teacher co-operation scale (continued)

	TCOOPS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.911	0.862	0.073	0.062
Denmark	0.925	0.884	0.062	0.045
Finland	0.965	0.946	0.030	0.034
Iceland	0.943	0.911	0.057	0.046
Italy	0.911	0.861	0.080	0.044
Mexico	0.975	0.961	0.043	0.028
Norway	0.963	0.942	0.053	0.034
Poland	0.957	0.933	0.044	0.035
Singapore	0.945	0.914	0.060	0.039
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.917	0.872	0.070	0.059
	TCOOPS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.927	0.887	0.072	0.067
Finland	0.959	0.936	0.049	0.029
Latvia	0.913	0.865	0.061	0.045
Mexico	0.942	0.909	0.048	0.045
Portugal	0.936	0.901	0.051	0.041
Romania	0.954	0.928	0.028	0.038
Singapore	0.952	0.926	0.056	0.039
Spain	0.882	0.816	0.058	0.055

Source: OECD, *TALIS Database*

Note. TCEXCHS and TCCOLLS are subscales of TCOOPS, they do not possess their own fit indices, but their fit is measured through the overall scale. TCOOPS does not possess its own reliability index, but is represented through the coefficient Alphas of the TCEXCHS and TCCOLLS.

Table 10.72 shows that the two scales measuring co-operation among teaching staff established a metric level of invariance, with $\Delta CFI = 0.032$, $\Delta TLI = 0.015$, $RMSEA = 0.005$ and $SRMR = 0.037$ deemed an acceptable difference between the model with equal loadings and the model without constraint. When more restriction was specified, wherein the equality of loadings and intercepts were evaluated, a large drop in model fit was observed. This drop signifies that the mean score comparisons for these scales cannot be interpreted unequivocally. However, comparing the relationships of the scale with other constructs across countries is permissible.

For the computation of the factor scores for TCEXCHS and TCCOLLS, a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED 2 calibration was used because of the scalar non-invariance of the scales. The same loadings and intercepts were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Table 10.73 presents these parameters. Latent means of TCEXCHS and TCCOLLS were estimated separately, and unique variances were allowed to vary in each country per population. The operationalised latent factors TCEXCHS and TCCOLLS had factor scores determinacies of above 0.90 or 0.80 for most of the participating countries (see Table 10.74). Only France from the ISCED 2 population showed lower factor score determinacies for both scales. A considerably lower factor score determinacy was

observed for some countries for the TCCOLLS scale. They included Bulgaria, Flanders (Belgium), the Slovak Republic and Spain from the ISCED Level 2 population, Singapore from the ISCED Level 3 population and Finland, Singapore, Spain and Portugal from the TALIS-PISA population.

Table 10.72 Measurement invariance model-data fit for TCOOPS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.939	0.906	0.058	0.041	-	-	-	-
Metric	0.907	0.891	0.063	0.078	0.032	0.015	0.005	0.037
Scalar	0.404	0.437	0.142	0.254	0.503	0.454	0.079	0.176

Source: OECD, *TALIS Database*

Table 10.73 Item loadings and intercepts for TCEXCHS and TCCOLLS

Scale	Item	Loading	Intercept
Exchange and Coordination for Teaching	TT2G33D	1.000	4.077
	TT2G33E	1.006	4.645
	TT2G33F	1.261	3.893
	TT2G33G	0.819	3.978
Professional Collaboration	TT2G33A	1.000	2.801
	TT2G33B	0.814	2.177
	TT2G33C	0.854	2.765
	TT2G33H	0.912	3.047

Source: OECD, *TALIS Database*

Table 10.74 Factor scores determinacies for the TCEXCHS and TCCOLLS

Countries (ISCED 2)	TCEXCHS	TCCOLLS
Australia	0.860	0.828
Brazil	0.904	0.867
Bulgaria	0.861	0.771
Chile	0.916	0.911
Croatia	0.883	0.794
Czech Republic	0.874	0.804
Denmark	0.857	0.829
Estonia	0.843	0.846
Finland	0.835	0.810
France	0.762	0.731
Iceland	0.864	0.783
Israel	0.865	0.791
Italy	0.865	0.844
Japan	0.847	0.822
Korea	0.906	0.848
Latvia	0.854	0.821
Malaysia	0.905	0.861
Mexico	0.923	0.912

Table 10.74 Factor scores determinacies for the TCEXCHS and TCCOLLS (*continued*)

Netherlands	0.831	0.814
Norway	0.860	0.817
Poland	0.879	0.803
Portugal	0.862	0.782
Romania	0.871	0.851
Serbia	0.897	0.862
Singapore	0.879	0.788
Slovak Republic	0.867	0.779
Spain	0.811	0.766
Sweden	0.831	0.787
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.904	0.882
Alberta (Canada)	0.890	0.854
England (United Kingdom)	0.872	0.817
Flanders (Belgium)	0.846	0.740
Countries (ISCED 1)	TCEXCHS	TCCOLLS
Denmark	0.853	0.830
Finland	0.848	0.833
Mexico	0.919	0.929
Norway	0.866	0.801
Poland	0.875	0.817
Sub-national entities		
Flanders (Belgium)	0.816	0.903
Countries (ISCED 3)	TCEXCHS	TCCOLLS
Australia	0.872	0.822
Denmark	0.862	0.840
Finland	0.846	0.864
Iceland	0.818	0.820
Italy	0.872	0.851
Mexico	0.910	0.880
Norway	0.891	0.867
Poland	0.896	0.835
Singapore	0.881	0.782
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.897	0.871
Countries (TALIS-PISA link)	TCEXCHS	TCCOLLS
Australia	0.890	0.836
Finland	0.827	0.783
Latvia	0.837	0.808
Mexico	0.927	0.913
Portugal	0.857	0.763
Romania	0.869	0.833
Singapore	0.884	0.776
Spain	0.834	0.762

Source: OECD, *TALIS Database*

The next step involved transforming the factor scores to a convenience metric. The indexes of TCEXCHS and TCCOLLS were separately calculated to have a standard deviation of 2.0, and the mid-point of 10 coincided with the mid-point of each scale. This transformation means that a score of 10 for TCEXCHS corresponds with the average answer of 3.5 on items TT2G33D, TT2G33E, TT2G33F and TT2G33G (see Figure 10.23), and a score of 10 for TCCOLLS corresponds with the average answer of 3.5 on items TT2G33A, TT2G33B, TT2G33C and TT2G33H (see Figure 10.24). A score above 10 indicates consistent repetition of the activities described by the items in both the TCEXCHS and TCCOLLS scales. Finally, the scores for the index of TCOOPS were computed as composite scores by taking a simple average of TCEXCHS and TCCOLLS, and summarising it from the factor scores and the transformed scores.

Figure 10.23 Scale Mid-Point for TCEXCHS

On average, how often do you do the following in this school?

Please mark one choice in each row.

	Never	Once a year or less	2-4 times a year	5-10 times a year	1-3 times a month	Once a week or more
				Mid-Point = 3.5		
Exchange teaching materials with colleagues	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
Engage in discussions about the learning development of specific students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
Work with other teachers in my school to ensure common standards in evaluations for assessing student progress	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
Attend team conferences	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
	Inconsistent			Consistent		

Source: OECD

Figure 10.24 Scale Mid-Point for TCCOLLS**On average, how often do you do the following in this school?***Please mark one choice in each row.*

	Never	Once a year or less	2-4 times a year	5-10 times a year	1-3 times a month	Once a week or more
				Mid-Point = 3.5		
Teach jointly as a team in the same class ..	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
Observe other teachers' classes and provide feedback	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
Engage in joint activities across different classes and age groups (e.g. projects)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
Take part in collaborative professional learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
	Inconsistent			Consistent		

Source: OECD

Effective professional development (TEFFPROS)

In order to provide a description of the *effectiveness* of professional development scale, teachers were asked to answer items TT2G25A, TT2G25B, TT2G25C and TT2G25D. These items are listed in Table 10.75. The items were administered on a four-point scale, with each item having response categories of 1 for “not in any activities”, 2 for “yes, in some activities”, 3 for “yes, in most activities” and 4 for “yes, in all activities”.

The alpha reliability coefficient was above 0.80, 0.70 or 0.60 for the participating countries in the ISCED Level 2, ISCED Level 3 and TALIS-PISA populations. Japan from the ISCED Level 2 population and Finland from the TALIS-PISA population had a reliability coefficient slightly lower than 0.60 for the TEFFPROS scale. These reliabilities are reported in Table 10.76. The overall international reliability was above 0.70 for the ISCED Level 2, ISCED Level 3 and TALIS-PISA populations, and above 0.60 for the ISCED Level 1 population (i.e. $\alpha = 0.706$ for ISCED Level 2, $\alpha = 0.674$ for ISCED Level 1, $\alpha = 0.717$ for ISCED Level 3 and $\alpha = 0.709$ for TALIS-PISA). Results from the analysis of the internal structural relationship between the measured items and the latent factor TEFFPROS revealed a substantially good model-data fit for all countries in each population, but poor model fit for Chile and Croatia in the ISCED Level 2 population (see Table 10.77).

Table 10.75 Measured items for effective professional development

Considering the professional development activities you took part in during the last 12 months, to what extent have they included the following?		
Scale	Variable	Item Wording
Effective Professional Development	TT2G25A	A group of colleagues from my school or subject group
	TT2G25B	Opportunities for active learning methods (not only listening to a lecturer)
	TT2G25C	Collaborative learning activities or research with other teachers
	TT2G25D	An extended time-period (several occasions spread out over several weeks or months)

Source: OECD, *TALIS Database***Table 10.76 Reliability coefficient alpha for the effective professional development scale (TEFFPROS) for all countries across populations**

	TEFFPROS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.704
Brazil	0.724
Bulgaria	0.728
Chile	0.796
Croatia	0.634
Czech Republic	0.611
Denmark	0.700
Estonia	0.709
Finland	0.608
France	0.619
Iceland	0.699
Israel	0.692
Italy	0.706
Japan	0.598
Korea	0.805
Latvia	0.671
Malaysia	0.780
Mexico	0.724
Netherlands	0.732
Norway	0.673
Poland	0.669
Portugal	0.613
Romania	0.768
Serbia	0.704
Singapore	0.760
Slovak Republic	0.699
Spain	0.723
Sweden	0.696

Table 10.76 Reliability coefficient alpha for the effective professional development scale (TEFFPROS) for all countries across populations (*continued*)

Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.786
Alberta (Canada)	0.707
England (United Kingdom)	0.720
Flanders (Belgium)	0.653
	TEFFPROS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.678
Finland	0.616
Mexico	0.738
Norway	0.679
Poland	0.660
Sub-national entities	
Flanders (Belgium)	0.697
	TEFFPROS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.684
Denmark	0.691
Finland	0.718
Iceland	0.699
Italy	0.695
Mexico	0.709
Norway	0.685
Poland	0.667
Singapore	0.780
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.767
	TEFFPROS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.720
Finland	0.595
Latvia	0.704
Mexico	0.735
Portugal	0.612
Romania	0.774
Singapore	0.762
Spain	0.709

Source: OECD, *TALIS Database*

Table 10.77 Confirmatory factor analysis model-data fit for all countries across populations in the effective professional development scale

	TEFFPROS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.002	0.000	0.007
Brazil	0.988	0.964	0.031	0.019
Bulgaria	0.988	0.965	0.050	0.019
Chile	0.905	0.715	0.177	0.042
Croatia	0.844	0.533	0.179	0.045
Czech Republic	0.998	0.995	0.014	0.009
Denmark	1.000	1.002	0.000	0.007
Estonia	0.973	0.919	0.074	0.029
Finland	0.983	0.949	0.053	0.023
France	0.979	0.936	0.056	0.021
Iceland	1.000	0.999	0.009	0.012
Israel	0.990	0.971	0.039	0.018
Italy	1.000	1.008	0.000	0.001
Japan	1.000	1.010	0.000	0.002
Korea	1.000	1.001	0.000	0.005
Latvia	0.993	0.978	0.031	0.015
Malaysia	0.945	0.835	0.144	0.039
Mexico	0.981	0.944	0.068	0.025
Netherlands	0.971	0.913	0.068	0.026
Norway	0.955	0.866	0.065	0.030
Poland	0.990	0.969	0.036	0.019
Portugal	0.966	0.899	0.076	0.026
Romania	0.992	0.977	0.040	0.015
Serbia	0.947	0.842	0.096	0.041
Singapore	0.979	0.936	0.085	0.021
Slovak Republic	0.997	0.991	0.022	0.010
Spain	0.985	0.954	0.059	0.020
Sweden	0.978	0.934	0.061	0.024
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.989	0.966	0.056	0.015
Alberta (Canada)	0.978	0.933	0.075	0.021
England (United Kingdom)	0.991	0.972	0.043	0.015
Flanders (Belgium)	0.993	0.978	0.032	0.016
	TEFFPROS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.981	0.943	0.064	0.023
Finland	0.972	0.915	0.068	0.028
Mexico	0.994	0.981	0.036	0.017
Norway	1.000	1.000	0.003	0.008
Poland	0.955	0.864	0.069	0.032
Sub-national entities				
Flanders (Belgium)	0.976	0.927	0.071	0.025

Table 10.77 Confirmatory factor analysis model-data fit for all countries across populations in the effective professional development scale (*continued*)

	TEFFPROS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.000	0.000	0.007
Denmark	0.965	0.895	0.082	0.038
Finland	0.959	0.878	0.068	0.037
Iceland	0.966	0.897	0.084	0.029
Italy	0.986	0.957	0.059	0.019
Mexico	0.965	0.895	0.077	0.033
Norway	0.940	0.821	0.094	0.038
Poland	0.988	0.963	0.037	0.019
Singapore	1.000	1.000	0.000	0.007
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.996	0.988	0.037	0.011
	TEFFPROS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.995	0.984	0.037	0.013
Finland	0.979	0.936	0.052	0.022
Latvia	1.000	1.010	0.000	0.004
Mexico	0.967	0.902	0.065	0.029
Portugal	0.941	0.824	0.078	0.037
Romania	0.999	0.997	0.011	0.009
Singapore	0.983	0.950	0.074	0.018
Spain	0.990	0.969	0.029	0.019

Source: OECD, *TALIS Database*

Table 10.78 shows the index of effective professional development was metric invariant. Change in the model fit when additional equal factor loadings were introduced into the model was considered relatively small ($\Delta CFI = 0.021$, $\Delta TLI = 0.011$, and $\Delta RMSEA = 0.006$ and $\Delta SRMR = 0.030$). The difference in model fit was large, however, when the intercepts were also constrained to be equal across countries, a development signifying that the mean scores from the operationalised latent construct of the TEFFPROS scale had slightly different meaning from one country to the next and that comparison of the scale's mean scores should be interpreted with considerable caution.

Table 10.78 Measurement invariance model-data fit for TEFFPROS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.979	0.938	0.062	0.023	-	-	-	-
Metric	0.958	0.949	0.056	0.053	0.021	0.011	0.006	0.030
Scalar	0.770	0.823	0.104	0.109	0.188	0.126	0.048	0.056

Source: OECD, *TALIS Database*

The scalar non-invariance result led to CFA modelling of the pooled estimates of factor loadings and intercepts based on the ISCED 2 calibration sample. The same parameters from this pooled estimation were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Countries from each particular population had different latent means of TEFFPROS, and unique variances were allowed to vary. The estimated parameters used for the factor scores computation are presented in Table 10.79, and the factor scores determinacy for all countries is given in Table 10.80. The factor scores determinacy of above 0.80 indicated a high degree of determinacy between the latent factor TEFFPROS and the estimated factor scores (see the explanation earlier in this chapter on the factor score determinacy). Only Japan in the ISCED Level 2 population had a slightly lower factor score determinacy. The factor scores for TEFFPROS were transformed to a convenience metric with a standard deviation of 2.0 and the mid-point of 10 coinciding with the mid-point of the scale (see Figure 10.25). Thus, a score of 10 for TEFFPROS corresponds with the average response of 2.5 on items TT2G25A, TT2G25B, TT2G25C and TT2G25D. A score above 10 indicates consistent repetition of activity described by the items in the TEFFPROS scale.

Table 10.79 Item loadings and intercepts for TEFFPROS

Scale	Item	Loading	Intercept
Effective Professional Development	TT2G25A	1.000	2.381
	TT2G25B	1.340	2.228
	TT2G25C	1.347	2.030
	TT2G25D	0.994	1.802

Source: OECD, *TALIS Database*

Table 10.80 Factor scores determinacies for the TEFFPROS scale

Countries (ISCED 2)	TEFFPROS
Australia	0.857
Brazil	0.875
Bulgaria	0.846
Chile	0.902
Croatia	0.855
Czech Republic	0.810
Denmark	0.866
Estonia	0.860
Finland	0.834
France	0.816
Iceland	0.848
Israel	0.853
Italy	0.868
Japan	0.762
Korea	0.903
Latvia	0.847
Malaysia	0.902
Mexico	0.871
Netherlands	0.875
Norway	0.834
Poland	0.859
Portugal	0.844
Romania	0.880
Serbia	0.860
Singapore	0.887
Slovak Republic	0.849
Spain	0.858
Sweden	0.862
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.905
Alberta (Canada)	0.862
England (United Kingdom)	0.877
Flanders (Belgium)	0.837
Countries (ISCED 1)	TEFFPROS
Denmark	0.869
Finland	0.861
Mexico	0.870
Norway	0.842
Poland	0.854
Sub-national entities	
Flanders (Belgium)	0.871
Countries (ISCED 3)	TEFFPROS
Australia	0.859
Denmark	0.859
Finland	0.884

Table 10.80 Factor scores determinacies for the TEFFPROS scale (continued)

Countries (ISCED 3)	TEFFPROS
Iceland	0.860
Italy	0.875
Mexico	0.861
Norway	0.846
Poland	0.848
Singapore	0.903
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.904
Countries (TALIS-PISA link)	TEFFPROS
Australia	0.878
Finland	0.827
Latvia	0.865
Mexico	0.873
Portugal	0.828
Romania	0.883
Singapore	0.894
Spain	0.847

Source: OECD, *TALIS Database*

Figure 10.25 Scale Mid-Point for TEFFPROS

Considering the professional development activities you took part in during the last 12 months, to what extent have they included the following?

Please mark one choice in each row.

	Not in any activities	Yes, in some activities	Yes, in most activities	Yes, in all activities
A group of colleagues from my school or subject group	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Opportunities for active learning methods (not only listening to a lecturer)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Collaborative learning activities or research with other teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
An extended time-period (several occasions spread out over several weeks or months)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Mid-Point = 2.5

Inconsistent

Consistent

Source: OECD

Need for professional development in subject matter and pedagogy (TPDPEDS)

Five items measuring the degree of *need for professional development in subject matter and pedagogy* (TPDPEDS) were administered to teachers: TT2G26A, TT2G26B, TT2G26C, TT2G26D and TT2G26F. These items, listed in Table 10.81, each had four response categories: 1 for “no need at present”, 2 for “low level of need”, 3 for “moderate level of need” and 4 for “high level of need”.

The reliability coefficient alpha was above 0.70 for all of the participating countries (see Table 10.82). The overall international reliability was above 0.80 for all populations, where $\alpha = .870$ for ISCED Level 2, $\alpha = 0.841$ for ISCED Level 1, $\alpha = 0.851$ for ISCED Level 3 and $\alpha = .853$ for TALIS-PISA. The CFA modelling on the structural relationship between the measured items and the latent factor of TPDPEDS was acceptable for all countries in each population. Only Flanders (Belgium) had fit indices that were all below the acceptable range. Table 10.83 presents the CFA model fit.

Table 10.81 Measured items for needs for professional development in subject matter and pedagogy

For each of the areas listed below, please indicate the degree to which you currently need professional development.		
Scale	Variable	Item Wording
Needs for Professional Development in Subject Matter and Pedagogy	TT2G26A	Knowledge and understanding of my subject field(s)
	TT2G26B	Pedagogical competencies in teaching my subject field(s)
	TT2G26C	Knowledge of the curriculum
	TT2G26D	Student evaluation and assessment practice
	TT2G26F	Student behaviour and classroom management

Source: OECD, *TALIS Database*

Table 10.82 Reliability coefficient alpha for the need for professional development in subject matter and pedagogy (TPDPEDS) scale for all countries across populations

	TPDPEDS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.849
Brazil	0.850
Bulgaria	0.897
Chile	0.887
Croatia	0.841
Czech Republic	0.813
Denmark	0.803
Estonia	0.837
Finland	0.803
France	0.763
Iceland	0.788
Israel	0.860
Italy	0.864
Japan	0.833
Korea	0.910
Latvia	0.835
Malaysia	0.910
Mexico	0.853
Netherlands	0.768
Norway	0.787
Poland	0.797
Portugal	0.826
Romania	0.901
Serbia	0.855
Singapore	0.876
Slovak Republic	0.856
Spain	0.826
Sweden	0.799
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.861
Alberta (Canada)	0.841
England (United Kingdom)	0.823
Flanders (Belgium)	0.800
	TPDPEDS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.808
Finland	0.813
Mexico	0.886
Norway	0.801
Poland	0.820
Sub-national entities	
Flanders (Belgium)	0.776

Table 10.82 Reliability coefficient alpha for the need for professional development in subject matter and pedagogy
(continued)

	TPDPEDS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.849
Denmark	0.793
Finland	0.809
Iceland	0.805
Italy	0.839
Mexico	0.845
Norway	0.789
Poland	0.795
Singapore	0.872
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.878
	TPDPEDS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.845
Finland	0.809
Latvia	0.834
Mexico	0.839
Portugal	0.847
Romania	0.911
Singapore	0.876
Spain	0.825

Source: OECD, *TALIS Database*

Table 10.83 Confirmatory factor analysis model-data fit for all countries across populations in the need for professional development in subject matter and pedagogy scale

	TPDPEDS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.972	0.930	0.077	0.024
Brazil	0.987	0.967	0.039	0.020
Bulgaria	0.935	0.837	0.149	0.039
Chile	0.994	0.986	0.049	0.013
Croatia	0.947	0.867	0.127	0.038
Czech Republic	0.977	0.942	0.077	0.022
Denmark	0.957	0.892	0.101	0.030
Estonia	0.942	0.854	0.138	0.035
Finland	0.977	0.942	0.085	0.025
France	0.946	0.866	0.106	0.034
Iceland	0.933	0.832	0.138	0.058
Israel	0.964	0.910	0.087	0.023
Italy	0.981	0.953	0.076	0.020
Japan	0.984	0.960	0.071	0.023
Korea	0.981	0.953	0.075	0.020
Latvia	0.982	0.954	0.067	0.022
Malaysia	0.999	0.997	0.024	0.006
Mexico	0.975	0.937	0.096	0.027
Netherlands	0.863	0.658	0.137	0.052
Norway	0.995	0.988	0.025	0.012
Poland	0.964	0.909	0.080	0.031
Portugal	0.962	0.906	0.106	0.033
Romania	0.987	0.967	0.066	0.016
Serbia	0.988	0.969	0.062	0.020
Singapore	0.973	0.933	0.096	0.023
Slovak Republic	0.987	0.967	0.061	0.018
Spain	0.957	0.894	0.100	0.032
Sweden	0.958	0.896	0.113	0.050
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.924	0.811	0.136	0.038
Alberta (Canada)	0.944	0.860	0.129	0.034
England (United Kingdom)	0.951	0.878	0.104	0.030
Flanders (Belgium)	0.845	0.612	0.194	0.069
	TPDPEDS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.957	0.892	0.112	0.028
Finland	0.966	0.916	0.079	0.028
Mexico	0.997	0.993	0.032	0.011
Norway	0.996	0.989	0.025	0.012
Poland	0.988	0.970	0.053	0.018
Sub-national entities				
Flanders (Belgium)	0.903	0.757	0.149	0.055

Table 10.83 Confirmatory factor analysis model-data fit for all countries across populations in the need for professional development in subject matter and pedagogy scale (continued)

Countries (ISCED 3)	TPDPEDS			
	CFI	TLI	RMSEA	SRMR
Australia	0.964	0.909	0.102	0.028
Denmark	0.951	0.877	0.095	0.031
Finland	0.996	0.990	0.018	0.015
Iceland	0.982	0.956	0.072	0.023
Italy	0.989	0.971	0.056	0.018
Mexico	0.964	0.909	0.099	0.026
Norway	0.991	0.979	0.044	0.015
Poland	0.979	0.948	0.053	0.023
Singapore	0.975	0.937	0.095	0.020
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.963	0.907	0.103	0.027
Countries (TALIS-PISA link)	TPDPEDS			
	CFI	TLI	RMSEA	SRMR
Australia	0.969	0.922	0.083	0.025
Finland	0.951	0.877	0.110	0.032
Latvia	0.956	0.891	0.096	0.031
Mexico	0.963	0.907	0.070	0.032
Portugal	0.982	0.955	0.070	0.023
Romania	0.962	0.904	0.081	0.023
Singapore	0.968	0.920	0.109	0.025
Spain	0.942	0.855	0.101	0.035

Source: OECD, *TALIS Database*

The measurement invariance of the TPD PEDS scale was evaluated simultaneously across all of the participating countries in the reference population. Table 10.84 presents the results of this analysis. Results showed a slight but acceptable deterioration in the model fit when the factor loadings were constrained to be equal across countries (i.e. $\Delta CFI = 0.018$, $\Delta TLI = 0.018$, $\Delta RMSEA = 0.011$ and $\Delta SRMR = 0.033$). The difference in model fit between the models testing metric and scalar invariance was considered large, an outcome signifying that mean score comparisons should be carefully interpreted because each participating country is likely to ascribe slightly different meaning to the TPD PEDS mean scores. However, the result from this cross-cultural invariance did confirm the validity of cross-cultural comparisons of correlations of the TPD PEDS scale with other constructs.

Table 10.84 Measurement invariance model-data fit for TPD PEDS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.968	0.919	0.092	0.030	-	-	-	-
Metric	0.950	0.937	0.081	0.063	0.018	0.018	0.011	0.033
Scalar	0.830	0.855	0.124	0.120	0.120	0.082	0.043	0.057

Source: OECD, *TALIS Database*

The scalar invariance result for the TPD PEDS scale led to factor scores being computed from a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. In order to produce the factor scores, the same parameters were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations. Latent means of TPD PEDS were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.85 sets out the item loadings and intercepts used for the factor scores computation. The factor scores determinacy for all countries was above 0.90 or 0.80 (see Table 10.86), thereby indicating a high magnitude of determinacy between the latent factor TPD PEDS and the estimated factor scores for all of the participating countries.

The factor scores were then transformed to a convenience metric with a standard deviation of 2.0 and the mid-point of 10 coinciding with the mid-point of the scale (see Figure 10.26). Thus, a score of 10 for TPD PEDS corresponds with the average response of 2.5 on items TT2G26A, TT2G26B, TT2G26C, TT2G26D and TT2G26F. The degree of agreement with the items in the TPD PEDS scale is indicated by a score above ten.

Table 10.85 Item loadings and intercepts for TPD PEDS

Scale	Item	Loading	Intercept
Need for Professional Development in Subject Matter and Pedagogy	TT2G26A	1.000	2.213
	TT2G26B	1.050	2.316
	TT2G26C	0.929	2.141
	TT2G26D	0.933	2.389
	TT2G26F	0.823	2.359

Source: OECD, *TALIS Database*

Table 10.86 Factor scores determinacies for the TPD PEDS scale

Countries (ISCED 2)	TPD PEDS
Australia	0.932
Brazil	0.928
Bulgaria	0.958
Chile	0.949
Croatia	0.917
Czech Republic	0.904
Denmark	0.902
Estonia	0.919
Finland	0.906
France	0.874
Iceland	0.908
Israel	0.934
Italy	0.936
Japan	0.943
Korea	0.960
Latvia	0.927
Malaysia	0.958
Mexico	0.926
Netherlands	0.881
Norway	0.895
Poland	0.913
Portugal	0.921
Romania	0.951
Serbia	0.933
Singapore	0.944
Slovak Republic	0.934
Spain	0.903
Sweden	0.889
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.931
Alberta (Canada)	0.929
England (United Kingdom)	0.914
Flanders (Belgium)	0.916
Countries (ISCED 1)	TPD PEDS
Denmark	0.907
Finland	0.911
Mexico	0.948
Norway	0.908
Poland	0.918
Sub-national entities	
Flanders (Belgium)	0.904
Countries (ISCED 3)	TPD PEDS
Australia	0.930

Table 10.86 Factor scores determinacies for the TPD PEDS scale (continued)

Countries (ISCED 3)	TPD PEDS
Denmark	0.892
Finland	0.903
Iceland	0.916
Italy	0.919
Mexico	0.913
Norway	0.899
Poland	0.904
Singapore	0.945
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.940
Countries (TALIS-PISA link)	TPD PEDS
Australia	0.928
Finland	0.908
Latvia	0.929
Mexico	0.917
Portugal	0.933
Romania	0.957
Singapore	0.945
Spain	0.904

Source: OECD, *TALIS Database*

Figure 10.26 Scale Mid-Point for TPD PEDS

For each of the areas listed below, please indicate the degree to which you currently need professional development.

Please mark one choice in each row.

	No need at present	Low level of need	Moderate level of need	High level of need
	<div>Mid-Point = 2.5</div>			
Knowledge and understanding of my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Pedagogical competencies in teaching my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Knowledge of the curriculum	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Student evaluation and assessment practice	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Student behaviour and classroom management	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Source: OECD

Need for professional development for teaching for diversity (TPDDIVS)

To enable a description of the degree of need for *professional development for teaching for diversity* (TPDDIVS), teachers were asked to answer six items used to define the scale. These items were TT2G26H, TT2G26I, TT2G26J, TT2G26K, TT2G26L and TT2G26N (see Table 10.87). All of the items had four response categories: 1 for “no need at present”, 2 for “low level of need”, 3 for “moderate level of need” and 4 for “high level of need”.

The alpha reliability coefficient was above 0.70 for all of the participating countries. The overall international reliability was above 0.70 for all populations, where $\alpha = 0.844$ for ISCED Level 2, $\alpha = 0.794$ for ISCED Level 1, $\alpha = 0.845$ for ISCED Level 3 and $\alpha = 0.834$ for TALIS-PISA (see Table 10.88). The CFA modelling on the structural relationship between the measured items and the latent factor of TPDPEDS was acceptable for most of the participating countries in each population. Lack of model fit was observed for Bulgaria, Denmark, Finland, Poland and Romania in the ISCED Level 2 population. Finland, Mexico and Romania also had lack of model fit. Table 10.89 details the result for the CFA model fit.

Table 10.87 Measured items for need for professional development for teaching for diversity

For each of the areas listed below, please indicate the degree to which you currently need professional development.		
Scale	Variable	Item Wording
Need for Professional Development for Teaching for Diversity	TT2G26H	Approaches to individualised learning
	TT2G26I	Teaching students with special needs (see Question [9] for the definition)
	TT2G26J	Teaching in a multicultural or multilingual setting
	TT2G26K	Teaching cross-curricular skills (e.g. problem solving, learning-to-learn)
	TT2G26L	Approaches to developing cross-occupational competencies for future work or future studies
	TT2G26N	Student career guidance and counselling

Source: OECD, *TALIS Database*

Table 10.88 Reliability coefficient alpha for the need for professional development for teaching for diversity scale (TPDDIVS) for all countries across populations

	TPDDIVS
Countries (ISCED 2)	Coefficient Alpha
Australia	0.842
Brazil	0.815
Bulgaria	0.802
Chile	0.881
Croatia	0.811
Czech Republic	0.812
Denmark	0.777
Estonia	0.815
Finland	0.788
France	0.810
Iceland	0.840
Israel	0.850
Italy	0.847
Japan	0.822
Korea	0.868
Latvia	0.793
Malaysia	0.847
Mexico	0.806
Netherlands	0.770
Norway	0.811
Poland	0.754
Portugal	0.808
Romania	0.852
Serbia	0.803
Singapore	0.873
Slovak Republic	0.837
Spain	0.829
Sweden	0.804
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.841
Alberta (Canada)	0.809
England (United Kingdom)	0.840
Flanders (Belgium)	0.803
	TPDDIVS
Countries (ISCED 1)	Coefficient Alpha
Denmark	0.737
Finland	0.735
Mexico	0.820
Norway	0.758
Poland	0.712
Sub-national entities	
Flanders (Belgium)	†

Table 10.88 Reliability coefficient alpha for the need for professional development for teaching for diversity scale
(continued)

	TPDDIVS
Countries (ISCED 3)	Coefficient Alpha
Australia	0.841
Denmark	0.802
Finland	0.827
Iceland	0.855
Italy	0.827
Mexico	0.820
Norway	0.830
Poland	0.796
Singapore	0.862
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.828
	TPDDIVS
Countries (TALIS-PISA link)	Coefficient Alpha
Australia	0.849
Finland	0.788
Latvia	0.801
Mexico	0.804
Portugal	0.817
Romania	0.849
Singapore	0.870
Spain	0.829

Source: OECD, *TALIS Database*

Note. † Flanders (Belgium) does not have a reliability estimate for TPDDIVS because one of the items has a zero variance (not administered item)

Table 10.89 Confirmatory factor analysis model-data fit for all countries across populations in the need for professional development for teaching for diversity scale

	TPDDIVS			
Countries (ISCED 2)	CFI	TLI	RMSEA	SRMR
Australia	0.925	0.859	0.100	0.038
Brazil	0.902	0.817	0.071	0.055
Bulgaria	0.886	0.786	0.114	0.061
Chile	0.965	0.934	0.090	0.032
Croatia	0.975	0.954	0.065	0.026
Czech Republic	0.953	0.913	0.082	0.035
Denmark	0.893	0.799	0.121	0.050
Estonia	0.986	0.973	0.044	0.018
Finland	0.855	0.729	0.140	0.069
France	0.943	0.894	0.096	0.032
Iceland	0.955	0.916	0.092	0.033
Israel	0.959	0.924	0.076	0.035
Italy	0.969	0.942	0.075	0.027
Japan	0.967	0.938	0.071	0.027
Korea	0.931	0.870	0.109	0.051
Latvia	0.937	0.882	0.086	0.036
Malaysia	0.901	0.815	0.145	0.054
Mexico	0.927	0.864	0.096	0.050
Netherlands	0.950	0.906	0.061	0.032
Norway	0.925	0.860	0.091	0.046
Poland	0.876	0.767	0.115	0.063
Portugal	0.950	0.905	0.078	0.035
Romania	0.875	0.765	0.133	0.062
Serbia	0.941	0.889	0.088	0.037
Singapore	0.970	0.944	0.078	0.025
Slovak Republic	0.957	0.919	0.079	0.034
Spain	0.944	0.894	0.090	0.035
Sweden	0.939	0.886	0.089	0.043
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.942	0.892	0.098	0.038
Alberta (Canada)	0.938	0.884	0.094	0.040
England (United Kingdom)	0.920	0.850	0.105	0.039
Flanders (Belgium)	0.912	0.835	0.094	0.046
	TPDDIVS			
Countries (ISCED 1)	CFI	TLI	RMSEA	SRMR
Denmark	0.854	0.726	0.127	0.055
Finland	0.766	0.561	0.126	0.079
Mexico	0.900	0.812	0.115	0.049
Norway	0.762	0.553	0.141	0.085
Poland	0.872	0.760	0.095	0.074
Sub-national entities				
Flanders (Belgium)	0.943	0.857	0.102	0.034

Table 10.89 Confirmatory factor analysis model-data fit for all countries across populations in the need for professional development for teaching for diversity scale (*continued*)

	TPDDIVS			
Countries (ISCED 3)	CFI	TLI	RMSEA	SRMR
Australia	0.946	0.898	0.082	0.033
Denmark	0.926	0.862	0.081	0.041
Finland	0.949	0.905	0.055	0.031
Iceland	0.937	0.881	0.110	0.036
Italy	0.963	0.931	0.078	0.029
Mexico	0.856	0.730	0.153	0.074
Norway	0.937	0.882	0.091	0.040
Poland	0.953	0.912	0.062	0.038
Singapore	0.958	0.922	0.090	0.031
Sub-national entities				
Abu Dhabi (United Arab Emirates)	0.933	0.874	0.096	0.043
	TPDDIVS			
Countries (TALIS-PISA link)	CFI	TLI	RMSEA	SRMR
Australia	0.971	0.928	0.074	0.025
Finland	0.907	0.825	0.118	0.059
Latvia	0.957	0.919	0.059	0.029
Mexico	0.829	0.679	0.117	0.077
Portugal	0.959	0.923	0.054	0.031
Romania	0.823	0.556	0.129	0.076
Singapore	0.969	0.942	0.077	0.026
Spain	0.981	0.951	0.054	0.020

Source: OECD, *TALIS Database*

Note. † Item TT2G26L was excluded from scaling the scale for Flanders (Belgium) in the ISCED 1 population because the item was not administered.

A comparison between the unrestricted multiple-group CFA (i.e. configural invariance) and the model of equal factor loadings (i.e. metric invariance) showed an acceptable degree of invariance ($\Delta CFI = 0.013$, $\Delta TLI = 0.032$, and $\Delta RMSEA = 0.013$ and $\Delta SRMR = 0.017$), therefore providing support for the cross-country validity of this model. When the item intercepts were also constrained to be equal across the countries in the model with the scalar level of invariance, a large drop in model fit was observed (see Table 10.90). This drop means that mean score comparisons for the TPDDIVS scale cannot explicitly be interpreted due to these scores having a slightly different meaning from one country to the next.

Table 10.90 Measurement invariance model-data fit for TPDDIVS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
Configural	0.932	0.873	0.096	0.044	-	-	-	-
Metric	0.919	0.905	0.083	0.061	0.013	0.032	0.013	0.017
Scalar	0.706	0.751	0.134	0.148	0.213	0.154	0.051	0.087

Source: OECD, *TALIS Database*

After the invariance testing, factor scores were computed from a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED Level 2 calibration sample. The same parameters were fixed and applied to the ISCED Levels 2, 1, 3 and TALIS-PISA populations to produce the factor scores. Latent means of the TPDDIVS scale were estimated separately for each of the participating countries per population, and unique variances were allowed to vary. Table 10.91 sets out the item loadings and intercepts used for the factor scores. Table 10.92 presents the factor scores determinacy, which was above 0.90 or 0.80 for all countries, so indicating a high magnitude of determinacy between the operationalized latent factor TPDDIVS and the estimated factors scores (see the explanation of factor score determinacy given earlier in this chapter). The factor scores were then transformed to a convenience metric with a standard deviation of 2.0 and a mid-point of 10 that coincided with the mid-point of the scale (see Figure 10.27). A score of 10 for TPDDIVS thus corresponds with the average response of 2.5 on items TT2G26H, TT2G26I, TT2G26J, TT2G26K, TT2G26L and TT2G26N, while a score above 10 indicates the degree of agreement described by the items in the TPDDIVS scale.

Table 10.91 Item loadings and intercepts for TPDDIVS

Scale	Item	Loading	Intercept
Need for Professional Development for Teaching for Diversity	TT2G26H	0.872	2.455
	TT2G26I	0.873	2.630
	TT2G26J	0.918	2.154
	TT2G26K	1.000	2.401
	TT2G26L	1.041	2.257
	TT2G26N	0.963	2.269

Source: OECD, *TALIS Database*

Table 10.92 Factor scores determinacies for the TPDDIVS scale

Countries (ISCED 2)	TPDDIVS
Australia	0.920
Brazil	0.907
Bulgaria	0.901
Chile	0.944
Croatia	0.915
Czech Republic	0.906
Denmark	0.892
Estonia	0.903
Finland	0.874
France	0.909
Iceland	0.917
Israel	0.925
Italy	0.922
Japan	0.900
Korea	0.932
Latvia	0.887
Malaysia	0.930
Mexico	0.904
Netherlands	0.875
Norway	0.897
Poland	0.863
Portugal	0.901
Romania	0.934
Serbia	0.904
Singapore	0.936
Slovak Republic	0.919
Spain	0.910
Sweden	0.893
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.924
Alberta (Canada)	0.903
England (United Kingdom)	0.919
Flanders (Belgium)	0.894
Countries (ISCED 1)	TPDDIVS
Denmark	0.863
Finland	0.798
Mexico	0.912
Norway	0.853
Poland	0.830
Sub-national entities	
Flanders (Belgium)	0.865
Countries (ISCED 3)	TPDDIVS
Australia	0.919

Table 10.92 Factor scores determinacies for the TPDDIVS scale (*continued*)

Denmark	0.897
Finland	0.911
Iceland	0.922
Italy	0.806
Mexico	0.917
Norway	0.905
Poland	0.897
Singapore	0.931
Sub-national entities	
Abu Dhabi (United Arab Emirates)	0.916
Countries (TALIS-PISA link)	TPDDIVS
Australia	0.925
Finland	0.877
Latvia	0.900
Mexico	0.913
Portugal	0.907
Romania	0.937
Singapore	0.934
Spain	0.910

Source: OECD, *TALIS Database*

Figure 10.27 Scale Mid-Point for TPDDIVS

For each of the areas listed below, please indicate the degree to which you currently need professional development.

Please mark one choice in each row.

	No need at present	Low level of need	Moderate level of need	High level of need
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
Approaches to individualised learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Teaching students with special needs (see Question 91 for the definition)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Teaching in a multicultural or multilingual setting	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Teaching cross-curricular skills (e.g. problem solving, learning-to-learn)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Approaches to developing cross-occupational competencies for future work or future studies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
Student career guidance and counselling	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Source: OECD

Self-efficacy in teaching mathematics (TMSELEFFS)

The mathematics teachers from the TALIS-PISA population answered four items measuring the *self-efficacy in teaching mathematics scale* (TMSELEFFS). These items were TT2M15B, TT2M15D, TT2M15E and TT2M15F, descriptions of which are given in Table 10.93. All items in the scales were measured on a four-point scale, the response categories of which were 1 for “strongly disagree”, 2 for “disagree”, 3 for “agree” and 4 for “strongly agree”. Items TT2M15B, TT2M15D and TT2M15F were reverse coded (due to the negative statement about self-efficacy in teaching mathematics) in order to have the same positive direction as item TT2M15E.

Data from eight TALIS-PISA countries were used to evaluate the quality of the index of self-efficacy in teaching mathematics. The reliability coefficient alpha showed the scale reliability as above 0.70 for Australia, Portugal, Singapore and Spain. The scale reliability was above 0.60 for the rest of the countries in the TALIS-PISA population (see Table 10.94). The overall scale reliability from the pooled sample of TALIS-PISA observed an alpha coefficient close to 0.70. The CFA modelling for the countries in the TALIS-PISA population revealed a remarkably good model fit for all of them (see Table 10.95) except Romania, which showed a lack of model fit, resulting in the residual variance for one of the items being fixed to its observed variance to solve the model-data convergence issue.

Table 10.93 Measured items for teacher self-efficacy in teaching mathematics

How much do you agree or disagree with the following statements concerning your ability to teach mathematics?		
Scale	Variable	Item Wording
Self-Efficacy in Teaching Mathematics	†TT2M15B	I have a hard time getting students interested in mathematics
	†TT2M15D	I find it hard to meet the needs of the individual students in my mathematics class
	TT2M15E	I am able to get my students to feel confident in mathematics
	†TT2M15F	I have a hard time getting my students to understand underlying concepts in mathematics

Source: OECD, *TALIS Database*

Note. †Items were reverse coded.

Table 10.94 Reliability coefficient alpha for the self-efficacy in teaching mathematics scale (TMSELEFFS) for the TALIS-PISA Link countries

Countries (TALIS-PISA Link)	TMSELEFFS
	Coefficient Alpha
Australia	0.721
Finland	0.650
Latvia	0.621
Mexico	0.641
Portugal	0.713
Romania	0.649
Singapore	0.737
Spain	0.711

Source: OECD, *TALIS Database***Table 10.95 Confirmatory factor analysis model-data fit for TALIS-PISA Link countries in the self-efficacy in teaching mathematics scale**

Countries (TALIS-PISA Link)	TMSELEFFS			
	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.014	0.000	0.008
Finland	0.999	0.996	0.016	0.014
Latvia	0.995	0.984	0.022	0.027
Mexico	0.986	0.959	0.028	0.033
Portugal	0.989	0.967	0.047	0.020
Romania	0.661	0.323	0.098	0.282
Singapore	1.000	1.011	0.000	0.003
Spain	0.998	0.995	0.014	0.013

Source: OECD, *TALIS Database*

Table 10.96 shows a deficient degree of metric invariance with the occurrence of a relatively large drop in model fit between the model of equal factor loadings and the unrestricted configural model (i.e. $\Delta CFI = 0.029$, $\Delta TLI = 0.065$, $\Delta RMSEA = 0.016$ and $\Delta SRMR = 0.060$). Overall, the scale functioned well across the TALIS-PISA countries. These findings generally could support cross-cultural comparisons of correlations of self-efficacy in teaching mathematics with other constructs. However, the large drop of model fit observed when a more restricted invariance was imposed on the model with equal factor loadings and intercepts suggests the mean scores may have a slightly different meaning in each country. As such, mean score comparisons should be conducted with extreme care during further analyses.

Table 10.96 Measurement invariance model-data fit for TMSELEFFS

Invariance Level	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	$\Delta RMSEA$	$\Delta SRMR$
Configural	0.939	0.818	0.081	0.028	-	-	-	-
Metric	0.910	0.883	0.065	0.088	0.029	0.065	0.016	0.060
Scalar	0.635	0.698	0.104	0.159	0.275	0.185	0.039	0.071

Source: OECD, *TALIS Database*

Because of the lack of invariance at the required level (i.e. scalar invariance), a CFA model of the pooled estimates of factor loadings and intercepts based on the ISCED 2 calibration sample was used to compute the TMSELEFFS scale's factor scores. The same item parameters were fixed and used for the three ISCED-level and TALIS-PISA populations. Latent means of TMSELEFFS were estimated separately for each country per population, and unique variances were allowed to vary. Table 10.97 presents the item loadings and intercepts used for the factor scores computation. Table 10.98 reports the factor scores determinacy for all countries, all of which had a factor scores determinacy above 0.80. This outcome signifies a high determinacy between the operationalized latent factor TMSELEFFS and the estimated factor scores (see earlier in this chapter for an explanation of factor score determinacy). Only Finland and Latvia showed a slightly lower degree of factor score determinacy. The factor scores for TMSELEFFS were then transformed to a convenience metric with a standard deviation of 2.0 and a mid-point of 10 that coincided with the mid-point of the scale (Figure 10.28). This transformation means that a score of 10 for TMSELEFFS corresponds with the average response of 2.5 on items TT2M15B, TT2M15D, TT2M15E and TT2M15F, while a score below 10 indicates disagreement with the items in the TMSELEFFS scale.

Table 10.97 Item loadings and intercepts for TMSELEFFS

Scale	Item	Loading	Intercept
Self-Efficacy in Teaching Mathematics	TT2M15B	1.000	2.759
	TT2M15D	1.011	2.642
	TT2M15E	0.600	2.901
	TT2M15F	0.998	2.821

Source: OECD, *TALIS Database***Table 10.98 Factor scores determinacies for the TMSELEFFS scale**

Countries (TALIS-PISA link)	TMSELEFFS
Australia	0.868
Finland	0.792
Latvia	0.777
Mexico	0.804
Portugal	0.864
Romania	0.853
Singapore	0.864
Spain	0.839

Source: OECD, *TALIS Database*

Figure 10.28 Scale Mid-Point for TMSELEFFS

How much do you agree or disagree with the following statements concerning your ability to teach mathematics?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
	<div style="border: 1px solid black; background-color: #4a7ebb; color: white; padding: 5px; display: inline-block;">Mid-Point = 2.5</div>			
† I have a hard time getting students interested in mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
† I find it hard to meet the needs of the individual students in my mathematics class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
I am able to get my students to feel confident in mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
† I have a hard time getting my students to understand underlying concepts in mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
	Disagreement		Agreement	

Note. †Items were reverse coded.

Source: OECD

Description of simple categorisation indices and their parameters

The indices lack of pedagogical personnel (PLACKPER), lack of material resources (PLACKMAT), school autonomy for staffing (PSTFFAUT), school autonomy for budgeting (PBDGTAUT) and school autonomy for instructional policies (PINSTAUT) were created using the frequencies of the source variables because CFA models were not appropriate for the measured items comprising them.

School autonomy (PSTFFAUT, PBDGTAUT and PINSTAUT)

School autonomy indices were created using nine statements, each of which had five response options. Each response option (yes/no) had a variable of its own. Principals were asked to indicate which of the following (principal, school management team, teachers, school governing board, and external authority) had significant responsibility for each of the nine tasks. Principals were asked to mark all options that applied to each of the nine tasks. The response options for each statement were “you, as principal”, “other members of the school management team”, “teachers (not as a part of the school management team)”, “school <governing board>” and “<local, municipality/regional, state, or national/federal> authority”. The nine statements describing the tasks totaled 45 variables.

Three simple indices were formed: *school autonomy for staffing* (PSTFFAUT), *school autonomy for budgeting* (PBDGTAUT) and *school autonomy for instructional policies* (PINSTAUT). Table 10.99 lists the items and their indices.

Table 10.99 Measured items for School Autonomy

Regarding this school, who has a significant responsibility for the following tasks?		
<i>A 'significant responsibility' is one where an active role is played in decision making.</i>		
<i>Please mark as many choices as appropriate in each row.</i>		
Scale	Variable	Item Wording
School autonomy for staffing	TC2G18A1-TC2G18A5	Appointing or hiring teachers
	TC2G18B1-TC2G18B5	Dismissing or suspending teachers from employment
School autonomy for budgeting	TC2G18C1-TC2G18C5	Establishing teachers' starting salaries, including setting payscales
	TC2G18D1-TC2G18D5	Determining teachers' salary increases
	TC2G18E1-TC2G18E5	Deciding on budget allocations within the school
School autonomy for instructional policies	TC2G18F1-TC2G18F5	Establishing student disciplinary policies and procedures
	TC2G18G1-TC2G18G5	Establishing student assessment policies, including <national/regional> assessments
	TC2G18J1-TC2G18J5	Determining course content, including <national/regional> curricula
	TC2G18K1-TC2G18K5	Deciding which courses are offered

Source: OECD, *TALIS Database*

The indices were computed in the following way:

1. A new variable for each question was created (each question had five variables for each decision maker). If the number of valid responses for the five variables per statement was larger than 1, the variable was coded as 0.
2. If the minimum for the first three variables per statement (describing decision making as being the principal's responsibility or the responsibility of other members of the school) was equal to 2, and the minimum of the fourth and fifth variables (decision making being the responsibility of someone else) was equal to 1, then the new variable was coded as -1. Thus, if the principal selected school-governing board or an external authority, the task was considered to be an external responsibility (not autonomous).
3. If the school principal selected from both lists, the responsibility was considered to be a shared one (mixed), and the value remained as 0 (see Point 1).
4. If the minimum for the first three variables (the decision making being the responsibility of the principal or other members of the school) was equal to 1, and the minimum of the fourth and the fifth variables (decision making being someone else's responsibility) was equal to 2, then the new variable was coded as +1. Therefore, if the principal selected principal, school management team or teacher, the task was considered to be a school responsibility (autonomous).
5. The newly created variables for each scale -1 were recoded to 1, 0 to 2, +1 to 3.
6. For each scale, if more than half the tasks were classified as autonomous, the school was classified as autonomous. If more than half the tasks were classified as not autonomous, the

school was classified as not autonomous. If neither criterion was met, the school was classified as mixed.

The scale was coded as follows: 1 for “no autonomy”, 2 for “mixed autonomy” and 3 for “autonomy”.

Table 10.100 presents the reliabilities of the three indices. The reliability coefficients were computed after the fourth step (see above).

Table 10.100 Reliability coefficient alpha for the school autonomy indices

	PSTFFAUT	PBDGTAUT	PINSTAUT
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Australia	0.673	0.647	0.631
Brazil	0.913	0.917	0.787
Bulgaria	0.660	0.569	0.607
Chile	0.926	0.945	0.833
Croatia	0.807	0.540	0.580
Czech Republic	0.878	0.516	0.657
Denmark	0.457	0.669	0.647
Estonia	0.576	0.713	0.629
Finland	0.795	0.570	0.665
France	0.542	0.081	0.644
Iceland	0.703	0.631	0.539
Israel	0.841	0.738	0.675
Italy	0.622	0.783	0.506
Japan	0.882	0.564	0.651
Korea	0.911	0.496	0.465
Latvia	0.417	0.631	0.630
Malaysia	0.521	0.412	0.452
Mexico	0.867	0.897	0.840
Netherlands	0.414	0.632	0.635
Norway	0.510	-0.075	0.715
Poland	0.567	0.624	0.585
Portugal	0.660	0.285	0.637
Romania	0.765	0.614	0.639
Serbia	0.716	0.586	0.696
Singapore	0.838	0.494	0.758
Slovak Republic	0.725	0.602	0.651
Spain	0.964	0.493	0.653
Sweden	0.228	0.549	0.763
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.947	0.935	0.902
Alberta (Canada)	0.449	0.590	0.602
England (United Kingdom)	0.719	0.572	0.728
Flanders (Belgium)	0.390	0.447	0.482

Table 10.100 Reliability coefficient alpha for the school autonomy indices (*continued*)

	PSTFFAUT	PBDGTAUT	PINSTAUT
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Denmark	0.152	0.553	0.560
Finland	0.786	0.483	0.640
Mexico	0.841	0.846	0.697
Norway	0.810	0.389	0.417
Poland	0.605	0.679	0.682
Sub-national entities			
Flanders (Belgium)	0.688	-	0.536
	PSTFFAUT	PBDGTAUT	PINSTAUT
Countries (ISCED 3)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Australia	0.668	0.596	0.602
Denmark	1.000	0.608	0.555
Finland	0.792	0.567	0.673
Iceland	0.588	0.776	0.612
Italy	0.651	0.859	0.578
Mexico	0.876	0.917	0.813
Norway	0.110	0.575	0.503
Poland	0.507	0.730	0.634
Singapore	0.859	0.476	0.707
Sub-national entities			
Abu Dhabi (United Arab Emirates)	0.935	0.897	0.902
	PSTFFAUT	PBDGTAUT	PINSTAUT
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha	Coefficient Alpha
Australia	0.610	0.642	0.677
Finland	0.613	0.549	0.694
Latvia	0.512	0.620	0.672
Mexico	0.830	0.872	0.744
Portugal	0.557	0.599	0.554
Romania	0.759	0.566	0.625
Singapore	0.827	0.439	0.708
Spain	0.981	0.722	0.721

Source: OECD, *TALIS Database*

School resources (PLACKPER and PLACKMAT)

School resources indices were created using eight statements, each of which had four mutually exclusive response categories: 1 for “not at all”, 2 for “very little”, 3 for “to some extent” and 4 for “a lot”.

Two simple indices were formed: *lack of pedagogical personnel* (PLACKPER)” and *lack of material resources* (PLACKMAT). Table 10.101 lists these items and their indices.

The indices were computed in the following way:

1. If all responses to the component variables for the particular index were “not at all” or “very little”, the index was set to 1.
2. If all responses to the component variables for the particular index were “to some extent” or “a lot”, the index was set to 3.
3. All other combinations were coded as 2.

The scales were coded as follows: 1 for “not a problem”, 2 for “a bit of a problem”, and 3 for “a problem”.

The reliabilities of the two indices are presented in Table 10.102. The reliability coefficients were computed after the first step (see above).

Table 10.101 Measured items for school resources

Regarding this school, who has a significant responsibility for the following tasks?		
Scale	Variable	Item Wording
Lack of Pedagogical Personnel	TC2G31A	SHORTAGE OF QUALIFIED AND/OR [WELL PERFORMING] TEACHERS
	TC2G31B	SHORTAGE OF TEACHERS WITH COMPETENCE IN TEACHING STUDENTS WITH SPECIAL NEEDS
	TC2G31C	SHORTAGE OF VOCATIONAL TEACHERS
Lack of material	TC2G31D	SHORTAGE OR INADEQUACY OF INSTRUCTIONAL MATERIALS (E.G. TEXTBOOKS)
	TC2G31E	SHORTAGE OR INADEQUACY OF COMPUTERS FOR INSTRUCTION
	TC2G31F	INSUFFICIENT INTERNET ACCESS
	TC2G31G	SHORTAGE OR INADEQUACY OF COMPUTER SOFTWARE FOR INSTRUCTION
	TC2G31H	SHORTAGE OR INADEQUACY OF LIBRARY MATERIALS

Source: OECD, *TALIS Database*

Table 10.102 Reliability coefficient alpha for the school resources indices

	PLACKMAT	PLACKPER
Countries (ISCED 2)	Coefficient Alpha	Coefficient Alpha
Australia	0.728	0.511
Brazil	0.781	0.577
Bulgaria	0.674	0.468
Chile	0.834	0.783
Croatia	0.775	0.356
Czech Republic	0.731	0.507
Denmark	0.726	0.432
Estonia	0.693	0.447
Finland	0.749	0.453
France	0.791	0.402
Iceland	0.671	0.566
Israel	0.805	0.738
Italy	0.843	0.469
Japan	0.764	0.399
Korea	0.672	0.799
Latvia	0.800	0.542
Malaysia	0.769	0.710
Mexico	0.841	0.706
Netherlands	0.653	0.562
Norway	0.611	0.391
Poland	0.722	0.530
Portugal	0.726	0.626
Romania	0.877	0.704
Serbia	0.698	0.480
Singapore	0.795	0.545
Slovak Republic	0.728	0.561
Spain	0.712	0.480
Sweden	0.736	0.633
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.918	0.621
Alberta (Canada)	0.773	0.636
England (United Kingdom)	0.743	0.530
Flanders (Belgium)	0.689	0.693
	PLACKMAT	PLACKPER
Countries (ISCED 1)	Coefficient Alpha	Coefficient Alpha
Denmark	0.697	0.402
Finland	0.712	0.454
Mexico	0.779	0.533
Norway	0.590	0.422
Poland	0.750	0.144
Sub-national entities		
Flanders (Belgium)	0.784	†

Table 10.102 Reliability coefficient alpha for the school resources indices (*continued*)

	PLACKMAT	PLACKPER
Countries (ISCED 3)	Coefficient Alpha	Coefficient Alpha
Australia	0.614	0.437
Denmark	0.485	0.703
Finland	0.703	0.550
Iceland	0.536	0.197
Italy	0.796	0.426
Mexico	0.814	0.493
Norway	0.326	0.485
Poland	0.656	0.722
Singapore	0.749	0.534
Sub-national entities		
Abu Dhabi (United Arab Emirates)	0.898	0.592
	PLACKMAT	PLACKPER
Countries (TALIS-PISA link)	Coefficient Alpha	Coefficient Alpha
Australia	0.752	0.696
Finland	0.722	0.411
Latvia	0.817	0.553
Mexico	0.873	0.483
Portugal	0.641	0.606
Romania	0.816	0.794
Singapore	0.794	0.526
Spain	0.737	0.438

Source: OECD, *TALIS Database*

Note. †Flanders (Belgium) does not have a reliability estimate for PLACKPER because one of the items has a zero variance due to not administered item.

References

- Bollen, K.A. (1989), *Structural Equations with Latent Variables*, John Wiley & Sons, New York.
- Brown, T.A. (2006), *Confirmatory Factor Analysis for Applied Research*, Guilford Press, New York.
- Chen, F.F. (2007), “Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance”, *Structural Equation Modeling*, Vol. 14, No. 3, Psychology Press, New York, pp. 464-504.
- Cheung, G.W. and R.B. Rensvold (1998), “Cross-Cultural Comparisons Using Non-Invariant Measurement Items”, *Applied Behavioral Science Review*, Vol. 6, No. 1, NTL Institute, Arlington, Virginia, pp. 93-110.
- Cheung, G.W. and R.B. Rensvold (1999), “Testing Factorial Invariance across Groups: A Reconceptualization and Proposed New Method”, *Journal of Management*, Vol. 25, No. 1, Sage Publications, Thousand Oaks, California, pp. 1-27.
- Cheung, G.W. and R.B. Rensvold (2002), “Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance”, *Structural Equation Modeling*, Vol. 9, No. 2, Psychology Press, New York, pp. 233-255.
- Davidov, E. (2008), “A Cross-Country and Cross-Time Comparison of the Human Values Measurements with the Second Round of the European Social Survey”, *Survey Research Methods*, Vol. 2, No. 1, European Survey Research Association, Southampton, pp. 33-46.
- Dempster, A.P., et al. (1977), “Maximum Likelihood from Incomplete Data via the EM Algorithm”, *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, Vol. 39, No. 1, John Wiley & Sons, Hoboken, New Jersey, pp. 1-38.
- Desa, D. (2014), “A Comparison between Continuous and Categorical MGCFA for TALIS 2008 Complex Scales”, *OECD Education Working Papers*, OECD Publishing, Paris. Manuscript submitted for publication.
- Desa, D. (2014), "Evaluating Measurement Invariance of TALIS 2013 Complex Scales: Comparison between Continuous and Categorical Multiple-Group Confirmatory Factor Analyses", *OECD Education Working Papers*, No. 103, OECD Publishing. doi: [10.1787/5jz2kbbv1b7k-en](https://doi.org/10.1787/5jz2kbbv1b7k-en)
- Gorsuch, R.L. (1983), *Factor Analysis*, Lawrence Erlbaum Associates, Hillsdale, New Jersey.
- Graham, J.W. (2012), *Analysis of Missing Data*, Springer Science + Business Media, New York.
- Grice, J.W. (2001), “Computing and Evaluating Factor Scores”, *Psychological Methods*, American Psychological Association, Washington, DC, Vol. 6, pp. 430-450.
- Hansen, Y.K., et al. (2006), “Measures of Self-Reported Reading Resources, Attitudes and Activities Based on Latent Variable Modelling”, *International Journal of Research & Method in Education*, Vol. 29, No. 2, Routledge, London, pp. 221-237.

- Horn, J.L. and J.J. McArdle(1992), “A Practical and Theoretical Guide to Measurement Invariance in Aging Research”, *Experimental Aging Research*, Vol. 18, No. 3-4, Taylor & Francis Online, pp. 117-144.
- Hox, J.J. (2002), *Multilevel Analysis: Techniques and Applications*, Lawrence Erlbaum Associates, Mahwah, New Jersey.
- Hu, L. and P.M. Bentler (1999), “Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives”, *Structural Equation Modeling*, Vol. 6, No. 1, Psychology Press, New York, pp. 1-55.
- Huber, P.J. (1967), “The Behavior of Maximum Likelihood Estimates under Nonstandard Conditions”, *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*, Vol. 1, University of California Press, Berkeley and Los Angeles, California, pp. 221-233.
- Kline, R.B. (2011), *Principles and Practice of Structural Equation Modeling* (3rd edition), Guilford Press, New York.
- Little, T.D. (1997), “Mean and Covariance Structures (MACS) Analyses of Cross-Cultural Data: Practical and Theoretical Issues”, *Multivariate Behavioral Research*, Vol. 32, No.1, Taylor & Francis Online, pp. 53-76.
- Meredith, W. (1993), “Measurement Invariance, Factor Analysis and Factorial Invariance”, *Psychometrika*, Vol. 58, No. 4, Psychometric Society, Madison, Wisconsin, pp. 525-543.
- Muthén, B. (1977), “Some Results on Using Summed Raw Scores and Factor Scores from Dichotomous Items in the Estimation of Structural Equation Models”, unpublished technical report, University of Uppsala, Sweden.
- Muthén, B.O. (1998-2012), *Mplus Technical Appendices*, Muthén & Muthén, Los Angeles, California.
- Muthén, B.O. and D. Kaplan (1985), “A Comparison of some Methodologies for the Factor Analysis of Non-Normal Likert Variables”, *British Journal of Mathematical and Statistical Psychology*, Vol. 38, British Psychological Society, pp. 171-189.
- Muthén, L.K. and B.O. Muthén (1998-2012). “Mplus User’s Guide” (computer software, 7th edition), Muthén & Muthén, Los Angeles, California.
- OECD (2014, forthcoming).TALIS 2013 Results: An International Perspective on Teaching and Learning
- Raudenbush, S.W. and A.S. Bryk (2002), *Hierarchical Linear Models: Applications and Data Analysis Methods* (2nd edition), Sage Publications, London.
- Rubin, D.B. and D.T. Thayer(1982), “EM Algorithms for ML Factor Analysis”, *Psychometrika*, Vol. 47, Psychometric Society, Madison, Wisconsin, pp. 69-76.
- Rutkowski, L. and D. Svetina (2013), “Assessing the Hypothesis of Measurement Invariance in the Context of Large-Scale International Surveys”, *Educational and Psychological Measurement*, Vol. 74, No. 1, Sage Publications, London, pp. 31-57.
- Schafer, J.L. and J.W. Graham (2002), “Missing Data: Our View of the State of the Art”, *Psychological Methods*, Vol. 7, No. 2, American Psychological Association, Washington, DC, pp. 147-177.

- Schermelleh-Engel, K., et al. (2003), “Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit measures”, *Methods of Psychological Research Online*, Vol. 8, No. 2, University of Koblenz and Landau, pp. 23-74.
- Schönemann, P.H. and J.H. Steiger (1976), “Regression Component Analysis”, *British Journal of Mathematical and Statistical Psychology*, Vol. 29, British Psychological Society, pp. 175-189.
- Schulz, W. (2005), “Testing Parameter Invariance for Questionnaire Indices Using Confirmatory Factor Analysis and Item Response Theory”, paper presented at the 2006 annual meeting of the American Educational Research Association (AERA), San Francisco, California.
- Skrondal, A. and P. Laake (2001), “Regression among Factor Scores”, *Psychometrika*, Vol. 66, Psychometric Society, Madison, Wisconsin, pp. 563-575.
- Snijders, T.A.B. and R.J. Bosker (1994), “Modeled Variance in Two-Level Models”, *Sociological Methods & Research*, Vol. 22, No. 3, Sage Publications, pp. 342-363.
- Sörbom, D. (1974), “A General Method for Studying Differences in Factor Means and Factor Structure Between Groups”, *British Journal of Mathematical and Statistical Psychology*, Vol. 27, No. 2, British Psychological Society, pp. 229-239.
- Steenkamp, J.-B.E.M. and H. Baumgartner (1998), “Assessing Measurement Invariance in Cross-National Consumer Research”, *Journal of Consumer Research*, Vol. 25, No. 1, University of Chicago Press, Chicago, Illinois, pp. 78-90.
- Steiger, J.H. (1990), “Structural Model Evaluation and Modification: An Interval Estimation Approach”, *Multivariate Behavioral Research*, Vol. 25, No. 2, Psychology Press, New York, pp. 173-180.
- Vijver, F.J.R. van de and K. Leung (1997), *Methods and Data Analysis for Cross-Cultural Research*, Sage Publications, London.
- White, H. (1980), “A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity”, *Econometrica*, Vol. 48, No. 4, The Econometric Society, New York, pp. 817-830.
- Yu, C.-Y. (2002), “Evaluating Cutoff Criteria of Model Fit Indices for Latent Variable Models with Binary and Continuous Outcomes”, unpublished dissertation, University of California Los Angeles.

Notes

- 1 The latent variable treats the items as endogenous variables that are caused by other variables. Items are the manifest variables that can be directly measured.
- 2 Model identification concerns the relative ratio of freely estimated parameters (unknowns) to the number of known parameters within the structural equation modelling framework. Only when the latter exceeds the former is there enough information available to obtain a unique set of parameter estimates for each parameter in the model whose value is unknown.
- 3 Cyprus and the USA were not included in the parameter estimates of measurement invariance.
- 4 This procedure is analogous to that used in international large-scale assessments to obtain international item parameters, where an international calibration sample is made up of a selected group of participating countries that is equally represented. The item parameters calculated with this international calibration sample are then used to score all participating countries, and misfit is measured between the country data and the item parameters calculated with the pooled sample.

Annex A: TALIS 2013 Consortium, Experts and Consultants

IEA Data Processing and Research Center (Hamburg, Germany)

Steffen Knoll (International Study Director)

Ralph Carstens (International Deputy Study Director)

Friederike Westphal (International Project Manager, field operations)

Alena Becker (International Project Manager, data and analysis)

Mark Cockle (International Deputy Project Manager, field operations, data and analysis, software)

Dirk Hastedt (TALIS Project Advisor)

At the ISC, Dr Steffen Knoll acted as study director of TALIS 2013 and was responsible for the overall budget, contractual agreements and the international schedule. He co-ordinated the work of the TALIS International Consortium and was responsible for the work of the Framework Development Expert Group. Mr Ralph Carstens was responsible for overseeing and advising on all tasks related to data processing and software. He was a member of the Analysis Expert Group and the Item Development Expert Group and supported the TALIS study director. Ms Friederike Westphal co-ordinated the survey administration at the international level and she maintained close contact with the National Project Managers (NPMs). Ms Alena Becker acted as project manager for data management. As deputy data manager and deputy field operations manager, Mr Mark Cockle was responsible for the everyday business of field operations and data processing in co-operation with the NPMs and national data managers.

Data processing

Christine Busch (data processing)

Sebastian Meyer (national adaptation verification, data processing)

Hannah Köhler (data processing)

Pia Möbus (data processing)

Dirk Oehler (data processing)

Daniel Radtke (national adaptation verification, data processing)

Scaling

Andrés Sandoval-Hernandez (Head of Research and Analysis Unit, RandA)

Deana Desa (team leader, scaling, data analysis)

Plamen Mirazchyski (team leader, data analysis and quality control)

Jusuf Karameta (scaling, data quality control)

Agnes Stancel-Piatak (scaling, data analysis)

Meeting organisation

Bettina Wietzorek (meeting organisation)

Bianca Brandes (meeting organisation)

Anke Sielemann (meeting organisation)

ICT services

Malte Bahrenfuß (ICT services)

Matthias Jenßen (ICT services)

Frank Müller (ICT services)

Software development and programming

Meng Xue (Head of Software Development Unit)

Harpreet Singh Choudry (Head of Software Development Unit)

Tim Daniel (software development)

Michael Jung (software development)

Limiao Duan (programming)

Christian Harries (programming)

Vallimeena Chinnamadasamy (programming)

Maike Junod (programming)

Deepti Kalamadi (programming)

Poornima Mamadapur (programming)

Devi Potham Rajendra Prasath (programming)

IEA Secretariat (Amsterdam, the Netherlands)

Paulina Koršňáková (translation verification and international quality control)

Juriaan Hartenberg (Manager, financial control)

Roel Burgers (Manager, financial control)

Isabelle Braun-Gémin (Financial officer, financial control)

At the IEA Secretariat, Dr Paulina Koršňáková co-ordinated the translation verification and the implementation of international quality control procedures and instruments. cApStAn Linguistic Quality Control, an independent linguistic quality control agency located in Brussels, Belgium, performed the translation verification for all participants in a total of 32 languages. The IEA Secretariat appointed, contracted and trained independent quality control monitors to watch over survey implementation in each

participating country. Dr Koršňáková coordinated, as chair, the Item Development Expert Group.

Statistics Canada (Ottawa, Canada)

Jean Dumais (Sampling Referee)

Sylvie LaRoche (Coordinator sampling and weighting)

Lori Stratychuk (sampling and weighting)

Asma Alavi (weighting)

The sampling referee, Mr Jean Dumais, and his sampling team manager, Ms Sylvie LaRoche, both of Statistics Canada, conducted the sampling, weighting and adjudication. Based on the sampling frame information provided by the countries, the sampling team drew school samples for the TALIS ISCED Level 2 core survey for all participating countries and the optional ISCED Levels 1 and 3 and the TALIS-PISA Link for all those TALIS participants that opted for these populations for the field trial and the main survey. Furthermore, the team performed the weighting and sample adjudication for the main survey prior to data analysis for all 58 populations.

Consultants

David J. Rutkowski (Indiana University Bloomington, USA, scaling, framework development)

Leslie A. Rutkowski (Indiana University Bloomington, USA, framework development)

Ellen L. Prusinski (Indiana University Bloomington, USA, framework development)

Eugenio J. Gonzalez (Educational Testing Service - ETS, USA, scaling and analysis)

Framework Development Group

Group Co-ordinator: Steffen Knoll (IEA Data Processing and Research Center, Germany)

Paulina Koršňáková (IEA Secretariat, the Netherlands)

David J. Rutkowski (Indiana University Bloomington, USA)

Leslie A. Rutkowski (Indiana University Bloomington, USA)

Ellen L. Prusinski (Indiana University Bloomington, USA)

TALIS Expert Groups

Analysis Expert Group

Chair: Leslie Rutkowski (Indiana University Bloomington, USA)

Ralph Carstens (IEA Data Processing and Research Center, Germany)

Eugenio Gonzales (IEA Data Processing and Research Center, Germany)

Miyako Ikeda (OECD Secretariat, France)

Heather Price (Basis Policy Research, United States)

Fons van de Vijver (University of Tilburg, the Netherlands)

Instrument Development Expert Group

Chair: Paulina Koršňáková (IEA Secretariat, the Netherlands)

Giovanna Barzanò (Ministry of Education, Italy)

Julie Bélanger (OECD Secretariat, France)

Ralph Carstens (IEA Data Processing and Research Center, Germany)

Jean Dumais (Statistics Canada)

Ben Jensen (Grattan Institute, Australia)

Eckhard Klieme (German Institute for International Educational Research, Germany)

Peter Kloosterman (Indiana University, United States)

Steffen Knoll (IEA Data Processing and Research Center, Germany)

Sang Wang Park (Pusan National University, Republic of Korea)

Susan Seeber (University of Göttingen, Germany)

Svenja Vieluf (German Institute for International Educational Research, Germany)

Kristen Weatherby (OECD Secretariat, France)

Mara Westling Allodie (Stockholm University, Sweden)

Eva Wiren (Swedish National Agency of Education, Sweden)

Technical Advisory Group

Chair: Fons van de Vijver (University of Tilburg, the Netherlands)

Eduardo Backhoff (National Institute for Educational Evaluation, Mexico)

Jesper Lund (UNI-C, Denmark)

Dennis McInerney (Institute of Education, Hong Kong)

Heather Price (Basis Policy Research, United States)

ANNEX B: Policy Issues, Themes and Related Indicator Domains Examined in TALIS 2013

Table 2.4 Policy issues, themes and related indicator domains examined in TALIS 2013

Policy Issue 1:	Attracting teachers to the profession	
Theme 1.1	Attracting good students into teaching	
	Indicator No. 1	Appreciation of teachers profession by students, parents, principals, and by society (teachers point of view)
	Indicator No. 2	Expectations of the teachers' job at the beginning of teacher education and fulfilment of those expectations (teacher responses)
	Indicator No. 3	Factors motivating teacher recruitment
	Indicator No. 4	Terms and conditions of teacher contracts (salary, vacation, workload etc.) (System level data)
Theme 1.2	Initial teacher education	
	Indicator No. 5	Characteristics of initial teacher education (System level description)
	Indicator No. 6	Initial teacher training route followed
	Indicator No. 7	Teacher perceptions of the training
	Indicator No. 8	Perceived effectiveness
Theme 1.3	Adequacy of teacher supply and teacher shortages	
	Indicator No. 9	Levels and distribution of teacher shortages (as considered by principals)
	Indicator No. 10	Difficulties in replacing qualified teachers (as considered by principals)
	Indicator No. 11	Effectiveness and satisfaction with recruitment procedures (principal and teacher responses)
	Indicator No. 12	Decision-making responsibilities in recruitment (principal and teacher responses)
	Indicator No. 13	Teachers doing out-of-field teaching (teacher responses)
Theme 1.4	Effectiveness of recruitment and selection procedures and incentives	
	Indicator No. 14	Objectives of recruitment procedures (teacher and/or principal responses)
	Indicator No. 15	Perceptions of recruitment procedures (teacher and/or principal responses)

Table 2.4 Policy issues, themes and related indicator domains examined in TALIS 2013 (*continued*)

Theme 1.4	Effectiveness of recruitment and selection procedures and incentives	
	Indicator No. 16	Effectiveness and satisfaction with recruitment procedures (principal and teacher responses)
	Indicator No. 17	Description of recruitment process and decision-making responsibilities (principal responses)
Theme 1.5	Motivations and early career experience of teachers	
	Indicator No. 18	Career and teaching motivations of new teachers
	Indicator No. 19	General satisfaction of new teachers with teacher education, teaching, school climate, and career choice
	Indicator No. 20	Preparedness of new teachers for classroom teaching
	Indicator No. 21	Support and counselling needs of new teachers
	Indicator No. 22	Teacher sorting and tracking
Policy Issue 2:	Developing teachers within the profession	
Theme 2.1	Profile of teachers? in-service education and training	
	Indicator No. 23	Types of in-service education and training
	Indicator No. 24	Support and barriers for in-service education and training
	Indicator No. 25	Effectiveness of in-service education and training
	Indicator No. 26	Profile of mentoring and induction programmes
Theme 2.2	Frequency of in-service education and training	
	Indicator No. 27	Level and intensity of participation
	Indicator No. 28	Frequency and distribution of induction and mentoring programs
Theme 2.3	Satisfaction and effectiveness of in-service education and training	
	Indicator No. 29	Personal and school objectives of in-service education and training:
		- Decision-making structure (who in schools decides the type of education and training received and for which teachers)
		- Personal needs and requirements education and training
		- Incentives and plans for future education and training and perceived relationship with career structure and promotion opportunities
	Indicator No. 30	Assessment mechanisms for in-service education and training (including opinion on value of such assessment) (principal and teacher responses)
	Indicator No. 31	Development needs and un-satisfied demand
	Indicator No. 32	Government priorities for teachers? professional development (System level data)
	Indicator No. 33	Impact of in-service education and training

Table 2.4 Policy issues, themes and related indicator domains examined in TALIS 2013 (*continued*)

Policy Issue 3:	Retaining teachers in the profession	
Theme 3.1	Teacher attrition and turnover rates	
	Indicator No. 34	Teacher turnover and attrition (principal responses)
	Indicator No. 35	Qualified candidates and qualified teachers (principal responses)
	Indicator No. 36	National policies of controlling the number of teachers (system/national level data)
Theme 3.2	Job satisfaction and teacher human resource measures	
	Indicator No. 37	Job satisfaction, security and morale
	Indicator No. 38	Self-efficacy
	Indicator No. 39	Perceived status of the profession
	Indicator No. 40	Likelihood of leaving the profession
		- Per cent chance that teachers would leave their job voluntarily in the next 12 or 24 months.
		- Perceptions of gaining employment outside the profession (if they were to consider leaving).
Theme 3.3	Recognition, reward and evaluation of teachers	
	Indicator No. 41	School policies that recognise, reward and evaluate teachers – Frequency, criteria, outcomes (principals provide school-level data and teachers provide personal responses)
		- links to rewards and professional development, basis of evaluation, process for dealing with ineffective teachers, promotion and career diversification arrangements
	Indicator No. 42	Perceptions of the effectiveness of policies that recognise, reward and evaluate teachers (principal and teacher perceptions)
		- To what extent does it reflect and reward: good teaching; innovation; tenure; student test scores; peer reviews; supervisor assessment; education and training
		- To what extent is it individual or team oriented and what is its perceived impact upon morale, school effectiveness
		- What is the frequency and clarity of evaluation and reward procedures
		- What are the teachers' considerations of evaluation policies (frequencies, time usage) in student, teacher, and school level?
	Indicator No. 43	Interventions to address underperformance
	Indicator No. 44	Career ladder and prospects of teachers (principal and teacher personal responses)
		- Career plans and perceptions of career possibilities: in school, in other positions, schools, sector, industry
Theme 3.4	Support and guidance for the most experienced teachers	
	Indicator No. 45	Participation in professional development by 55+ teachers
	Indicator No. 46	Adaptation to changes in working climate, for example collaboration between the teachers and use of ICT
	Indicator No. 47	General job satisfaction for 55+ teachers
	Indicator No. 48	Teaching practices, beliefs and attitudes of 55+ teachers

Table 2.4 Policy issues, themes and related indicator domains examined in TALIS 2013 (*continued*)

Theme 3.4	Support and guidance for the most experienced teachers	
	Indicator No. 49	Maintaining motivation and work ability (Collaboration with younger teachers)
Theme 3.5	Division of teachers' working time	
	Indicator No. 50	Classroom teaching time
	Indicator No. 51	Teaching outside of the classroom (preparation, assessment, guidance of students)
	Indicator No. 52	Administrative duties
	Indicator No. 53	Extra-curricular activities
Policy Issue 4:	School policies supporting effectiveness	
Theme 4.1	School leadership	
	Indicator No. 54	Terms and conditions of employment of school leader
	Indicator No. 55	Qualifications and experience
	Indicator No. 56	Role and function of the school leader (administrative and pedagogical leadership)
	Indicator No. 57	Distributed leadership (team leadership in the school)
	Indicator No. 58	Training and development of school leaders
	Indicator No. 59	Attracting effective school leaders
	Indicator No. 60	School policies to support teaching and learning (e.g. ability-grouping, student assessment, target setting, discipline)
	Indicator No. 61	Perception of school leadership (only asked of teachers)
Theme 4.2	School climate and ethos	
	Indicator No. 62	Factors hindering instruction (student and teacher factors) (principal and teacher attitudinal responses)
	Indicator No. 63	Parental and community relations/participation with the school
	Indicator No. 64	Disciplinary climate
	Indicator No. 65	Student-teacher relations
	Indicator No. 66	School ethos (e.g. goal driven, high aspirations, community engagement)
Policy Issue 5:	Effective teachers and teaching	
Theme 5.1	Teachers' instructional practices and beliefs	
	Indicator No. 67	General beliefs about teaching (e.g. constructivist versus direct transmission)
	Indicator No. 68	Instructional practices (e.g. student oriented, structuring, enhanced activities)

Table 2.4 Policy issues, themes and related indicator domains examined in TALIS 2013 (*continued*)

Theme 5.1	Teachers' instructional practices and beliefs	
	Indicator No. 69	Classroom management
	Indicator No. 70	Effective teaching time
	Indicator No. 71	Attributes of a good teacher
	Indicator No. 72	Student assessment methods (formative and summative)
	Indicator No. 73	Teacher competence framework (System level data)
	Indicator No. 74	Career guidance to students
Theme 5.2	Education and qualifications of teachers	
	Indicator No. 75	Teacher experience (tenure, responsibilities, subject areas, other teaching experience/positions, experience at the same school)
	Indicator No. 76	Teacher qualifications, qualified status, certification
	Indicator No. 77	Teacher and principal observation of changes taken place during the last 9-10 years (one PISA cycle)
Theme 5.3	Teachers' professional practices	
	Indicator No. 78	Collaboration among staff
	Indicator No. 79	Participation in wider professional community
	Indicator No. 80	Teachers' participation in decision making at the school
	Indicator No. 81	Teacher representative bodies – role, profile and participation rates
	Indicator No. 82	Participation in educational policy making and improving quality of education at the various levels
Theme 5.4	21st Century skills: ICT in teaching	
	Indicator No. 83	Policies and practices at the system-level relating to ICT use in schools
	Indicator No. 84	Availability of ICT hardware and software in schools
	Indicator No. 85	Teachers pedagogical content knowledge and skills of integrating the usage of ICT in teaching
	Indicator No. 86	Frequency of pedagogical activities and use of ICT
Theme 5.5	Innovation and creativity	
	Indicator No. 87	Types of innovation introduced in school (technological, pedagogical, R&D, organisational/administrative, etc.)
	Indicator No. 88	Barriers and incentives for the use of innovation
	Indicator No. 89	Teachers' perception of their pedagogical autonomy
	Indicator No. 90	Evaluation and dissemination of innovative practices

Source: OECD, *TALIS Database*

ANNEX C : Sampling Forms

Figure 5.2 Sampling Form 1

Please return to Statistics Canada at TALIS@statcan.gc.ca

Sampling Form 1	Participation
------------------------	----------------------

TALIS 2013 Participant :

National Project Manager :

National Sample Manager :

1. Please specify the usual start and end date of the school year and the expected dates of surveying for the Main Survey.

Start of school year : (YYYY-MM-DD)	Survey Administration period:	End of school year: (YYYY-MM-DD)
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>

2. Does your country have some experience with other similar international surveys (e.g. PISA, TIMSS, SITES, PIRLS, TALIS)? *(Click in box and on right arrow to see drop down menu)*

3. Indicate the language(s) in which the survey will be administered.

4. Please specify other international options in which your country plan to participate: *(Click in box and on right arrow to select Yes or No)*

• Survey of ISCED Level 1 Teachers :	<input style="width: 100%;" type="text" value="Please Select Yes or No"/>	If Yes, Please fill Sampling Form - ISCED 1
• Survey of ISCED Level 3 Teachers :	<input style="width: 100%;" type="text" value="Please Select Yes or No"/>	If Yes, Please fill Sampling Form - ISCED 3
• PISA-LINK <i>(Survey of teachers of 15 year-olds in PISA 2012 schools)</i>	<input style="width: 100%;" type="text" value="Please Select Yes or No"/>	If Yes, Please fill Sampling Form - PISA-

5. Describe the grade structure at ISCED Level 2 (and ISCED level 1 and ISCED level 3 if relevant)

Source: OECD

Figure 5.3 Sampling Form 2

Please return to Statistics Canada at TALIS@statcan.gc.ca

Sampling Form 2	National Target and Survey Population
------------------------	--

See Sections 3.1 and 3.2 of the Sampling Manual.

TALIS 2013 Participant :

1. Total number of schools and ISCED Level 2 teachers in the target population:

# of schools	# of ISCED Level 2 teachers
[a]	

School-level exclusions

2. Describe the reasons for school exclusion from the national target population (if applicable).

	Reason for exclusion	# of schools	# of ISCED Level 2 teachers
1.			
2.			
3.			
4.			
5.			
TOTAL: (Sum of exclusions - Calculated automatically)		[b] 0	0

# of schools	# of ISCED Level 2 teachers
[c]	

3. Total number of schools and ISCED Level 2 teachers in the national survey population:
(Box [c] = Box [a] - Box [b])

# of schools	# of ISCED Level 2 teachers
[d]	

4. Percentage of coverage of the national target population in terms of number of schools and ISCED Level 2 teachers:
(Box [d] = Box [c] ÷ Box [a] x 100)

%	%
[d]	

Values calculated automatically

5. Describe your data sources (provide copies of relevant tables).

Figure 5.4 Sampling Form 3

Please return to Statistics Canada at TALIS@statcan.gc.ca

Sampling Form 3	Stratification
------------------------	-----------------------

See Section 5.5 of the Sampling Manual.

TALIS 2013 Participant :

Stratification of schools

1. List and describe the variables to be used for stratification in order of importance:
(Please note that the choice of variables used for explicit or implicit stratification will be discussed during consultations with Statistics Canada)

Stratification Variables			
	Name	Description	# of levels
1			
2			
3			
4			
5			
6			

Include additional information if necessary:

2. If applicable, describe additional requirements for sub-national estimates (oversampling of specific groups of the population):

Figure 5.5 Sampling Form 4

Please return to Statistics Canada at TALIS@statcan.gc.ca

Sampling Form 4	Sampling Frame Description
------------------------	-----------------------------------

See Section 5.2 of the Sampling Manual.

TALIS 2013 Participant :

1. Specify the school measure of size (MOS) to be used. *(Click in box and on right arrow to see drop down menu)*

Please select the MOS to be used

If "Other", please describe:

2. Specify the reference year for which the data are provided in the sampling frame:

3. Describe the source of information used for the creation of the school sampling frame.

4. Define the units used in the sampling frame (i.e. whole schools, shifts, tracks, programmes, etc.).

Figure 5.7 Sampling Form ISCED 1

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Sampling Form - ISCED 1

See Appendix I of the Sampling Manual.

TALIS 2013 Participant :

1. Total number of schools and ISCED Level 1 teachers in the target population:

	# of schools	# of ISCED Level 1 teachers
[a ₁]		

School-level Exclusions

2. Describe the reasons for school exclusion from the national target population (*if applicable*).

Reason for exclusion	# of schools	# of ISCED Level 1 teachers
1.		
2.		
3.		
4.		
5.		
TOTAL: (<i>Sum of exclusions - Calculated automatically</i>)	[b ₁] 0	0

3. Total number of schools and ISCED Level 1 teachers in the national survey population: (*Box [c₁] = Box [a₁] - Box [b₁]*)

[c ₁]		
--------------------	--	--

4. Percentage or coverage of the national target population (ISCED 1):

(*Box [d₁] = Box [c₁] ÷ Box [a₁] × 100*)

[d ₁]	%	%
--------------------	---	---

Values calculated automatically

Other Information

5. If different from ISCED Level 2, list and describe the variables to be used for stratification in order of importance

Stratification variables			
	name	Description	# of levels
1			
2			
3			
4			
5			
6			

6. Are there schools offering both ISCED Level 1 and ISCED Level 2 education?

Please Select Yes or No

7. If the survey administration language(s) for ISCED Level 1 is/are different than the one specified for ISCED level 2, please describe.

8. Specify the school measure of size (MOS) to be used for ISCED level 1. (*Click in box and on right arrow to see drop down menu*)

Please select the MOS to be used

If "Other", please describe:

9. Describe your data sources (*provide copies of relevant tables*).

Figure 5.8 Sampling Form ISCED 3

Please return to Statistics Canada at TALIS@statcan.gc.ca

Sampling Form - ISCED 3

See Appendix II of the Sampling Manual.

TALIS 2013 Participant :

1. Total number of schools and ISCED Level 3 teachers in the target population:

	# of schools	# of ISCED Level 3 teachers
[a ₃]		

School-level Exclusions

2. Describe the reasons for school exclusion from the national target population (if applicable).

Reason for exclusion	# of schools	# of ISCED Level 3 teachers
1.		
2.		
3.		
4.		
5.		
TOTAL: (Sum of exclusions - Calculated automatically)	[b ₃] 0	0

3. Total number of schools and ISCED Level 3 teachers in the national survey population: (Box [c₃] = Box [a₃] - Box [b₃])

[c₃]

4. Percentage of coverage of the national target population (ISCED 3): [d₃] %

(Box [d₃] = Box [c₃] ÷ Box [a₃] × 100)

Values calculated automatically

Other Information

5. If different from ISCED Level 2, list and describe the variables to be used for stratification in order of importance (Can be different from ISCED Level 2 variables only if there are no schools with both ISCED levels 2 & 3):

Stratification variables			
	name	Description	# of levels
1			
2			
3			
4			
5			
6			

6. Are there schools offering both ISCED Level 2 and ISCED Level 3 education? Please Select Yes or No

7. If the survey administration language(s) for ISCED Level 3 is/are different than the one specified for ISCED level 2, please describe.

8. Specify the school measure of size (MOS) to be used for ISCED level 3. (Click in box and on right arrow to see drop down menu)

Please select the MOS to be used

If "Other", please describe:

9. Describe your data sources (provide copies of relevant tables).

Figure 5.9 Sampling Form Pisa Link

Please return to Statistics Canada at TALIS@statcan.gc.ca

Sampling Form - PISA LINK

See Appendix III of the Sampling Manual.

TALIS 2013 Participant :

1. Total number of schools selected for the PISA main survey sample:

of schools

Information about the PISA 2012 school sample

2. Indicate the ISCED levels in which 15 year-olds PISA students are taught.

3. Please define the units used in PISA 2012 sampling frame (i.e. whole schools, shifts, tracks, programmes, etc.).

4. Please include any other relevant information about the PISA 2012 school sample (*stratification variables used, oversampling done, etc.*)

Figure 5.10 Additional Information

Please return to Statistics Canada at TALIS@statcan.gc.ca

Additional Information (if necessary)

TALIS 2013 Participant :

ANNEX D: Target and Survey populations

Table 5.7 Target and survey populations - ISCED 2 core

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
Australia	Target Population		2 869	84 474
		Mainstream schools' in very remote area	305	1525
		Non-mainstream schools' including Alternative Curriculum correctional Distance Education Hospital Koorie Pathways school Language School Mature Age Non-English Curriculum and Special School		
	Survey Population		2 564	82 949
	Coverage after Exclusions (%)		89.4	98.2%
Brazil	Target Population		62 676	881 540
		Schools with less than 6 teachers.	9 681	32 829
		Remote (4 schools excluded after sampling was done) - Estimated numbers		
	Survey Population		52 995	848 711
	Coverage after Exclusions (%)		84.6	96.3
Bulgaria	Target Population		2 189	27 998
		Very small schools with less than 4 ISCED 2 teachers	142	817
		Schools for students with special education needs		
		Teachers not teaching to classrooms excluded in one sampled school (estimate)		
	Survey Population		2 047	27 181
	Coverage after Exclusions (%)		93.5	97.1
Chile	Target Population		6 041	58 374
		Schools with no more than 3 teachers	236	663
		schools located in geographically remote areas		
		International school with English teachers only		
	Survey Population		5 802	57 711
	Coverage after Exclusions (%)		96.0	98.9
Croatia	Target Population		971	19 906
		National minority schools (Italian Hungarian Czech Serbian schools)	17	241
	Survey Population		954	19 665

Table 5.7 Target and survey populations - ISCED 2 core (continued)

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
	Coverage after Exclusions (%)		98.2	98.8
Cyprus	Target Population		102.0	4 610
		Very remote school	1	17
		Schools with students taught in language other than Greek or English	1	10
	Survey Population		100	4 583
	Coverage after Exclusions (%)		98.0	99.4
Czech Republic	Target Population		2 639	30 831
		Lower grades of Conservatoires - Specific education programmes that may be attended as another ISCED level too.	94	369
		Small schools with less than 5 full-time employment teachers		
	Survey Population		2 545	30 462
	Coverage after Exclusions (%)		96.4	98.8
Denmark	Target Population		1 789	52 652
		Public Youth Schools	187	744
		Small schools: Public or private primary schools with 5 or fewer teachers		
		MOS missing (only potentially level 2)		
	Survey Population		1 602	51 908
	Coverage after Exclusions (%)		89.5	98.6
Estonia	Target Population		425	8 437
		International schools	8	80
		Remote areas schools (islands)		
		School of Ballet		
	Survey Population		417	8 357
	Coverage after Exclusions (%)		98.1	99.1
Finland	Target Population		734	Unknown
		International/foreign/immersion schools where all students are taught in languages other than Finnish or Swedish	8	Unknown
	Survey Population		726	Unknown
	Coverage after Exclusions (%)		98.9	Unknown
France	Target Population		7 160	217 368
		Schools located in overseas French Territories	329	8169
		Schools located in La Réunion and Mayotte under southern hemisphere calendar		

Table 5.7 Target and survey populations - ISCED 2 core (continued)

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
		Private schools under different administration		
	Survey Population		6 831	209 199
	Coverage after Exclusions (%)		95.4	96.2
Iceland	Target Population		145	1 350
		Very small schools	3	6
	Survey Population		142	1344
	Coverage after Exclusions (%)		97.9	99.6
Israel	Target Population		2 139	140 744
		Foreign schools which do not teach according to the Israeli Curriculum .The language of instruction is English or French	3	
		Ultra-Orthodox schools	1 038	30,576
	Survey Population		1 098	110 168
	Coverage after Exclusions (%)		51.3	78.3
Italy	Target Population		7 917	178 385
		Special schools (little schools in hospitals/prisons)	12	188
		Schools with no more than 3 teachers	227	578
		Schools in remote geographical areas	44	507
		Schools annexed to other institutions (i.e. academy of music school of art etc. For these schools principals are not comparable to the other ones);	61	827
		Laboratory schools (these kind of schools have a special ordinance which makes them different from the other schools)	4	159
	Survey Population		7 569	176 126
	Coverage after Exclusions (%)		95.6	98.7
Japan	Target Population		10 863	289 125
		Temporary closed schools	105	0
		Schools (8) discovered to have excluded part-time teachers		1,374
		Schools (4) discovered to have excluded special needs teachers		626
		Schools (1) discovered to have excluded Phys Ed teachers		103
		Schools (1) discovered to have excluded Grade Head teachers		139
	Survey Population		10 758	286 884
	Coverage after Exclusions (%)		99.0	99.2
Korea	Target Population		3 183	110 658
		"Branch" schools which are located in remote areas (usually less than 10 teachers)	32	271

Table 5.7 Target and survey populations - ISCED 2 core (continued)

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
	Survey Population		3 151	110 387
	Coverage after Exclusions (%)		99.0	99.8
Latvia	Target Population		750	88 775
		International school (for diplomats' children etc)	4	149
		Special regime (criminal) school		
	Survey Population		746	88 626
	Coverage after Exclusions (%)		99.5	99.8
Malaysia	Target Population		+ 2 138	132 578
		School with less than 20 teachers	167	2,001
		Private schools	Unknown	11,653
		State religious schools		
		MARA schools		
		Government aided religious schools		
	Survey Population		1 971	118 924
	Coverage after Exclusions (%)		92.2	89.7
Mexico	Target Population		15 881	315 829
		Oaxaca state excluded due to labour dispute	2 608	10,232
		Comunitaria		
	Survey Population		13 273	305 597
	Coverage after Exclusions (%)		83.6	96.8
Netherlands	Target Population		542	78 263
		No exclusion	0	0
	Survey Population		542	78 263
	Coverage after Exclusions (%)		100.0	100.0
Norway	Target Population		1 226	22 997
	Exclusions:	One private school includes both level 2 and 3. Teachers may teach on both levels. Defined as level 3 school	147	410
		A French and a German school are excluded		
		23 schools with very few level 2 students and/or teachers (less than 4 ISCED Level 2 teachers)		
	Survey Population		1 079	22 585
	Coverage after Exclusions (%)		88.0	98.2
Poland	Target Population		6 532	172 326
		No exclusions	0	
	Survey Population		6 532	172 326
	Coverage after Exclusions (%)		100.0	100.0
Portugal	Target Population		1 318	46 088
		Schools with non-Portuguese Curricula	16	258

Table 5.7 Target and survey populations - ISCED 2 core (continued)

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
	Survey Population		1 302	45 830
	Coverage after Exclusions (%)		98.8	99.4
Romania	Target Population		5 865	70 807
		Very small schools (no more than 24 students of ISCED Level 2)	153	849
	Survey Population		5 712	69 958
	Coverage after Exclusions (%)		97.4	98.8
Serbia	Target Population		1 083	47 833
		Small schools	10	62
	Survey Population		1 073	47 771
	Coverage after Exclusions (%)		99.1	99.9
Singapore	Target Population		197	10 383
		Non participating private schools (27 out of 32; includes 4 schools with unknown measure of size)	27	524
	Survey Population		170	9 855
	Coverage after Exclusions (%)		86.3	94.9
Slovak Republic	Target Population		1 642	27 271
		Number of teachers ISCED 2 in school is 3 or less	19	34
	Survey Population		1 623	27 237
	Coverage after Exclusions (%)		98.8	99.9
Spain	Target Population		7 322	241 177
		Small schools with less than 4 ISCED Level 2 teachers	58	113
	Survey Population		7 264	241 064
	Coverage after Exclusions (%)		99.2	100.0
Sweden	Target Population		1 731	301 907
		Small Schools with less than 6 students in the target grades	71	228
	Survey Population		1 660	301 679
	Coverage after Exclusions (%)		95.9	99.9
United States	Target Population		68 030	815 840
		Schools with less than 3 ISCED level 2 teachers Weighted estimate from PSS used for small private schools	23 050	26,426
		Private schools who did not participate in the Private School Survey (Weighted estimates from PSS used)	744	6,276
	Survey Population		44 236	783 138
	Coverage after Exclusions (%)		65.0	96.0
Sub-national entities				
Abu Dhabi (United Arab Emirates)	Target Population		268	86 726
		Very small school	1	9

Table 5.7 Target and survey populations - ISCED 2 core (*continued*)

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
	Survey Population		267	86 717
	Coverage after Exclusions (%)		99.6	100.0
Alberta (Canada)	Target Population		1 174	134 527
		Band-operated schools - these schools operate on First Nations' reserves and are the responsibility of the federal government rather than being the responsibility of Alberta Education	228	3,109
		Very small schools (fewer than 6 students in Grades 7-9)		
		Federal schools		
	Survey Population		946	131 418
	Coverage after Exclusions (%)		80.6	97.7
England (United Kingdom)	Target Population		4 347	1 773 534
		Very small schools (<4 teachers in total)	71	3526
		Very small private schools (<=10 ISCED level 2 pupils or <5 teachers and <=50 pupils in total)		
		International schools (non-english & independent)		
	Survey Population		4 276	1 770 008
	Coverage after Exclusions (%)		98.4	99.8
Flanders (Belgium)	Target Population		726	19 557
		School that cannot be classified on the basis of the explicit stratification variable (specific case)	6	35
		Schools with fewer than 5 teachers		
	Survey Population		720	19 522
	Coverage after Exclusions (%)		99.2	99.8

Source: OECD, *TALIS Database*

Table 5.8 Target and survey populations - ISCED 1

	Population and Coverage	Reasons for exclusions	Number of schools	Number of teachers
Denmark	Target Population		1 692	58 528
		Small schools (< 5 teachers)	90	279
		No MOS available		
	Survey Population		1 602	58 249
	Coverage after Exclusions (%)		94.7	99.5
Finland	Target Population		2 435	Unknown
		International/foreign/immersion schools where all students are taught in languages other than Finnish or Swedish	26	
		Schools offering ISCED 1 2 and 3 education		
	Survey Population		2 409	Unknown
	Coverage after Exclusions (%)		98.9	Unknown
Mexico	Target Population		76 738	549 986
		Remote school excluded after sampling (weighted count)	4 589	26,382
		Oaxaca state excluded due to labour dispute		
	Survey Population		72 149	523 604
	Coverage after Exclusions (%)		94.0	95.2
Norway	Target Population		2 485	41 845
		A French and a German school are excluded	139	343
		Schools with very few ISCED level 1 pupils and/or teachers		
	Survey Population		2 346	41 502
	Coverage after Exclusions (%)		94.4	99.2
Poland	Target Population		13 017	282 711
		No exclusions	0	0
	Survey Population		13 017	282 711
	Coverage after Exclusions (%)		100.0	100.0
Sub-national entities				
Flanders (Belgium)	Target Population		2 193	29 989
		Schools where the language of instruction is French	58	300
		Schools with fewer than 5 teachers		
	Survey Population			
	Coverage after Exclusions (%)		97.4	99.0

Source: OECD, *TALIS Database*

Table 5.9 Target and survey populations - ISCED 3

	Population and Coverage	Reasons for Exclusions	Number of schools	Number of teachers
Australia	Target Population		2 346	39 837
		Non-mainstream schools' including Alternative Curriculum, correctional, Distance Education, Hospital, Koorie Pathways school, Language School, Mature Age, Non-English Curriculum, and Special School	173	716
		Mainstream schools' in very remote area		
	Survey Population		2 173	39 121
	Coverage after Exclusions (%)		92.6	98.2
Denmark	Target Population		345	22 000
		Small schools	2	Unknown
	Survey Population		343	22 000
	Coverage after Exclusions (%)		99.4	100
Finland	Target Population		620	Unknown
		International/foreign/immersion schools, where all students are taught in languages other than Finnish or Swedish	5	Unknown
	Survey Population		615	Unknown
	Coverage after Exclusions (%)		99.2	Unknown
Iceland	Target Population		31	1 774
		No exclusions	0	0
	Survey Population		31	1 774
	Coverage after Exclusions (%)		100	100
Italy	Target Population		6 982	260 788
		Special schools	15	232
		Schools with no more than 3 teachers	245	1 748
		Schools in remote geographical areas		
		Schools annexed to other institutions (i.e. academy of music, school of art, etc. For these schools, principals are not comparable to the other ones);		
	Survey Population		6 737	259 040
	Coverage after Exclusions (%)		96.5	99.3
Mexico	Target Population		12 209	274 506
		No exclusions	0	0
	Total Exclusions		0	0
	Survey Population		12 209	274 506
	Coverage after Exclusions (%)		100	100
Norway	Target Population		421	24 910
		No exclusions	0	0
	Survey Population		421	24 910
	Coverage after Exclusions (%)		100	100

Table 5.9 Target and survey populations - ISCED 3 (*continued*)

	Population and Coverage	Reasons for Exclusions	Number of schools	Number of teachers
Poland	Target Population		6 952	210 806
		No exclusions	0	0
	Survey Population		6 952	210 806
	Coverage after Exclusions (%)		100	100
Singapore	Target Population		198	13 009
	Exclusions:	Non participating private schools (27 out of 32; includes 4 schools with unknown measure of size)	27	588
	Survey Population		171	12 421
	Coverage after Exclusions (%)		86.4	95.5
Sub-national entities				
Abu Dhabi (United Arab Emirates)	Target Population		214	54 999
		Very small schools	2	13
	Survey Population		212	54 986
	Coverage after Exclusions (%)		99	99.9

Source: OECD, *TALIS Database*

ANNEX E: Characteristics of National Samples ISCED 1

Annex E: Characteristics of national samples ISCED 1

Denmark

In Denmark, the ISCED Level 1 education covers grades 0 to 6 (mandatory).

Coverage and exclusions			
		ISCED Level 1 Schools	# ISCED Level 1 and 2 teachers
Target Population		1,692	58,528
Exclusions:	Small schools (< 5 teachers)	51	159
	No MOS available	39	120
Total Exclusions		90	279
Survey Population		1,602	58,249
Coverage after Exclusions (%)		94.7%	99.5%

Note: The number of teachers represent the total number of teachers in the school (Grade 0 and Grade 1 to 9).

Sample design

Sample allocation:	Proportional to the number of teachers.
Sample sizes:	20 schools selected for the Field Trial and 198 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample.
Measure of size:	Count of ISCED Level 1 students.
Explicit Stratification:	Explicit stratification was organised by school level (ISCED 1 only, ISCED 2 only and ISCED 1 and 2).
Implicit Stratification:	Implicit stratification was organised by school type (public, private, continuation) and urbanisation (5).

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
ISCED1 only	20	0	11	4	2	3
ISCED 1and2	178	1	91	40	13	33
Total	198	1	102	44	15	36

Data sources

The school sampling frame was developed using data collected by UNI-C and Statistics Denmark annually from all schools at the beginning of each school year. The data used was from school year 2010-2011.

Finland

In Finland, the ISCED level 1 education corresponds to grades 1 to 6.

Coverage and exclusions			
		ISCED Level 1 Schools	# of ISCED Level 1 teachers
Target Population		2,435	Unknown
Exclusions:	International/foreign/immersion schools, where all students are taught in languages other than Finnish or Swedish	7	
	Schools offering ISCED 1, 2 and 3 education	19	
Total Exclusions		26	0
Survey Population		2,409	Unknown
Coverage after Exclusions (%)		98.9%	Unknown

Only a few schools were offering ISCED levels 1,2 and 3 education. These schools were excluded from the ISCED level 1 study.

Sample design

Sample allocation:	Proportional to the number of ISCED level 1 students.
Sample sizes:	19 schools selected for the Field Trial and 199 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size; overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., and Kaufman, S. (2000).
Measure of size:	Count of ISCED level 1 students.
Explicit Stratification:	Explicit stratification was organised by region (South, West, East, North, Swedish speaking area).
Implicit Stratification:	Implicit stratification was organised by urbanization (Urban, Rural).

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
Southern Finland	90	4	73	10	2	1
Western Finland	47	0	43	4	0	0
Eastern Finland	23	1	20	2	0	0
Northern Finland	27	0	26	0	1	0
Swedish speaking area	12	0	11	1	0	0
Total	199	5	173	17	3	1

Data sources

The school sampling frame was developed using the school registrations from Statistics Finland, from school year 2010-2011.

Mexico

In Mexico, the ISCED Level 1 corresponds to primary education (called "Primaria"). It is the start of the compulsory education in Mexico and comprises grades 1 to 6.

Coverage and exclusions		ISCED Level 1 Schools	# of ISCED Level 1 teachers
Target Population		76,738	549,986
Exclusions:	Migrant gral public.	182	294
	Remote school excluded after sampling (weighted count)	378	756
	Oaxaca state excluded due to union strike	4,029	25,332
Total Exclusions		4,589	26,382
Survey Population		72,149	523,604
Coverage after Exclusions (%)		94.0%	95.2%

Note: Schools from Oaxaca state were excluded after sampling. The schools were temporarily closed during data collection due to a teacher's union strike.

Sample design

Sample allocation:	Proportional to the number of ISCED level 1 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Count of ISCED Level 1 teachers in school.
Explicit Stratification:	Explicit stratification was organised by school funding (public, private) and by school type (general, indigena) within the public school stratum.
Implicit Stratification:	Implicit stratification was organised by state (32) and urbanisation (urban, rural).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	Participating Schools		Non-participating schools
				1st replacement	2nd replacement	
Public - General	167	7	150	1	1	8
Private	21	0	21	0	0	0
Public - Indigena	12	2	10	0	0	0
Total	200	9	181	1	1	8

Data sources

The school sampling frame was developed using the National system of educative information (911- SNIE), for the 2012-2013 school year.

Norway

In Norway, the ISCED Level 1 corresponds to the primary school education and covers the Grade 1 to Grade 7.

Coverage and exclusions			
		ISCED Level 1 Schools	# of ISCED Level 1 teachers
Target Population		2,485	41,845
Exclusions:	A French and a German school are excluded	2	26
	51 schools with very few level 1 pupils and/or teachers	137	317
Total Exclusions		139	343
Survey Population		2,346	41,502
Coverage after Exclusions (%)		94.4%	99.2%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 1 students within school type but not to the number of ISCED Level 1 students within municipality size.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample selected simultaneously with the ISCED 2 Level school sample.
Measure of size:	Count of ISCED Level 1 students.
Explicit Stratification:	Explicit stratification was organised by school type (ISCED 2 only, ISCED 1 and 2) and by municipality size defined by the number of schools in the municipality (less than 6 schools, 6 or more schools).
Implicit Stratification:	Implicit stratification was organised by municipality.

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
I1 - Sing	12	1	6	1	0	4
I1 - Mult	152	7	80	26	11	28
I12 - Sing	8	0	2	0	0	6
I12 - Mult	28	1	12	5	1	9
Total	200	9	100	32	12	47

Data sources

The source of information used for the creation of the school sampling frame was the Primary and Lower Secondary School Information System (GSI / Grunnskolen informasjons system) for the 2010/2011 school year.

Poland

In Poland the ISCED Level 1 education corresponds to grades 1 to 6 in elementary schools.

Coverage and exclusions			
		ISCED Level 1 Schools	# of ISCED Level 1 teachers
Target Population		13,017	282,711
Exclusions:	No exclusion	0	0
Total Exclusions		0	0
Survey Population		13,017	282,711
Coverage after Exclusions (%)		100.0%	100.0%

Note: The total number of ISCED Level 1 teachers had to be estimated using data from last year's database, because as of October 30th 2011 not all of the schools have sent the data about their teachers. MOS is the number of students as of October 30th 2011.

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 students, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size.
Measure of size:	Count of ISCED Level 1 students.
Explicit Stratification:	Explicit stratification was organised by type of funding (public, non public) and urbanization (urban, rural) within public stratum. A special stratum was created for schools with no information.
Implicit Stratification:	Implicit stratification was organised by urbanization (urban, rural) within non public stratum.

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
Public - Urban	108	0	83	13	0	12
Public - Rural	83	2	63	5	0	13
Non-public - All	5	0	5	0	0	0
Missing mos - Missing mos	4	4	0	0	0	0
Total	200	6	151	18	0	25

Data sources

The school sampling frame was developed using the Educational Information System – EIS (System Informacji Oświatowej) which is a complex database created by Polish Ministry of Education. Its legal purpose is to collect data reported by educational institutions in Poland. The data is for school year 2011-2012.

Belgium Fl.

In Belgium (Flanders), the ISCED Level 1 education consists of primary education and is composed of grades 1 to 6.

Coverage and exclusions			
		ISCED Level 1 Schools	# of ISCED Level 1 teachers
Target Population		2,193	29,989
Exclusions:	Schools where the language of instruction is French	8	137
	Schools with fewer than 5 teachers	50	163
Total Exclusions		58	300
Survey Population		2,135	29,689
Coverage after Exclusions (%)		97.4%	99.0%

Sample design

Sample allocation:	Disproportional allocation to allow comparison between educational networks (3).
Sample sizes:	20 schools selected for the Field Trial and 240 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size
Measure of size:	Count of ISCED Level 1 teachers in school.
Explicit Stratification:	Explicit stratification was organised by educational networks. There are 3 educational networks in Flanders: community-run education subsidised publicly-run education and subsidised privately-run education, for a total of 3 explicit strata.
Implicit Stratification:	No implicit stratification variables used.

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
Com. Educ.	60	0	28	14	9	9
Sub. Priv.	120	0	68	20	9	23
Sub. Publ.	60	0	29	13	8	10
Total	240	0	125	47	26	42

Data sources

School sampling frame taken from the Administrative database from the Flemish Ministry for Education and Training, from school year 2011/2012.

Australia

In Australia, the education system is the responsibility of each individual state or territory. The ISCED Level 2 education corresponds to junior secondary schooling and covers grades 7 to 10 in Australian Capital Territory, New South Wales, Tasmania and Victoria, while it covers grades 8 to 10 in Northern Territory, Queensland, South Australia and Western Australia."

Coverage and exclusions

		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		2,869	84,474
Exclusions:	Mainstream schools' in very remote area	187	999
	Non-mainstream schools' including Alternative Curriculum, correctional, Distance Education, Hospital, Koorie Pathways school, Language School, Mature Age, Non-English Curriculum, and Special School	118	526
Survey Population		2,564	82,949
Coverage after Exclusions (%)		89.4%	98.2%

Note 1: Adult Education Schools should be listed as out-of-scope but no breakdown from country is available.

Note 2: Number of ISCED 2 teachers is an estimate based on the students /teachers ratio.

Sample design

Sample allocation:	Proportional to the number of schools, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 154 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample (Chowdhury, S., Chu, A., & Kaufman, S. (2000)).
Measure of size:	Number of ISCED Level 2 teachers in school estimated using student teacher ratios by State and Sector.
Explicit Stratification:	Explicit stratification was organised by state (6) and territory (2) and by sector (Catholic, Government or Independent) in larger states, for a total of 17 explicit strata.
Implicit Stratification:	Implicit stratification was organised by sector (3) in smaller states, by geographic location (7) and Quintiles of Index of Socio-Economic Advantage (5)

School Participation Status

Explicit Strata	----- Participating Schools -----						Non-participating schools
	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement		
ACT - All Type	4	0	1	1	0		2
NSW - Catholic	11	0	6	3	2		0
NSW - Government	31	0	18	5	3		5
NSW - Independen	9	0	4	2	0		3
VIC - Catholic	9	0	7	1	0		1
VIC - Government	23	1	14	1	0		7
VIC - Independen	9	0	3	1	4		1
QLD - Catholic	5	0	1	1	0		3
QLD - Government	16	0	9	2	2		3
QLD - Independen	6	0	5	1	0		0
SA - Cat.+Ind.	4	1	3	0	0		0
SA - Government	5	0	3	0	2		0
WA - Catholic	4	0	1	0	1		2
WA - Government	7	0	5	0	0		2
WA - Independen	4	0	2	0	2		0
TAS - All Type	4	0	3	1	0		0
NT - All Type	3	0	3	0	0		0
Total	154	2	88	19	16		29

Data sources

School sampling frame was developed by Australian Council for Educational Research (ACER) by coordinating information from multiple sources including the Australian Bureau of Statistics (ABS) and commonwealth, state, territory education department databases, from the 2010 school year.

Brazil

In Brazil, ISCED 2 is related to the "final grades/years of fundamental education" (in Portuguese, "séries/anos finais do ensino fundamental") with 4 years of duration. It corresponds to the period between the 6th to the 9th year of basic education level.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		62,676	881,540
Exclusions:	Schools with less than 6 teachers.	9,630	31,132
	Remote (4 schools excluded after sampling was done) - Estimated numbers	51	1,697
Survey Population		52,995	848,711
Coverage after Exclusions (%)		84.6%	96.3%

Sample design

Sample allocation: Disproportional allocation to get estimates by State and type for public schools.

Sample sizes: 20 schools selected for the Field Trial and 1142 schools selected for the Main Survey.

Method of sample selection: Systematic proportional to size sample.

Measure of size: Count of ISCED Level 2 teachers in school.

Explicit Stratification: Explicit stratification was organised by type (State or Municipal) by States (27) and Private (all states).

Implicit Stratification: Implicit stratification was organised by State within Private explicit stratum.

School Participation Status						
Explicit Strata	Total sampled schools	----- Participating Schools -----				Non-participating schools
		Ineligible schools	Sampled schools	1st replacement	2nd replacement	
ACRE - State	20	1	18	0	0	1
ACRE - Municipal	20	6	13	0	0	1
ALAGOAS - State	20	4	16	0	0	0
ALAGOAS - Municipal	20	0	18	0	0	2
AMAPÁ - State	20	0	20	0	0	0
AMAPÁ - Municipal	21	1	20	0	0	0
AMAZONAS - State	20	2	18	0	0	0
AMAZONAS - Municipal	20	3	17	0	0	0
BAHIA - State	20	0	20	0	0	0
BAHIA - Municipal	20	1	19	0	0	0
CEARÁ - State	20	1	19	0	0	0
CEARÁ - Municipal	20	2	18	0	0	0
DISTRITO FEDERAL - State	20	0	20	0	0	0
ESPÍRITO SANTO - State	20	0	20	0	0	0
ESPÍRITO SANTO - Municipal	20	0	20	0	0	0
GOIÁS - State	20	0	19	0	0	1
GOIÁS - Municipal	20	1	18	0	0	1
MARANHÃO - State	20	8	12	0	0	0
MARANHÃO - Municipal	20	0	19	1	0	0
MATO GROSSO - State	20	0	18	0	0	2
MATO GROSSO - Municipal	20	2	18	0	0	0
MATO GROSSO DO SUL - State	20	0	20	0	0	0
MATO GROSSO DO SUL - Municipal	20	0	19	0	0	1
MINAS GERAIS - State	20	0	20	0	0	0
MINAS GERAIS - Municipal	20	0	19	0	0	1
PARANÁ - State	20	0	19	0	0	1
PARANÁ - Municipal	20	0	15	0	0	5
PARAÍBA - State	20	2	18	0	0	0
PARAÍBA - Municipal	20	1	18	0	0	1

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
PARÁ - State	20	0	20	0	0	0
PARÁ - Municipal	20	1	18	0	0	1
PERNAMBUCO - State	20	2	18	0	0	0
PERNAMBUCO - Municipal	20	0	20	0	0	0
PIAUÍ - State	20	0	20	0	0	0
PIAUÍ - Municipal	20	0	20	0	0	0
RIO DE JANEIRO - State	20	0	19	0	0	1
RIO DE JANEIRO - Municipal	20	0	19	1	0	0
RIO GRANDE DO NORTE - State	20	0	20	0	0	0
RIO GRANDE DO NORTE - Municipal	20	0	20	0	0	0
RIO GRANDE DO SUL - State	20	0	19	1	0	0
RIO GRANDE DO SUL - Municipal	20	2	17	1	0	0
RONDÔNIA - State	20	0	20	0	0	0
RONDÔNIA - Municipal	20	0	20	0	0	0
RORAIMA - State	20	0	20	0	0	0
RORAIMA - Municipal	9	0	8	0	0	1
SANTA CATARINA - State	20	2	17	0	0	1
SANTA CATARINA - Municipal	20	0	19	0	0	1
SERGIPE - State	20	0	19	0	0	1
SERGIPE - Municipal	20	0	20	0	0	0
SÃO PAULO - State	23	0	23	0	0	0
SÃO PAULO - Municipal	20	0	20	0	0	0
TOCANTINS - State	20	0	20	0	0	0
TOCANTINS - Municipal	20	0	20	0	0	0
All States - Private	50	0	43	3	0	4
All States - Federal	39	2	36	0	0	1
Total	1142	44	1063	7	0	28

Data sources

The school sampling frame was developed using the National School Census, from 2011 school year.

Bulgaria

In Bulgaria, the ISCED Level 2 education corresponds to the second stage of basic education and covers grades 5 to 8.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		2,189	27,998
Exclusions:	Very small schools with less than 4 ISCED 2 teachers	80	207
	Schools for students with special education needs	62	497
	Teachers not teaching to classrooms excluded in one sampled school (estimate)	0	113
Survey Population		2,047	27,181
Coverage after Exclusions (%)		93.5%	97.1%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic proportional to size sample.
Measure of size:	Count of ISCED Level 2 teachers.
Explicit Stratification:	Explicit Stratification was organised by school type (General, Vocational, Profiled).
Implicit Stratification:	Implicit stratification was organised by location (Capital, Large City, Other Location)

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
General	160	1	152	5	1	1
Vocational	26	0	24	1	0	1
Profiled	14	0	12	2	0	0
Total	200	1	188	8	1	2

Data sources

School sampling frame was developed by the National Center for Informatics Coverage of Education. Data from school year 2011/2012 was used.

Chile

In Chile, basic schools covers Grade 1 to grade 8 education. The ISCED level 2 education corresponds to Grade 5 to Grade 8 while the ISCED level 1 education covers Grade 1 to Grade 4.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		6,041	58,374
Exclusions:	schools with no more than 3 teachers	234	605
	schools located in geographically remote areas	4	45
	International school with English teachers only	1	13
Survey Population		5,802	57,711
Coverage after Exclusions (%)		96.0%	98.9%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic proportional to size sample.
Measure of size:	Count of ISCED Level 2 teachers in school.
Explicit Stratification:	Explicit stratification was organised by type of institution (3): Public, Government Dependent Private and Independent Private
Implicit Stratification:	Implicit stratification was organised by region (15).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
1.PUBLIC	86	1	80	1	0	4
2.GOVERNMENT DEPENDENT PRIVATE	92	3	78	2	1	8
3.INDEPENDENT PRIVATE	22	1	14	1	1	5
Total	200	5	172	4	2	17

Data sources

The school sampling frame was developed using the Students Information General System (SIGE by its acronyms in spanish) for ISCED 0-3 levels. (via web application) and the National school directory.

Croatia

In Croatia, the ISCED Level 2 education correspond to Grade 5 to Grade 8. Pupils at these levels are taught by subject teachers.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		971	19,906
Exclusions:	National minority schools (Italian, Hungarian, Czech, Serbian schools)	17	241
Survey Population		954	19,665
Coverage after Exclusions (%)		98.2%	98.8%

Sample design

Sample allocation: Proportional to the number of ISCED 2 teachers.

Sample sizes: 14 schools selected for the Field Trial and 201 schools selected for the Main Survey.

Method of sample selection: Systematic sample proportional to school size with overlap control with the ICILS sample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the ICILS sample. The approach used to minimize the overlap was developed by Chowdury and Chu.

Measure of size: Count of ISCED Level 2 teachers.

Explicit Stratification: Explicit stratification was organised by region (01-Central Croatia; 02-Eastern Croatia; 03-Northern Croatia; 04-Western Croatia; 05-Southern Croatia; 06-City of Zagreb).

Implicit Stratification: Implicit stratification was organised by urbanisation level (1- Large cities; 2- Towns; 3- Other).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Central Croatia	44	0	44	0	0	0
Eastern Croatia	32	0	32	0	0	0
Northern Croatia	23	0	23	0	0	0
Western Croatia	27	0	26	1	0	0
Southern Croatia	44	0	44	0	0	0
City of Zagreb	31	0	29	0	0	2
Total	201	0	198	1	0	2

Data sources

The school sampling frame was developed using data from the Croatian Bureau of Statistics, for school year 2010-2011.

Czech Republic

In the Czech Republic, the ISCED level 2 education includes the second stage of the elementary school (grades 6 to 9) and lower grades of the gymnasiums (grades 1 to 4 of 8 years long programme or grades 1 to 2 of 6 years long programme).

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		2,639	30,831
Exclusions:	Lower grades of Conservatoires - Specific education programmes that may be attended as another ISCED level too.	18	82
	Small schools with less than 5 full-time employment teachers	76	287
Survey Population		2,545	30,462
Coverage after Exclusions (%)		96.4%	98.8%

Note: In place of the count of ISCED level 2 teachers, the count of full-time employments is provided. The count of teachers is not available for different ISCED levels separately, only aggregated for all levels in one school.

Sample design

Sample allocation:	Proportional to the number of full-time employment, with additional oversampling for the private schools stratum.
Sample sizes:	20 schools selected for the Field Trial and 220 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the ICILS, PISA and TALIS Field Test samples. The sample overlap control method used minimizes the probability of selecting schools already sampled in ICILS, PISA or TALIS Field Test samples. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Count of full-time employments.
Explicit Stratification:	Explicit stratification was organised by type of funding (Public, Private).
Implicit Stratification:	Implicit stratification was organised by programme (Elementary school, Gymnasium) and Region (14).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
Public	191	1	188	2	0	0
Private	30	0	30	0	0	0
Total	221	1	218	2	0	0

Data sources

The school sampling frame was taken from Annual statistics of schools, October 2010, Institution for information in education (data are collected every October and tables are available usually in February next year).

Cyprus

In Cyprus, the ISCED Level 2 education is defined differently for public schools and private schools. In public schools, it consists of Grade 1 (12-13 years old students), Grade 2 (13-14 years old students) and Grade 3 (14-15 years old students). In private schools, the ISCED Level 2 education consists of Year/Grade 7 (12-13 years old students), Year/Grade 8 (13-14 years old students) and Year/Grade 9 (14-15 years old students).

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		102	4,610
Exclusions:	Very remote school	1	17
	Schools with students taught in language other than Greek or English	1	10
Survey Population		100	4,583
Coverage after Exclusions (%)		98.0%	99.4%

Sample design

Sample allocation:	Not applicable.
Sample sizes:	Convenience sample of 20 schools selected for the Field Trial and census of schools (100) for the Main Survey.
Method of sample selection:	Not applicable.
Measure of size:	Not applicable.
Explicit Stratification:	Not applicable.
Implicit Stratification:	Not applicable.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
All	100	1	98	0	0	1
Total	100	1	98	0	0	1

Data sources

For public schools the source of information for the development of the school sampling frame is the Ministry of Education and Culture. For private schools the source of information is the private school itself via the school principal/administrative officer. Data from school year 2011-2012 was used.

Denmark

In Denmark, the ISCED Level 2 education covers grades 7 to 9 (mandatory) and a voluntary grade 10.

Coverage and exclusions		ISCED Level 2 Schools	ISCED Level 1 and 2 teachers
Target Population		1,789	52,652
Exclusions:	Public Youth Schools	100	550
	Small schools: Public or private primary schools with 5 or fewer teachers	48	144
Survey Population	MOS missing (only potentially level 2)	39	50
Coverage after Exclusions (%)		1,602 89.5%	51,908 98.6%

Note: The number of teachers represent the total number of teachers in the school (Grade 0 and Grade 1 to 9)

Sample design

Sample allocation:	Proportional to the number of teachers.
Sample sizes:	20 schools selected for the Field Trial and 198 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample.
Measure of size:	Count of ISCED Level 2 students.
Explicit Stratification:	Explicit stratification was organised by school level (ISCED 1 only, ISCED 2 only and ISCED 1 and 2).
Implicit Stratification:	Implicit stratification was organised by school type (public, private, continuation) and urbanisation (5).

School Participation Status

Explicit Strata	----- Participating Schools -----						Non-participating schools
	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement		
ISCED2 only	30	2	15	5	3		5
ISCED 1and2	168	13	82	30	13		30
Total	198	15	97	35	16		35

Data sources

The school sampling frame was developed using data collected by UNI-C and Statistics Denmark annually from all schools at the beginning of each school year. The data used was from school year 2010-2011.

Estonia

In Estonia, the ISCED Level 2 education covers grades 7 to 9.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		425	8,437
Exclusions:	International schools	3	21
	Remote areas schools (islands)	4	32
	School of Ballet	1	27
Survey Population		417	8,357
Coverage after Exclusions (%)		98.1%	99.1%

Sample design

Sample allocation:	Proportional to the number of ISCED 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic random sampling.
Measure of size:	No measure of size provided.
Explicit Stratification:	Explicit stratification was organised by location (Urban, Rural) and by school type (Secondary, Basic) region (city and municipality) and by school type (schools providing lower secondary education (basic or põhikool) and schools providing lower and upper secondary education (Gümnaasium), for a total of 4 explicit strata.
Implicit Stratification:	No implicit variable used.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Urban - Upper & Lower Sec.	65	0	61	4	0	0
Urban - Basic school	15	0	13	2	0	0
Rural - Upper & Lower Sec.	35	0	32	3	0	0
Rural - Basic school	85	3	78	4	0	0
Total	200	3	184	13	0	0

Data sources

School sampling frame was collected by the Estonian Educational Information System (EEJS / EHIS), for school year 2011/2012.

Finland

In Finland, the ISCED level 2 education corresponds to grades 7 to 9, plus an optional 10th grade.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		734	Unknown
Exclusions:	International/foreign/immersion schools, where all students are taught in languages other than Finnish or Swedish	8	Unknown
Survey Population		726	Unknown
Coverage after Exclusions (%)		98.9%	Unknown

Sample design

Sample allocation: Proportional to the number of ISCED level 2 students, then adjusted to have a minimum of 2 schools selected in the smaller stratum.

Sample sizes: 20 schools selected for the Field Trial and 152 schools selected for the Main Survey.

Method of sample selection: Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000). The ISCED level 2 sample was selected simultaneously with the ISCED Level 3 sample.

Measure of size: Count of ISCED level 2 students.

Explicit Stratification: Explicit stratification was organised by school type and by region. The ISCED 2 only schools were split into 5 regions (South, West, East, North, Swedish speaking area) and the ISCED 2 and 3 schools were split into 2 regions (All but Swedish, Swedish speaking area).

Implicit Stratification: Implicit stratification was organised by urbanization (Urban, Rural).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
ISCED2 only - Southern Finland	62	2	56	4	0	0
ISCED2 only - Western Finland	33	0	32	1	0	0
ISCED2 only - Eastern Finland	18	0	16	2	0	0
ISCED2 only - Northern Finland	19	0	13	5	0	1
ISCED2 only - Swedish speaking area	9	0	9	0	0	0
ISCED 2and3 - All but Swedish	7	0	6	0	0	1
ISCED 2and3 - Swedish speaking area	2	0	2	0	0	0
Total	150	2	134	12	0	2

Data sources

The school sampling frame was developed using the school registrations from Statistics Finland, from school year 2010-2011.

France

In France, the ISCED 2 education level comprises the 6th, 5th, 4th and 3rd years in college ("6ème, 5ème, 4ème et 3ème en collège")

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		7,160	217,368
Exclusions:	Schools located in overseas French Territories	109	3,155
	Schools located in La Réunion and Mayotte under southern hemisphere calendar	101	5,014
Survey Population	Private schools under different administration	119	
Coverage after Exclusions (%)		6,831	209,199
		95.4%	96.2%

Note: The number of ISCED Level 2 teachers in excluded private schools under different administration is unknown.

Sample design

Sample allocation:	Disproportional allocation to allow comparison between the three school types.
Sample sizes:	20 schools selected for the Field Trial and 250 schools selected for the Main Survey.
Method of sample selection:	Systematic proportional to size sample.
Measure of size:	Count of ISCED Level 2 teachers.
Explicit Stratification:	Explicit stratification was organised by school type (Public hors éducation prioritaire, public en éducation prioritaire and privé sous contrat)
Implicit Stratification:	Implicit stratification was organised by urbanicity (3) and school size (3).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
PUB. PRIO.	60	0	42	3	0	15
PUB.HORS.PR.	125	0	107	4	0	14
PRIVE	65	0	48	0	0	17
Total	250	0	197	7	0	46

Data sources

The list of schools was created from the "Base centrale des établissements", from 30 June 2011. The "Base centrale des établissements" is used as a reference file for computing statistics about schools.

Iceland

The Icelandic education system covers grades 1 to 10. The ISCED Level 2 education covers grades 8 to 10 (typically starting at 13 years of age).

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		145	1,350
Exclusions:	Very small schools	3	6
Survey Population		142	1344
Coverage after Exclusions (%)		97.9%	99.6%

Note: The number of ISCED Level 2 teachers is an estimate provided by the head of the Union of Primary School Teachers, Félag Grunnskólakennara. It may be subject to change, once information from each school is gathered.

Sample design

Sample allocation:	Not applicable.
Sample sizes:	Convenience sample of 12 larger schools selected for the Field Trial and all schools selected for the Main Survey.
Method of sample selection:	Not applicable.
Measure of size:	Not applicable.
Explicit Stratification:	Not applicable.
Implicit Stratification:	Not applicable.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
All	145	9	129	0	0	7
Total	145	9	129	0	0	7

Data sources

The school sampling frame was provided by Námsmatsstofnun, Educational Testing Institute, Iceland. It is the institute in charge of administering the national examination at the end of ISCED 2 education.

Israel

In Israel, the ISCED Level 2 education correspond to grades 7 to 9. There are four types of schools at ISCED Level 2: schools composed of primary and lower secondary education (grades 1-8); School offering lower secondary education (grades 7-9); Schools offering lower and upper secondary education (grades 7-12); Schools offering upper secondary education (grades 9-12)

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 classes
Target Population		2,139	140,744
Exclusions:	Foreign schools which do not teach according to the Israeli Curriculum .The language of instruction is English or French	3	
	Ultra-Orthodox schools	1,038	30,576
Survey Population		1,098	110,168
Coverage after Exclusions (%)		51.3%	78.3%

Note: The number of ISCED Level 2 teachers is not available. The table above shows coverage in terms of the number of ISCED Level 2 classes.

Note: The ultra-orthodox schools are excluded from the TALIS study.

Sample design

Sample allocation:	Proportional to the number of ISCED level 2 classes.
Sample sizes:	20 schools selected for the Field Trial and 154 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size. The TALIS sample was selected simultaneously with the ICILS sample to avoid overlap.
Measure of size:	Count of ISCED 2 classes in school.
Explicit Stratification:	Explicit stratification was organised by study eligibility (TALIS only, TALIS and ICILS) and by school orientation (Hebrew Secular, Hebrew religious, Arabic-Arab, Arabic- Druze, Arabic- Bedouin)
Implicit Stratification:	Implicit stratification was organised by grade structure (Primary + Lower secondary, Lower secondary, Lower +Upper secondary, Upper secondary) and by Socio-Economic Status (Low, Medium, High).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
TALIS only - Hebrew Secular	10	0	10	0	0	0
TALIS only - Hebrew Religious	6	0	6	0	0	0
TALIS only - Arabic-Arab	8	0	7	0	0	1
TALIS only - Arabic-Bedouin	2	0	2	0	0	0
TALIS&ICILS - Hebrew Secular	95	1	91	0	0	3
TALIS&ICILS - Hebrew Religious	28	0	28	0	0	0
TALIS&ICILS - Arabic-Arab	33	0	33	0	0	0
TALIS&ICILS - Arabic-Druze	6	0	6	0	0	0
TALIS&ICILS - Arabic-Bedouin	12	0	12	0	0	0
Total	200	1	195	0	0	4

Data sources

The school sampling frame was developed using the registration of schools and classes from the Ministry of Education, updated May 2011.

Italy

In Italy, the ISCED Level 2 education corresponds to the lower secondary schooling and lasts three years. There are state and non state ISCED level 2 schools, consisting of public schools managed by Central Government, public schools managed by Local Government (only in two regions) and private schools.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		7,917	178,385
Exclusions:	Special schools (little schools in hospitals/prisons)	12	188
	Schools with no more than 3 teachers	227	578
	Schools in remote geographical areas	44	507
	Schools annexed to other insitutions (i.e. academy of music, school of art, etc. For these schools, principals are not comparable to the other ones);	61	827
	Laboratory schools (these kind of schools have a special ordinance which makes them different from the other schools)	4	159
Survey Population		7,569	176,126
Coverage after Exclusions (%)		95.6%	98.7%

Sample design

Sample allocation:	Proportional to the number of ISCED level 2 teachers
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size.
Measure of size:	Count of ISCED 2 teachers in school.
Explicit Stratification:	Explicit stratification was organised by territorial division (North Italy; Central Italy; South and Insular Italy) and school funding (Public, Private)
Implicit Stratification:	Implicit stratification was organised by school performance (School distribution by student performance measured with national tests yearly administered to ISCED level 2 students (grade 8th) for public schools only (only public stratified by performance)

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
North Italy - Public	76	0	61	13	0	2
North Italy - Private	7	0	5	1	1	0
Central Italy - Public	33	0	25	4	3	1
Central Italy - Private	4	0	2	1	1	0
South and Insular Italy - Public	76	1	56	15	3	1
South and Insular Italy - Private	4	1	2	1	0	0
Total	200	2	151	35	8	4

Data sources

The school sampling frame was developed using administrative data owned by the Ministry of education for public schools managed by Central Government, data from yearly census survey managed by the the Ministry of education's Statistics Office for public schools managed by Local Government and for private schools.

Japan

In Japan, the ISCED Level 2 education corresponds to lower secondary education and covers Grade 7 to Grade 9. Lower secondary school is the second stage of compulsory education and lasts three years.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		10,863	289,125
Exclusions:	Temporary closed schools	105	0
	Schools (8) discovered to have excluded part-time teachers		1,374
	Schools (4) discovered to have excluded special needs teachers		626
	Schools (1) discovered to have excluded Phys Ed teachers		103
	Schools (1) discovered to have excluded Grade Head teachers		139
Survey Population		10,758	286,884
Coverage after Exclusions (%)		99.0%	99.2%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic proportional to size.
Measure of size:	Count of ISCED Level 2 teachers in school.
Explicit Stratification:	Explicit stratification was organised by school type (Public Schools, Private or National Schools) and by location (1.Very Large City, 2.Large City, 3.Small City and 4.Non-City Area) for public schools only.
Implicit Stratification:	No implicit stratification used.
Note:	In several schools, some teachers who should have been included were mistakenly excluded (e.g. part-time, special needs).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non-participating schools
			Sampled schools	1 st replacement	2 nd replacement	
Pub/V.Big C.	36	0	30	5	0	1
Pub/Big City	28	0	27	1	0	0
Pub/Small C.	90	0	85	3	0	2
Pub/Non-city	23	0	20	3	0	0
Priv. or Nat	23	0	14	4	0	5
Total	200	0	176	16	0	8

Data sources

The school sampling frame was developed using the School Basic Survey (Gakkou Kihon Tyousa) by Ministry of Education, Culture, Sports, Science and Technology.

Korea

In the Korean Republic, the ISCED Level 2 education is offered in Middle Schools (also called Junior High School) and covers three grades called Grade 1 to Grade 3.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		3,183	110,658
Exclusions:	"Branch" schools which are located in remote areas (usually less than 10 teachers)	32	271
Survey Population		3,151	110,387
Coverage after Exclusions (%)		99.0%	99.8%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size of school.
Measure of size:	Count of ISCED Level 2 teachers
Explicit Stratification:	Explicit stratification was organised by type of funding (public, private).
Implicit Stratification:	None.
Note:	The data collection occurred in the early part of the year following TALIS reference year.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
Public	165	0	114	30	4	17
Private	35	1	22	6	1	5
Total	200	1	136	36	5	22

Data sources

The school sampling frame was developed using the statistical database managed by Korean Educational Development Institute, from school year 2011-2012.

Latvia

In Latvia, the ISCED Level 2 education corresponds to grades 5 to 9.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 students
Target Population		750	88,775
Exclusions:	International school (for diplomats' children, etc)	2	85
	Special regime (criminal) school	2	64
Survey Population		746	88,626
Coverage after Exclusions (%)		99.5%	99.8%

Note: The number of ISCED Level 2 teachers is not available. Table above provides coverage in terms of ISCED Level 2 students.

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 students.
Sample sizes:	20 schools selected for the Field Trial and 150 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Count of ISCED Level 2 students.
Explicit Stratification:	Explicit stratification was organised by school type (Basic (grades 1-6 or 1-9), secondary (grades 1-12), gymnasium (grades 7-12 or 1-12) and urbanisation (Riga, cities, towns, rural) in basic and secondary school strata.
Implicit Stratification:	Implicit stratification was organised by urbanisation (Riga, cities, towns, rural) in gymnasium school stratum.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Basic - Riga	5	0	4	0	0	1
Basic - City	6	1	4	0	0	1
Basic - Town	7	1	5	1	0	0
Basic - Rural	25	1	18	1	0	5
Secondary - Riga	30	2	18	1	0	9
Secondary - City	19	0	17	0	0	2
Secondary - Town	22	0	17	1	0	4
Secondary - Rural	18	0	15	0	0	3
Gymnasium - All	18	0	13	1	0	4
Total	150	5	111	5	0	29

Data sources

The school sampling frame was developed using data from Data from the Ministry of Education and Science, for school year 2011-2012.

Malaysia

In Malaysia, The ISCED Level 2 education consists of Form 1, 2 and 3 students which are equivalent to Grade 6,7 and 8.

Coverage and exclusions		ISCED Level 2 Schools	Count of teachers in school
Target Population		+ 2,138	132,578
Exclusions:	School with less than 20 teachers	167	2,001
	Private schools	Unknown	3,892
	State religious schools	Unknown	2,422
	MARA schools	Unknown	1,549
	Government aided religious schools	Unknown	3,790
Survey Population		1,971	118,924
Coverage after Exclusions (%)		92.2%	89.7%

Although it was indicated that the measure of size was the number of ISCED level 2 teachers, it seems from discussions with the NPM that the measure of size was rather the total number of teachers. The count of teachers from the frame is much higher than the estimated number of teacher. However, the estimate is fairly in line with the estimate from 2008.

In TALIS 2008, the MARA schools and Religious schools (SMAR/SMAN) were part of the target population. In 2013, these schools are excluded. as a result, the exclusion rate is greater than 5%.

Sample design

Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size.
Measure of size:	Number of teachers in school
Explicit Stratification:	Explicit stratification was organised by region (North, South, Central, East Coast and East Malaysia)
Implicit Stratification:	No implicit stratification used.
Data sources:	The school sampling frame was developed using data provided by Educational Planning and Research Division, Ministry of Education, for school year 2011.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
North	49	0	34	0	0	15
Central	41	0	39	0	0	2
East Coast	37	0	28	0	0	9
South	39	0	20	1	0	18
East Malaysia	34	0	28	0	0	6
Total	200	0	149	1	0	50

Data sources

Although in the sampling forms, it was mentioned that the measure of size was the number of ISCED Level 2 teachers, it was rather the total number of teachers in the schools based on discussions with the NPM.

Mexico

In Mexico, the ISCED Level 2 is compulsory and corresponds to lower secondary education. It is comprised of three grades for the Secondary Certificate (Year 7 to Year 9) or four grades for the Job Training Certificate (Year 7 to Year 10). ISCED Level 2 education is offered in regular (General, particular and Técnica) schools and in Telesecundaria schools.

Following discussions held among OECD, Mexico and Statistics Canada, it was decided that teachers teaching in Telesecundaria schools don't meet the TALIS definition of an ISCED Level 2 teacher. These schools and their teachers are classified as out of scope for TALIS but are part of a national option for Mexico.

Coverage and exclusions			
		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		15,881	315,829
Exclusions:	Oaxaca state excluded due to union strike	518	7,681
	Comunitaria	2,090	2,551
Survey Population		13,273	305,597
Coverage after Exclusions (%)		83.6%	96.8%

Note: Schools from Oaxaca state were excluded after sampling. The schools were temporarily closed during data collection due to a teacher's union strike.

Sample design

Target Population: Following discussions held among OECD, Mexico and Statistics Canada, it was decided that teachers teaching in Telesecundaria schools don't meet the TALIS definition of an ISCED Level 2 teacher. These schools and their teachers are classified as out of scope for TALIS but are part of a national option for Mexico.

Sample allocation: Proportional to the number of ISCED level 2 teachers.

Sample sizes: 20 schools selected for the Field Trial and 200 schools selected for the Main Survey.

Method of sample selection: Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).

Measure of size: Count of ISCED Level 2 teachers in school.

Explicit Stratification: Explicit stratification was organised by school funding (public, private) and school type within public school strata (general, technical).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
Public - General	102	2	95	0	1	4
Public - Technical	55	3	48	1	0	3
Private	43	1	42	0	0	0
Total	200	6	185	1	1	7

Data sources

Implicit stratification was organised by state (32) and urbanization (urban, rural).

Netherlands

In the Netherlands, the ISCED Level 2 education correspond to lower secondary education, which covers Grade 1 to Grade 3. It consists of the first three years of pre-university education (6 years total), the first three years of senior secondary education (5 years total) and all four years of pre-vocational secondary education.

Coverage and exclusions		ISCED Level 2 Schools	ISCED Level 2 and 3 teachers
Target Population		542	78,263
Exclusions:	No exclusion	0	0
Survey Population		542	78,263
Coverage after Exclusions (%)		100.0%	100.0%

Note: The number of ISCED Level 2 teachers is unavailable. Counts in the table reflect the number of ISCED levels 2 and 3.

Sample design

Sample allocation:	Not applicable.
Sample sizes:	10 schools selected for the Field Trial and 150 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample.
Measure of size:	Count of ISCED Level 2 students.
Explicit Stratification:	No explicit stratification used.
Implicit Stratification:	Implicit stratification organised by school size.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
All schools	150	2	76	29	14	29
	8	0	8	0	0	0
Total	158	2	84	29	14	29

Data sources

The source of information used for the creation of the school sampling frame came from the Agency of the Dutch Ministry of Education, for educational administrative services & information (DUO-Cfi), from school year 2011-2012.

Norway

In Norway, the ISCED Level 2 corresponds to the lower secondary education and covers Grade 8 to Grade 10.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		1,226	22,997
Exclusions:	One private school includes both level 2 and 3. Teachers may teach on both levels. Defined as level 3 school	1	61
	A French and a German school are excluded	2	42
	23 schools with very few level 2 students and/or teachers (less than 4 ISCED Level 2 teachers)	144	309
Survey Population		1,079	22,585
Coverage after Exclusions (%)		88.0%	98.2%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 students within school type but not to the number of ISCED Level 2 students within municipality size.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample selected simultaneously with the ISCED 1 Level school sample.
Measure of size:	Count of ISCED Level 2 students.
Explicit Stratification:	Explicit stratification was organised by school type (ISCED 2 only, ISCED 1 and 2) and by municipality size defined by the number of schools in the municipality (less than 6 schools, 6 or more schools).
Implicit Stratification:	Implicit stratification was organised by municipality.

School Participation Status						
Explicit Strata	----- Participating Schools -----					Non-participating schools
	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	
I2-Sing	8	1	2	0	0	5
I2-Mult	134	0	83	20	2	29
I 12-Sing	12	0	10	0	0	2
I 12-Mult	46	1	16	9	3	17
Total	200	2	111	29	5	53

Data sources

The source of information used for the creation of the school sampling frame was the Primary and Lower Secondary School Information System (GSI / Grunnskolen informasjonssystem) for the 2010/2011 school year.

Poland

In Poland, the ISCED Level 2 education is referred to as gimnazjum (junior high and lower secondary). It covers three grades ((1st, 2nd and 3rd) which generally correspond to years 7th, 8th and 9th in school.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		6,532	172,326
Survey Population		6,532	172,326
Coverage after Exclusions (%)		100.0%	100.0%

Note: The total number of ISCED Level 2 teachers had to be estimated using data from last year's database, because as of October 30th 2011 not all of the schools have sent the data about their teachers. MOS is the number of students as of October 30th 2011.

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 students, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size.
Measure of size:	Count of ISCED Level 2 students.
Explicit Stratification:	Explicit stratification was organised by type (public, non-public) and region (urban, rural)
Implicit Stratification:	No implicit stratification done.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
Public - Urban	120	1	97	19	3	0
Public - Rural	69	0	60	9	0	0
Non-public - All	7	0	4	1	1	1
Missing mos - Missing mos	4	3	1	0	0	0
Total	200	4	162	29	4	1

Data sources

The school sampling frame was developed using the Educational Information System – EIS (System Informacji Oświatowej) which is a complex database created by Polish Ministry of Education. Its legal purpose is to collect data reported by educational institutions in Poland. The data is for school year 2011-2012.

Portugal

In Portugal, the ISCED Level 2 education covers three years of schooling (7th grade - 9th grade), and includes educational programmes of both general and vocational courses. Teaching in lower secondary is organized by subjects.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		1,318	46,088
Exclusions:	Schools with non-Portuguese Curricula	16	258
Survey Population		1,302	45,830
Coverage after Exclusions (%)		98.8%	99.4%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimises the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Count of ISCED Level 2 teachers in school.
Explicit Stratification:	Explicit stratification was organised by type of funding (public, private) and by region (Alentejo, Algarve, Centro, Lisboa, Norte) within public schools.
Implicit Stratification:	Implicit stratification was organised by region (see above) for the public schools and by area (AMU, APR, APU).
Note:	Azores and Madeira were excluded from data collection.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
Público - 101.Norte	69	1	61	1	0	6
Público - 102.Centro	41	0	41	0	0	0
Público - 103.Lisboa	46	0	40	2	0	4
Público - 104.Alentejo	15	0	15	0	0	0
Público - 105.Algarve	8	0	8	0	0	0
Privado - All regions	20	0	16	1	0	3
Total	199	1	181	4	0	13

Data sources

The school sampling frame was developed using data from the Ministry of Education and Science and from Statistics Portugal. Data is from school year 2010/2011.

Romania

In Romania, the ISCED Level 2 education correspond to Special Lower Secondary (învatamânt gimnazial).

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		5,865	70,807
Exclusions:	Very small schools (no more than 24 students of ISCED Level 2)	153	849
Survey Population		5,712	69,958
Coverage after Exclusions (%)		97.4%	98.8%

Sample design

Sample allocation: Proportional to the number of ISCED Level 2 students.

Sample sizes: 20 schools selected for the Field Trial and 200 schools selected for the Main Survey.

Method of sample selection: Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).

Measure of size: Count of ISCED Level 2 students in school.

Explicit Stratification: Explicit stratification was organised by Environment (urban area/ rural area)

Implicit Stratification: Implicit stratification was organised by school type (Public , Private) and by geographical area in the public school strata.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Rural	94	3	91	0	0	0
Urban	106	0	105	0	1	0
Total	200	3	196	0	1	0

Data sources

SIVECO ROMANIA, School year 2011.

Serbia

In Serbia, the ISCED Level 2 education consists of 4 grades, from 5th grade to 8th grade. Each classroom has around 30 students and each subject is taught by a different teacher.

Coverage and exclusions		ISCED Level 2 Schools	ISCED Level 1 and 2 teachers
Target Population		1,083	47,833
Exclusions:	Small schools	10	62
Survey Population		1,073	47,771
Coverage after Exclusions (%)		99.1%	99.9%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size.
Measure of size:	Count of ISCED Level 1 and 2 teachers.
Explicit Stratification:	Explicit stratification was organised by region (East Serbia, Belgrade, South Serbia, Vojvodina, West Serbia).
Implicit Stratification:	Implicit stratification was organised by urbanisation (urban, rural, missing).
Note:	Users should use caution as school listings could not all be confirmed and differences between school listings and sampling frame information could not be explained.

School Participation Status						
			----- Participating Schools -----			
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
East Serbia	24	0	21	3	0	0
Belgrade	36	0	31	4	0	1
South Serbia	31	0	21	4	1	5
Vojvodina	58	0	44	10	3	1
West Serbia	51	0	42	7	0	2
Total	200	0	159	28	4	9

Data sources

The school sampling frame was developed using the database from the Ministry of education, for school year 2010/2011.

Singapore

In Singapore, the ISCED Level 2 education consists of the Lower Secondary and covers Grade 7 and Grade 8.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		197	10,383
Exclusions:	Non participating private schools (27 out of 32; includes 4 schools with unknown measure of size)	27	524
Survey Population		170	9,855
Coverage after Exclusions (%)		86.3%	94.9%

Sample design

Sample allocation: Not applicable

Sample sizes: 10 largest schools selected for the Field Trial. All schools selected for the Main Survey, with the exception of 13 smaller schools randomly assigned to survey either ISCED 2 and PISALINK teachers or ISCED 3 and PISALINK teachers.

Method of sample selection: Not applicable

Measure of size: Not applicable.

Explicit Stratification: Not applicable.

Implicit Stratification: Not applicable.

Note: The ISCED 2 and ISCED 3 coverage falls below 95% after the exclusion of 27 private schools.

School Participation Status						
			----- Participating Schools -----			
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non- participating schools
Public	159	0	159	0	0	0
Total	159	0	159	0	0	0

Data sources

Ministry of Education database and direct information from private schools. School Year 2011.

Slovak Republic

In Slovak Republic, the ISCED Level 2 education is offered in elementary and grammar schools. It covers Grade 5 to Grade 9 in elementary schools and Grade 1 to Grade 4 in grammar schools.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		1,642	27,271
Exclusions:	Number of teachers ISCED 2 in school is 3 or less	19	34
Survey Population		1,623	27,237
Coverage after Exclusions (%)		98.8%	99.9%

Sample design

Sample allocation:	Proportional to the number of ISCED 2 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size.
Measure of size:	Count if full-time and part-time ISCED 2 teachers.
Explicit Stratification:	Explicit stratification was organised by school type (Elementary or Grammar) and urbanization (urban, rural).
Implicit Stratification:	Implicit stratification was organised by region (8) and Founder (Public, Other).

School Participation Status						
Explicit Strata	----- Participating Schools -----					Non-participating schools
	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	
Elementary school - Urban	90	0	83	4	3	0
Elementary school - Rural	65	0	60	4	1	0
Grammar school - Urban	45	5	27	10	1	2
Total	200	5	170	18	5	2

Data sources

Institut of Informations and Prognosis in Education, Bratislava. This institution is part of Ministry of Education. <http://www.uips.sk/>

Spain

In Spain, the education system is the responsibility of each individual autonomous community. There are eighteen autonomous communities in total. The ISCED Level 2 education consists of four grades, from 1st Compulsory Secondary to 4th Compulsory Secondary.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		7,322	241,177
Exclusions:	Small schools with less than 4 ISCED Level 2 teachers	58	113
Survey Population		7,264	241,064
Coverage after Exclusions (%)		99.2%	100.0%

Note: The reported number of teachers covers both ISCED levels 2 and 3 teachers. NPM reports that 85% of those teachers are ISCED Level 2.

Sample design

Sample allocation:	Proportional to the number of ISCED level 2 teachers, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Count of ISCED level 2 and 3 teachers.
Explicit Stratification:	Explicit stratification was organised by Autonomous Community (18).
Implicit Stratification:	Implicit stratification was organised by school type (Public, Private) and urbanization (Rural, Urban). In the Basque country, language (3) was also used.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
Andalusia	39	1	36	0	0	2
Aragon	5	0	5	0	0	0
Asturias	4	0	4	0	0	0
Balearic Islands	5	0	5	0	0	0
Basque Country	11	1	8	1	0	1
Canary Islands	8	0	8	0	0	0
Cantabria	4	0	4	0	0	0
Castile La Mancha	9	0	9	0	0	0
Castile and Leon	11	0	11	0	0	0
Catalonia	31	0	30	0	0	1
Ceuta and Melilla	4	0	4	0	0	0
Extremadura	5	0	5	0	0	0
Galicia	11	0	10	0	0	1
La Rioja	3	0	3	0	0	0
Madrid	21	0	21	0	0	0
Murcia	6	0	6	0	0	0
Navarra	4	0	4	0	0	0
Valencia	19	0	18	0	0	1
Total	200	2	191	1	0	6

Data sources

The school sampling frame was created using data provided by the eighteen autonomous communities, from school year 2011-2012.

Sweden

In Sweden, compulsory education includes 9 years, from the age of 7. The ISCED Level 2 education covers grades 7 to 9.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 Students
Target Population		1,731	301,907
Exclusions:	Small Schools with less than 6 students in the target grades	71	228
Survey Population		1,660	301,679
Coverage after Exclusions (%)		95.9%	99.9%

Note: The number of ISCED Level 2 teachers is not available. The table provides counts of ISCED Level 2 students instead.

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 students.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size.
Measure of size:	Count of ISCED Level 2 students in school.
Explicit Stratification:	Explicit stratification was organised by school Type (Public, Private)
Implicit Stratification:	Implicit stratification was organised by geographical area based on first two digits of postal code (98)

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Public	171	6	155	3	1	6
Private	29	1	25	2	0	1
Total	200	7	180	5	1	7

Data sources

The school sampling frame was developed using the Swedish national school statistics, for school year 2010-2011.

United States

In the United States, the ISCED Level 2 corresponds to grades 7, 8, and 9. These three grades will be found in schools of varying grade configurations, e.g., Kindergarten to Grade 8 schools; Grade 6 to Grade 8 schools; Grade 9 to Grade 12 schools; Kindergarten to grade 12 schools; or Grade 7 to Grade 9 schools. Thus, ISCED Level 2 teachers are found in junior high/middle schools and high schools (which often include Grade 9).

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		68,030	815,840
Exclusions:	Schools with less than 3 ISCED level 2 teachers . Weighted estimate from PSS used for small private schools	23,050	26,426
	Private schools who did not participate in the Private School Survey (Weighted estimates from PSS used)	744	6,276
Survey Population		44,236	783,138
Coverage after Exclusions (%)		65.0%	96.0%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 teachers, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 201 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size.
Measure of size:	Count of ISCED level 2 teachers.
Explicit Stratification:	Explicit stratification was organised by school funding (Public, Private) and grade structure (middle, junior, high, other)
Implicit Stratification:	Implicit stratification was organised by region (4), urbanicity (4), percent of total students in all minority groups and school size.
Note:	The data from the United States is located below the line in selected tables in this report and is not included in the calculations for the international average. This is because the United States did not meet the international standards for participation rates, as shown in the table below. As mentioned previously, to maintain a minimum level of reliability, the TALIS Technical Standards require at least 75% of schools (after replacement) and at least 75% of teachers within the selected schools must participate in the survey. However, participation rates for the United State were deemed sufficiently high to report the United States. data independently.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Pub - Mid, JH	71	0	36	8	6	21
Pub - HS	49	1	18	7	4	19
Pub - Other	63	2	21	5	8	27
Priv - Mid, JH, HS	4	0	0	2	0	2
Priv - Other	14	0	3	4	0	7
Total	201	3	78	26	18	76

Data sources

The Common Core of Data (CCD) is a universe survey covering all public schools in the United States. The Private School Survey (PSS) is a census of private schools in the United States; the target population for PSS is all private schools who participated in the survey. Schools that did not take part in the survey are treated as exclusion.

Abu Dhabi (United Arab Emirates)

In Abu Dhabi, the ISCED Level 2 education corresponds to Grade 6 to Grade 9.

Coverage and exclusions		ISCED Level 2 Schools	# of students in schools
Target Population		268	86,726
Exclusions:	Very small school	1	9
Survey Population		267	86,717
Coverage after Exclusions (%)		99.6%	100.0%

The number of ISCED Level 2 teachers is not available. The total number of students is shown in the table above.

Sample design

Sample allocation: Disproportional allocation of schools according to the type (ISCED 2 only and ISCED 2 and 3 schools) to have enough sampled schools for both ISCED 2 and ISCED 3 studies.

Sample sizes: 10 schools selected for the Field Trial and 200 schools selected for the Main Survey.

Method of sample selection: Systematic with equal probability sampling.

Measure of size: Not applicable.

Explicit Stratification: Explicit stratification was organised by school level (ISCED 2 only schools and ISCED 2 and 3 schools).

Implicit Stratification: Implicit stratification was organised by school gender (boys, girls, co-edu) and by school type (private, public).

School Participation Status						
			----- Participating Schools -----			
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non- participating schools
ISCED 2 and 3	114	11	90	0	0	13
ISCED 2 only	86	3	76	0	0	7
Total	200	14	166	0	0	20

Data sources

The school sampling frame was developed using the database of all Public and Private Schools in ABU DHABI, from the Abu Dhabi Education Council.

Alberta (Canada)

In Alberta, Canada, the ISCED level 2 education corresponds to grades 7 to 9.

Coverage and exclusions		ISCED Level 2 Schools	ISCED Level 2 students
Target Population		1,174	134,527
Exclusions:	Band-operated schools - these schools operate on First Nations' reserves and are the responsibility of the federal government rather than being the responsibility of Alberta Education	43	2,007
	Very small schools (with fewer than 6 students in Grades 7-9)	173	543
	Federal schools	12	559
Survey Population		946	131,418
Coverage after Exclusions (%)		80.6%	97.7%

Note: No data is available on the number of teachers teaching grades 7-9. Instead, the number of students enrolled in those grades was provided.

Sample design

Sample allocation:	Proportional to the number of ISCED level 2 students, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample.
Measure of size:	Count of ISCED Level 2 students in school.
Explicit Stratification:	Explicit stratification was organised by type of school authority (Public, Separate, Francophone, Charter, Private)
Implicit Stratification:	Implicit stratification was organised by urbanization indicator (Urban core, Urban fringe, Rural fringe, Urban area outside CMAs/CAs, Rural area outside CMAs/CAs).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Charter	4	0	4	0	0	0
Francophone	4	0	4	0	0	0
Private	9	0	6	1	1	1
Public	135	4	96	17	8	10
Separate	48	2	38	5	2	1
Total	200	6	148	23	11	12

Data sources

The school sampling frame was developed using the Alberta Education's Corporate Data Warehouse, from the 2010-2011 school year.

England (United Kingdom)

In England, the ISCED level 2 education corresponds to years 7, 8 and 9. Generally, pupils are taught in secondary schools which fully cover ISCED level 2 and 3 grades, with many additionally providing post-secondary education. Around 14% of schools in scope also cover ISCED level 1, particularly in the private sector. In 14% of the in-scope schools, the ISCED level 2 is only partially covered, meaning that at least one grade (year group) is not present. Some schools, around 10% of those in scope, partially cover level 2 alongside ISCED level 1. In 4% of schools ISCED level 2 is partially covered alongside ISCED level 3.

Coverage and exclusions		ISCED Level 2 Schools	ISCED Level 2 Students
Target Population		4,347	1,773,534
Exclusions:	Very small schools (<4 teachers in total)	3	12
	Very small private schools (<=10 ISCED level 2 pupils or <5 teachers and <=50 pupils in total)	49	324
	International schools (non-english & independent)	19	3,190
Survey Population		4,276	1,770,008
Coverage after Exclusions (%)		98.4%	99.8%

Note: The counts of ISCED level 2 teachers are not available. The number of ISCED level 2 students are provided.

Sample design

Sample allocation:	Proportional to the number of ISCED 2 students, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 205 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size.
Measure of size:	Number of ISCED Level 2 students in school
Explicit Stratification:	Explicit stratification was as organised by school funding (State Funded or Privately Funded) and size of school (small, not small) and geographical regions (4) for state funded schools.
Implicit Stratification:	Implicit stratification was organised by mean level of pupil achievement (3 levels using PriorBand and KS4B), only for not small school strata.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non-participating schools
			Sampled schools	1st replacement	2nd replacement	
06. State, Small, All regions, All bands	4	0	1	1	0	2
07. State, Not Small, North, High	14	0	9	1	1	3
08. State, Not Small, North, Middle	23	0	16	3	0	4
09. State, Not Small, North, Low	16	0	9	1	1	5
10. State, Not Small, Midlands, High	9	0	6	1	0	2
11. State, Not Small, Midlands, Middle	17	0	11	0	4	2
12. State, Not Small, Midlands, Low	11	0	6	4	0	1
13. State, Not Small, London, High	7	0	2	2	0	3
14. State, Not Small, London, Middle	11	0	6	0	0	5
15. State, Not Small, London, Low	8	0	3	1	0	4
16. State, Not Small, South, High	19	0	10	2	2	5
17. State, Not Small, South, Middle	31	0	21	3	2	5
18. State, Not Small, South, Low	18	0	7	7	1	3
01. Private, small	4	0	2	0	0	2
02. Private, not small	13	0	6	1	1	5
Total	205	0	115	27	12	51

Data sources

The list of schools was provided by the Department for Education Schools Database (SCDB). Data on the number of teachers and pupils in private schools is sourced from the School Level Annual Census (SLASC). Data on the numbers and characteristics of pupils attending state schools is sourced from the School Census (SC), school year 2010/2011.

Flanders (Belgium)

In Belgium (Flanders), the ISCED Level 2 education corresponds to the first stage of secondary education and is composed of grades 7 and 8. In the first stage, there are two streams called A and B.

Coverage and exclusions		ISCED Level 2 Schools	# of ISCED Level 2 teachers
Target Population		726	19,557
Exclusions:	School that cannot be classified on the basis of the explicit stratification variable (specific case)	1	22
	Schools with fewer than 5 teachers	5	13
Survey Population		720	19,522
Coverage after Exclusions (%)		99.2%	99.8%

Sample design

Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size.
Measure of size:	Count of ISCED 2 teachers.
Explicit Stratification:	Explicit stratification was organised by educational networks. There are 3 educational networks in Flanders: community-run education subsidised publicly-run education and subsidised privately-run education, for a total of 3 explicit strata.
Implicit Stratification:	No implicit variable used.
Data sources:	School sampling frame taken from the Administrative database from the Flemish Ministry for Education and Training, from school year 2011/2012.
Note:	The ISCED2 sampling was done based on "administrative units" rather than on schools; users should therefore be careful when comparing "school level" estimates.

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Participating Schools			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Com. Ed.	60	0	38	10	3	9
Sub. pri	100	0	69	13	5	13
Sub. Pub	40	0	29	1	0	10
Total	200	0	136	24	8	32

Data sources

When more than one administrative unit (sampling unit) for the same school (same teachers), teachers are counted in the administrative unit where their paid duty is highest (In case of an equal distribution (e.g.. 50% in school a and 50% in school b).

Annex E: Characteristics of national samples ISCED 1

Australia

In Australia, the education system is the responsibility of each individual state or territory. The ISCED Level 3 education includes teachers teaching in Years 11 and 12 (Senior Secondary).

Coverage and exclusions			
		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		2,346	39,837
Exclusions:	Non-mainstream schools' including Alternative Curriculum, correctional, Distance Education, Hospital, Koorie Pathways school, Language School, Mature Age, Non-English Curriculum, and Special School	86	387
	Mainstream schools' in very remote area	87	329
Total Exclusions		173	716
Survey Population		2,173	39,121
Coverage after Exclusions (%)		92.6%	98.2%

Note 1: Adult Education Schools should be listed as out-of-scope but no breakdown from country is available.

Note 2: Number of ISCED 3 teachers is an estimate based on the students /teachers ratio.

Sample design

Sample allocation:	Proportional to the number of schools, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 156 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample and the ISCED 2 sample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample or in the ISCED 2 sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Number of ISCED Level 3 teachers in school estimated using student teacher ratios by State and Sector.
Explicit Stratification:	Explicit stratification was organised by state (6) and territory (2) and by sector (Catholic, Government or Independent) in larger states, for a total of 17 explicit strata.
Implicit Stratification:	Implicit stratification was organised by sector (3) in smaller states, by geographic location (7) and Quintiles of Index of Socio-Economic Advantage (5)

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
ACT - All Type	4	0	2	0	2	0
NSW - Catholic	10	0	8	0	1	1
NSW - Government	26	0	13	8	0	5
NSW - Independen	8	0	5	1	0	2
VIC - Catholic	8	0	7	1	0	0
VIC - Government	22	0	12	3	1	6
VIC - Independen	9	0	5	3	0	1
QLD - Catholic	6	0	4	0	2	0
QLD - Government	19	0	14	2	0	3
QLD - Independen	7	0	2	2	1	2
SA - Cat.+Ind.	5	0	5	0	0	0
SA - Government	8	1	2	2	0	3
WA - Catholic	4	0	2	0	0	2

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
WA - Government	9	0	3	3	0	3
WA - Independen	4	0	3	1	0	0
TAS - All Type	4	1	3	0	0	0
NT - All Type	3	1	1	0	0	1
Total	156	3	91	26	7	29

Data sources

School sampling frame was developed by Australian Council for Educational Research (ACER) by coordinating information from multiple sources including the Australian Bureau of Statistics (ABS) and commonwealth, state, territory education department databases, from school year 2010.

Denmark

In Denmark, the ISCED Level 3 education consists of grades 2 and 3 (a few grade 4) for the Academic track: 2-3 grades (a few 4). Vocational track: No grades. An introductory course of variable length, typical 6 months, followed by practice in a company. Then various school courses later. Total length of education is 2 to 4 years.

Coverage and exclusions			
		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		345	22,000
Exclusions:	Small schools	2	Unknown
Total Exclusions		2	Unknown
Survey Population		343	22,000
Coverage after Exclusions (%)		99.4%	100.0%

The number of ISCED level 3 teachers is not available at the school level.

Sample design

Sample allocation:	Proportional to the number of ISCED level 3 students.
Sample sizes:	20 schools selected for the Field Trial and 150 schools selected for the Main Survey.
Method of sample selection:	Systematic random sample.
Measure of size:	Count of ISCED Level 3 students.
Explicit Stratification:	Explicit stratification was organised by educational type (Academic stream (1 level) + Vocational stream (four levels).
Implicit Stratification:	Implicit stratification was organised by urbanisation (5).

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
Vocational, mercantile	20	0	13	2	0	5
Vocational, agriculture	4	0	2	1	0	1
Vocational, technical	34	2	22	0	0	10
Vocational, health care	11	1	5	2	0	3
Academic, all tracks	81	0	52	11	3	15
Total	150	3	94	16	3	34

Data sources

The school sampling frame was developed using data collected by UNI-C and Statistics Denmark annually from all schools at the beginning of each school year. The data used was from school year 2010-2011.

Finland

In Finland, the ISCED level 3 education corresponds to grades 11 to 13.

Coverage and exclusions			
		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		620	Unknown
Exclusions:	International/foreign/immersion schools, where all students are taught in languages other than Finnish or Swedish	5	
Total Exclusions		5	Unknown
Survey Population		615	Unknown
Coverage after Exclusions (%)		99.2%	Unknown

Sample design

Sample allocation:	Proportional to the number of ISCED level 3 students, then adjusted to have a minimum of 2 schools selected in the smaller stratum.
Sample sizes:	13 schools selected for the Field Trial and 150 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000). The ISCED level 3 sample was selected simultaneously with the ISCED Level 2 sample.
Measure of size:	Count of ISCED level 3 students.
Explicit Stratification:	Explicit stratification was organised by school type and by region. The ISCED 3 only schools were split into 5 regions (South, West, East, North, Swedish speaking area) and the ISCED 2 and 3 schools were split into 2 regions (All but Swedish, Swedish speaking area).
Implicit Stratification:	Implicit stratification was organised by urbanisation (Urban, Rural).

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	Participating Schools		Non-participating schools
				1st replacement	2nd replacement	
ISCED3 only - Southern Finland	60	0	55	2	1	2
ISCED3 only - Western Finland	34	0	31	1	0	2
ISCED3 only - Eastern Finland	19	0	18	1	0	0
ISCED3 only - Northern Finland	20	0	19	0	1	0
ISCED3 only - Swedish speaking area	12	0	11	0	0	1
ISCED 2and3 - All but Swedish	5	0	4	0	0	1
ISCED 2and3 - Swedish speaking area	2	0	2	0	0	0
Total	152	0	140	4	2	6

Data sources

The school sampling frame was developed using the school registrations from Statistics Finland, from school year 2010-2011.

Iceland

In Iceland, the ISCED 3 level comprises two types of school. In some schools, pupils are part of the same class for 4 consecutive years, culminating with the Stúdentspróf (giving rights to enter university). In the other type of school, pupils accumulate a certain number of credits, leading also to the Stúdentspróf, but can achieve this not necessarily remaining in the same class (or not even same school). Their ISCED Level 3 studies can consist of different blends of vocational and academic subjects.

Coverage and exclusions			
		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		31	1,774
Total Exclusions		0	0
Survey Population		31	1,774
Coverage after Exclusions (%)		100.0%	100.0%

Note: Number of ISCED Level 3 schools was provided at the home page of the Ministry of Education: <http://www.menntamalaraduneyti.is/stofnanir/>

Sample design

Sample allocation:	Not applicable.
Sample sizes:	Convenience sample of 12 larger schools selected for the Field Trial and all schools selected for the Main Survey.
Method of sample selection:	Not applicable.
Measure of size:	Not applicable.
Explicit Stratification:	Not applicable.
Implicit Stratification:	Not applicable.

School Participation Status						
Explicit Strata	----- Participating Schools -----					Non-participating schools
	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	
All	31	0	29	0	0	2
Total	31	0	29	0	0	2

Data sources

The school sampling frame was provided by Námsmatsstofnun, Educational Testing Institute, Iceland. It is the institute in charge of administering the national examination at the end of ISCED 2 education.

Italy

In Italy, the ISCED Level 3 education corresponds to the upper secondary schooling. There are state and non state ISCED level 3 schools, consisting of public schools managed by Central Government, public schools managed by Local Government (only in two regions) and private schools.

Coverage and exclusions			
		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		6,982	260,788
Exclusions:	Special schools	15	232
	Schools with no more than 3 teachers	175	344
	Schools in remote geographical areas	19	332
	Schools annexed to other institutions (i.e. academy of music, school of art, etc. For these schools, principals are not comparable to the other ones);	36	840
Total Exclusions		245	1,748
Survey Population		6,737	259,040
Coverage after Exclusions (%)		96.5%	99.3%

Sample design

Sample allocation:	Disproportional to have a sample of 100 academic schools.
Sample sizes:	20 schools selected for the Field Trial and 218 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size.
Measure of size:	Count of ISCED 3 teachers in school.
Explicit Stratification:	Explicit stratification was organised by territorial division (North Italy; Central Italy; South and Insular Italy) and school type (academic, vocational).
Implicit Stratification:	Implicit stratification was organised by the school program (Liceo education, Vocational Institute, Vocational Institute, Arts Institute) and school funding (public, private).

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
North Italy - Academic	37	0	32	3	2	0
North Italy - Vocational	47	0	40	5	1	1
Central Italy - Academic	21	0	12	6	1	2
Central Italy - Vocational	21	0	12	5	3	1
South and Insular Italy - Academic	42	0	31	8	1	2
South and Insular Italy - Vocational	50	1	35	12	1	1
Total	218	1	162	39	9	7

Data sources

The school sampling frame was developed using administrative school lists from the Ministry of education.

Mexico

In Mexico, the ISCED Level 3 is compulsory and corresponds to upper secondary education (called Bachillerato). It comprises grades 10 to 12.

Following discussions held among OECD, Mexico and Statistics Canada, it was decided that teachers teaching in Telebachillerato schools don't meet the TALIS definition of an ISCED Level 3 teacher. These schools and their teachers are classified as out of scope for TALIS.

Coverage and exclusions		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		12,209	274,506
Exclusions:	No exclusions	0	0
Total Exclusions		0	0
Survey Population		12,209	274,506
Coverage after Exclusions (%)		100.0%	100.0%

Note: Schools from Oaxaca state were excluded after sampling. The schools were temporarily closed during data collection due to a teacher's union strike.

Sample design

Target Population:	Following discussions held among OECD, Mexico and Statistics Canada, it was decided that teachers teaching in Telebachillerato schools don't meet the TALIS definition of an ISCED Level 3 teacher. These schools and their teachers are classified as out of scope for TALIS.
Sample allocation:	Proportional to the number of ISCED level 3 teachers.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to school size with overlap control with the PISALINK subsample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the PISALINK sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).
Measure of size:	Count of ISCED Level 3 teachers.
Explicit Stratification:	Explicit stratification was organised by school type (General, tecnico, tecnologico) and funding (public, private)
Note:	In the ISCED 3 sample, six (6) schools were rejected because unapproved teacher sampling procedures.

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
GENERAL - PUBLICO	74	0	69	0	0	5
GENERAL - PRIVADO	51	1	45	2	1	2
TECNICO - PUBLICO	16	0	15	1	0	0
TECNICO - PRIVADO	5	0	4	1	0	0
TECNOLOGICO - PUBLICO	44	0	42	1	0	1
TECNOLOGICO - PRIVADO	9	0	9	0	0	0
Total	199	1	184	5	1	8

Data sources

Implicit stratification was organised by state (32) and urbanisation (urban, rural).

Norway

In Norway, the ISCED Level 3 corresponds to the upper secondary education and covers grades 11th through 13th. / General: 3 years in school / Vocational A: 2 years in school plus 2 years apprenticeship / Vocational B: 3 years in school.

Coverage and exclusions			
		ISCED Level 3 Schools	ISCED Level 3 teachers
Target Population		421	24,910
Total Exclusions		0	0
Survey Population		421	24,910
Coverage after Exclusions (%)		100.0%	100.0%

Sample design

Sample allocation:	Proportional to the number of ISCED Level 3 students.
Sample sizes:	20 schools selected for the Field Trial and 150 schools selected for the Main Survey.
Method of sample selection:	Systematic random sampling.
Measure of size:	Count of ISCED Level 3 students.
Explicit Stratification:	Explicit stratification was organised by school type (general, vocational, combined).
Implicit Stratification:	Implicit stratification was organised by geographical region (3) and funding (public and private).

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non- participating schools
General	13	1	5	0	1	6
Combined	116	2	65	15	5	29
Vocational	21	1	10	2	3	5
Total	150	4	80	17	9	40

Data sources

A school data file is aggregated from a student file containing all level 3 students as of October 2010.

Poland

In Poland the ISCED Level 3 education corresponds to grades 10 to 12(13) in Upper Secondary, Specialized Secondary, Technical Schools, Basic Vocational Schools and Supplementary Technical Secondary Schools.

Coverage and exclusions		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		6,952	210,806
Total Exclusions		0	0
Survey Population		6,952	210,806
Coverage after Exclusions (%)		100.0%	100.0%

Note: The total number of ISCED Level 3 teachers had to be estimated using data from last year's database, because as of October 30th 2011 not all of the schools have sent the data about their teachers. MOS is the number of students as of October 30th 2011.

Sample design

Sample allocation:	Proportional to the number of ISCED Level 2 students, then adjusted to have a minimum of 4 schools selected in the smaller strata.
Sample sizes:	20 schools selected for the Field Trial and 200 schools selected for the Main Survey.
Method of sample selection:	Systematic sample proportional to size.
Measure of size:	Count of ISCED Level 3 students.
Explicit Stratification:	Explicit stratification was organised by type of funding (public, non public) and urbanization (urban, rural) within public stratum. A special stratum was created for schools with no information.
Implicit Stratification:	Implicit stratification was organised by urbanization (urban, rural) within non public stratum and by type of school (upper secondary general, Technical, Vocational, Specialized)

School Participation Status						
Explicit Strata	Total sampled schools	Ineligible schools	----- Participating Schools -----			Non- participating schools
			Sampled schools	1st replacement	2nd replacement	
Public - Urban	177	2	132	15	3	25
Public - Rural	11	0	7	1	0	3
Non-public - All	6	0	4	0	0	2
Missing mos - Missing mos	6	6	0	0	0	0
Total	200	8	143	16	3	30

Data sources

The school sampling frame was developed using the Educational Information System – EIS (System Informacji Oświatowej) which is a complex database created by Polish Ministry of Education. Its legal purpose is to collect data reported by educational institutions in Poland. The data is for school year 2011-2012.

Singapore

In Singapore, the ISCED Level 3 education consists of the Upper Secondary and covers Grade 9 and Grade 10.

Coverage and exclusions			
		ISCED Level 3 Schools	# of ISCED Level 3 teachers
Target Population		198	13,009
Exclusions:	Non participating private schools (27 out of 32; includes 4 schools with unknown measure of size)	27	588
Total Exclusions		27	588
Survey Population		171	12,421
Coverage after Exclusions (%)		86.4%	95.5%

Sample design

Sample allocation: Not applicable

Sample sizes: 10 largest schools selected for the Field Trial. All schools selected for the Main Survey, with the exception of 13 smaller schools randomly assigned to survey either ISCED 2 and PISALINK teachers or ISCED 3 and PISALINK teachers.

Method of sample selection: Not applicable

Measure of size: Not applicable.

Explicit Stratification: Not applicable.

Implicit Stratification: Not applicable.

Note: The ISCED 2 and ISCED 3 coverage falls below 95% after the exclusion of 27 private schools.

School Participation Status						
			----- Participating Schools -----			
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
Public	159	0	159	0	0	0
Total	159	0	159	0	0	0

Data sources

Ministry of Education database and direct information from private schools. School Year 2011.

UAE (Abu Dhabi)

In Abu Dhabi, the ISCED Level 3 education corresponds to Grade 10 to Grade 12.

Coverage and exclusions		ISCED Level 3 Schools	Total number of students
Target Population		214	54,999
Exclusions:	Very small schools	2	13
Total Exclusions		2	13
Survey Population		212	54,986
Coverage after Exclusions (%)		99.1%	100.0%

The number of ISCED Level 3 teachers is not available. The total number of students is provided instead in the table above.

Sample design

Sample allocation: Disproportional allocation of schools according to the type (ISCED 2 only and ISCED 2 and 3 schools) to have enough sampled schools for both ISCED 2 and ISCED 3 studies.

Sample sizes: 10 schools selected for the Field Trial and 200 schools selected for the Main Survey.

Method of sample selection: Systematic sampling with overlap control with the ISCED 2 sample. The sample overlap control method used minimizes the probability of selecting schools already sampled in the ISCED 2 sample. The approach used to minimize the overlap was developed by Chowdhury, S., Chu, A., & Kaufman, S. (2000).

Measure of size: Not applicable.

Explicit Stratification: Explicit stratification was organised by school level (ISCED 3 only schools and ISCED 2 and 3 schools).

Implicit Stratification: Implicit stratification was organised by school gender (boys, girls, co-edu) and by school type (private, public).

School Participation Status						
----- Participating Schools -----						
Explicit Strata	Total sampled schools	Ineligible schools	Sampled schools	1st replacement	2nd replacement	Non-participating schools
ISCED 2 and 3	167	13	134	0	0	20
ISCED 3 only	33	0	31	0	0	2
Total	200	13	165	0	0	22

Data sources

The school sampling frame was developed using the database of all Public and Private Schools in Abu Dhabi, from the Abu Dhabi Education Council.

ANNEX F: Teacher Listing and Tracking forms

Figure 5.11 TALIS 2013 MS

TALIS 2013 MS [ISCED LEVEL2] Teacher Tracking Form							
TALIS Country/Region							
School Name							
School ID							
①	②	②	③	④	⑤	⑥	⑦
Teacher Name	Teacher ID	Teacher ID	Year Of Birth	Gender	Main Subject Domain for [ISCED Level 2] Classes	Teacher Questionnaire Mode	Teacher Questionnaire Return Status

③ Year of Birth: YYYY

④ Gender:

1 = Female; 2 = Male; 9 = Not specified

⑤ Main Subject Domain when teaching classes [at ISCED Level 1]:

1 = Language (mother tongue, foreign language) ; 2 = Human Sciences (History, Geography, Civics, Economics...);

3 = Mathematics & Science (Physics, Chemistry, Geology, Biology...); 4 = Other (Music, Art, Religion, Physical Education, Home Economics...); 9 = Not specified

⑥ Teacher Questionnaire Mode:

1 = Online; 2 = Paper

⑦ Teacher Questionnaire Return Status:

1 = Returned (paper); 2 = Returned (online); 3 = Not returned; 4 = Left school permanently; 5 = Teacher should have been Out-of-Scope; 6 = Teacher should have been exempted

Figure 5.12 TALIS 2013 MS(ISCED LEVEL 2) TEACHER TRAKING FORM

TALIS 2013 MS [ISCED LEVEL2] Teacher Tracking Form							
TALIS Country/Region							
School Name							
School ID							
1	2	2	3	4	5	6	7
Teacher Name	Teacher ID	Teacher ID	Year Of Birth	Gender	Main Subject Domain for [ISCED Level 2] Classes	Teacher Questionnaire Mode	Teacher Questionnaire Return Status

③ Year of Birth: YYYY

④ Gender:

1 = Female; 2 = Male; 9 = Not specified

⑤ Main Subject Domain when teaching classes [at ISCED Level 1]:

1 = Language (mother tongue, foreign language) ; 2 = Human Sciences (History, Geography, Civics, Economics...);

3 = Mathematics & Science (Physics, Chemistry, Geology, Biology...); 4 = Other (Music, Art, Religion, Physical Education, Home Economics...); 9 = Not specified

⑥ Teacher Questionnaire Mode:

1 = Online; 2 = Paper

⑦ Teacher Questionnaire Return Status:

1 = Returned (paper); 2 = Returned (online); 3 = Not returned; 4 = Left school permanently; 5 = Teacher should have been Out-of-Scope; 6 = Teacher should have been exempted

ANNEX G: Participation and Estimated Size of Teachers Populations

Table 9.6 Participation and estimated size of teacher population, ISCED Level 1 , by participating country, 2013

	Number of participating schools	Responding teachers in participating schools	School Participation before Replacement (%)	School Participation After Replacement (%)	Teacher Participation in Participating Schools (%)	Overall Participation (%)	Weighted estimated size of teacher population
Denmark	161	2 088	51.8	81.7	78.9	64.5	35 946
Finland	193	2 922	89.2	99.5	92.6	92.2	25 425
Mexico	183	1 291	94.8	95.8	95.5	91.5	458 616
Norway	144	2 450	52.4	75.4	84.9	64.0	42 459
Poland	169	3 151	77.8	87.1	98.0	85.4	211 617
Sub-national entities							
Flanders (Belgium)	198	2 681	52.1	82.5	91.0	75.1	29 149

Table 9.7 Participation and estimated size of teacher population, ISCED Level 2 , by participating country, 2013

	Number of participating schools	Responding teachers in participating schools	School participation before replacement (%)	School participation after replacement (%)	Teacher participation in participating schools (%)	Overall participation (%)	Weighted estimated size of teacher population
Australia	123	2 059	57.9	80.9	86.8	70.2	106 225
Brazil	1 070	14 000	96.8	97.4	93.7	91.3	594 874
Bulgaria	197	2 975	94.5	99.0	97.4	96.4	26 501
Chile	178	1 676	88.2	91.3	93.0	84.9	51 632
Croatia	199	3 675	98.5	99.0	95.6	94.6	16 714
Cyprus	98	1 867	99.0	99.0	95.4	95.4	3 754
Czech Republic	220	3 219	99.1	100	98.3	98.3	37 419
Denmark	148	1 649	53.0	80.9	77.0	62.3	25 125
Estonia	197	3 129	93.4	100	98.8	98.8	7 728
Finland	146	2 739	90.5	98.6	91.3	90.1	18 386
France	204	3 002	78.8	81.6	75.2	61.4	198 232
Iceland	129	1 430	94.9	94.9	79.9	75.8	1 901
Israel	195	3 403	98.0	98.0	86.4	84.7	33 065

Table 9.7 Participation and estimated size of teacher population, ISCED Level 2 , by participating country, 2013
(continued)

Italy	194	3 337	76.3	98.0	89.5	87.7	178 382
Japan	192	3 484	88.0	96.0	99.2	95.2	222 809
Korea	177	2 933	68.3	88.9	88.1	78.3	85 184
Latvia	116	2 126	76.6	80.0	96.1	76.9	12 894
Malaysia	150	2 984	74.5	75.0	96.9	72.7	92 735
Mexico	187	3 138	95.4	96.4	90.5	87.3	250 831
Netherlands	127	1 912	53.8	81.4	75.2	61.2	58 190
Norway	145	2 981	56.1	73.2	79.6	58.3	22 631
Poland	195	3 858	82.7	99.5	97.0	96.5	132 502
Portugal	192	3 808	94.4	97.0	91.7	88.9	44 494
Romania	197	3 286	99.5	100	98.1	98.1	68 810
Serbia	191	3 857	79.5	95.5	96.6	92.3	23 179
Singapore	163	3 174	100	100	98.8	98.8	9 732
Slovak Republic	193	3 493	87.2	99.0	96.4	95.4	27 163
Spain	192	3 339	96.5	97.0	90.5	87.8	204 508
Sweden	186	3 319	93.3	96.4	86.6	83.5	30 043
United States	122	1 926	39.4	61.6	83.3	51.4	1 052 144
Sub-national entities							
Abu Dhabi (United Arab Emirates)	166	2 433	89.2	89.2	83.3	74.3	7 919
Alberta (Canada)	182	1 773	76.3	93.8	93.0	87.3	10 208
England (United Kingdom)	154	2 496	56.1	75.1	83.4	62.7	216 131
Flanders (Belgium)	168	3 129	68.0	84.0	89.3	75.1	19 184

Table 9.8 Participation and estimated size of teacher population, ISCED Level 3 by participating country, 2013

	Number of participating schools	Responding teachers in participating schools	School participation before replacement (%)	School participation after replacement (%)	Teacher participation in participating schools (%)	Overall participation (%)	Weighted estimated size of teacher population
Australia	124	1 982	59.5	81.0	83.9	68.0	76 666
Denmark	113	1 514	63.9	76.9	75.1	57.7	19 914
Finland	146	2 412	92.1	96.1	90.1	86.5	22 527
Iceland	29	1 104	93.5	93.5	78.2	73.2	1 504
Italy	210	3 659	74.7	96.8	89.2	86.3	273 498
Mexico	190	2 940	92.9	96.0	91.4	87.7	232 835
Norway	106	2 658	54.8	72.6	72.6	52.7	22 727
Poland	162	3 289	74.5	84.4	96.1	81.1	174 108
Singapore	163	3 201	100	100	99.0	99.0	12 235
Sub-national entities							
Abu Dhabi (United Arab Emirates)	165	2 472	88.2	88.2	80.3	70.9	6 414

Table 9.9 Participation and estimated size of teacher population TALIS – PISA link, by participating country, 2013

	Number of participating schools	Responding teachers in participating schools	School participation before replacement (%)	School participation after replacement (%)	Teacher participation in participating schools (%)	Overall participation (%)	Weighted estimated size of teacher population
Australia	122	2 719	57.7	81.9	84.2	68.9	85 750
Finland	147	3 326	96.7	98.0	93.6	91.8	18 254
Latvia	118	2 123	82.0	84.9	96.7	82.1	10 228
Mexico	152	2 167	96.7	99.3	90.4	89.9	378 222
Portugal	143	3 190	94.7	94.7	93.3	88.4	51 532
Romania	147	3 275	98.0	98.0	98.4	96.4	86 051
Singapore	166	4 130	100	100	99.1	99.1	12 052
Spain	310	6 130	99.0	99.0	92.8	91.9	173 216

ANNEX H: Questionnaires



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(105 x 35 mm)

Organisation for Economic Co-operation and Development (OECD)
Teaching and Learning International Survey (TALIS) 2013

Mathematics Teacher Module

PISA Schools

Main Study Version

[International English, UK Spelling]

[National Project Information]

International Project Consortium:

International Association for the Evaluation of Educational Achievement (IEA), The Netherlands
IEA Data Processing and Research Center (IEA DPC), Germany
Statistics Canada, Canada

About the TALIS 2013 Mathematics Teacher Module

The primary subject area for PISA 2012 (OECD Programme for International Student Assessment) is mathematics and it would be helpful to have background information on mathematics teaching and learning for countries that participated in PISA 2012. You were asked to complete the TALIS survey and, as a mathematics teacher, we are asking you for additional information about your mathematics <classes> and the general focus of mathematics instruction in your school. PISA was administered to 15-year-old students and thus, for the purposes of this survey, we ask you to think about teaching students of this age.

As was the case with the main TALIS questionnaire, these questions were designed to be used in countries with differing mathematics curricula and educational systems. In cases where you are not sure how to answer, we ask you to take your best guess about what is true for you and the <classes> you teach. Note that the confidentiality promised with the main TALIS questionnaire also applies to this module.

About the Questionnaire

- You should complete this questionnaire module AFTER you have completed the main TALIS Teacher Questionnaire.
- This questionnaire module should take approximately 15-20 minutes to complete.
- Guidelines for answering the questions are typed in italics. Most questions can be answered by marking the one most appropriate answer.
- When you have completed this questionnaire, please [National Return Procedures and Date].

Thank you very much for your participation!

Selecting a <Target Class>

Like the teaching practices section of the TALIS Teacher Questionnaire, most of the questions in this survey focus on one <class> that you teach. The next three questions are designed to select one of your mathematics <classes> so that you can answer the rest of the questions with regard to that <class>.

We are aware that the <class> that is selected here may not represent the breadth of your teaching practices. However, this process allows us to get a picture of the full range of classes that are taught in each country that participates in this survey.

- 1. Please list all mathematics <classes> you teach where some of the students are 15 years old.**

Please list below.

- 2. Which of the <classes> listed in Question [1] has the most 15-year-olds? If you have several classes with almost the same number of 15-year-olds and one of those classes was the one that you identified for Questions [33 to 44] in the main TALIS Teacher Questionnaire, please use that <class> here.**

Please give the name of the <class> that will be referred to as the <target class>.

- 3. Is the <class> you just identified in the previous question the same one that you identified for Questions [33 to 44] in the TALIS Teacher Questionnaire?**

Please mark one choice.

☐₁ Yes

☐₂ No

About the <Target Class>

For the questions below, please respond with respect to the <target class> you specified in Question [2].

4. Which of the following best describes the achievement level of students in the <target class>?

Please mark one choice.

- ☐₁ Mostly high achieving students in mathematics.
- ☐₂ Mostly average students in mathematics.
- ☐₃ Mostly low achieving students in mathematics.
- ☐₄ Approximately equal numbers of high, average, and low achievement students in mathematics.

5. How many times per school week on average does the <target class> meet for a mathematics lesson?

Please write down a whole number. If the number of times changes each week, write the average.

Time(s) per week

6. When you meet with the <target class>, what is the average length of a mathematics lesson?

Please specify the scheduled number of minutes.

Minutes

7. During a typical mathematics lesson, how likely are you to use each of the following strategies in the <target class>?

Please mark one choice in each row.

	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely
a) I lecture or explain a mathematics concept or procedure to the whole class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I go over homework or problem sets with the whole class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I review a previous lesson or lessons with the whole class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I have students work individually.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I have students work in groups.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I have students complete a test or quiz.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) I complete classroom administrative tasks (e.g. recording attendance, handing out school information/forms).	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

8. How often do you assign homework for completion outside of the classroom to the students in the <target class>?

Please mark one choice.

- ☐₁ Never or almost never → **Please go to Question [10]**
- ☐₂ Occasionally
- ☐₃ Frequently
- ☐₄ In all or nearly all lessons

9. About how much time do you expect an average student in the <target class> to work on each homework assignment?

Please mark one choice.

- ☐₁ 15 minutes or less
- ☐₂ 16 to 30 minutes
- ☐₃ 31 to 60 minutes
- ☐₄ More than 60 minutes
- ☐₅ Length of time to complete homework assignments varies a great deal.

10. How often do students in the <target class> have calculators available for use in their mathematics assignments?

Please mark one choice.

- ☐₁ Never or almost never
☐₂ Occasionally
☐₃ Frequently
☐₄ In all or nearly all assignments

11. How often are students in the <target class> allowed to use calculators in tests or quizzes?

Please mark one choice.

- ☐₁ Never or almost never
☐₂ Occasionally
☐₃ Frequently
☐₄ In all or nearly all tests or quizzes

12. Over the course of the school year, how frequently are the following types of ICT (information and communication technology) resources used when teaching the <target class>?

Please mark one choice in each row.

	Never or almost never	Occasionally	Frequently	Always or almost always
a) Drill and practice software	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Topic-specific software (e.g. geometry software)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Spreadsheets or other data analysis software	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Software for assessing student learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Internet resources	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Your Educational Approaches in the <Target Class>

Countries and individuals differ in their educational approaches and a major goal of TALIS is to draw a picture of teachers' opinions and practices in participating countries. We rely on your expertise to describe your opinions and how you teach as accurately as possible.

Your response to most questions is likely to be the same regardless of which of your <classes> you think about, but if the response varies depending on the <class> you teach, please focus on the <target class>.

13. How often do you employ the following teaching practices in the <target class>?

Please mark one choice in each row.

	Never or almost never	Occasionall y	Frequently	In all or nearly all lessons
a) I explicitly state learning goals.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I ask short, fact-based questions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I expect students to explain their thinking on complex problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I give students a choice of problems to solve.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I connect mathematics concepts I teach to uses of those concepts outside of school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I encourage students to solve problems more than one way.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) I require students to provide written explanations of how they solve problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) I require students to work on mathematics projects that take more than a single class period to complete.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) I go over homework problems that students were not able to solve.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) I encourage students to work together to solve problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

14. How much do you agree or disagree with the following goals for and views about teaching mathematics?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) The goal of teaching mathematics is to help students use mathematics to solve real-world problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I want my students to see the structure of the number system and the logic of mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Explaining why an answer is correct is just as important as getting a correct answer.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Even with the availability of calculators and computers, students need to learn traditional methods for doing mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Students should be able to figure out for themselves whether they have solved a mathematics problem correctly.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Students should learn basic skills before being asked to solve complex mathematics problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Asking students to solve difficult problems in class helps them become good problem solvers.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) I'd rather have my students solve a few complex problems than a lot of relatively easy ones.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) An important reason for teaching mathematics is to help students become more logical.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Graphics calculators and computers can be used to help students see mathematics concepts in new and different ways.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) Doing mathematics requires hypothesising, estimating, and creative thinking.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
l) Most things a student needs to know in mathematics can be learned through memorisation.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

15. How much do you agree or disagree with the following statements concerning your ability to teach mathematics?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) I am able to ask questions that get students to think deeply about mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I have a hard time getting students interested in mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I always know which of my students understand and which do not.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I find it hard to meet the needs of the individual students in my mathematics class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I am able to get my students to feel confident in mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I have a hard time getting my students to understand underlying concepts in mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

16. How much do you agree or disagree with each of the following statements about teaching mathematics?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) There is usually a best method for solving a mathematics problem and my job is to make sure students learn that method.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I feel that I can do a better job when I have students with similar ability levels in my class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Grades are a primary motivator for getting students to learn mathematics.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I would like my students to study mathematics because it is an interesting and worthwhile subject rather than only because they want good marks.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) A good mathematics teacher tells students exactly how to do every problem that is presented.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Having students like mathematics is more important than having them learn to solve problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Mathematics teachers in my school have the support of the school administration.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Your Education for Teaching Mathematics

17. Were the following elements included in your mathematics education or training? If yes, was this before or after you took up a position as teacher?

Please mark one choice in each row.

	Before	After	Before and after	Never
a) Mathematics courses equivalent to those needed for a degree in mathematics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Courses on how to teach mathematics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Practice teaching in mathematics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

This is the end of the questionnaire.

Thank you very much for your participation!

Please [National Return Procedures and Date]



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Organisation for Economic Co-operation and Development (OECD)
Teaching and Learning International Survey (TALIS) 2013

Principal Questionnaire

[<ISCED level x> or PISA schools]

Main Study Version

[International English, UK Spelling]

[National Project Information]

International Project Consortium:

International Association for the Evaluation of Educational Achievement (IEA), The Netherlands

IEA Data Processing and Research Center (IEA DPC), Germany

Statistics Canada, Canada

About TALIS 2013

The second Teaching and Learning International Survey (TALIS 2013) is an international survey that offers the opportunity for teachers and principals to provide input into education analysis and policy development. TALIS is being conducted by the Organisation for Economic Co-operation and Development (OECD) and [Name of country], along with more than 30 other countries, is taking part in the survey.

Cross-country analysis of this data will allow countries to identify other countries facing similar challenges and to learn from other policy approaches. School principals and teachers will provide information about issues such as the professional development they have received; their teaching beliefs and practices; the review of teachers' work and the feedback and recognition they receive about their work; and various other workplace issues such as school leadership, and school climate.

Being an international survey, it is possible that some questions do not fit very well within your national context. In these cases, please answer as best as you can.

Confidentiality

All information that is collected in this study will be treated confidentially. While results will be made available by country and by type of school within a country, you are guaranteed that neither you, this school, nor any school personnel will be identified in any report of the results of the study. {Participation in this survey is voluntary and any individual may withdraw at any time.}

About the Questionnaire

- This questionnaire asks for information about school education and policy matters.
- The person who completes this questionnaire should be the principal of this school. If you do not have the information to answer particular questions, please consult other persons in this school.
- This questionnaire should take approximately 30 to 45 minutes to complete.
- <When questions refer to 'this school' we mean by 'school': national school definition.>
- Guidelines for answering the questions are typed in italics. Most questions can be answered by marking the one most appropriate answer.
- When you have completed this questionnaire, please [National Return Procedures and Date].
- When in doubt about any aspect of the questionnaire, or if you would like more information about the questionnaire or the study, you can reach us by using the following contact details: [National centre contact information, phone number and preferably e-mail address]

Thank you very much for your participation!

Personal Background Information

These questions are about you, your education and your position as school principal. In responding to the questions, please mark the appropriate choice(s) or provide figures where necessary.

1. Are you female or male?

☐₁ Female

☐₂ Male

2. How old are you?

Please write a number.

Years

3. What is the highest level of formal education you have completed?

Please mark one choice.

☐₁ <Below ISCED Level 5>

☐₂ <ISCED Level 5B>

☐₃ <ISCED Level 5A>

☐₄ <ISCED Level 6>

4. How many years of work experience do you have?

Please write a number in each row. Write 0 (zero) if none.

Count part of a year as 1 year.

a) Year(s) working as a principal at this school

b) Year(s) working as a principal in total

c) Year(s) working in other school management roles (do not include years working as a principal)

d) Year(s) working as a teacher in total (include any years of teaching)

e) Year(s) working in other jobs

5. What is your current employment status as a principal?*Please mark one choice.*

- ☐₁ Full-time (more than 90% of full-time hours) without teaching obligation
- ☐₂ Full-time (more than 90% of full-time hours) with teaching obligation
- ☐₃ Part-time (less than 90% of full-time hours) without teaching obligation
- ☐₄ Part-time (less than 90% of full-time hours) with teaching obligation

6. Did the formal education you completed include the following and, if yes, was this before or after you took up a position as principal?*Please mark one choice in each row.*

	Before	After	Before and after	Never
a) School administration or principal training programme or course	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Teacher training/education programme or course	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Instructional leadership training or course	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

7. During the last 12 months, did you participate in any of the following professional development activities aimed at you as a principal, and if yes, for how many days?*Professional development is defined as activities that aim to develop an individual's professional skills and knowledge.**Please indicate 'Yes' or 'No' in part (A) for each of the activities listed below. If 'Yes' in part (A), please specify the number of days spent on the activity in part (B).**Please sum up activities in full days (a full day is 6-8 hours). Please include activities taking place during weekends, evenings or other off work hours.*

	(A) Participation		(B) Duration in days
	Yes	No	
a) In a professional network, mentoring or research activity	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
b) In courses, conferences or observational visits	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
c) Other	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

8. How strongly do you agree or disagree that the following present barriers to your participation in professional development?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) I do not have the pre-requisites (e.g. qualifications, experience, seniority).	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Professional development is too expensive/unaffordable.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) There is a lack of employer support.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Professional development conflicts with my work schedule.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I do not have time because of family responsibilities.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) There is no relevant professional development offered.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) There are no incentives for participating in such activities.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

School Background Information

9. Which best describes this school's location?

Please mark one choice.

- ☐₁ [Hamlet or rural area] (1,000 people or fewer)
- ☐₂ [Village] (1,001 to 3,000 people)
- ☐₃ [Small town] (3,001 to 15,000 people)
- ☐₄ [Town] (15,001 to 100,000 people)
- ☐₅ [City] (100,001 to 1,000,000 people)
- ☐₆ [Large city] (more than 1,000,000 people)

10. Is this school publicly- or privately-managed?

Please mark one choice.

- ☐₁ Publicly-managed

This is a school managed by a public education authority, government agency, municipality, or governing board appointed by government or elected by public franchise.

- ☐₂ Privately-managed

This is a school managed by a non-government organisation; e.g. a {church,} trade union, business or other private institution.

11. Thinking about the funding of this school in a typical year, which of the following applies?

Please mark one choice in each row.

- | | Yes | No |
|--|---------------------------------------|---------------------------------------|
| a) 50% or more of the school's funding comes from the <government>.
<i>Includes departments, municipal, local, regional, state and national</i> | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| b) Teaching personnel are funded by the <government>.
<i>Includes departments, municipal, local, regional, state and national</i> | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |

12. For each type of position listed below, please indicate the number of staff (head count) currently working in this school.

Staff may fall into multiple categories.

Please write a number in each row. Write 0 (zero) if there are none.

- a) Teachers, irrespective of the grades/ages they teach
Those whose main professional activity at this school is the provision of instruction to students
- b) Personnel for pedagogical support, irrespective of the grades/ages they support
Including all teacher aides or other non-teaching professionals who provide instruction or support teachers in providing instruction, professional curriculum/instructional specialists, educational media specialists, psychologists {and nurses}
- c) School administrative personnel
Including receptionists, secretaries, and administration assistants
- d) School management personnel
Including principals, assistant principals, and other management staff whose main activity is management
- e) Other staff

13. Are the following <ISCED levels> and/or programmes taught in this school and, if yes, are there other schools in your location that compete for students at that level and/or programme?

Please indicate 'Yes' or 'No' in part (A) for each of the levels and/or programmes listed below.

If 'Yes' in part (A), please indicate in part (B) the number of other schools in this location that compete for your students.

	(A) Level/programme taught		(B) Competition		
	Yes	No	Two or more other schools	One other school	No other schools
a) <ISCED Level 0>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
b) <ISCED Level 1>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
c) <ISCED Level 2>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
d) <ISCED Level 3> general education programmes	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
e) <ISCED Level 3> vocational or technical education programmes	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃

14. What is the current school enrolment, i.e. the number of students of all grades/ages in this school?

Please write a number.

Students

15. Please estimate the broad percentage of [<ISCED level x> or 15-year-old] students in this school who have the following characteristics.

<Special need students cover those for whom a special learning need has been formally identified because they are mentally, physically, or emotionally disadvantaged. [Often they will be those for whom additional public or private resources (personnel, material or financial) have been provided to support their education.]>

<'Socioeconomically disadvantaged homes' refers to homes lacking the basic necessities or advantages of life, such as adequate housing, nutrition or medical care.>

Students may fall into multiple categories. Please mark one choice in each row.

	None	1% to 10%	11% to 30%	31% to 60%	More than 60%
a) Students whose [first language] is different from the language(s) of instruction or from a dialect of this/these languages(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
b) Students with special needs	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
c) Students from socioeconomically disadvantaged homes	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

School Leadership

16. Do you have a school management team?

'School management team' refers to a group within the school that has responsibilities for leading and managing the school in decisions such as those involving instruction, use of resources, curriculum, assessment and evaluation, and other strategic decisions related to the appropriate functioning of the school.

Please mark one choice.

☐₁ Yes

☐₂ No → Please go to Question [18].

17. Are the following currently represented on your school management team?

Please mark one choice in each row.

	Yes	No
a) You, as principal	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
b) [Vice/deputy principal or assistant principal]	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
c) Financial manager	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
d) Department heads	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
e) Teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
f) Representative(s) from school <governing boards>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
g) Parents or guardians	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
h) Students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
i) Other	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂

18. Regarding this school, who has a significant responsibility for the following tasks?

A 'significant responsibility' is one where an active role is played in decision making.

Please mark as many choices as appropriate in each row.

	You, as principal	Other members of the school manage- ment team	Teachers (not as a part of the school manage- ment team)	School <governing board>	<Local, municipality /regional, state, or national/ federal> authority
a) Appointing or hiring teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
b) Dismissing or suspending teachers from employment	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
c) Establishing teachers' starting salaries, including setting payscales	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
d) Determining teachers' salary increases	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
e) Deciding on budget allocations within the school	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
f) Establishing student disciplinary policies and procedures	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
g) Establishing student assessment policies, including <national/regional> assessments	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
h) Approving students for admission to the school	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
i) Choosing which learning materials are used	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
j) Determining course content, including <national/regional> curricula	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
k) Deciding which courses are offered	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁

19. On average throughout the school year, what percentage of time in your role as a principal do you spend on the following tasks in this school?

Rough estimates are sufficient. Please write a number in each row. Write 0 (zero) if none.

Please ensure that responses add up to 100%.

- a) % Administrative and leadership tasks and meetings
Including human resource/personnel issues, regulations, reports, school budget, preparing timetables and class composition, strategic planning, leadership and management activities, responding to requests from district, regional, state, or national education officials
- b) % Curriculum and teaching-related tasks and meetings
Including developing curriculum, teaching, classroom observations, student evaluation, mentoring teachers, teacher professional development
- c) % Student interactions
Including counselling and conversations outside structured learning activities, discipline
- d) % Parent or guardian interactions
Including formal and informal interactions
- e) % Interactions with local and regional community, business and industry
- f) % Other
-
- 100 % Total**

20. Please indicate if you engaged in the following in this school during the last 12 months.

If you have not been a principal in this school for 12 months, please indicate if you engaged in the following since you started working as a principal in this school.

Please mark one choice in each row.

- | | Yes | No |
|--|---------------------------------------|---------------------------------------|
| a) I used student performance and student evaluation results (including national/international assessments) to develop the school's educational goals and programmes. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| b) I worked on a professional development plan for this school. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |

21. Please indicate how frequently you engaged in the following in this school during the last 12 months.

Please mark one choice in each row.

	Never or rarely	Sometimes	Often	Very often
a) I collaborated with teachers to solve classroom discipline problems.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I observed instruction in the classroom.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I took actions to support co-operation among teachers to develop new teaching practices.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I took actions to ensure that teachers take responsibility for improving their teaching skills.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I took actions to ensure that teachers feel responsible for their students' learning outcomes. .	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I provided parents or guardians with information on the school and student performance.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) I checked for mistakes and errors in school administrative procedures and reports.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) I resolved problems with the lesson timetable in this school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) I collaborated with principals from other schools. ..	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

22. How strongly do you agree or disagree with these statements as applied to this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) This school provides staff with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) This school provides parents or guardians with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) This school provides students with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I make the important decisions on my own.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) There is a collaborative culture which is characterised by mutual support.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

23. Do you have a school <governing board>?*Please mark one choice.*☐₁ Yes☐₂ No → **Please go to Question [25].****24. Are the following currently represented on this school's <governing board>?***Please mark one choice in each row.*

	Yes	No
a) Representatives of a <local, municipality/regional, state, or national/federal> authority	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
b) Members of the school management team	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
c) School administrative personnel	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
d) Teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
e) Parents or guardians	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
f) Students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
g) Trade unions	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
h) Representatives of business {labour market institutions, a church,} or other private institutions	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
i) Others	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂

25. During this school year, does this school provide any of the following to parents or guardians?*Please mark one choice in each row.*

	Yes	No
a) Workshops or courses for parents or guardians	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
b) Services to support parents' or guardians' participation, such as providing child care	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
c) Support for parental association(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
d) Parental meeting(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂

26. To what extent do the following limit your effectiveness as a principal in this school?

'A career-based wage system' is used when an employee's salary is determined mainly by his or her educational level and age or seniority rather than by his or her performance on the job.

Please mark one choice in each row.

	Not at all	Very little	To some extent	A lot
a) Inadequate school budget and resources	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Government regulation and policy	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Teachers' absences	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Lack of parent or guardian involvement and support	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Teachers' career-based wage system	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Lack of opportunities and support for my own professional development	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Lack of opportunities and support for teachers' professional development	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) High workload and level of responsibilities in my job	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) Lack of shared leadership with other school staff members	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Teacher Formal Appraisal

In this section, 'appraisal' is defined as when a teacher's work is reviewed by the principal, an external inspector or by his or her colleagues. Here, it is defined as a more formal approach (e.g. as part of a formal performance management system, involving set procedures and criteria) rather than a more informal approach (e.g. through informal discussions).

27. On average, how often is each teacher formally appraised in this school by the following people?

Please mark one choice in each row.

If none of the response choices reflect your school's situation, please choose the one that is closest to it.

	Never	Less than once every two years	Once every two years	Once per year	Twice or more per year
a) You, as principal	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
b) Other members of the school management team	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
c) Assigned mentors	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
d) Teachers (who are not part of the school management team)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
e) External individuals or bodies (e.g. inspectors, municipality representatives, districts/jurisdictions office personnel, or other persons from outside the school)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

If you answered 'Never' to each of the above → Please go to the Question [30].

28. Who performs the following tasks as part of the formal appraisal of teachers' work in this school?

Please mark as many choices as appropriate in each row.

	External individuals or bodies	You, as principal	Member(s) of school manage- ment team	Assigned mentors	Other teachers (not a part of the manage- ment team)	Not used in this school
a) Direct observation of classroom teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Student surveys about teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Assessments of teachers' content knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Analysis of students' test scores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Discussion of teachers' self-assessments of their work (e.g. presentation of a portfolio assessment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Discussion about feedback received by parents or guardians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29. Please indicate the frequency that each of the following occurs in this school following a teacher appraisal.

Please mark one choice in each row.

	Never	Sometimes	Most of the time	Always
a) Measures to remedy any weaknesses in teaching are discussed with the teacher.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) A development or training plan is developed for each teacher. ..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) If a teacher is found to be a poor performer, material sanctions such as reduced annual increases in pay are imposed on the teacher.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) A mentor is appointed to help the teacher improve his/her teaching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) A change in a teacher's work responsibilities (e.g. increase or decrease in his/her teaching load or administrative/managerial responsibilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) A change in a teacher's salary or a payment of a financial bonus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) A change in the likelihood of a teacher's career advancement ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Dismissal or non-renewal of contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

School Climate

30. How strongly do you agree or disagree with these statements as applied to this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) The school staff share a common set of beliefs about schooling/learning.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) There is a high level of co-operation between the school and the local community.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) School staff have an open discussion about difficulties.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) There is mutual respect for colleagues' ideas.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) There is a culture of sharing success.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) The relationships between teachers and students are good.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

31. Is this school's capacity to provide quality instruction currently hindered by any of the following issues?

Please mark one choice in each row.

	Not at all	Very little	To some extent	A lot
a) Shortage of qualified and/or [well performing] teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Shortage of teachers with competence in teaching students with special needs	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Shortage of vocational teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Shortage or inadequacy of instructional materials (e.g. textbooks)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Shortage or inadequacy of computers for instruction	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Insufficient Internet access	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Shortage or inadequacy of computer software for instruction	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Shortage or inadequacy of library materials	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

- i) Shortage of support personnel ☐₁ ☐₂ ☐₃ ☐₄

32. In this school, how often do the following occur?

Please mark one choice in each row.

By students in this school:

- | | Never | Rarely | Monthly | Weekly | Daily |
|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| a) Arriving late at school | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| b) Absenteeism (i.e. unjustified absences) ... | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| c) Cheating | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| d) Vandalism and theft | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| e) Intimidation or verbal abuse among students (or other forms of non-physical bullying) | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| f) Physical injury caused by violence among students | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| g) Intimidation or verbal abuse of teachers or staff | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| h) Use/possession of drugs and/or alcohol ... | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |

By teachers in this school:

- | | Never | Rarely | Monthly | Weekly | Daily |
|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| i) Arriving late at school | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| j) Absenteeism (i.e. unjustified absences) ... | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |
| k) Discrimination (e.g. based on gender, ethnicity, religion, or disability, etc.) | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ | <input type="checkbox"/> ₅ |

Teacher Induction and Mentoring

The following section includes questions on induction and mentoring.

An 'induction programme' is defined as a structured range of activities at school to support new teachers' introduction into the teaching profession/school. Student teachers still within the teacher education programme are not included. An induction programme could include peer work with other new teachers, mentoring by experienced teachers, etc. The formal arrangement could be defined by your school, or in relation to other schools, or by educational authorities/external agencies.

'Mentoring' is defined as a support structure at schools where more experienced teachers support less experienced teachers. This structure might involve all teachers in the school or only new teachers.

33. Do new teachers at this school have access to an induction programme?

Please mark one choice in each row.

- | | Yes | No |
|--|---------------------------------------|---------------------------------------|
| a) There is an induction programme for new teachers. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| b) There are <u>informal</u> induction activities for new teachers not part of an induction programme. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| c) There is a general and/or administrative introduction to the school for new teachers. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |

If you answered 'No' to a) → Please go to Question [36].

34. Which teachers at this school are offered an induction programme?

Please mark one choice.

- ☐₁ All teachers who are new to this school
- ☐₂ Only teachers new to teaching

35. What structures and activities are included in this induction programme?

Please mark as many choices as appropriate.

- ☐₁ Mentoring by experienced teachers
- ☐₁ Courses/seminars
- ☐₁ Scheduled meetings with principal and/or colleague teachers
- ☐₁ A system of peer review
- ☐₁ Networking/virtual communities
- ☐₁ Collaboration with other schools
- ☐₁ Team teaching (together with more experienced teachers)
- ☐₁ A system of diaries/journals, portfolios, etc. to facilitate learning and reflection

- ☐₁ None of the above

36. Do teachers at your school have access to a mentoring system?

Please mark one choice.

- ☐₁ Yes, but only teachers who are new to teaching, i.e. in their first job as teachers, have access.
- ☐₂ Yes, all teachers who are new to this school have access.
- ☐₃ Yes, all teachers at this school have access.
- ☐₄ No, at present there is no access to a mentoring system for teachers in this school.
→ **Please go to Question [38].**

37. Is the mentor's main subject field(s) the same as that of the teacher being mentored?

Please mark one choice.

- ☐₁ Yes, most of the time
- ☐₂ Yes, sometimes
- ☐₃ No, rarely or never

38. How would you generally rate the importance of mentoring for teachers and schools?

Please mark one choice in each row.

	Not important at all	Of low importance	Of moderate importance	Of high importance
a) To improve teachers' pedagogical competence	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) To strengthen teachers' professional identity	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) To improve teachers' collaboration with colleagues	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) To support less experienced teachers' in their teaching	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) To expand teachers' main subject(s) knowledge ...	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) To improve students' general performance	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Job Satisfaction

39. Finally, we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) The advantages of this profession clearly outweigh the disadvantages.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) If I could decide again, I would still choose this job/position.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I would like to change to another school if that were possible.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I regret that I decided to become a principal.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I enjoy working at this school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I would recommend my school as a good place to work.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) I think that the teaching profession is valued in society.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) I am satisfied with my performance in this school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) All in all, I am satisfied with my job.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

This is the end of the questionnaire.

Thank you very much for your participation!

Please [National Return Procedures and Date]

[Placeholder for identification label]
(105 x 35 mm)

Organisation for Economic Co-operation and Development (OECD)
Teaching and Learning International Survey (TALIS) 2013

Teacher Questionnaire**[<ISCED level x> or PISA schools]**

Main Study Version

[International English, UK Spelling]

[National Project Information]

International Project Consortium:

International Association for the Evaluation of Educational Achievement (IEA), The Netherlands

IEA Data Processing and Research Center (IEA DPC), Germany

Statistics Canada, Canada

About TALIS 2013

The second Teaching and Learning International Survey (TALIS 2013) is an international survey that offers the opportunity for teachers and principals to provide input into education analysis and policy development. TALIS is being conducted by the Organisation for Economic Co-operation and Development (OECD) and [Name of country], along with more than 30 other countries, is taking part in the survey.

Cross-country analysis of this data will allow countries to identify other countries facing similar challenges and to learn from other policy approaches. School principals and teachers will provide information about issues such as the professional development they have received; their teaching beliefs and practices; the review of teachers' work and the feedback and recognition they receive about their work; and various other school leadership, management and workplace issues.

In the TALIS study, it is our intention to draw a picture of the different educational practices in all the participating countries. Countries and individuals may differ in their educational approaches. We rely on your expertise to describe us your work and opinion as accurately as possible.

Being an international survey, it is possible that some questions do not fit very well within your national context. In these cases, please answer as best as you can.

Confidentiality

All information that is collected in this study will be treated confidentially. While results will be made available by country and by type of school within a country, you are guaranteed that neither you, this school, nor any school personnel will be identified in any report of the results of the study. {Participation in this survey is voluntary and any individual may withdraw at any time.}

About the Questionnaire

- When questions refer to 'this school' we mean by 'school': national school definition.>
- This questionnaire should take approximately 45 to 60 minutes to complete.
- Guidelines for answering the questions are typed in italics. Most questions can be answered by marking the one most appropriate answer.
- When you have completed this questionnaire, please [National Return Procedures and Date].
- When in doubt about any aspect of the questionnaire, or if you would like more information about the questionnaire or the study, you can reach us by using the following contact details: [National centre contact information, phone number and preferably e-mail address]

Thank you very much for your participation!

Background Information

These questions are about you, your education and the time you have spent in teaching. In responding to the questions, please mark the appropriate choice(s) or provide figures where necessary.

1. Are you female or male?

- ☐₁ Female
☐₂ Male

2. How old are you?

Please write a number.

Years

3. What is your current employment status as a teacher?

Please consider your employment status for all of your current teaching jobs combined.

Please mark one choice.

- ☐₁ Full-time (more than 90% of full-time hours) → **Please go to Question [5].**
☐₂ Part-time (71-90% of full-time hours)
☐₃ Part-time (50-70% of full-time hours)
☐₄ Part-time (less than 50% of full-time hours)

4. Why do you work part-time?

Please mark one choice.

- ☐₁ I chose to work part-time.
☐₂ There was no possibility to work full-time.

5. How many years of work experience do you have?

Please round up to whole years.

- a) Year(s) working as a teacher at this school
b) Year(s) working as a teacher in total
c) Year(s) working in other education roles (do not include years working as a teacher)
d) Year(s) working in other jobs

6. What is your employment status as a teacher at this school?*Please mark one choice.*

- ☐₁ Permanent employment (an on-going contract with no fixed end-point before the age of retirement)
- ☐₂ Fixed-term contract for a period of more than 1 school year
- ☐₃ Fixed-term contract for a period of 1 school year or less

7. Do you currently work as a teacher of [<ISCED level x>/15-year-olds] at another school?*Please mark one choice.*

- ☐₁ Yes
- ☐₂ No → **Please go to Question [9].**

8. If 'Yes' in the previous question, please indicate in how many other schools you currently [work as a <ISCED level x> teacher/teach to 15-year-old students].*Please write a number.* School(s)**9. Across all your [<ISCED level x> classes/classes where most students are 15 years old] at this school, how many are special needs students?**

<Special needs students cover those for whom a special learning need has been formally identified because they are mentally, physically, or emotionally disadvantaged. [Often they will be those for whom additional public or private resources (personnel, material or financial) have been provided to support their education.]>

Please mark one choice.

- ☐₁ None
- ☐₂ Some
- ☐₃ Most
- ☐₄ All

10. What is the highest level of formal education you have completed?*Please mark one choice.*

- ☐₁ <Below ISCED Level 5>
- ☐₂ <ISCED Level 5B>
- ☐₃ <ISCED Level 5A>
- ☐₄ <ISCED Level 6>

11. Did you complete a <teacher education or training programme>?*Please mark one choice.*

- ☐₁ Yes
- ☐₂ No

12. Were the following elements included in your formal education or training?*Please mark one choice in each row.*

	Yes, for all subject(s) I teach	Yes, for some subject(s) I teach	No
a) Content of the subject(s) I teach	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
b) Pedagogy of the subject(s) I teach	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
c) Classroom practice (practicum, internship or student teaching) in the subject(s) I teach	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃

13. In your teaching, to what extent do you feel prepared for the elements below?*Please mark one choice in each row.*

	Not at all	Somewhat	Well	Very well
a) Content of the subject(s) I teach	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Pedagogy of the subject(s) I teach	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Classroom practice in the subject(s) I teach	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

14. Were any of the subject categories listed below included in your formal education or training?

Please mark as many choices as appropriate in each row.

Because this is an international survey, we had to categorise many of the actual subjects taught in schools into broad categories. Please refer to the subject examples below. If the exact name of one of your subjects is not listed, please mark the category you think best fits the subject.

Reading, writing and literature: reading and writing (and literature) in the mother tongue, in the language of instruction, or in the tongue of the country (region) as a second language (for non-natives); language studies, public speaking, literature

Mathematics: mathematics, mathematics with statistics, geometry, algebra, etc.

Science: science, physics, physical science, chemistry, biology, human biology, environmental science, agriculture/horticulture/forestry

Social studies: social studies, community studies, contemporary studies, economics, environmental studies, geography, history, humanities, legal studies, studies of the own country, social sciences, ethical thinking, philosophy

Modern foreign languages: languages different from the language of instruction

Ancient Greek and/or Latin

Technology: orientation in technology, including information technology, computer studies, construction/surveying, electronics, graphics and design, keyboard skills, word processing, workshop technology/design technology

Arts: arts, music, visual arts, practical art, drama, performance music, photography, drawing, creative handicraft, creative needlework

Physical education: physical education, gymnastics, dance, health

Religion and/or ethics: religion, history of religions, religion culture, ethics

Practical and vocational skills: vocational skills (preparation for a specific occupation), technics, domestic science, accountancy, business studies, career education, clothing and textiles, driving, home economics, polytechnic courses, secretarial studies, tourism and hospitality, handicraft

Interdisciplinary subject: integration of content and perspective of several traditional school subjects

	In <ISCED Level 4 or 5B >	In <ISCED Level 5A or above>	In <Subject specialisation> as part of the teacher training	At the in- service or professional development stage
a) Reading, writing and literature	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
b) Mathematics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
c) Science	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
d) Social studies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
e) Modern foreign languages	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
f) Ancient Greek and/or Latin	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
g) Technology	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
h) Arts	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
i) Physical education	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
j) Religion and/or ethics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
k) Practical and vocational skills	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
l) Interdisciplinary subject	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
m) Other (please specify below)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁

15. During this current school year, do you teach the subjects below to any [<ISCED Level X> / 15-year-old] students in this school?

Please mark one choice in each row.

	Yes	No
a) Reading, writing and literature	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
b) Mathematics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
c) Science	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
d) Social studies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
e) Modern foreign languages	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
f) Ancient Greek and/or Latin	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
g) Technology	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
h) Arts	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
i) Physical education	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
j) Religion and/or ethics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
k) Practical and vocational skills	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
l) Other	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂

- 16. During your most recent complete calendar week, approximately how many 60-minute hours did you spend in total on teaching, planning lessons, marking, collaborating with other teachers, participating in staff meetings and on other tasks related to your job at this school?**

A 'complete' calendar week is one that was not shortened by breaks, public holidays, sick leave, etc.

Also include tasks that took place during weekends, evenings or other off classroom hours.

Round to the nearest whole hour.

Hours

- 17. Of this total, how many 60-minute hours did you spend on teaching during the most recent calendar week?**

Please only count actual teaching time.

Time spent on preparation, marking, etc. will be recorded in Question [18].

Hours

- 18. As a teacher of this school, during your most recent complete calendar week, how many 60-minute hours did you spend on the following tasks?**

Also include tasks that took place during weekends, evenings or other off classroom hours. Please exclude all time spent teaching as this was recorded in the previous question.

Rough estimates are sufficient.

If you did not perform the task during the most recent complete calendar week, write 0 (zero).

- a) Individual planning or preparation of lessons either at school or out of school
- b) Team work and dialogue with colleagues within this school
- c) Marking/correcting of student work
- d) Students counselling (including student supervision, virtual counselling, career guidance and delinquency guidance)
- e) Participation in school management
- f) General administrative work (including communication, paperwork and other clerical duties you undertake in your job as a teacher)
- g) Communication and co-operation with parents or guardians
- h) Engaging in extracurricular activities (e.g. sports and cultural activities after school)
- i) Other tasks

Teacher Professional Development

In this section, 'professional development' is defined as activities that aim to develop an individual's skills, knowledge, expertise and other characteristics as a teacher.

Please only consider professional development you have taken after your initial teacher training/education.

19. In your **first regular employment as a teacher**, did/do you take part in any induction programme?

An 'induction programme' is defined as a range of structured activities to support your introduction into the teaching profession, for example peer work with other new teachers, mentoring by experienced teachers, etc.

Please mark one choice in each row.

- | | Yes | No |
|---|---------------------------------------|---------------------------------------|
| a) I took/take part in an induction programme. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| b) I took/take part in <u>informal</u> induction activities not part of an induction programme. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| c) I took/take part in a general and/or administrative introduction to the school. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |

20. Are you currently involved in any mentoring activities?

This question refers to mentoring by or for teachers at your school. It does not refer to students within the teacher education who are practising as teachers at school.

Please mark one choice in each row.

- | | Yes | No |
|---|---------------------------------------|---------------------------------------|
| a) I presently have an assigned mentor to support me. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| b) I serve as an assigned mentor for one or more teachers. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |

21. I. During the last 12 months, did you participate in any of the following professional development activities, and if yes, for how many days did they last?

Please indicate 'Yes' or 'No' in part (A) for each of the activities listed below. If 'Yes' in part (A), please specify the number of days spent on the activity in part (B).

Please sum up the activities in full days (a full day is 6-8 hours). Please include activities taking place during weekends, evenings or other off work hours.

	(A) Participation		(B) Duration in days
	Yes	No	
a) Courses/workshops (e.g. on subject matter or methods and/or other education-related topics)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
b) Education conferences or seminars (where teachers and/or researchers present their research results and discuss educational issues)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
c) Observation visits to other schools	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
d) Observation visits to business premises, public organisations, non-governmental organisations	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
e) In-service training courses in business premises, public organisations, non-governmental organisations	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

II. During the last 12 months, did you participate in any of these activities?

Please indicate 'Yes' or 'No' for each of the activities listed below.

	Yes	No
f) Qualification programme (e.g. a degree programme)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
g) Participation in a network of teachers formed specifically for the professional development of teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
h) Individual or collaborative research on a topic of interest to you professionally	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
i) Mentoring and/or peer observation and coaching, as part of a formal school arrangement	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂

If you did not participate in any professional development activities during the last 12 months → Please go to Question [26].

22. Did the professional development activities you participated in during the last 12 months cover the following topics? If so, what positive impact did these have on your teaching?

For each specified alternative please indicate 'Yes' or 'No' in part (A). If 'Yes' in part (A) please estimate the impact in part (B).

	(A) Topic		(B) Positive impact			
	Yes	No	No	Small	Moderate	Large
a) Knowledge and understanding of my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Pedagogical competencies in teaching my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Knowledge of the curriculum	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Student evaluation and assessment practices	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) ICT (information and communication technology) skills for teaching	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Student behaviour and classroom management	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) School management and administration	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Approaches to individualised learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) Teaching students with special needs (see question [9] for the definition)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Teaching in a multicultural or multilingual setting	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) Teaching cross-curricular skills (e.g. problem solving, learning-to-learn)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
l) Approaches to developing cross-occupational competencies for future work or future studies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
m) New technologies in the workplace	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
n) Student career guidance and counselling ...	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

23. For the professional development in which you participated in the last 12 months, how much did you personally have to pay for?

Please mark one choice.

- ☐₁ None
- ☐₂ Some
- ☐₃ All

24. For the professional development in which you participated in the last 12 months, did you receive any of the following support?

Please mark one choice in each row.

- | | Yes | No |
|---|---------------------------------------|---------------------------------------|
| a) I received scheduled time for activities that took place during regular working hours at this school. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| b) I received a salary supplement for activities outside working hours. | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |
| c) I received non-monetary support for activities outside working hours (reduced teaching, days off, study leave, etc.). | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ |

25. Considering the professional development activities you took part in during the last 12 months, to what extent have they included the following?

Please mark one choice in each row.

- | | Not in any
activities | Yes, in
some
activities | Yes, in
most
activities | Yes, in
all
activities |
|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| a) A group of colleagues from my school or subject group | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ |
| b) Opportunities for active learning methods (not only listening to a lecturer) | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ |
| c) Collaborative learning activities or research with other teachers | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ |
| d) An extended time-period (several occasions spread out over several weeks or months) | <input type="checkbox"/> ₁ | <input type="checkbox"/> ₂ | <input type="checkbox"/> ₃ | <input type="checkbox"/> ₄ |

26. For each of the areas listed below, please indicate the degree to which you currently need professional development.

Please mark one choice in each row.

	No need at present	Low level of need	Moderate level of need	High level of need
a) Knowledge and understanding of my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Pedagogical competencies in teaching my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Knowledge of the curriculum	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Student evaluation and assessment practice	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) ICT (information and communication technology) skills for teaching	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Student behaviour and classroom management	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) School management and administration	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Approaches to individualised learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) Teaching students with special needs (see question [9] for the definition)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Teaching in a multicultural or multilingual setting	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) Teaching cross-curricular skills (e.g. problem solving, learning-to-learn)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
l) Approaches to developing cross-occupational competencies for future work or future studies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
m) New technologies in the workplace	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
n) Student career guidance and counselling	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

27. How strongly do you agree or disagree that the following present barriers to your participation in professional development?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) I do not have the pre-requisites (e.g. qualifications, experience, seniority).	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Professional development is too expensive/unaffordable.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) There is a lack of employer support.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Professional development conflicts with my work schedule.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I do not have time because of family responsibilities.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) There is no relevant professional development offered.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) There are no incentives for participating in such activities.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Teacher Feedback

We would like to ask you about the feedback you receive about your work in this school.

'Feedback' is defined broadly as including any communication you receive about your teaching, based on some form of interaction with your work (e.g. observing you teach students, discussing your curriculum or students' results).

Feedback can be provided through informal discussions with you or as part of a more formal and structured arrangement.

28. In this school, who uses the following methods to provide feedback to you?

'External individuals or bodies' as used below refer to, for example, inspectors, municipality representatives, or other persons from outside the school.

Please mark as many choices as appropriate in each row.

	External individuals or bodies	School principal	Member(s) of the school manage- ment team	Assigned mentors	Other teachers (not a part of the manage- ment team)	I have never receive d this feedbac k in this school.
a) Feedback following direct observation of your classroom teaching	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
b) Feedback from student surveys about your teaching	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
c) Feedback following an assessment of your content knowledge	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
d) Feedback following an analysis of your students' test scores	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
e) Feedback following your self-assessment of your work (e.g. presentation of a portfolio assessment)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁
f) Feedback following surveys or discussions with parents or guardians	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁	<input type="checkbox"/> ₁

If you answered 'I have never received this feedback in this school' to each of the above → Please go to Question [31].

29. In your opinion, when you receive this feedback, what is the emphasis placed on the following areas?

Please mark one choice in each row.

	Not considered at all	Considered with low importance	Considered with moderate importance	Considered with high importance
a) Student performance	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Knowledge and understanding of my subject field(s) ..	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Pedagogical competencies in teaching my subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Student assessment practices	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Student behaviour and classroom management	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Teaching of students with special needs	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Teaching in a multicultural or multilingual setting	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) The feedback I provide to other teachers to improve their teaching	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) Feedback from parents or guardians	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Student feedback	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) Collaboration or working with other teachers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

30. Concerning the feedback you have received at this school, to what extent has it directly led to a positive change in any of the following?

Please mark one choice in each row.

	No positive change	A small change	A moderate change	A large change
a) Your public recognition from the principal and/or your colleagues	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Your role in school development initiatives (e.g. curriculum development group, development of school objectives)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) The likelihood of your career advancement (e.g. promotion)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) The amount of professional development you undertake	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Your job responsibilities at this school	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Your confidence as a teacher	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Your salary and/or financial bonus	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Your classroom management practices	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) Your knowledge and understanding of your main subject field(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Your teaching practices	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) Your methods for teaching students with special needs	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
l) Your use of student assessments to improve student learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
m) Your job satisfaction	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
n) Your motivation	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

31. We would now like to ask you about teacher appraisal and feedback in this school more generally. How strongly do you agree or disagree with the following statements about this school?

Here, 'appraisal' is defined as review of teachers' work. This appraisal can be conducted in a range of ways from a more formal approach (e.g. as part of a formal performance management system, involving set procedures and criteria) to the more informal approach (e.g. through informal discussions).

When a statement does not apply in your context, please omit the item.

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) The best performing teachers in this school receive the greatest recognition (e.g. rewards, additional training or responsibilities).	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Teacher appraisal and feedback has little impact upon the way teachers teach in the classroom.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Teacher appraisal and feedback are largely done to fulfil administrative requirements.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) A development or training plan is established for teachers to improve their work as a teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Feedback is provided to teachers based on a thorough assessment of their teaching.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) If a teacher is consistently under-performing, he/she would be dismissed.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Measures to remedy any weaknesses in teaching are discussed with the teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) A mentor is appointed to help the teacher improve his/her teaching.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Your Teaching in General

32. We would like to ask about your personal beliefs on teaching and learning. Please indicate how strongly you disagree or agree with each of the following statements.

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) My role as a teacher is to facilitate students' own inquiry.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Students learn best by finding solutions to problems on their own.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Thinking and reasoning processes are more important than specific curriculum content.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

33. On average, how often do you do the following in this school?

Please mark one choice in each row.

	Never	Once a year or less	2-4 times a year	5-10 times a year	1-3 times a month	Once a week or more
a) Teach jointly as a team in the same class	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
b) Observe other teachers' classes and provide feedback	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
c) Engage in joint activities across different classes and age groups (e.g. projects)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
d) Exchange teaching materials with colleagues	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
e) Engage in discussions about the learning development of specific students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
f) Work with other teachers in my school to ensure common standards in evaluations for assessing student progress	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
g) Attend team conferences	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
h) Take part in collaborative professional learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆

34. In your teaching, to what extent can you do the following?*Please mark one choice in each row.*

	Not at all	To some extent	Quite a bit	A lot
a) Get students to believe they can do well in school work .	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Help my students value learning	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Craft good questions for my students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Control disruptive behaviour in the classroom	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Motivate students who show low interest in school work	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Make my expectations about student behaviour clear	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Help students think critically	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Get students to follow classroom rules	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) Calm a student who is disruptive or noisy	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Use a variety of assessment strategies	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) Provide an alternative explanation for example when students are confused	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
l) Implement alternative instructional strategies in my classroom	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Your Teaching in the <Target Class>

In the following, we want to get into more detail about your teaching practices. Within this questionnaire, we cannot cover the whole scope of your teaching. Therefore we use an exemplary approach and focus on the teaching of one <class>.

The following questions ask you about a particular <class> that you teach. The <class> that we would like you to respond to is the first [<ISCED Level x>] <class> [attended by 15-year-old students] that you taught in this school in one of these subjects after 11 a.m. last Tuesday. Please note that if you do not teach a <class> [at <ISCED Level x>] / [attended by 15-year-old students] on Tuesday, this can be a class taught on a day following the last Tuesday.

In the questions below, this <class> will be referred to as the <target class>.

35. We would like to understand the composition of the <target class>. Please estimate the broad percentage of students who have the following characteristics.

<'Socioeconomically disadvantaged homes' refers to homes lacking the basic necessities or advantages of life, such as adequate housing, nutrition or medical care.>

This question asks about your personal perception of student background. It is acceptable to base your replies on rough estimates.

Students may fall into multiple categories.

Please mark one choice in each row.

	None	1% to 10%	11% to 30%	31% to 60%	More than 60%
a) Students whose [first language] is different from the language(s) of instruction or from a dialect of this/these language(s)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
b) Low academic achievers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
c) Students with special needs	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
d) Students with behavioural problems	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
e) Students from socioeconomically disadvantaged homes	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
f) Academically gifted students	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

36. Is your teaching in the <target class> directed entirely or mainly to <special needs> students?

Please mark one choice.

- ☐₁ Yes → Please go to Question [44].
- ☐₂ No

37. Into which subject category does this <target class> fall?

Please mark one choice.

- ☐₁ Reading, writing and literature
Includes reading and writing (and literature) in the mother tongue, in the language of instruction, or in the tongue of the country (region) as a second language (for non-natives); language studies, public speaking, literature
- ☐₂ Mathematics
Includes mathematics, mathematics with statistics, geometry, algebra, etc.
- ☐₃ Science
Includes science, physics, physical science, chemistry, biology, human biology, environmental science, agriculture/horticulture/forestry
- ☐₄ Social studies
Includes social studies, community studies, contemporary studies, economics, environmental studies, geography, history, humanities, legal studies, studies of the own country, social sciences, ethical thinking, philosophy
- ☐₅ Modern foreign languages
Includes languages different from the language of instruction
- ☐₆ Ancient Greek and/or Latin
- ☐₇ Technology
Includes orientation in technology, including information technology, computer studies, construction/surveying, electronics, graphics and design, keyboard skills, word processing, workshop technology/design technology
- ☐₈ Arts
Includes arts, music, visual arts, practical art, drama, performance music, photography, drawing, creative handicraft, creative needlework
- ☐₉ Physical education
Includes physical education, gymnastics, dance, health
- ☐₁₀ Religion and/or ethics
Includes religion, history of religions, religion culture, ethics
- ☐₁₁ Practical and vocational skills
Includes vocational skills (preparation for a specific occupation), technics, domestic science, accountancy, business studies, career education, clothing and textiles, driving, home economics, polytechnic courses, secretarial studies, tourism and hospitality, handicraft
- ☐₁₂ Other

38. How many students are currently enrolled in this <target class>?*Please write a number.* Students**39. For this <target class>, what percentage of <class> time is typically spent on each of the following activities?***Write a percentage for each activity. Write 0 (zero) if none.**Please ensure that responses add up to 100%.*a) % Administrative tasks (e.g. recording attendance, handing out school information/forms)b) % Keeping order in the classroom (maintaining discipline)c) % Actual teaching and learning**100 % Total****40. Please indicate how representative you feel the <target class> is of all the classes you teach.***Please mark one choice.*☐₁ Very representative☐₂ Representative☐₃ Not representative**41. How strongly do you agree or disagree with the following statements about this <target class>?***Please mark one choice in each row.*

	Strongly disagree	Disagree	Agree	Strongly agree
a) When the lesson begins, I have to wait quite a long time for students to quiet down.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Students in this class take care to create a pleasant learning atmosphere.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I lose quite a lot of time because of students interrupting the lesson.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) There is much disruptive noise in this classroom.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

42. How often does each of the following happen in the <target class> throughout the school year?

Please mark one choice in each row.

	Never or almost never	Occasion- ally	Frequently	In all or nearly all lessons
a) I present a summary of recently learned content.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Students work in small groups to come up with a joint solution to a problem or task.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I give different work to the students who have difficulties learning and/or to those who can advance faster.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I refer to a problem from everyday life or work to demonstrate why new knowledge is useful.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I let students practice similar tasks until I know that every student has understood the subject matter.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I check my students' exercise books or homework.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) Students work on projects that require at least one week to complete.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Students use ICT (information and communication technology) for projects or class work.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

43. How often do you use the following methods of assessing student learning in the <target class>?

Please mark one choice in each row.

	Never or almost never	Occasionally	Frequently	In all or nearly all lessons
a) I develop and administer my own assessment.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) I administer a standardised test.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Individual students answer questions in front of the class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I provide written feedback on student work in addition to a <mark, i.e. numeric score or letter grade>.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I let students evaluate their own progress.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I observe students when working on particular tasks and provide immediate feedback.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

School Climate and Job Satisfaction

44. How strongly do you agree or disagree with these statements as applied to this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) This school provides staff with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) This school provides parents or guardians with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) This school provides students with opportunities to actively participate in school decisions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) This school has a culture of shared responsibility for school issues.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) There is a collaborative school culture which is characterised by mutual support.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

45. How strongly do you agree or disagree with the following statements about what happens in this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) In this school, teachers and students usually get on well with each other.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Most teachers in this school believe that the students' well-being is important.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Most teachers in this school are interested in what students have to say.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) If a student from this school needs extra assistance, the school provides it.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

46. {Finally}we would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) The advantages of being a teacher clearly outweigh the disadvantages.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) If I could decide again, I would still choose to work as a teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) I would like to change to another school if that were possible.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) I regret that I decided to become a teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) I enjoy working at this school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) I wonder whether it would have been better to choose another profession.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) I would recommend my school as a good place to work.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) I think that the teaching profession is valued in society.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) I am satisfied with my performance in this school.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) All in all, I am satisfied with my job.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

47. How strongly do you agree or disagree with the following statements concerning your personal attitudes?

Please mark one choice in each row.

	Totally disagree	Neutral	Totally agree
a) I always listen carefully to students.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
b) I am confident about my judgements about students.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
c) I have doubts about my ability to succeed as a teacher.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
d) I have always been honest with myself about my teaching qualities.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
e) I feel threatened by teachers who are very successful.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
f) I have said things that hurt colleagues' or students' feelings.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
g) I feel angry when colleagues express ideas different from my own.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
h) I help students and colleagues in trouble.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
i) I admit when I do not know something if a student asks a question in class.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇
j) I am irritated by students who ask for favours.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇

Teacher Mobility

We would like to know if you travelled abroad for professional purposes.

Please consider only travel for a week or more at educational institutions or schools. Do not consider conferences or workshops.

48. Have you ever been abroad for professional purposes in your career as teacher or during your teacher education/training?

Please mark as many choices as appropriate.

- ☐ No → **Please go to the end of the questionnaire.**
- ☐ Yes, as a student as part of my teacher education
- ☐ Yes, as a teacher in an EU programme (e.g. Comenius)
- ☐ Yes, as a teacher in a regional or national programme
- ☐ Yes, as a teacher as arranged by my school or school district
- ☐ Yes, by my own initiative

49. If yes in the previous question, what were the purpose(s) of your visit(s) abroad?

Please mark as many choices as appropriate.

- ☐ Studying, as part of your teacher education
- ☐ Language learning
- ☐ Learning of other subject areas
- ☐ Accompanying visiting students
- ☐ Establishing contact with schools abroad
- ☐ Teaching
- ☐ Other

This is the end of the questionnaire.

Thank you very much for your participation!

Please [National Return Procedures and Date]

ANNEX I: Construction and Validation of Scales indices

Table 10.103 CFA intercepts and loadings for the reference population (ISCED 2) by country: PSCDELIQS

Countries (Reference Population)	Intercept				Loading			
	TC2G32D	TC2G32E	TC2G32F	TC2G32G	TC2G32D	TC2G32E	TC2G32F	TC2G32G
Australia	2.177	2.950	2.027	2.256	0.258	1.000	0.845	1.328
Brazil	2.045	2.834	1.904	2.073	0.695	1.000	0.637	0.747
Bulgaria	2.052	2.618	1.880	1.580	0.656	1.000	0.654	0.613
Chile	1.910	2.243	1.768	1.726	0.627	1.000	0.741	0.745
Croatia	1.894	2.415	1.790	1.700	0.559	1.000	0.555	0.629
Czech Republic	2.190	2.289	1.633	1.428	0.438	1.000	0.447	0.650
Denmark	1.812	2.413	1.804	1.917	0.807	1.000	0.994	1.114
Estonia	1.852	2.698	1.651	2.211	0.507	1.000	0.390	0.926
Finland	2.237	2.969	1.945	2.154	0.406	1.000	0.397	0.687
France	2.150	2.636	2.100	1.849	0.627	1.000	0.735	0.548
Iceland	1.895	2.171	1.790	1.876	0.617	1.000	0.763	1.094
Israel	2.143	2.241	1.889	1.565	0.492	1.000	0.656	0.445
Italy	1.810	2.288	1.492	1.523	0.627	1.000	0.509	0.661
Japan	1.572	1.788	1.565	1.408	1.150	1.000	1.111	1.006
Korea	2.075	2.325	2.020	1.457	0.775	1.000	0.878	0.401
Latvia	1.911	2.602	1.641	1.738	0.424	1.000	0.418	0.853
Malaysia	2.326	1.753	1.543	1.425	0.589	1.000	0.975	0.871
Mexico	2.107	2.608	2.098	1.633	0.625	1.000	0.767	0.416
Netherlands	2.560	2.941	2.034	2.080	0.688	1.000	0.732	0.477
Norway	2.073	2.573	1.914	2.165	0.146	1.000	0.341	0.866
Poland	2.023	2.177	1.502	1.482	0.878	1.000	0.383	0.479
Portugal	2.200	2.403	2.013	1.967	0.712	1.000	0.773	0.680
Romania	1.502	2.209	1.530	1.302	0.622	1.000	0.691	0.517
Serbia	1.900	2.443	1.819	1.615	0.871	1.000	0.729	0.937
Singapore	2.040	2.212	1.762	1.759	0.709	1.000	0.769	0.799
Slovak Republic	2.041	2.002	1.628	1.415	1.002	1.000	0.562	0.658
Spain	1.882	2.423	1.674	1.804	0.809	1.000	0.623	0.777
Sweden	2.264	2.935	1.874	2.040	0.372	1.000	0.310	0.641
Sub-national entities								
Abu Dhabi (United Arab Emirates)	1.838	2.134	1.663	1.513	0.708	1.000	0.719	0.432
Alberta (Canada)	2.034	2.790	1.762	1.782	0.670	1.000	0.781	0.842
England (United Kingdom)	1.991	2.326	1.838	1.890	0.267	1.000	0.565	0.877
Flanders (Belgium)	2.283	2.917	1.910	2.202	0.576	1.000	0.546	0.707

Source: OECD, *TALIS Database*

Table 10.104 CFA intercepts and loadings for the reference population (ISCED 2) by country: PSCMUTRS

Countries (Reference Population)	Intercept				Loading			
	TC2G30C	TC2G30D	TC2G30E	TC2G30F	TC2G30C	TC2G30D	TC2G30E	TC2G30F
Australia	3.161	3.315	3.276	3.533	1.154	1.005	1.000	0.661
Brazil	3.313	3.185	3.194	3.191	0.766	0.930	1.000	0.653
Bulgaria	3.199	2.961	3.037	3.121	0.579	0.895	1.000	0.588
Chile	3.408	3.268	3.247	3.384	0.619	0.960	1.000	0.579
Croatia	3.132	3.056	3.199	3.162	0.918	1.067	1.000	0.586
Czech Republic	3.153	3.030	3.071	3.191	0.740	0.723	1.000	0.637
Denmark	3.065	3.129	3.087	3.447	0.556	0.917	1.000	0.678
Estonia	3.077	3.015	2.943	3.108	0.543	0.799	1.000	0.496
Finland	3.263	3.190	3.026	3.224	0.814	0.913	1.000	0.525
France	3.031	3.106	3.000	3.290	0.699	0.780	1.000	0.531
Iceland	3.152	3.142	3.198	3.406	0.416	0.684	1.000	0.486
Israel	3.316	3.079	3.313	3.356	0.115	0.426	1.000	0.376
Italy	3.075	3.028	2.985	3.158	0.700	0.850	1.000	0.482
Japan	3.189	3.067	3.234	3.281	1.007	0.802	1.000	0.658
Korea	3.201	3.362	3.291	3.445	0.825	0.887	1.000	0.660
Latvia	3.171	3.140	3.180	3.111	0.847	1.079	1.000	0.483
Malaysia	3.184	3.355	3.562	3.531	0.970	1.026	1.000	0.937
Mexico	3.192	3.209	3.159	3.272	0.840	0.993	1.000	0.703
Netherlands	2.871	2.963	2.849	3.203	0.866	0.708	1.000	0.831
Norway	3.253	3.137	3.002	3.342	1.551	2.019	1.000	0.946
Poland	3.134	3.059	3.031	3.139	0.741	1.178	1.000	0.430
Portugal	3.077	3.067	3.067	3.300	0.835	0.797	1.000	0.401
Romania	3.412	3.564	3.538	3.370	0.777	0.873	1.000	0.812
Serbia	3.199	3.134	3.004	3.159	0.842	1.033	1.000	0.505
Singapore	3.211	3.298	3.350	3.418	0.788	0.862	1.000	0.811
Slovak Republic	3.411	3.172	3.175	3.137	0.881	1.196	1.000	0.690
Spain	3.197	3.162	3.055	3.325	0.781	1.022	1.000	0.504
Sweden	3.196	3.113	3.002	3.391	0.714	0.814	1.000	0.492
Sub-national entities								
Abu Dhabi (United Arab Emirates)	3.271	3.423	3.388	3.411	0.859	1.048	1.000	0.846
Alberta (Canada)	3.474	3.359	3.399	3.562	0.852	1.064	1.000	0.792
England (United Kingdom)	3.115	3.307	3.345	3.655	0.745	1.064	1.000	0.642
Flanders (Belgium)	3.086	3.180	3.138	3.340	1.161	1.434	1.000	0.333

Source: OECD, *TALIS Database*

Table 10.105 CFA intercepts and loadings for the reference population (ISCED 2) by country: PDISLEADS

Countries (Reference Population)	Intercept			Loading		
	TC2G22A	TC2G22B	TC2G22C	TC2G22A	TC2G22B	TC2G22C
Australia	3.255	2.868	2.843	0.738	1.000	3.083
Brazil	3.407	3.211	3.075	0.566	1.000	0.580
Bulgaria	3.387	2.960	2.820	0.357	1.000	0.563
Chile	3.230	2.973	2.932	0.457	1.000	0.740
Croatia	3.258	3.030	2.827	0.429	1.000	0.608
Czech Republic	3.283	3.006	2.970	0.408	1.000	0.683
Denmark	3.407	2.808	2.846	0.273	1.000	0.346
Estonia	3.382	3.101	3.092	0.508	1.000	0.428
Finland	3.236	2.537	2.715	0.220	1.000	0.267
France	3.315	2.976	2.733	0.452	1.000	0.634
Iceland	3.415	2.943	2.887	0.379	1.000	0.626
Israel	3.184	2.550	2.427	0.162	1.000	0.540
Italy	3.147	2.909	2.322	0.153	1.000	0.453
Japan	3.137	2.507	2.340	0.286	1.000	0.652
Korea	3.590	3.312	3.130	0.546	1.000	0.665
Latvia	3.373	3.262	3.216	0.658	1.000	0.423
Malaysia	3.211	3.013	2.607	1.557	1.000	4.786
Mexico	3.320	3.112	2.967	0.434	1.000	0.636
Netherlands	3.113	2.849	2.719	0.253	1.000	0.772
Norway	3.363	2.946	2.959	1.252	1.000	3.260
Poland	3.217	3.102	3.126	0.533	1.000	0.838
Portugal	3.320	3.110	2.860	0.469	1.000	0.590
Romania	3.418	3.131	2.765	0.518	1.000	0.598
Serbia	3.395	3.304	3.090	0.683	1.000	0.683
Singapore	3.320	2.658	2.935	0.595	1.000	1.539
Slovak Republic	3.280	2.956	2.521	0.879	1.000	3.213
Spain	3.424	3.135	2.959	0.522	1.000	0.782
Sweden	3.327	2.541	2.857	0.275	1.000	0.379
Sub-national entities						
Abu Dhabi (United Arab Emirates)	3.227	2.904	2.828	0.591	1.000	0.711
Alberta (Canada)	3.406	3.080	2.864	0.655	1.000	0.518
England (United Kingdom)	3.233	2.846	3.166	0.500	1.000	0.591
Flanders (Belgium)	3.340	3.016	3.059	0.678	1.000	1.495

Source: OECD, *TALIS Database*

Table 10.106 CFA intercepts and loadings for the reference population (ISCED 2) by country: PJOBSATS

Countries (Reference Population)	Intercept							Loading						
	TC2G39A	TC2G39B	TC2G39D	TC2G39E	TC2G39F	TC2G39H	TC2G39I	TC2G39A	TC2G39B	TC2G39D	TC2G39E	TC2G39F	TC2G39H	TC2G39I
Australia	3.585	3.575	3.724	3.779	3.866	3.263	3.495	1.000	0.720	0.407	1.000	0.697	0.245	0.534
Brazil	2.870	3.138	3.447	3.695	3.608	3.208	3.262	1.000	1.045	0.606	1.000	1.091	0.589	0.832
Bulgaria	2.714	2.892	3.114	3.407	3.346	3.172	3.200	1.000	1.389	0.799	1.000	0.845	0.578	0.572
Chile	3.381	3.537	3.539	3.678	3.655	3.375	3.599	1.000	1.257	1.123	1.000	1.027	0.408	0.576
Croatia	2.831	2.936	3.304	3.420	3.477	3.196	3.207	1.000	1.143	1.010	1.000	0.806	0.669	0.990
Czech Republic	2.791	3.137	3.432	3.471	3.467	3.065	3.122	1.000	1.380	1.221	1.000	0.882	0.284	0.540
Denmark	3.524	3.500	3.717	3.654	3.746	3.394	3.524	1.000	0.915	0.463	1.000	0.798	0.592	0.960
Estonia	2.950	3.092	3.661	3.261	3.497	2.917	3.149	1.000	1.017	0.583	1.000	0.760	0.528	0.587
Finland	3.416	3.326	3.552	3.303	3.504	3.194	3.259	1.000	1.257	0.807	1.000	0.669	0.368	0.740
France	2.954	3.407	3.595	3.467	3.374	3.013	3.256	1.000	1.501	0.880	1.000	0.908	0.281	0.680
Iceland	3.452	3.221	3.529	3.635	3.683	3.231	3.404	1.000	1.323	0.627	1.000	1.022	0.414	0.644
Israel	3.443	3.454	3.604	3.559	3.650	3.429	3.514	1.000	1.790	1.084	1.000	0.741	0.246	0.353
Italy	2.793	3.308	3.493	3.354	3.286	3.087	3.232	1.000	0.890	0.957	1.000	0.911	0.228	0.571
Japan	2.692	2.699	3.442	3.064	3.159	2.631	3.081	1.000	1.275	0.819	1.000	0.906	0.615	0.699
Korea	3.348	3.298	3.419	3.396	3.331	3.299	3.377	1.000	1.067	0.520	1.000	1.122	1.073	0.995
Latvia	2.810	2.941	3.274	3.550	3.354	3.102	3.145	1.000	1.560	0.324	1.000	1.267	0.676	0.701
Malaysia	3.649	3.658	3.692	3.675	3.655	3.530	3.594	1.000	0.847	0.304	1.000	1.132	0.863	0.821
Mexico	3.651	3.706	3.749	3.849	3.765	3.589	3.713	1.000	1.134	-0.010	1.000	1.132	0.634	0.473
Netherlands	3.323	3.385	3.582	3.575	3.468	3.032	3.376	1.000	0.937	0.748	1.000	0.987	0.366	1.019
Norway	3.306	3.279	3.647	3.680	3.684	3.020	3.326	1.000	1.114	0.606	1.000	0.870	0.166	0.253
Poland	3.084	3.313	3.096	3.547	3.519	3.061	3.234	1.000	1.193	0.213	1.000	0.889	0.487	0.717
Portugal	3.138	3.290	3.647	3.652	3.668	3.289	3.336	1.000	1.402	1.035	1.000	0.958	0.385	0.454
Romania	2.811	3.032	3.209	3.586	3.476	3.304	3.351	1.000	2.137	0.749	1.000	0.829	0.241	0.268
Serbia	2.806	2.814	3.259	3.284	3.462	3.253	3.217	1.000	1.007	0.740	1.000	0.622	0.334	0.634
Singapore	3.533	3.544	3.578	3.638	3.631	3.382	3.553	1.000	1.352	0.334	1.000	0.942	0.632	0.730
Slovak Republic	2.688	3.033	3.268	3.528	3.536	3.091	3.119	1.000	0.822	0.475	1.000	0.956	0.357	0.647
Spain	3.287	3.364	3.413	3.627	3.643	3.329	3.423	1.000	0.982	1.018	1.000	1.108	0.727	0.684
Sweden	3.144	3.129	3.498	3.569	3.609	3.077	3.183	1.000	1.697	0.765	1.000	0.724	0.232	0.322
Sub-national entities														
Abu Dhabi (United Arab Emirates)	3.146	3.220	3.486	3.426	3.346	3.299	3.319	1.000	0.782	0.555	1.000	1.073	0.677	0.792
Alberta (Canada)	3.376	3.265	3.456	3.682	3.702	3.394	3.429	1.000	1.210	0.443	1.000	1.148	0.480	0.926
England (United Kingdom)	3.451	3.423	3.557	3.609	3.652	3.175	3.359	1.000	1.087	0.453	1.000	0.902	0.350	0.478
Flanders (Belgium)	2.787	3.150	3.395	3.505	3.602	3.043	3.283	1.000	1.119	0.996	1.000	1.062	0.956	2.271

Source: OECD, TALIS Database

Table 10.107 CFA intercepts and loadings for the reference population (ISCED 2) by country: PINSLEADS

Countries (Reference Population)	Intercept			Loading		
	TC2G21C	TC2G21D	TC2G21E	TC2G21C	TC2G21D	TC2G21E
Australia	2.720	2.863	3.014	1.000	1.453	0.996
Brazil	2.938	2.941	3.057	1.000	1.744	1.007
Bulgaria	2.817	3.080	3.239	1.000	2.623	0.976
Chile	3.165	3.228	3.332	1.000	1.876	1.162
Croatia	2.674	2.679	2.781	1.000	1.739	1.000
Czech Republic	2.797	2.788	2.836	1.000	1.449	0.937
Denmark	2.413	2.575	2.503	1.000	2.959	1.907
Estonia	2.327	2.525	2.551	1.000	2.002	1.249
Finland	2.584	2.322	2.408	1.000	2.528	1.387
France	2.707	2.540	2.668	1.000	2.298	0.962
Iceland	2.580	2.708	2.953	1.000	1.756	0.926
Israel	2.872	2.992	3.081	1.000	1.408	0.968
Italy	2.742	2.653	2.783	1.000	2.262	1.085
Japan	2.309	2.415	2.325	1.000	1.892	1.026
Korea	2.949	2.974	3.056	1.000	1.668	1.051
Latvia	2.695	2.873	3.011	1.000	2.660	1.709
Malaysia	3.373	3.349	3.564	1.000	1.221	0.638
Mexico	2.930	3.040	3.243	1.000	2.056	1.194
Netherlands	2.405	2.725	3.053	1.000	2.170	1.188
Norway	2.643	2.495	2.418	1.000	1.841	1.204
Poland	2.744	2.832	3.167	1.000	2.158	0.767
Portugal	2.677	2.742	2.898	1.000	2.032	1.301
Romania	3.011	3.037	3.168	1.000	1.550	0.877
Serbia	3.059	2.997	3.048	1.000	2.504	1.515
Singapore	2.795	3.113	3.303	1.000	1.682	1.144
Slovak Republic	2.978	2.936	3.012	1.000	2.818	1.467
Spain	2.792	2.578	2.792	1.000	1.680	0.912
Sweden	2.593	2.489	2.743	1.000	1.775	0.849
Sub-national entities						
Abu Dhabi (United Arab Emirates)	3.332	3.327	3.365	1.000	1.314	1.009
Alberta (Canada)	2.905	2.982	3.125	1.000	1.240	0.920
England (United Kingdom)	2.720	2.975	3.197	1.000	1.613	1.054
Flanders (Belgium)	2.335	2.433	2.596	1.000	1.296	0.859

Source: OECD, *TALIS Database*

Table 10.108 CFA intercepts and loadings for the reference population (ISCED 2) by country: TSELEFFS

	Intercept												Loading											
Countries (Reference Population)	TT2G 34A	TT2G3 4B	TT2G 34C	TT2G 34D	TT2G 34E	TT2G 34F	TT2G3 4G	TT2G 34H	TT2G 34I	TT2G 34J	TT2G 34K	TT2G 34L	TT2G3 4A	TT2G 34B	TT2G 34C	TT2G 34D	TT2G 34E	TT2G 34F	TT2G3 4G	TT2G 34H	TT2G 34I	TT2G 34J	TT2G 34K	TT2G 34L
Australia	3.277	3.192	3.219	3.264	2.861	3.514	3.077	3.338	3.176	3.252	3.501	3.189	1.000	1.101	1.000	1.000	0.976	0.799	0.835	0.962	0.972	1.092	1.024	1.236
Brazil	3.443	3.482	3.436	3.306	3.261	3.495	3.456	3.349	3.295	3.294	3.484	3.259	1.000	1.130	1.000	1.000	1.150	0.763	1.001	1.072	1.020	1.343	1.208	1.537
Bulgaria	3.252	3.373	3.085	3.237	2.859	3.633	3.072	3.510	3.247	3.236	3.516	2.929	1.000	1.075	1.000	1.000	1.325	0.698	1.044	0.859	1.066	1.089	0.899	1.257
Chile	3.309	3.374	3.320	3.381	3.170	3.448	3.350	3.429	3.331	3.286	3.460	3.316	1.000	1.064	1.000	1.000	0.996	0.892	1.054	1.081	1.067	1.170	1.002	1.147
Croatia	2.795	2.577	3.157	3.163	2.588	3.401	2.956	3.078	3.138	3.089	3.463	3.341	1.000	1.024	1.000	1.000	0.929	0.693	0.813	0.858	1.056	1.232	1.130	1.199
Czech Republic	2.605	2.453	2.851	3.079	2.320	2.911	2.603	2.987	3.066	2.894	3.161	2.649	1.000	1.008	1.000	1.000	0.919	0.719	0.844	0.892	0.995	1.233	1.049	1.195
Denmark	3.633	3.499	3.531	3.502	3.055	3.700	3.339	3.382	3.495	3.058	3.589	3.255	1.000	1.210	1.000	1.000	1.142	0.739	1.128	1.095	1.048	1.072	0.906	1.140
Estonia	3.083	3.160	2.958	3.044	2.967	3.216	2.958	3.151	2.976	2.928	3.022	2.758	1.000	1.065	1.000	1.000	1.113	0.868	0.941	0.956	1.022	1.250	1.310	1.405
Finland	3.181	3.084	3.358	3.242	2.814	3.415	2.980	3.187	3.045	2.827	3.045	2.931	1.000	1.091	1.000	1.000	0.933	0.868	0.847	1.041	1.095	1.255	1.238	1.320
France	3.238	3.163	3.278	3.351	2.950	3.625	3.189	3.559	3.399	3.239	3.561	3.119	1.000	1.357	1.000	1.000	1.256	0.738	0.934	0.936	1.128	1.601	1.420	1.943
Iceland	3.360	3.198	3.532	3.383	2.973	3.330	2.985	3.402	3.301	3.281	3.378	3.089	1.000	1.095	1.000	1.000	0.970	0.713	0.899	0.951	1.025	1.371	1.244	1.483
Israel	3.406	3.245	3.315	3.219	3.036	3.429	3.067	3.225	3.143	3.028	3.392	3.104	1.000	1.160	1.000	1.000	1.071	0.673	0.924	1.006	1.020	1.527	1.247	1.582
Italy	3.393	3.369	3.243	3.390	3.224	3.392	3.438	3.517	3.277	3.258	3.596	3.302	1.000	1.142	1.000	1.000	1.265	0.681	1.025	0.886	1.087	1.332	1.111	1.321
Japan	2.149	2.249	2.464	2.627	2.169	2.613	1.992	2.568	2.581	2.215	2.636	2.492	1.000	1.186	1.000	1.000	1.073	0.718	0.775	0.967	1.049	0.981	1.226	1.247
Korea	2.984	2.989	2.948	2.957	2.701	2.837	2.750	3.010	2.914	2.786	3.033	2.745	1.000	1.052	1.000	1.000	1.062	0.831	0.963	0.947	0.991	1.093	1.059	1.145
Latvia	3.172	3.000	3.269	3.168	2.804	3.371	3.044	3.309	3.088	3.203	3.256	2.753	1.000	1.269	1.000	1.000	1.302	0.716	0.987	0.942	1.031	1.446	1.415	1.611
Malaysia	3.460	3.529	3.391	3.560	3.476	3.291	3.305	3.597	3.578	3.229	3.448	3.297	1.000	0.968	1.000	1.000	1.069	0.881	1.055	0.990	1.002	1.290	1.148	1.334

Table 10.108 CFA intercepts and loadings for the reference population (ISCED 2) by country: TSELEFFS (continued)

Mexico	3.306	3.384	3.196	3.310	3.125	3.260	3.317	3.237	3.137	3.176	3.400	3.260	1.000	1.119	1.000	1.000	1.039	0.839	1.101	1.113	1.098	1.168	1.054	1.221
Netherlands	3.195	2.839	3.141	3.265	2.763	3.434	2.984	3.256	3.197	2.789	3.369	2.825	1.000	1.140	1.000	1.000	1.139	0.857	0.975	0.919	0.913	1.470	1.331	1.627
Norway	2.938	2.702	2.909	3.126	2.438	3.260	2.794	3.112	3.118	2.930	3.150	2.846	1.000	1.118	1.000	1.000	0.907	0.752	0.867	0.904	0.987	1.427	1.286	1.486
Poland	3.127	2.870	3.016	3.323	2.770	3.476	2.998	3.373	3.330	3.232	3.209	2.836	1.000	1.051	1.000	1.000	0.923	0.771	0.765	1.012	1.050	1.133	1.156	1.305
Portugal	3.603	3.626	3.573	3.453	3.341	3.501	3.511	3.538	3.406	3.595	3.751	3.504	1.000	1.046	1.000	1.000	1.066	0.742	0.986	1.031	1.091	1.197	0.979	1.319
Romania	3.477	3.415	3.706	3.688	3.266	3.710	3.396	3.617	3.676	3.644	3.833	3.437	1.000	1.186	1.000	1.000	1.237	0.765	1.016	1.053	1.023	1.376	0.884	1.579
Serbia	3.096	2.984	3.223	3.224	2.798	3.332	3.146	3.358	3.244	3.144	3.449	2.943	1.000	1.176	1.000	1.000	1.122	0.745	0.922	1.041	1.080	1.217	1.134	1.323
Singapore	3.248	3.194	3.122	3.156	2.994	3.343	3.014	3.208	3.052	2.954	3.283	2.975	1.000	1.068	1.000	1.000	1.009	0.840	0.902	1.020	1.018	1.176	0.987	1.236
Slovak Republic	3.315	3.250	3.353	3.319	3.159	3.502	3.213	3.422	3.349	3.249	3.351	3.019	1.000	1.148	1.000	1.000	1.120	0.763	1.030	0.995	1.022	1.187	1.127	1.384
Spain	2.903	2.984	3.121	3.150	2.675	3.294	3.049	3.128	2.962	3.170	3.486	3.151	1.000	1.149	1.000	1.000	1.011	0.631	0.838	0.954	0.950	1.067	1.023	1.309
Sweden	3.361	2.986	3.072	3.231	2.829	3.292	2.952	3.248	3.196	3.138	3.488	2.970	1.000	1.157	1.000	1.000	1.177	0.670	0.961	1.044	1.116	1.349	1.156	1.519
Sub-national entities																								
Abu Dhabi (United Arab Emirates)	3.681	3.662	3.609	3.638	3.610	3.737	3.552	3.711	3.607	3.559	3.706	3.677	1.000	1.033	1.000	1.000	1.071	0.767	1.045	0.874	1.046	1.270	1.016	1.175
Alberta (Canada)	3.263	3.148	3.170	3.340	2.808	3.561	3.136	3.379	3.235	3.255	3.493	3.235	1.000	1.148	1.000	1.000	1.023	0.691	0.847	0.963	0.940	1.122	0.990	1.236
England (United Kingdom)	3.494	3.338	3.383	3.394	3.045	3.643	3.132	3.492	3.290	3.344	3.607	3.221	1.000	1.156	1.000	1.000	1.039	0.760	0.915	0.930	0.944	1.045	0.877	1.197
Flanders (Belgium)	3.326	3.064	3.413	3.491	2.972	3.523	3.200	3.494	3.472	3.045	3.548	2.932	1.000	1.194	1.000	1.000	1.016	0.744	0.868	0.992	1.076	1.426	1.133	1.433

Source: OECD, TALIS Database

Table 10.109 CFA intercepts and loadings for the reference population (ISCED 2) by country: TJOBSATS

Countries (Reference Population)	Intercept								Loading							
	TT2G46A	TT2G46B	TT2G46C	TT2G46D	TT2G46E	TT2G46F	TT2G46G	TT2G46J	TT2G46A	TT2G46B	TT2G46C	TT2G46D	TT2G46E	TT2G46F	TT2G46G	TT2G46J
Australia	3.245	3.139	3.036	3.452	3.309	2.921	3.168	3.206	0.816	1.039	0.937	0.758	1.000	1.000	1.039	0.850
Brazil	2.650	2.847	3.160	3.232	3.343	2.902	3.188	3.120	0.664	0.924	0.794	0.762	1.000	1.000	1.018	0.599
Bulgaria	2.694	2.857	3.088	3.182	3.245	2.705	3.172	3.179	0.712	1.036	0.842	0.843	1.000	1.000	0.933	0.488
Chile	3.008	3.205	2.851	3.371	3.263	2.977	3.184	3.414	0.480	0.715	0.991	0.728	1.000	1.000	1.023	0.550
Croatia	2.828	3.096	3.154	3.460	3.102	2.937	3.069	3.139	0.552	0.960	0.861	0.704	1.000	1.000	0.873	0.608
Czech Republic	2.516	2.866	3.219	3.284	3.082	2.900	3.014	2.996	0.552	0.927	0.834	0.813	1.000	1.000	0.912	0.762
Denmark	3.210	3.086	3.328	3.496	3.451	2.931	3.282	3.305	0.700	1.029	0.877	0.694	1.000	1.000	1.033	0.838
Estonia	2.746	2.822	3.074	3.218	2.943	2.775	2.926	3.003	0.606	0.917	0.746	0.772	1.000	1.000	0.884	0.519
Finland	3.361	3.181	3.167	3.511	3.225	3.023	3.167	3.173	0.694	0.956	0.828	0.713	1.000	1.000	0.901	0.806
France	2.629	3.010	2.976	3.424	3.244	3.136	3.053	3.048	0.585	0.842	0.930	0.760	1.000	1.000	1.041	0.536
Iceland	3.234	2.857	3.139	3.285	3.346	2.675	3.291	3.253	0.662	1.045	0.909	0.742	1.000	1.000	1.046	0.633
Israel	3.118	3.158	3.278	3.430	3.338	3.134	3.208	3.328	0.571	0.847	0.884	0.774	1.000	1.000	1.024	0.728
Italy	2.651	3.172	3.087	3.399	3.189	3.199	3.082	3.202	0.539	0.864	0.792	0.828	1.000	1.000	0.934	0.405
Japan	2.880	2.668	2.803	3.344	2.944	3.029	2.693	2.990	0.627	0.985	0.759	0.810	1.000	1.000	0.893	0.821
Korea	3.049	2.772	2.771	3.009	2.856	2.699	2.723	3.029	0.834	1.173	0.703	0.853	1.000	1.000	0.947	0.717
Latvia	2.623	2.772	3.068	3.181	3.210	2.762	3.042	3.021	0.519	1.061	0.717	0.777	1.000	1.000	0.886	0.462
Malaysia	3.518	3.431	2.598	3.521	3.288	3.349	3.120	3.384	0.893	1.274	0.683	0.769	1.000	1.000	0.956	0.608
Mexico	3.031	3.595	2.976	3.742	3.496	3.437	3.297	3.606	0.587	0.922	0.867	0.682	1.000	1.000	1.016	0.492
Netherlands	3.098	3.086	3.084	3.434	3.275	3.166	3.055	3.148	0.741	1.082	0.912	0.833	1.000	1.000	0.886	0.851
Norway	3.188	2.992	3.206	3.315	3.364	2.799	3.242	3.221	0.663	0.981	0.859	0.772	1.000	1.000	1.046	0.790
Poland	2.895	3.036	3.094	3.284	3.197	2.850	3.033	3.130	0.725	1.002	0.880	0.843	1.000	1.000	0.948	0.681
Portugal	2.842	2.911	3.042	3.213	3.314	2.692	3.176	3.256	0.690	0.937	0.976	0.875	1.000	1.000	1.005	0.387
Romania	2.699	3.005	3.169	3.306	3.264	2.950	3.128	3.130	0.493	0.904	0.811	0.746	1.000	1.000	1.033	0.726
Serbia	2.992	3.142	3.038	3.445	3.136	3.005	3.122	3.143	0.623	1.029	0.729	0.727	1.000	1.000	0.862	0.728

Table 10.109 CFA intercepts and loadings for the reference population (ISCED 2) by country: TJOBSATS (*continued*)

Singapore	2.985	3.012	2.689	3.199	3.016	2.608	2.816	3.011	0.833	1.053	0.794	0.770	1.000	1.000	1.011	0.726
Slovak Republic	2.580	2.816	3.099	3.093	3.099	2.615	2.948	2.997	0.899	1.252	0.769	1.004	1.000	1.000	0.930	0.484
Spain	3.016	3.276	3.105	3.521	3.217	3.207	3.148	3.279	0.739	0.956	0.842	0.703	1.000	1.000	0.908	0.521
Sweden	2.858	2.556	3.112	3.168	3.269	2.571	3.033	3.091	0.799	1.073	0.925	0.835	1.000	1.000	1.116	0.677
Sub-national entities																
Abu Dhabi (United Arab Emirates)	3.012	3.024	2.873	3.322	3.168	2.812	3.055	3.237	0.840	1.114	0.785	0.808	1.000	1.000	0.977	0.694
Alberta (Canada)	3.226	3.160	3.028	3.481	3.383	2.910	3.249	3.226	0.694	0.918	0.902	0.673	1.000	1.000	1.051	0.794
England (United Kingdom)	3.128	3.069	2.830	3.420	3.153	2.895	2.992	2.999	0.794	1.019	0.908	0.746	1.000	1.000	1.029	0.852
Flanders (Belgium)	3.037	3.217	3.358	3.545	3.399	3.176	3.236	3.330	0.505	0.915	0.984	0.721	1.000	1.000	1.055	0.741

Source: OECD, *TALIS Database*

Table 10.110 CFA intercepts and loadings for the reference population (ISCED 2) by country: TSCSTAKES

Countries (Reference Population)	Intercept					Loading				
	TT2G44A	TT2G44B	TT2G44C	TT2G44D	TT2G44E	TT2G44A	TT2G44B	TT2G44C	TT2G44D	TT2G44E
Australia	2.605	2.708	2.592	2.653	2.746	1.301	0.946	1.000	1.136	1.017
Brazil	2.780	2.855	2.618	2.843	2.804	1.132	0.978	1.000	0.878	0.886
Bulgaria	3.164	2.985	2.877	2.952	2.913	1.459	1.121	1.000	1.136	1.256
Chile	2.707	2.757	2.620	2.798	2.909	1.019	0.884	1.000	1.024	0.899
Croatia	2.813	2.944	2.761	2.753	2.867	1.391	0.872	1.000	1.074	1.110
Czech Republic	2.865	2.903	2.810	2.838	3.011	1.518	1.048	1.000	1.088	1.152
Denmark	2.824	2.683	2.547	2.884	2.997	1.487	0.910	1.000	1.279	1.123
Estonia	2.954	2.955	2.899	2.813	2.895	1.276	1.125	1.000	0.879	1.013
Finland	2.809	2.607	2.677	2.882	2.950	1.601	1.143	1.000	1.139	1.101
France	2.789	2.742	2.514	2.545	2.747	1.452	0.856	1.000	0.957	0.800
Iceland	2.851	2.807	2.700	2.863	2.998	1.277	0.976	1.000	1.102	0.982
Israel	2.690	2.597	2.530	2.819	2.958	1.263	0.863	1.000	1.093	1.054
Italy	2.733	2.809	2.369	2.916	2.893	1.577	1.067	1.000	1.110	1.083
Japan	2.792	2.616	2.456	2.677	2.921	1.309	0.865	1.000	1.074	0.859
Korea	2.627	2.876	2.706	2.726	2.765	1.225	0.776	1.000	0.970	1.000
Latvia	3.034	3.129	3.027	3.000	3.072	1.328	0.972	1.000	1.094	1.071
Malaysia	2.884	2.895	2.543	3.109	3.101	1.481	0.961	1.000	0.999	0.999
Mexico	2.562	2.678	2.430	2.814	2.715	1.187	0.934	1.000	0.966	0.935
Netherlands	2.706	2.782	2.669	2.768	2.818	1.601	0.907	1.000	0.917	0.760
Norway	2.910	2.851	2.784	2.782	3.183	1.447	0.901	1.000	1.321	0.779
Poland	2.867	3.038	2.936	2.854	2.931	1.327	0.914	1.000	1.004	0.928
Portugal	2.783	2.967	2.747	2.756	2.811	1.271	0.786	1.000	1.137	1.032
Romania	2.956	2.870	2.666	3.099	3.181	1.468	1.052	1.000	0.954	1.022
Serbia	2.842	3.049	2.810	2.957	2.881	1.302	0.865	1.000	1.080	1.086
Singapore	2.760	2.753	2.766	2.829	2.874	1.255	0.825	1.000	1.093	1.000
Slovak Republic	2.795	2.850	2.470	2.710	2.887	1.454	0.945	1.000	0.632	0.929

Table 10.110 CFA intercepts and loadings for the reference population (ISCED 2) by country: TSCSTAKES (*continued*)

	Intercept					Loading				
Countries (Reference Population)	TT2G44A	TT2G44B	TT2G44C	TT2G44D	TT2G44E	TT2G44A	TT2G44B	TT2G44C	TT2G44D	TT2G44E
Spain	2.859	2.897	2.770	2.839	2.849	1.173	0.962	1.000	0.973	0.850
Sweden	2.788	2.667	2.727	2.625	2.831	1.233	0.962	1.000	1.331	1.050
Sub-national entities										
Abu Dhabi (United Arab Emirates)	2.659	2.807	2.640	2.893	3.050	1.237	0.990	1.000	0.978	0.893
Alberta (Canada)	2.928	3.030	2.819	2.905	2.973	1.286	0.848	1.000	1.187	1.131
England (United Kingdom)	2.519	2.694	2.822	2.639	2.666	1.728	1.050	1.000	1.361	1.375
Flanders (Belgium)	2.848	2.910	2.955	2.780	2.914	1.568	1.052	1.000	1.249	1.137

Source: OECD, *TALIS Database*

Table 10.111 CFA intercepts and loadings for the reference population (ISCED 2) by country: TSCTSTUDS

Countries (Reference Population)	Intercept				Loading			
	TT2G45A	TT2G45B	TT2G45C	TT2G45D	TT2G45A	TT2G45B	TT2G45C	TT2G45D
Australia	3.325	3.541	3.288	3.342	1.000	1.190	1.234	0.956
Brazil	3.139	3.263	3.044	2.909	1.000	1.313	1.338	1.073
Bulgaria	3.160	3.278	3.184	3.428	1.000	1.392	1.300	1.055
Chile	3.254	3.416	3.229	3.264	1.000	1.274	1.250	0.991
Croatia	3.070	3.278	3.037	3.219	1.000	1.520	1.585	1.430
Czech Republic	3.113	3.177	3.032	3.277	1.000	1.507	1.399	1.105
Denmark	3.558	3.682	3.361	3.062	1.000	1.005	1.014	0.790
Estonia	3.142	3.193	3.062	3.313	1.000	1.346	1.127	0.919
Finland	3.211	3.397	3.214	3.379	1.000	1.340	1.309	0.936
France	3.155	3.250	3.119	3.294	1.000	1.680	1.591	1.035
Iceland	3.370	3.655	3.441	3.220	1.000	1.262	1.419	1.047
Israel	3.221	3.274	3.177	3.302	1.000	1.387	1.454	0.931
Italy	3.022	3.287	3.088	3.083	1.000	1.694	1.773	1.310
Japan	3.108	3.195	3.181	3.155	1.000	1.778	1.864	1.301
Korea	3.147	3.107	3.100	2.868	1.000	1.325	1.272	1.090
Latvia	3.099	3.189	3.099	3.353	1.000	1.536	1.322	1.052
Malaysia	3.241	3.460	3.055	3.189	1.000	0.948	0.931	0.893
Mexico	3.092	3.364	3.019	2.851	1.000	1.194	1.260	1.134
Netherlands	3.291	3.374	3.153	3.137	1.000	1.304	1.065	0.863
Norway	3.401	3.526	3.335	3.163	1.000	1.212	1.145	0.795
Poland	3.105	3.072	3.068	3.344	1.000	1.242	1.243	1.000
Portugal	3.297	3.409	3.150	3.390	1.000	1.307	1.157	0.965
Romania	3.198	3.274	3.103	3.175	1.000	1.203	1.246	1.151
Serbia	3.091	3.270	3.066	3.195	1.000	1.326	1.396	1.198
Singapore	3.157	3.287	3.074	3.261	1.000	1.338	1.114	1.046
Slovak Republic	3.053	3.174	3.012	3.255	1.000	1.300	1.058	0.891
Spain	3.216	3.313	3.115	3.139	1.000	1.498	1.468	1.047
Sweden	3.388	3.563	3.288	2.924	1.000	1.224	1.257	0.762
Sub-national entities								
Abu Dhabi (United Arab Emirates)	3.234	3.508	3.234	3.369	1.000	1.075	1.136	1.032
Alberta (Canada)	3.358	3.633	3.428	3.419	1.000	1.208	1.343	1.023
England (United Kingdom)	3.364	3.591	3.367	3.450	1.000	1.133	1.208	1.006
Flanders (Belgium)	3.272	3.347	3.191	3.443	1.000	1.341	1.230	0.876

Source: OECD, *TALIS Database*

Table 10.112 CFA intercepts and loadings for the reference population (ISCED 2) by country: TCDISCS

Countries (Reference Population)	Intercept				Loading			
	TT2G41A	TT2G41B	TT2G41C	TT2G41D	TT2G41A	TT2G41B	TT2G41C	TT2G41D
Australia	2.938	2.734	2.865	2.974	0.797	0.648	1.000	0.860
Brazil	2.400	2.501	2.470	2.398	1.000	0.696	1.000	1.039
Bulgaria	3.071	2.834	2.882	3.068	0.850	0.691	1.000	0.951
Chile	2.518	2.730	2.600	2.585	0.828	0.348	1.000	0.919
Croatia	3.159	2.841	3.052	3.104	0.824	0.665	1.000	1.040
Czech Republic	2.992	2.794	2.999	2.978	0.788	0.649	1.000	0.921
Denmark	3.043	3.084	3.004	3.061	0.810	0.508	1.000	0.953
Estonia	2.994	2.664	3.052	3.036	0.912	0.678	1.000	0.924
Finland	2.809	2.622	2.847	2.831	0.808	0.674	1.000	0.999
France	2.729	2.762	2.689	2.868	0.854	0.644	1.000	0.915
Iceland	2.579	2.717	2.654	2.886	0.881	0.533	1.000	0.914
Israel	2.776	2.879	2.884	3.021	0.808	0.580	1.000	0.926
Italy	2.988	2.805	2.921	3.187	0.915	0.640	1.000	0.942
Japan	3.239	2.961	3.422	3.275	1.063	0.595	1.000	1.028
Korea	2.785	2.850	2.711	2.870	0.877	0.410	1.000	0.930
Latvia	2.890	2.679	2.933	2.868	0.853	0.625	1.000	1.020
Malaysia	2.873	2.828	2.771	2.922	0.882	0.614	1.000	0.903
Mexico	3.026	2.912	2.975	2.993	0.783	0.535	1.000	0.814
Netherlands	2.325	2.846	2.716	2.870	0.679	0.718	1.000	0.950
Norway	2.741	2.793	2.844	2.958	0.852	0.548	1.000	1.012
Poland	3.151	2.812	3.002	3.102	0.790	0.539	1.000	0.863
Portugal	2.654	2.721	2.632	2.818	0.931	0.746	1.000	0.991
Romania	3.198	3.024	3.127	3.171	0.787	0.468	1.000	0.901
Serbia	3.112	2.903	3.016	3.097	0.932	0.658	1.000	0.982
Singapore	2.681	2.626	2.674	2.711	0.862	0.595	1.000	0.954
Slovak Republic	2.856	2.714	2.710	2.762	0.853	0.644	1.000	1.045
Spain	2.583	2.614	2.583	2.665	0.902	0.651	1.000	0.947
Sweden	2.946	2.645	2.889	2.809	0.923	0.689	1.000	0.955
Sub-national entities								
Abu Dhabi (United Arab Emirates)	3.144	2.935	3.057	3.223	0.914	0.555	1.000	0.975
Alberta (Canada)	2.934	2.819	2.861	2.905	0.828	0.567	1.000	0.944
England (United Kingdom)	3.053	2.879	2.947	3.064	0.823	0.623	1.000	0.937
Flanders (Belgium)	2.849	2.747	2.771	2.906	0.818	0.620	1.000	0.957

Source: OECD, *TALIS Database*

Table 10.113 CFA intercepts and loadings for the reference population (ISCED 2) by country: TCONSBS

Countries (Reference Population)	Intercept				Loading			
	TT2G32A	TT2G32B	TT2G32C	TT2G32D	TT2G32A	TT2G32B	TT2G32C	TT2G32D
Australia	3.266	2.871	3.152	3.039	0.941	1.382	1.098	1.000
Brazil	3.198	3.151	3.181	2.853	1.101	1.421	1.164	1.000
Bulgaria	3.623	3.106	3.285	3.291	0.493	1.113	1.065	1.000
Chile	3.392	3.281	3.241	3.313	0.869	1.287	1.258	1.000
Croatia	3.234	3.136	3.300	3.247	0.947	1.309	1.087	1.000
Czech Republic	3.154	3.184	3.226	3.068	0.838	1.307	1.122	1.000
Denmark	3.485	3.248	3.334	3.082	0.776	1.308	1.256	1.000
Estonia	3.207	2.915	3.209	3.179	0.863	1.269	1.202	1.000
Finland	3.336	2.986	3.213	3.218	0.779	1.286	1.210	1.000
France	3.234	3.337	3.250	2.928	0.805	1.219	1.185	1.000
Iceland	3.678	3.215	3.229	3.241	0.682	1.150	1.202	1.000
Israel	3.398	3.211	3.435	3.361	0.982	1.145	1.062	1.000
Italy	3.204	2.691	2.810	3.218	0.978	2.107	1.985	1.000
Japan	3.178	3.259	3.209	2.820	0.934	1.193	1.113	1.000
Korea	3.423	3.411	3.410	3.161	1.020	1.159	1.069	1.000
Latvia	3.440	3.170	3.343	3.157	1.171	1.283	1.207	1.000
Malaysia	3.212	2.934	3.239	3.144	1.171	1.380	1.053	1.000
Mexico	3.448	3.279	3.480	2.980	0.957	1.474	1.265	1.000
Netherlands	3.349	3.083	3.248	2.747	0.807	1.369	1.057	1.000
Norway	3.260	2.552	3.151	2.916	0.674	0.949	0.692	1.000
Poland	3.197	3.135	3.210	3.093	0.859	1.283	1.226	1.000
Portugal	3.248	3.202	3.454	3.271	1.054	1.443	1.248	1.000
Romania	3.249	3.326	3.337	3.162	0.903	1.232	1.184	1.000
Serbia	3.416	3.158	3.373	3.138	0.616	1.174	1.082	1.000
Singapore	3.264	3.178	3.326	3.349	0.901	1.148	1.022	1.000
Slovak Republic	3.277	3.114	3.254	3.163	0.734	1.163	1.153	1.000
Spain	3.193	3.098	3.058	3.151	0.959	1.480	1.269	1.000
Sweden	3.062	2.424	3.012	3.059	0.967	1.276	1.135	1.000
Sub-national entities								
Abu Dhabi (United Arab Emirates)	3.492	3.338	3.483	3.323	1.012	1.353	1.149	1.000
Alberta (Canada)	3.348	3.061	3.254	3.220	0.955	1.326	1.112	1.000
England (United Kingdom)	3.364	3.151	3.311	2.925	1.045	1.461	1.133	1.000
Flanders (Belgium)	3.535	3.066	3.204	2.855	0.619	1.355	1.379	1.000

Source: OECD, *TALIS Database*

Table 10.114 CFA intercepts and loadings for the reference population (ISCED 2)

Countries (Reference Population)	Intercept								Loading							
	TT2G33 A	TT2G33 B	TT2G33 C	TT2G33 D	TT2G33 E	TT2G33 F	TT2G33 G	TT2G33 H	TT2G33 A	TT2G33 B	TT2G33 C	TT2G33 D	TT2G33 E	TT2G33 F	TT2G33 G	TT2G33 3H
Australia	2.897	2.270	2.598	5.125	5.165	4.486	4.146	3.808	1.000	0.691	0.804	1.000	0.933	1.332	0.733	0.439
Brazil	2.604	1.558	2.852	3.428	4.255	3.703	2.765	2.861	1.000	0.547	0.710	1.000	0.975	1.223	0.757	0.976
Bulgaria	1.668	2.140	3.066	4.105	4.767	3.749	4.633	3.039	1.000	1.150	1.233	1.000	1.007	1.413	0.694	1.565
Chile	3.104	2.159	2.611	3.798	4.075	3.705	2.838	3.210	1.000	0.903	0.963	1.000	0.991	1.140	0.864	1.095
Croatia	1.781	1.480	2.480	3.537	4.440	3.655	3.141	3.175	1.000	0.800	1.174	1.000	1.091	1.390	0.889	1.354
Czech Republic	1.909	2.315	2.921	4.113	5.134	4.403	4.739	3.437	1.000	1.191	0.931	1.000	1.003	1.468	0.458	1.140
Denmark	4.148	2.423	3.284	4.587	4.735	3.660	4.891	3.124	1.000	0.907	0.674	1.000	1.189	1.239	0.705	0.519
Estonia	2.970	2.177	2.866	3.595	5.102	3.922	4.289	3.193	1.000	0.647	0.696	1.000	0.850	1.333	0.919	0.824
Finland	2.962	1.575	2.478	3.816	5.240	3.909	4.179	2.081	1.000	0.569	0.638	1.000	0.647	1.200	0.789	0.457
France	2.079	1.426	2.716	4.008	5.128	3.283	2.624	2.097	1.000	0.428	0.993	1.000	0.480	1.138	0.688	0.404
Iceland	2.630	1.427	2.796	3.690	4.727	4.008	2.634	3.324	1.000	0.356	0.716	1.000	0.831	1.027	0.284	0.559
Israel	2.139	1.824	2.995	4.520	4.657	3.906	5.131	3.879	1.000	0.837	1.043	1.000	1.074	1.194	0.694	1.919
Italy	3.712	2.101	3.115	3.967	4.895	3.990	4.517	2.601	1.000	0.969	0.874	1.000	0.782	0.993	0.323	0.762
Japan	3.545	3.230	2.571	3.981	4.389	3.234	4.593	2.773	1.000	0.551	0.699	1.000	0.924	0.974	0.443	0.517
Korea	2.554	2.660	1.827	3.439	2.590	2.880	3.278	2.427	1.000	0.686	0.890	1.000	1.039	0.975	0.960	1.278
Latvia	2.820	2.527	2.833	3.746	4.905	4.054	2.654	2.893	1.000	0.811	0.878	1.000	0.898	1.214	0.483	0.980
Malaysia	2.683	2.239	2.523	4.325	4.521	4.120	2.881	2.899	1.000	0.832	0.977	1.000	1.077	1.101	0.554	0.740
Mexico	4.517	2.140	2.892	3.568	3.684	3.381	3.906	3.538	1.000	1.271	1.566	1.000	1.160	1.379	0.920	1.598
Netherlands	1.900	2.309	2.743	3.992	4.136	3.403	4.545	3.197	1.000	0.825	0.886	1.000	1.239	1.510	0.696	0.810
Norway	3.095	2.301	2.592	4.745	4.942	4.246	5.528	2.656	1.000	0.926	0.547	1.000	1.032	1.326	0.445	0.642
Poland	3.308	2.593	3.225	4.055	5.147	4.447	4.095	3.168	1.000	1.054	1.045	1.000	0.889	1.211	0.724	0.682
Portugal	2.505	1.664	2.866	4.620	4.559	4.182	4.885	2.663	1.000	0.710	0.643	1.000	1.068	1.342	0.381	0.459
Romania	2.647	2.927	3.178	3.496	5.050	3.898	4.293	3.155	1.000	0.984	0.990	1.000	0.576	1.083	0.581	0.794
Serbia	2.475	2.412	2.713	3.711	4.591	3.566	4.077	3.252	1.000	0.975	1.094	1.000	0.925	1.287	0.730	0.942
Singapore	3.397	2.623	2.554	4.512	4.488	4.341	3.304	3.731	1.000	0.737	0.716	1.000	1.111	1.084	0.604	0.623

Table 10.114 CFA intercepts and loadings for the reference population (ISCED 2)-(continued)

Countries (Reference Population)	Intercept								Loading							
	TT2G33 A	TT2G33 B	TT2G33 C	TT2G33 D	TT2G33 E	TT2G33 F	TT2G33 G	TT2G33 H	TT2G33 A	TT2G33 B	TT2G33 C	TT2G33 D	TT2G33 E	TT2G33 F	TT2G33 G	TT2G33 3H
Slovak Republic	4.099	2.563	3.049	4.235	4.001	3.927	2.264	1.758	1.000	0.913	0.996	1.000	1.333	1.307	0.613	0.518
Spain	1.956	1.295	2.120	4.118	5.388	4.313	5.303	3.089	1.000	0.511	0.890	1.000	0.620	1.254	0.544	0.757
Sweden	3.413	1.951	2.618	3.618	5.321	4.332	5.250	3.342	1.000	0.580	0.546	1.000	0.710	1.163	0.564	0.355
Sub-national entities																
Abu Dhabi (United Arab Emirates)	3.196	3.148	3.431	4.405	4.543	4.424	4.592	3.884	1.000	0.992	0.952	1.000	1.094	1.089	0.624	0.931
Alberta (Canada)	2.431	1.899	2.781	4.355	4.985	3.905	3.582	3.786	1.000	0.737	0.858	1.000	0.801	1.275	0.917	0.916
England (United Kingdom)	2.506	2.807	2.272	4.912	5.160	4.122	3.572	3.573	1.000	0.884	0.885	1.000	1.145	1.454	1.123	1.192
Flanders (Belgium)	1.946	1.381	2.923	4.363	3.895	3.433	3.950	1.990	1.000	0.493	0.709	1.000	0.915	1.356	0.869	1.072

Source: OECD, *TALIS Database*

Table 10.115 CFA intercepts and loadings for the reference population (ISCED 2) by country: TEFFPROS

Countries (Reference Population)	Intercept				Loading			
	TT2G25 A	TT2G25 B	TT2G25 C	TT2G25 D	TT2G25 A	TT2G25 B	TT2G25 C	TT2G25 D
Australia	2.420	2.225	2.068	1.619	1.000	1.316	1.265	0.890
Brazil	2.315	2.195	2.154	1.798	1.000	1.323	1.326	1.029
Bulgaria	2.200	1.871	2.066	1.331	1.000	0.913	1.109	0.441
Chile	2.264	2.235	2.030	1.920	1.000	1.162	1.341	1.130
Croatia	2.750	2.236	1.963	1.489	1.000	1.619	1.871	1.025
Czech Republic	1.999	2.118	1.738	1.658	1.000	1.354	1.200	0.812
Denmark	2.625	2.470	2.056	1.580	1.000	1.285	1.316	0.640
Estonia	2.293	2.221	2.058	1.892	1.000	1.317	1.417	1.134
Finland	2.399	2.180	1.913	1.541	1.000	2.247	2.227	1.456
France	2.463	2.058	1.935	1.810	1.000	1.452	1.273	0.845
Iceland	2.383	2.039	1.778	1.899	1.000	1.113	1.402	1.137
Israel	2.443	2.053	1.915	2.404	1.000	1.269	1.127	0.990
Italy	2.459	2.118	1.884	2.038	1.000	1.588	1.364	1.211
Japan	2.086	2.186	2.005	1.331	1.000	1.293	1.805	0.980
Korea	2.017	2.004	1.970	1.578	1.000	1.187	1.209	0.891
Latvia	2.273	2.469	2.188	1.914	1.000	1.592	1.788	1.337
Malaysia	2.707	2.400	2.177	1.744	1.000	1.290	1.360	1.100
Mexico	2.317	2.313	2.275	1.918	1.000	1.322	1.473	1.112
Netherlands	2.448	2.245	2.166	2.131	1.000	1.228	1.446	1.117
Norway	2.037	1.941	1.614	1.739	1.000	1.349	0.964	0.960
Poland	2.416	2.329	2.051	1.902	1.000	1.767	1.695	1.268
Portugal	2.541	2.290	2.144	1.609	1.000	1.619	1.589	0.483
Romania	2.508	2.549	2.265	2.389	1.000	1.317	1.273	1.229
Serbia	2.422	2.247	1.838	1.660	1.000	1.508	1.559	1.176
Singapore	2.366	2.294	2.192	1.824	1.000	1.204	1.325	1.016
Slovak Republic	2.103	2.109	1.768	1.817	1.000	1.425	1.101	1.139
Spain	2.229	2.302	2.001	2.058	1.000	1.015	1.114	0.900
Sweden	2.534	2.056	1.785	1.878	1.000	1.870	1.771	1.878
Sub-national entities								
Abu Dhabi (United Arab Emirates)	2.768	2.557	2.423	2.026	1.000	1.346	1.470	1.230
Alberta (Canada)	2.429	2.290	2.222	1.807	1.000	1.143	1.315	0.913
England (United Kingdom)	2.486	2.293	2.117	1.772	1.000	1.354	1.354	1.065
Flanders (Belgium)	2.310	2.136	1.931	1.511	1.000	1.271	1.446	0.731

Source: OECD, *TALIS Database*

Table 10.116 CFA intercepts and loadings for the reference population (ISCED 2)

Countries (Reference Population)	Intercept					Loading				
	TT2G2 6A	TT2G2 6B	TT2G2 6C	TT2G2 6D	TT2G2 6F	TT2G2 6A	TT2G2 6B	TT2G2 6C	TT2G2 6D	TT2G2 6F
Australia	1.860	1.966	1.990	2.082	1.881	1.000	1.108	1.099	1.034	0.848
Brazil	2.271	2.243	2.137	2.323	2.602	1.000	1.127	1.149	1.219	1.007
Bulgaria	2.147	2.205	1.870	2.338	2.476	1.000	0.993	1.117	0.919	0.733
Chile	2.008	2.179	2.150	2.332	2.321	1.000	1.087	1.101	1.084	0.915
Croatia	2.126	2.418	1.834	2.466	2.586	1.000	1.152	1.090	1.248	1.150
Czech Republic	2.328	2.107	1.869	2.079	2.360	1.000	1.464	1.221	1.407	1.406
Denmark	2.236	2.227	1.873	2.273	2.180	1.000	1.162	1.046	1.241	1.072
Estonia	2.374	2.415	2.571	2.530	2.556	1.000	1.162	1.097	1.264	1.060
Finland	2.171	2.121	2.070	2.136	2.250	1.000	1.200	1.086	1.315	1.088
France	1.989	2.410	1.817	2.491	2.119	1.000	1.324	0.924	1.250	0.998
Iceland	2.476	2.442	2.946	2.837	2.526	1.000	0.999	1.058	1.371	0.940
Israel	2.222	2.251	1.968	2.204	2.162	1.000	1.141	1.127	1.189	1.052
Italy	2.666	2.839	2.481	2.780	2.794	1.000	1.085	1.040	1.107	1.063
Japan	3.458	3.526	2.993	3.296	3.331	1.000	1.016	1.068	1.317	1.089
Korea	2.909	3.030	2.886	2.962	3.033	1.000	0.996	1.011	0.887	0.767
Latvia	2.020	2.074	1.907	2.171	2.467	1.000	1.064	1.086	1.139	0.892
Malaysia	3.018	3.006	2.976	3.254	2.823	1.000	0.951	0.991	0.767	0.952
Mexico	2.136	2.434	2.065	2.304	2.226	1.000	1.040	1.066	1.093	0.913
Netherlands	2.158	2.134	2.005	2.248	2.240	1.000	1.404	0.944	0.944	1.279
Norway	2.582	2.607	2.325	2.734	2.140	1.000	1.235	1.239	1.296	1.146
Poland	1.532	1.663	1.503	1.822	2.347	1.000	1.269	1.220	1.539	1.226
Portugal	2.355	2.329	2.065	2.364	2.520	1.000	1.163	1.061	1.111	0.931
Romania	1.891	2.169	1.971	2.040	2.380	1.000	1.054	1.092	1.136	0.993
Serbia	1.955	2.175	2.157	2.199	2.348	1.000	1.134	1.006	1.286	1.104
Singapore	2.344	2.576	2.411	2.662	2.365	1.000	1.006	1.018	0.888	0.820
Slovak Republic	2.336	2.314	2.412	2.279	2.418	1.000	1.182	1.088	1.372	1.182
Spain	1.907	2.357	1.854	2.160	2.356	1.000	1.151	1.056	1.258	1.062
Sweden	2.290	2.347	2.622	2.899	2.291	1.000	1.157	1.635	1.635	0.981
Sub-national entities										
Abu Dhabi (United Arab Emirates)	1.517	1.768	1.521	1.884	1.815	1.000	1.116	1.073	1.051	1.022
Alberta (Canada)	1.941	1.960	1.803	2.206	1.864	1.000	1.047	0.962	0.901	0.805
England (United Kingdom)	1.638	1.782	1.726	1.931	1.712	1.000	1.168	1.116	1.145	0.977
Flanders (Belgium)	1.865	1.926	1.742	2.153	1.910	1.000	0.778	0.878	0.560	0.512

Source: OECD, *TALIS Database*

Table 10.117 CFA intercepts and loadings for the reference population (ISCED 2) by country: TPDDIVS

Countries (Reference Population)	Intercept						Loading					
	TT2G26H	TT2G26I	TT2G26J	TT2G26K	TT2G26L	TT2G26N	TT2G26H	TT2G26I	TT2G26J	TT2G26K	TT2G26L	TT2G26N
Australia	2.294	2.340	1.836	2.098	1.964	1.918	0.814	0.936	0.985	1.000	1.167	1.031
Brazil	2.450	3.347	3.127	2.671	2.761	2.965	0.812	0.591	0.765	1.000	0.992	0.803
Bulgaria	2.325	2.616	2.387	2.303	2.558	2.339	0.931	0.662	0.765	1.000	0.917	0.960
Chile	2.417	2.686	2.501	2.364	2.357	2.480	0.876	0.898	0.893	1.000	1.041	0.964
Croatia	2.675	2.956	1.909	2.478	2.488	2.306	0.749	0.671	0.666	1.000	0.997	0.751
Czech Republic	2.117	2.181	1.750	2.146	1.944	1.683	0.855	0.750	0.610	1.000	0.973	0.708
Denmark	2.018	2.711	1.825	2.090	2.017	1.663	0.685	0.761	0.780	1.000	1.065	0.644
Estonia	2.348	2.664	2.078	2.639	2.228	2.276	0.867	0.847	0.926	1.000	1.096	0.825
Finland	2.397	2.504	1.907	2.148	1.671	1.476	0.873	0.798	0.880	1.000	0.834	0.586
France	2.621	2.731	1.865	2.354	2.246	2.579	0.721	0.752	0.749	1.000	1.057	0.738
Iceland	2.614	2.696	2.350	2.383	2.303	2.162	0.742	0.741	0.864	1.000	1.061	0.865
Israel	2.252	2.592	2.066	2.320	2.313	2.342	0.844	0.788	0.835	1.000	0.994	0.941
Italy	2.780	3.017	2.848	2.814	2.521	2.736	0.890	0.787	0.836	1.000	0.976	0.822
Japan	3.311	3.261	2.574	3.224	2.934	3.335	0.906	0.941	0.886	1.000	1.011	0.929
Korea	2.980	3.146	2.729	2.984	2.934	3.263	0.794	0.750	0.906	1.000	0.949	0.686
Latvia	2.477	2.179	1.727	2.453	2.012	2.286	0.845	0.787	0.783	1.000	0.920	0.831
Malaysia	2.958	2.075	2.338	2.997	2.869	2.814	0.936	0.908	1.015	1.000	1.049	0.944
Mexico	2.534	3.149	2.838	2.515	2.717	2.693	0.954	0.748	0.736	1.000	0.967	0.960
Netherlands	2.514	2.308	1.717	2.305	1.904	2.087	0.800	0.884	0.699	1.000	0.984	0.827
Norway	2.204	2.469	2.022	2.501	2.308	1.969	0.728	0.887	0.996	1.000	1.309	1.082
Poland	2.271	2.469	1.484	2.119	1.585	1.936	0.621	0.615	0.801	1.000	1.012	0.948
Portugal	2.544	2.975	2.574	2.541	2.562	2.522	0.914	0.818	1.002	1.000	1.079	0.971
Romania	2.473	2.579	2.310	2.420	2.444	2.490	0.831	0.805	0.816	1.000	1.020	0.790
Serbia	2.425	2.869	1.874	2.289	2.036	2.351	0.834	0.699	0.663	1.000	0.851	0.798
Singapore	2.578	2.557	2.125	2.486	2.412	2.426	0.814	0.921	0.976	1.000	1.060	0.864
Slovak Republic	2.366	2.556	2.061	2.329	2.094	1.967	0.842	0.802	0.943	1.000	1.052	0.901

Table 10.117 CFA intercepts and loadings for the reference population (ISCED 2) by country: TPDDIVS (*continued*)

Countries (Reference Population)	Intercept						Loading					
	TT2G26H	TT2G26I	TT2G26J	TT2G26K	TT2G26L	TT2G26N	TT2G26H	TT2G26I	TT2G26J	TT2G26K	TT2G26L	TT2G26N
Spain	2.479	2.818	2.651	2.464	2.401	2.435	0.901	0.886	0.910	1.000	1.008	0.911
Sweden	2.499	2.658	2.132	2.412	2.044	1.594	0.798	0.801	0.847	1.000	0.970	0.584
Sub-national entities												
Abu Dhabi (United Arab Emirates)	2.069	2.475	2.139	2.064	2.263	2.178	0.901	0.735	0.889	1.000	1.069	0.939
Alberta (Canada)	2.252	2.334	1.814	2.030	1.886	1.799	0.802	0.829	0.881	1.000	0.991	0.746
England (United Kingdom)	2.110	2.205	1.877	1.950	1.926	1.915	0.677	0.839	1.048	1.000	1.107	0.983
Flanders (Belgium)	2.109	2.043	1.534	1.853	1.495	1.578	0.829	0.878	0.828	1.000	0.844	0.853

Source: OECD, *TALIS Database*

Table 10.118 CFA intercepts and loadings for TMSELEFFS by country in TALIS-PISA Link population

Countries (TALIS-PISA Link)	Intercept				Loading			
	TT2M15B	TT2M15D	TT2M15E	TT2M15F	TT2M15B	TT2M15D	TT2M15E	TT2M15F
Australia	2.694	2.593	2.974	2.816	0.919	0.762	0.432	1.000
Finland	2.759	2.677	2.646	2.928	0.960	1.033	0.990	1.000
Latvia	2.874	2.683	2.883	3.001	1.041	1.353	0.908	1.000
Mexico	2.682	2.817	3.149	2.683	0.955	1.194	0.362	1.000
Portugal	2.969	2.695	2.968	3.035	1.226	0.921	0.726	1.000
Romania	2.879	2.903	3.134	3.042	1.575	1.635	0.299	1.000
Singapore	2.737	2.450	2.934	2.721	1.015	1.177	0.601	1.000
Spain	2.572	2.444	2.653	2.459	1.011	0.977	0.790	1.000

Source: OECD, *TALIS Database*

TALIS 2013 Technical Report

The OECD's Teaching and Learning International Survey (TALIS) has been designed to provide data and analyses on the conditions needed for effective teaching and learning in schools. As the first international survey with this focus, it seeks to fill important information gaps that have been identified at the national and international levels of education systems. This *TALIS 2013 Technical Report* describes the development of the TALIS 2013 instruments and methods used in sampling, data collection, scaling and data analysis phases of the second round of the survey. It also explains the rigorous quality control programme that operated during the survey process, which included numerous partners and external experts from around the world. The information in this report complements the initial international report, *TALIS 2013 Results: An International Perspective on Teaching and Learning* (OECD, 2014).

Further reading:

TALIS 2013 Results: An International Perspective on Teaching and Learning (OECD, 2014)

A Teachers' Guide to TALIS 2013 (OECD, 2014)

Education at a Glance 2013: OECD Indicators (OECD, 2013)

The Experience of New Teachers (OECD, 2012)

Teaching Practices and Pedagogical Innovations (OECD, 2012)

Consult this publication on line at: www.oecd.org/edu/school/TALIS-technical-report-2013.pdf