TALIS 2008 Technical Report

Teaching And Learning International Survey

OECD

TALIS 2008
Technical Report

OECD

Teaching **A**nd **L**earning **I**nternational **S**urvey

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Foreword

The OECD's new 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.

TALIS is conceptualised as a programme of surveys, with successive rounds designed to address policy-relevant issues chosen by countries. This *Technical Report* relates to the first round of TALIS conducted in 2007-08, which studied lower secondary education in both the public and private sectors. It examined important aspects of teachers' professional development; teacher beliefs, attitudes and practices; teacher appraisal and feedback; and school leadership.

This report describes the development of the TALIS instruments and the methods used in sampling, data collection, scaling and data analysis, for those wishing to review and replicate the procedures used. Furthermore, it provides insight into the rigorous quality control programme that operated during all phases of the survey, involving numerous partners and external experts.

The information in this report complements the *User Guide for the TALIS International Database* (available for download from *www.oecd.org/edu/talis/*). The *Guide* provides a basic yet thorough introduction to the TALIS international database and to the results included in the first international report from TALIS, *Creating Effective Teaching and Learning Environments: First Results from TALIS* (OECD, 2009).

The database contains the survey responses from more than 70 000 teachers and more than 4 000 school principals in the 24 countries who participated in the first round of TALIS. The database was used to generate information and to act as a base for the production of the initial international report from the first round of TALIS published in June 2009 (OECD, 2009).

TALIS is a collaborative effort by the participating countries, guided by their governments on the basis of shared policy-driven interests. Representatives of each country form the TALIS Board of Participating Countries, which determines the policy orientations of TALIS as well as the analysis and results produced from it.

The OECD recognises the significant contributions of Dirk Hastedt, Steffen Knoll, Ralph Carstens and Friederike Westphal of the IEA Data Processing and Research Center in Hamburg, Germany, who co-edited this report. The principal authors of specific chapters were for Chapter 1: Dirk Hastedt, Steffen Knoll and Friederike Westphal; Chapter 4: Barbara Malak-Minklewiez and Suzanne Morony; Chapters 5 and 10: Jean Dumais and Sylvie LaRoche; Chapter 6: Friederike Westphal and Steffen Knoll; Chapter 7: Ralph Carstens; Chapter 8: Barbara Malak-Minklewiez, Suzanne Morony and Friederike Westphal; Chapter 9: Alena Becker and Ralph Carstens; Chapter 11: Svenja Vieluf, Juan Leon and Ralph Carstens. Chapters 2 and 3 and parts of Chapter 11 were authored by the OECD Secretariat.

The editorial work at the OECD Secretariat was carried out by Eric Charbonnier, Michael Davidson, Ben Jensen, Niccolina Clements, Soojin Park and Elisabeth Villoutreix. A full list of contributors to the TALIS project is included in Annex A of this report. This report is published under the responsibility of the Secretary-General of the OECD.

Barbara Ischinger

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Director for Education, OECD

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Table of Contents

FOREWORD 3

LIST OF ABBREVIATIONS AND ACRONYMS 15

CHAPTER 1 **INTRODUCTION AND SUMMARY** 17
Abstract 18
Overview of TALIS 18
Management of the study 18
Standardised procedures to ensure high-quality data 19
National centres and National Project Managers 19
Main tasks of the National Project Managers 19
Phases of the TALIS study 20
Pilot study 20
Field trial 20
Main survey 21

CHAPTER 2 **OVERVIEW OF TALIS 2008 AND FRAMEWORK DEVELOPMENT** 23
Abstract 24
The rationale for and aims of TALIS 24
The TALIS survey programme design 25
TALIS linked to PISA 25
The conceptual and analytic framework of the programme 25
Choosing the policy focus for TALIS 26
References 28

CHAPTER 3 **DEVELOPMENT OF TEACHER AND PRINCIPAL QUESTIONNAIRES** 29
Abstract 30
The role and membership of the OECD TALIS Instrument Development Expert Group 30
Timeline and phases of questionnaire development 31
Frameworks guiding questionnaire development 31
Teacher background characteristics and professional development 33
Principal and school background characteristics 34
School leadership and management 34
Appraisal of and feedback to teachers 35
Teaching practices, attitudes and beliefs 37
Pilot test 39
Field trial 39
References 42

CHAPTER 4 **TRANSLATION AND CULTURAL ADAPTATION** 45
Abstract 46
Overview 46
Instruments to be translated 46
Cultural and national adaptations 47
Translation procedures 47
Identifying the target language 48
Engaging translators 49
Producing translations 49
Submitting materials for external verification 50

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International translation verification 51
Processes of translation verification 51
Translation verification report 51
Translation verification summary 51
Feedback from National Project Managers on translation and translation verification 52
International Quality Control Monitor review of translation 52
Layout verification: paper and on line data collection 52
References 54

CHAPTER 5 **SAMPLE DESIGN** 55
Abstract 56
Overview 56
International sampling plan 56
Target population and survey population: International requirements and national implementations 56
Sample size requirements 58
National sampling strategies 58
Sampling frames 59
Stratification 59
Sample selection 59
Sampling for the field trial 60
National sampling plans 60
References 64

CHAPTER 6 **SURVEY OPERATIONS PROCEDURES** 65
Abstract 66
Manuals and software 66
Contacting schools and within-school sampling procedures 67
Identification numbers, Teacher Listing Forms and Teacher Tracking Forms 67
Assigning materials to teachers and school principals 68
Administering the questionnaires and national quality control 69
Monitoring the on line questionnaires 69
Material receipt and preparing for data entry 69
Survey Activities Questionnaire 69
References 71

CHAPTER 7 **ON LINE DATA COLLECTION** 73
Abstract 74
Overview 74
Design and mixed-mode considerations 74
Technical implementation 76
Operations 78
Field trial 79
Main study participation, mode distribution and evaluation 80
References 88

CHAPTER 8 **QUALITY ASSURANCE** 89
Abstract 90
Overview 90
Quality control in TALIS survey administration 90
International quality control monitoring programme 91
Survey anonymity 91
School co-ordinator interviews 92
Initial preparations 92
Survey administration activities 93
General observations 93

Survey Activities Questionnaire 94
Contacting schools 94
Preparing survey materials 95
Conversion to on line data collection 96
Survey administration 96
Data entry and verification 97
National quality control monitoring programme 97
References 101

CHAPTER 9 **CREATING AND CHECKING THE INTERNATIONAL DATABASE** 103
Abstract 104
Overview 104
Data entry and verification at national centres 104
Data checking, editing and quality control at the IEA Data Processing and Researcher Center 106
Import, documentation and structure check 107
Identification variable and linkage cleaning 108
Resolving inconsistencies in questionnaire data 108
Handling missing data 110
Interim data products 111
Building the international database 111
References 113

CHAPTER 10 **ESTIMATION WEIGHTS, PARTICIPATION RATES AND SAMPLING ERROR** 115
Abstract 116
Overview 116
Elements of the estimation weight (final weight) 116
School base weight (school design weight) 117
School non-response adjustment factor 117
Final school weight 118
Teacher base weight (teacher design weight) 118
Teacher non-response adjustment factor 119
Teacher adjustment factor for incidental exclusions 119
Teacher multiplicity adjustment factor 119
Final teacher weight 120
Participation rates 120
Participation rates for schools 121
Participation rate for teachers 121
Overall participation rates 122
Reporting participation rates 122
Meeting participation rates standard for TALIS 122
Sampling error with Balanced Repeated Replication 123
Creating replicates for Balanced Repeated Replication 123
Estimating the sampling error 125
Design effect and effective sample size 125
References 129

CHAPTER 11 **CONSTRUCTION AND VALIDATION OF SCALES AND INDICES** 131
Abstract 132
Overview 132
Simple questionnaire indices, ratios and indicators 132
Student-teacher ratio 132
Validation of complex questionnaire scale indices 135
Indices derived through Principal Components Analysis 135
Description of complex scale indices and their parameters 145
School leadership indices 145
References 205

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ANNEX A **TALIS CONSORTIUM, EXPERTS AND CONSULTANTS** **207**

ANNEX B **CHARACTERISTICS OF NATIONAL SAMPLES** **211**
Australia **212**
Austria **213**
Belgium (Flanders) **214**
Brazil **215**
Bulgaria **216**
Denmark **217**
Estonia **218**
Hungary **219**
Iceland **220**
Ireland **221**
Italy **222**
Korea **223**
Lithuania **224**
Malaysia **225**
Malta **226**
Mexico **227**
Norway **228**
Poland **229**
Portugal **230**
Slovak Republic **231**
Slovenia **232**
Spain (Excluding La Rioja, Canarias) **233**
The Netherlands **234**
Turkey **235**

ANNEX C **SAMPLING FORMS** **237**
Sampling Form 1 – Participation **238**
Sampling Form 2 – National Target Population **239**
Sampling Form 3 – Stratification **240**
Sampling Form 4 – Sampling Frame Description **241**
Sampling Form 5 – Excluded schools **242**
Sampling Form 6 – Population counts by strata **243**
Sampling Form 7 – Sample allocation **244**

ANNEX D **TALIS PRINCIPAL AND TEACHER QUESTIONNAIRE** **245**
Principal Questionnaire **246**
- Background information **247**
- School background information **248**
- School management **250**
- Teacher appraisal **253**
- School resources **255**

Teacher Questionnaire **259**
- Background information **260**
- Professional development **262**
- Teacher appraisal and feedback **264**
- Teaching practices, beliefs and attitudes **267**
- Your teaching in a particular <class> at this school **271**

FIGURES

Figure 1.1 Milestones of the survey 21

Figure 2.1 Policy issues and related indicator domains examined in TALIS 26
Figure 2.2 Results of priority-rating exercise 27

Figure 3.1 Survey themes for TALIS 32
Figure 3.2 Structure for evaluation of education in schools: data collected in TALIS 36
Figure 3.3 Principal Questionnaire item on student characteristics, altered for the main survey 41

Figure 4.1 Countries and languages participating in TALIS 48

Figure 5.1 TALIS international target and survey populations 57

Figure 6.1 Responsibilities of NPMs and the SC during survey administration 68

Figure 7.1 Architectural overview of the SurveySystem 76

Figure 9.1 Overview of iterative data processing at the IEA DPC 107

Figure 11.1 Illustration of CFA parameters 137
Figure 11.2 Latent y notation for a one-factor CFA model 138
Figure 11.3 Illustration of configural invariance of the construct Self-efficacy across two countries 140
Figure 11.4 Illustration of metric non-invariance for two countries 141
Figure 11.5 Illustration of scalar non-invariance across two countries 142
Figure 11.6 Illustration of non-invariance of residual variance across two countries 142

TABLES

Table 5.1 Reasons for and magnitude of school exclusion, by country 61
Table 5.2 Derivation of the required sample size 62
Table 5.3 Illustration of systematic random sampling with PPS 62
Table 5.4 Overview of the national sampling plans 63

Table 7.1 Extent to which paper and on line administration modes were used for the Principal Questionnaire during the main study (sorted in descending order of on line usage and country name) 84
Table 7.2 Extent to which paper and on line administration modes were used for the Teacher Questionnaire during the main study (sorted in descending order of on line usage and country name) 85
Table 7.3 Percentage of questionnaires administered on line, by respondent type and gender 85
Table 7.4 Percentage of questionnaires administered on line, by teachers' age group 86
Table 7.5 Percentage of schools that administered questionnaires on line, by country 86
Table 7.6 Error typology: type, initial percentage of all analysed login attempts, percentage of successful corrections, and percentage of residual failed login attempts (sorted in descending order of magnitude of initial error rate) 86

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Table 7.7 Maximum, mean, and median duration for completing an on line questionnaire, as well as percentage of completed questionnaires within one login, one day, and one week, by country 87

Table 8.1 Preliminary activities of the School Co-ordinator 99
Table 8.2 Questionnaire distribution and returns 99
Table 8.3 Use of forms in survey administration 99
Table 8.4 Use of specialist translators and reviewers 100

Table 10.1 Quality ratings and unweighted participation rates 126
Table 10.2 Unweighted participation rates, by country 126
Table 10.3 Weighted participation rates, by country 126
Table 10.4 Example of BRR-ready sample design and random assignation of pseudo PSUs 127
Table 10.5 Estimated design effects and effective sample sizes for selected key variables, their average and the original and effective sample sizes, by country (Teacher Questionnaire variables) 127
Table 10.6 Estimated design effects and effective sample size for selected key variables, their average and the original and effective sample sizes, by country (Principal Questionnaire variables) 128

Table 11.1 Item wording for school autonomy indices 152
Table 11.2 Selection of indices – rotated component matrix 152
Table 11.3 Factor loadings used for computation of factor scores for the indices of school autonomy 152
Table 11.4 Reliabilities for indices of school autonomy 153
Table 11.5 Item wording for school resource indices 153
Table 11.6 Selection of indices-rotated component matrix 154
Table 11.7 Factor loadings used for computation of factor scores for the indices of school resources 154
Table 11.8 Reliabilities for indices of school resources 154
Table 11.9 International means and standard deviations of school- and teacher-level factor score estimates using equally weighted pooled data 155
Table 11.10 Item wording of school leadership indices and dimensions 155
Table 11.11 Single items measuring school leadership and management behaviours 156
Table 11.12 Reliabilities for indices of school leadership 156
Table 11.13 Model fit for the scale Framing and communicating the school's goals and curricular development 157
Table 11.14 Model fit for the scale Promoting instructional improvements and professional development 157
Table 11.15 Model fit for the scale Supervision of instruction in the school 158
Table 11.16 Model fit for the scale Accountability role of the principal 158
Table 11.17 Model fit for the scale Bureaucratic rule-following 159
Table 11.18 Multiple group CFA examining different levels of cross-cultural invariance of the scale Framing and communicating the school's goals and curricular development 159
Table 11.19 Multiple group CFA examining different levels of cross-cultural invariance of the scale Promoting instructional improvements and professional development 159
Table 11.20 Multiple group CFA examining different levels of cross-cultural invariance of the scale Supervision of instruction in the school 160

Table 11.21 Multiple group CFA examining different levels of cross-cultural invariance of the scale Accountability role of the principal 160
Table 11.22 Multiple group CFA examining different levels of cross-cultural invariance of principals' Bureaucratic rule-following 160
Table 11.23 Factor loadings used for the computation of factor scores for the indicator Framing and communicating the school's goals and curricular development 160
Table 11.24 Item intercepts used for the computation of factor scores for the indicator Framing and communicating the school's goals and curricular development, by country 161
Table 11.25 Unique variances used for the computation of factor scores for the indicator Framing and communicating the school's goals and curricular development, by country 161
Table 11.26 Factor loadings used for the computation of factor scores for the indicator Promoting instructional improvements and professional development 162
Table 11.27 Item intercepts used for the computation of factor scores for the indicator Promoting instructional improvements and professional development, by country 162
Table 11.28 Unique variances used for the computation of factor scores for the indicator Promoting instructional improvements and professional development, by country 163
Table 11.29 Factor loadings used for the computation of factor scores for the indicator Supervision of instruction in the school 163
Table 11.30 Item intercepts used for the computation of factor scores for the indicator Supervision of instruction in the school, by country 164
Table 11.31 Unique variances used for the computation of factor scores for the indicator Supervision of instruction in the school, by country 164
Table 11.32 Factor loadings used for the computation of factor scores for the indicator Accountability role of the principal 165
Table 11.33 Item intercepts used for the computation of factor scores for the indicator Accountability role of the principal, by country 165
Table 11.34 Unique variances used for the computation of factor scores for the indicator Accountability role of the principal, by country 166
Table 11.35 Factor loadings used for the computation of factor scores for the indicator Bureaucratic rule-following 166
Table 11.36 Item intercepts used for the computation of factor scores for the indicator Bureaucratic rule-following, by country 167
Table 11.37 Unique variances used for the computation of factor scores for the indicator Bureaucratic rule-following, by country 167
Table 11.38 Factor score determinacy for the scales related to school principal's leadership, by country 168
Table 11.39 Item wording of school climate items and dimensions – Principal Questionnaire 168
Table 11.40 Single items measuring aspects of school climate 169
Table 11.41 Item wording of school climate items and dimensions – Teacher Questionnaire 169
Table 11.42 Reliabilities for school climate indices, by country 169
Table 11.43 Model fit and latent correlations for factors influencing school climate, by country 170
Table 11.44 Multiple group CFA examining different levels of cross-cultural invariance of factors influencing school climate 170
Table 11.45 Factor loadings used for the computation of factor scores for the indicator School climate: student delinquency 170
Table 11.46 Item intercepts used for the computation of factor scores for the indicator School climate: student delinquency, by country 171
Table 11.47 Unique variances used for the computation of factor scores for the indicator School climate: student delinquency, by country 171

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Table 11.48 Factor loadings used for the computation of factor scores for the indicator School climate: teachers' working morale 172
Table 11.49 Item intercepts used for the computation of factor scores for the indicator School climate: teachers' working morale, by country 172
Table 11.50 Unique variances used for the computation of factor scores for the indicator School climate: teachers' working morale, by country 173
Table 11.51 Factor score determinacy for the indicators School climate: student delinquency and School climate: teachers' working morale, by country 173
Table 11.52 Model fit of Teacher-student relations (TQ), by country 174
Table 11.53 Multiple group CFA examining different levels of cross-cultural invariance of Teacher-student relations 174
Table 11.54 Factor loadings used for the computation of factor scores for the indicator Teacher-student relations 174
Table 11.55 Item intercepts used for the computation of factor scores for the indicator Teacher-student relations, by country 175
Table 11.56 Unique variances used for the computation of factor scores for the indicator Teacher-student relations, by country 175
Table 11.57 Factor score determinacy for the indicators Teacher-student relations, by country 176
Table 11.58 Item wording of Classroom disciplinary climate items and dimensions 176
Table 11.59 Reliabilities for Classroom disciplinary climate, by country 177
Table 11.60 Model fit Classroom disciplinary climate, by country 177
Table 11.61 Multiple group CFA examining different levels of cross-cultural invariance of Classroom disciplinary climate 178
Table 11.62 Factor loadings used for the computation of factor scores for the indicator Classroom disciplinary climate 178
Table 11.63 Item intercepts used for the computation of factor scores for the indicator Classroom disciplinary climate, by country 178
Table 11.64 Unique variances used for the computation of factor scores for the indicator Classroom disciplinary climate, by country 179
Table 11.65 Factor score determinacy for the indicators Classroom disciplinary climate, by country 179
Table 11.66 Item wording of the scale Self-efficacy 180
Table 11.67 Reliabilities for Self-efficacy, by country 180
Table 11.68 Model fit for Self-efficacy, by country 181
Table 11.69 Multiple group CFA examining different levels of cross-cultural invariance of Self-efficacy 181
Table 11.70 Factor loadings used for the computation of factor scores for the indicator Self-efficacy 181
Table 11.71 Item intercepts used for the computation of factor scores for the indicator Self-efficacy, by country 182
Table 11.72 Unique variances used for the computation of factor scores for the indicator Self-efficacy, by country 182
Table 11.73 Factor score determinacy for the indicators Self-efficacy, by country 183
Table 11.74 Item wording of teachers' and principals' beliefs items and dimensions 183
Table 11.75 Single items measuring teachers' and principals' Beliefs about instruction 184
Table 11.76 Reliabilities for indices of teachers' Beliefs about instruction, by country 184
Table 11.77 Model fit and latent correlations for teachers' Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country 185

Table 11.78 Multiple group CFA examining different levels of cross-cultural invariance of teachers' Direct transmission beliefs about instruction **185**
Table 11.79 Multiple group CFA examining different levels of cross-cultural invariance of teachers' Constructivist beliefs about instruction **186**
Table 11.80 Factor loadings used for the computation of factor scores for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction **186**
Table 11.81 Item intercepts used for the computation of factor scores for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country **186**
Table 11.82 Unique variances used for the computation of factor scores for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country **187**
Table 11.83 Factor score determinacy for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country **188**
Table 11.84 Reliabilities for indices of principals' Constructivist beliefs about instruction, by country **188**
Table 11.85 Model fit for principals' Constructivist beliefs about instruction, by country **189**
Table 11.86 Multiple group CFA examining different levels of cross-cultural invariance of principals' Constructivist beliefs about instruction **189**
Table 11.87 Factor loadings used for the computation of factor scores for the indicator principals' Constructivist beliefs about instruction **189**
Table 11.88 Item intercepts used for the computation of factor scores for the indicator principals' Constructivist beliefs about instruction, by country **190**
Table 11.89 Unique variances used for the computation of factor scores for the indicator principals' Constructivist beliefs about instruction, by country **190**
Table 11.90 Factor score determinacy for the indicators principals' Constructivist beliefs about instruction, by country **191**
Table 11.91 Item wording of classroom teaching practices items and dimensions **191**
Table 11.92 Single items measuring classroom teaching practices items and dimensions **191**
Table 11.93 Reliabilities for indices of classroom teaching practices, by country **192**
Table 11.94 Reliabilities for indices of classroom teaching practices, by subject **192**
Table 11.95 Model fit and latent correlations for classroom teaching practices, by country **193**
Table 11.96 Model fit and latent correlations for classroom teaching practices, by subject **193**
Table 11.97 Multiple group CFA examining different levels of cross-cultural invariance of Classroom teaching practice: structuring **194**
Table 11.98 Multiple group CFA examining different levels of cross-cultural invariance of Classroom teaching practice: student-oriented **194**
Table 11.99 Multiple group CFA examining different levels of cross-cultural invariance of Classroom teaching practice: enhanced activities **194**
Table 11.100 Factor loadings used for the computation of factor scores for the indicator Classroom teaching practice: structuring **194**
Table 11.101 Item intercepts used for the computation of factor scores for the indicator Classroom teaching practice: structuring, by country **195**
Table 11.102 Unique variances used for the computation of factor scores for the indicator Classroom teaching practice: structuring, by country **195**
Table 11.103 Factor loadings used for the computation of factor scores for the indicator Classroom teaching practice: student-oriented **196**
Table 11.104 Item intercepts used for the computation of factor scores for the indicator Classroom teaching practice: student-oriented, by country **196**

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Table 11.105 Unique variances used for the computation of factor scores for the indicator Classroom teaching practice: student-oriented, by country **197**
Table 11.106 Factor loadings used for the computation of factor scores for the indicator Classroom teaching practice: enhanced activities **197**
Table 11.107 Item intercepts used for the computation of factor scores for the indicator Classroom teaching practice: enhanced activities, by country **198**
Table 11.108 Unique variances used for the computation of factor scores for the indicator Classroom teaching practice: enhanced activities, by country **198**
Table 11.109 Factor score determinacy for the indicators of Classroom teaching practice, by country **199**
Table 11.110 Item wording of Co-operation among staff **199**
Table 11.111 Single items measuring Co-operation among staff **199**
Table 11.112 Reliabilities for indices of Co-operation among staff, by country **200**
Table 11.113 Model fit and latent correlations for indices of Co-operation among staff, by country **200**
Table 11.114 Multiple group CFA examining different levels of cross-cultural invariance of Exchange and co-ordination for teaching **201**
Table 11.115 Multiple group CFA examining different levels of cross-cultural invariance of Professional collaboration **201**
Table 11.116 Factor loadings used for the computation of factor scores for the indicator Exchange and co-ordination for teaching **201**
Table 11.117 Item intercepts used for the computation of factor scores for the indicator Exchange and co-ordination for teaching, by country **202**
Table 11.118 Unique variances used for the computation of factor scores for the indicator Exchange and co-ordination for teaching, by country **202**
Table 11.119 Factor loadings used for the computation of factor scores for the indicator Professional collaboration **203**
Table 11.120 Item intercepts used for the computation of factor scores for the indicator Professional collaboration, by country **203**
Table 11.121 Unique variances used for the computation of factor scores for the indicator Professional collaboration, by country **204**
Table 11.122 Factor score determinacy for the indicators of co-operation among staff, by country **204**

List of abbreviations and acronyms

Abbreviation/Acronym	Meaning	Comments
CFA	Confirmatory Factor Analysis	
DPC	IEA Data Processing and Research Center	*Part of IEA*
FT	Field Trial	
IQCM	International Quality Control Monitor	*Contracted by IEA*
IDEG	OECD TALIS Instrument Development Expert Group	
IEA	International Association for the Evaluation of Educational Achievement	
INES	OECD Indicators of Education Systems Programme	
ISC	International Study Centre	*In TALIS, the IEA Data Processing and Research Center*
ISCED	International Standard Classification of Education	
MOS	Measure of Size	
MS	Main Study	
NAF	National Adaptation Form	
NDM	National Data Manager	
NPM	National Project Manager	
NQM	National Quality Monitor	
ODC	Online Data Collection	
P&P	Paper and Pencil	
PQ	Principal/School Questionnaire	
SC	School Co-ordinator	
STF	School Tracking Form	
TALIS	Teaching and Learning International Survey	
TLF	Teacher Listing Form	*Form produced by WinW3S*
TQ	Teacher Questionnaire	
TTF	Teacher Tracking Form	*Form produced by WinW3S*
WinDEM	Windows Data Entry Manager	*Software*
WinW3S	Windows Within School Sampling Software	*Software*

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Chapter 1

Introduction and Summary

18 Abstract

18 Overview of TALIS

18 Management of the study

19 Standardised procedures to ensure high-quality data

19 National centres and National Project Managers

- 19 Main tasks of the National Project Managers

20 Phases of the TALIS study

- 20 Pilot study
- 20 Field trial
- 21 Main survey

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Abstract

This chapter offers an overview of the OECD Teaching and Learning International Survey (TALIS) and summarises the survey's main features and objectives. It introduces the main stakeholders in the management and implementation of TALIS and their responsibilities, discusses standardised procedures used for the data collection and analyses and outlines the survey's milestones, beginning with the pilot study in 2006.

OVERVIEW OF TALIS

TALIS is the first international survey to focus on the working conditions of teachers and the learning environment in schools. It focuses on four main research areas: school leadership; professional development; teacher appraisal and feedback; and teaching practices, beliefs and attitudes. Data were collected through two types of questionnaires: a principal questionnaire that was completed by school principals and a teacher questionnaire that was completed by the sampled teachers. The questionnaires were designed to be completed by paper-and-pencil or on line.

The OECD Teaching and Learning International Survey (TALIS) *Technical Report* offers detail and documentation about the development of the TALIS instruments and the methods used in sampling, data collection, scaling and data analysis. The *Technical Report* enables review and replication of the procedures used for TALIS. Furthermore, it provides insight into the rigorous quality control programme that operated during all phases of the survey, involving numerous partners of the Consortium as well as external experts.

The first cycle of TALIS was conducted in 24 countries: Australia, Austria, Belgium (Flemish Community), Brazil, Bulgaria, Denmark, Estonia, Hungary, Iceland, Ireland, Italy, Korea, Lithuania, Malta, Malaysia, Mexico, the Netherlands, Norway, Poland, Portugal, Spain, the Slovak Republic, Slovenia and Turkey. Sixteen countries chose to use the on line data collection module (refer to Chapter 6 for more details).

The International Association for the Evaluation of Educational Achievement Data Processing and Research Center (IEA DPC), together with its consortium members Statistics Canada and the IEA Secretariat, partnered with the OECD as international contractor in April 2006. The International Study Centre (ISC) completed the work for the first cycle of TALIS in September 2009 with the publication of the TALIS international report, *Creating Effective Teaching and Learning Environments: First Results from TALIS* (OECD, 2009) and the *TALIS 2008 Technical Report* (OECD, 2010).

The first sections of this chapter outline how the first cycle of TALIS was managed at the international and national levels. The final two sections outline the three major phases of the survey.

MANAGEMENT OF THE STUDY

The OECD Secretariat represented and co-ordinated TALIS, holding overall responsibility for managing the project and monitoring implementation on a day-to-day basis through their communication with the international contractor. The OECD Secretariat served as the secretariat for the TALIS Board of Participating Countries (BPC), fostered consensus between the participating countries and acted as interlocutors to the TALIS BPC and the international contractor.

The TALIS Consortium (see Annex A) included members from the IEA Secretariat (Amsterdam, Netherlands), Statistics Canada (Ottawa, Canada) and the IEA DPC (Hamburg, Germany), where the ISC was located.

Mr. Juriaan Hartenberg managed financial and contractual relations between the Consortium and the OECD.

STANDARDISED PROCEDURES TO ENSURE HIGH-QUALITY DATA

In order to ensure international comparability of the questionnaires and the quality of the international database, the ISC implemented standardised procedures throughout all stages of survey preparation, survey administration and data processing. The ISC prepared six manuals that described all the necessary steps to the successful implementation of TALIS. The manuals were provided in both English and French (the two working languages of the OECD) and NPMs were requested to follow the procedures as outlined in the manuals.

Statistics Canada conducted the sampling and weighting for all participating countries following the rules and guidelines outlined in the *TALIS Sampling Manual* (MS-02-03). For more details about the sample design of TALIS, see Chapter 5. For more details about sampling weights and participation rates, see Chapter 10.

IEA provided a software package for within-school sampling, data entry and on line data collection (ODC). Participating countries were asked to use the software, which had operated successfully in numerous IEA surveys and had been specially adapted for TALIS. IEA Windows Within-School Sampling Software (WinW3S) enabled NPMs to draw the teacher sample for each nationally sampled school. When the questionnaires arrived back at the national centres, data were entered using the IEA Windows Data Entry Manager (WinDEM). Countries applying the ODC module were provided with the IEA SurveySystemDesigner. During a three-day data management seminar at the beginning of the survey, national data managers were trained in the correct use of these software packages. This extensive hands-on training familiarised them with the software at the survey preparation stage.

Quality control was implemented at different levels and during all phases of the survey to closely monitor survey procedures and data outcomes. At the international level, the IEA Secretariat co-ordinated quality control of the survey operations procedures whereas at the national level NPMs were asked to nominate quality control monitors who reported exclusively to the NPM (see Chapter 8 for more details on quality control).

During the first TALIS cycle the ISC held an annual or bi-annual meeting for all NPMs in order to provide an update on the progress of the survey and to discuss procedures, questionnaires and data.

NATIONAL CENTRES AND NATIONAL PROJECT MANAGERS

The first task for participating countries was to establish a national centre under the auspices of an experienced NPM, who became responsible for preparing and co-ordinating the survey at the national level. In most countries NPMs were supported by a national data manager who managed the technical aspects of administering the survey. Depending on the size of the country and the organisation of the national centre, the number of staff members who were involved in the survey varied considerably. Regular communication between the NPM and the ISC ensured that survey administration proceeded according to the international schedule.

Main tasks of the National Project Managers

In order to collect TALIS data, national centres distributed questionnaires to teachers and principals who completed and returned the questionnaires within a defined period of time. This procedure differed significantly from data collection for achievement studies, which rely on standardised testing sessions. It was a demanding task to ensure high participation rates at the school and teacher level. In order to achieve this, NPMs had to cooperate intensively with teachers unions and the ministry. Since TALIS is a new survey, public relation efforts were necessary to raise awareness among principals and teachers prior to the main data collection.

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At national centres NPMs and data managers performed the following tasks:

- established an overall schedule in co-operation with the ISC;
- attended NPM meetings to become acquainted with all TALIS instruments, materials and survey procedures;
- provided an up-to-date national sampling frame of International Standard Classification of Education (ISCED) Level 2 schools and discussed national options like oversampling directly with the sampling experts from Statistics Canada;
- performed within-school sampling and tracking using the IEA WinW3S;
- appointed an experienced translator to produce the national version(s) of the questionnaires based on the international instruments;[1]
- documented the required cultural adaptations using the National Adaptation Forms;
- prepared for ODC with the IEA SurveySystemDesigner (if applicable);
- nominated and trained school co-ordinators;
- nominated and trained national quality control monitors;
- monitored the return status of the questionnaires using a software tool provided by the ISC;
- entered data manually using WinDEM or monitored data entry if an external agency was subcontracted;
- performed quality control procedures in WinDEM; and
- completed the survey activities questionnaire after survey administration.

PHASES OF THE TALIS STUDY

The TALIS design included three major components: a pilot study, a field trial and the main survey. For the pilot study five countries volunteered to test the questionnaires within some self-selected schools. Each country was requested to run a field trial according to the standardised procedures mentioned in the previous section. All countries that completed the field trial also performed the main survey.

Pilot study

In order to check the quality and the content of the questionnaires, a small pilot study was conducted in the third quarter of 2006. Brazil, Malaysia, Norway, Portugal and Slovenia volunteered to test the instruments in their countries within a survey administration window of three weeks. Each of the participating countries selected five schools. Within these schools, one principal and five teachers volunteered to respond to the questionnaires. Therefore every pilot study country gathered data from 5 principals and 25 teachers. Data were entered by the national centres and processed by the ISC. Each NPM prepared a summary report reflecting the strengths and weaknesses of the survey procedures and outlining the feedback received from principals and teachers.

To facilitate survey implementation, the first three-day NPM meeting in Paris, France was held two months prior to the administration of the pilot study. The purposes of the meeting were to present the instruments, materials and survey operations procedures for TALIS and to introduce NPMs to the survey schedule.

Field trial

The objective of the field trial (FT) was to test the survey instruments and operational procedures in all participating countries in preparation for the main survey (MS). Austria, Bulgaria and Mexico, which joined the survey in early 2007 (somewhat later than other countries), also performed field trials. Bulgaria's field trial utilised MS instruments, as these were already complete when it joined the survey.

In November 2006, the second two-day NPM meeting was held in Hamburg, Germany to discuss the outcomes of the pilot study and the required changes to the instruments for the FT. After the NPM meeting, the ISC conducted a three-day data management seminar to train the national data managers in using WinW3S for within school sampling, WinDEM for data entry and the IEA SurveySystemDesigner for on line data collection. The 16 countries that had decided to use ODC for the main survey trialled procedures and data collection during the FT.

All participating countries conducted the FT during a six-week timeframe in the second and third quarter of 2007.[2] Sampling, translation verification and layout verification were performed following main survey standards. The expected sample size per country was 400 teachers and 20 principals out of 20 schools sampled by Statistics Canada prior to the FT (see Chapter 5 for more details). Exceptions were made for Iceland and Malta because of their size: the sample size for Iceland was 10 schools, 10 principals and 100 teachers and the sample size for Malta was 4 schools, 4 principals and 40 teachers.

Data entry was performed under the supervision of the NPM or data manager using IEA WinDEM software. National data sets were then submitted to the ISC for data processing and quality checks.

After the FT the ISC collected feedback from NPMs on how the survey had been perceived within the country and whether modifications to the procedures were needed. One of the challenges of TALIS was to achieve high participation rates at the school and individual levels. Considerable efforts were exerted in communicating information about the study. Information about best practices relative to ensuring high participation rates was gathered and shared with all NPMs prior to the MS preparation and was included in the *TALIS Manual for National Project Managers* (MS-01-03) .

Main survey

The third three-day NPM meeting was held in July 2007 in Tallinn, Estonia to prepare NPMs for administrating the MS. The meeting focused on the outcomes of the FT and the presentation of the finalised MS instruments. The rules for international and national quality control monitoring (see Chapter 8) were explained since, unlike the FT, the MS utilised external experts for quality control at the international level.

Figure 1.1

Milestones of the survey

	Activity
2006: third quarter	Pilot study: conducted in five self-selected countries
2007: first and second quarter	FT: testing of software and procedures; mandatory for all participating countries
2007: second and third quarter	Finalisation of instruments; fine-tuning of software and procedures
2007: fourth quarter	MS: Southern Hemisphere countries
2008: first and second quarter	MS: Northern Hemisphere countries
2008: third quarter	Data processing, cleaning, weighting
2008: third and fourth quarter	Analysis of the MS data; drafting of the International and the Technical Reports
2009: first and second quarter	Finalisation and release of the International Report
2009: second quarter	International database analyser training at the ISC
2009: second and third quarter	Finalisation and release of the Technical Report and the TALIS User Guide

Source: OECD.

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Southern Hemisphere countries conducted the MS in the fourth quarter of 2007 and had until February 2008 to submit their data. Northern Hemisphere countries administered the survey within a self-selected period during the first and second quarter of 2008, with a final data submission deadline of May 31, 2008.

All data were processed and cleaned at the ISC. Weights and weight adjustments were performed at Statistics Canada in the third quarter of 2008.

In October 2008 the fourth three-day NPM meeting in Dublin, Ireland, took place. The purpose of the meeting was to review prototype tables for the TALIS international report in plenary and to discuss country data in individual country sessions. All countries had an opportunity to verify their entries in the National Adaptation Database (NADB). NPMs provided feedback about the first round of TALIS, allowing their experiences to be incorporated into the second round of the survey.

We would like to take the opportunity to thank all participants who contributed to the success of the first round of TALIS.

NOTES

1. Although the questionnaire translations were verified by independent experts, NPMs retained overall responsibility for the final versions.

2. Only Bulgaria conducted the survey in the fourth quarter of 2007 within a timeframe of four weeks.

Chapter 2

Overview of TALIS 2008 and Framework Development

24 Abstract

24 The rationale for and aims of TALIS

25 The TALIS survey programme design

- 25 TALIS linked to PISA

25 The conceptual and analytic framework of the programme

26 Choosing the policy focus for TALIS

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Abstract

This chapter presents the rationale and aims of TALIS, as well as the design of the TALIS survey programme, which was conceptualised as a cycle of surveys, the first of which was conducted in 2007-08 and is the focus of this report. The chapter presents the conceptual and analytical frameworks that shaped the development of the programme and offers an overview of the policy issues and indicators considered and chosen for the first TALIS cycle.

THE RATIONALE FOR AND AIMS OF TALIS

TALIS was developed as part of the Organisation for Economic Co-operation and Development (OECD) Indicators of Education Systems (INES) project, which, over the past 20 years has developed a coherent set of indicators that provide a reliable basis for the quantitative comparison of the functioning and performance of education systems in OECD and partner countries. The main product of the INES project is the annual OECD publication *Education at a Glance* (OECD, 2008).

Providing information on teachers, teaching and learning is an essential component of the INES programme. At the INES General Assembly in 2000 in Tokyo, countries called for increased attention to teachers and teaching in future work. The importance of teachers, including the need for better information on the quality of learning and how teaching influences learning, was affirmed at the meeting of education sub-Ministers in Dublin in 2003.

Although the INES programme has made considerable progress over the years in developing indicators about the learning environment and organisation of schools, as well as learning outcomes, significant gaps remain in the knowledge base on teachers and teaching. To address these deficiencies, a data strategy was developed that proposed steps towards improving the indicators on teachers, teaching and learning. The strategy that was developed identified strands of work, one of which was an international survey of teachers, which evolved into the TALIS programme.

At the same time, the OECD review of teacher policy, which concluded with the report *Teachers Matter: Attracting, Developing and Retaining Effective Teachers* (OECD, 2005), identified a need to develop better national and international information on teachers. The policy framework used in the policy review as well as the specific data gaps and priorities that it highlighted were instrumental in the design of TALIS.

The overall aim of the TALIS series of surveys is therefore to provide, in a timely and cost-efficient manner, policy relevant, robust international indicators and analysis on teachers and teaching that help countries to review and develop policies that create the conditions for effective schooling. Such cross-country analyses provide the opportunity to examine countries facing similar challenges and to learn from different policy approaches and the impact they have on the learning environment in schools.

The guiding principles that shaped the development of the survey strategy are:

- *Policy relevance*. Clarity about the 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-orientation*. The results should yield information that can be used to develop indicators.
- *Validity, reliability, comparability and rigour*. 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 conceived as a sequence of surveys that, over time, could be administered to teachers from all phases of schooling. The design also incorporates a progressive move to a more fully implemented link of teacher information to the Programme for International Student Assessment (PISA) operated by the OECD. The specific plans for successive survey rounds will be reviewed after the first round of the cycle is completed.

Countries participating in the first round of TALIS decided that the main focus of the first round should be teachers in lower secondary education and their school principals, but also agreed that there should be international options through which countries could also survey teachers at other levels of education.

The first round of TALIS comprised a core target population and international sampling options. The core included a representative sample of International Standard Classification of Education (ISCED) Level 2 teachers and principals of their schools. The international options included the following: *Option 1:* a representative sample of teachers of primary education (ISCED Level 1) and the principals of their schools; *Option 2:* a representative sample of teachers of 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 schools that took part in PISA 2006 and the principals of those schools.

The TALIS Board of Participating Countries (BPC) agreed that for an option to be adopted as an *international* option, more than half of the participating countries would need to decide to take it up; otherwise the option would be pursued as a *national* option. In the event, none of the international options was adopted and only Iceland pursued a national option of surveying ISCED Level 1 teachers and their principals. In addition, alongside the TALIS international survey, Mexico conducted a national survey of teachers in *Telesecundaria* (distance learning) schools using slightly adapted versions of the TALIS survey instruments.

TALIS linked to PISA

In the process of developing TALIS, several countries expressed a desire to have the survey linked to outcome measures. Options for achieving this were considered and a link to the PISA outcome measures was seen as the most obvious route. Following concerns raised by countries about conceptual, methodological and operational issues, two expert reviews considered what scientifically valid insights could be gained from linking TALIS to PISA.

The assessment from these reviews clarified that while insights to teacher and teaching effectiveness could not be gained through linking a teacher survey to PISA, there would be value in using the teacher responses to develop a fuller picture of the learning environment of 15-year-old students in PISA schools and to examine the relationship with that and school level PISA outcome variables. Nevertheless, some uncertainties remained and it was therefore decided to include in the first round of TALIS an experimental link to PISA 2006 for those countries that were interested in taking up the option. As no country pursued this option, further consideration will be given to the extent of the link between TALIS and PISA in planning future rounds of TALIS.

THE CONCEPTUAL AND ANALYTIC FRAMEWORK OF THE PROGRAMME

A joint taskforce comprising experts from the INES Network A (learning outcomes) and Network C (learning environment and school organisation) developed the original conceptual framework for the TALIS programme. The taskforce was asked to develop a data strategy on teachers, teaching and learning in order to fill the data gaps at the international level and help make the coverage of the INES indicators more complete. A major part of this

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strategy was a survey programme that developed into TALIS. Underpinning the data strategy was a conceptual framework for the development of data and indicators, encompassing the following seven dimensions: *i)* policies for maintaining a high-quality teaching force; *ii)* system-wide characteristics of the teacher workforce; *iii)* school policies and antecedents that impact teaching and learning; *iv)* classroom ecology; *v)* student characteristics; *vi)* teacher characteristics and antecedents; and *vii)* teaching and learning activities.

In the course of developing TALIS, the components of this conceptual framework were transposed into a policy framework for questionnaire development. The framework identifies five main policy issues that to a large degree reflect the policy issues that had been studied in the OECD teacher policy review (OECD, 2005). The five main policy issues together with the "indicator domains" within them are shown in Figure 2.1.

Full details of the framework are contained in the OECD document *Proposal for an international survey of teachers, teaching and learning* (EDU/EC/CERI(2005)5).

Figure 2.1

Policy issues and related indicator domains examined in TALIS

POLICY ISSUE 1	**Attracting teachers to the profession**
Indicator No. 1	Adequacy of teacher supply and teacher shortages
Indicator No. 2	Profile of new teachers
Indicator No. 3	Motivations and early career experience of new teachers
Indicator No. 4	Effectiveness of recruitment and selection procedures and incentives
POLICY ISSUE 2	**Developing teachers within the profession**
Indicator No. 5	Profile of teachers' education and training
Indicator No. 6	Frequency and distribution of education and training
Indicator No. 7	Satisfaction and effectiveness of education and training
POLICY ISSUE 3	**Retaining teachers in the profession**
Indicator No. 8	Teacher attrition and turnover
Indicator No. 9	Job satisfaction and human resource measures
Indicator No. 10	Recognition, feedback, reward and evaluation of teachers
POLICY ISSUE 4	**School policies and effectiveness**
Indicator No. 11	School leadership
Indicator No. 12	School climate
POLICY ISSUE 5	**Quality teachers and teaching**
Indicator No. 13	Teaching practices, beliefs, and attitudes
Indicator No. 14	Quality of teachers (experience, qualifications, responsibilities)
Indicator No. 15	Division of working time

Source: OECD.

CHOOSING THE POLICY FOCUS FOR TALIS

In order to narrow down the proposed content of the survey and to assist countries in deciding whether to participate in TALIS, a priority rating exercise was conducted. Initially this involved all OECD countries but once the group of participating countries was established, it reviewed and finalised the results. The rating involved each country assigning 150 rating points across the 15 "indicators" in the framework shown above, with higher points indicating a higher priority for an indicator to be included in the first round of the TALIS survey.

Figure 2.2 shows the results of the rating exercise, which produced a priority ranking of the 15 indicators.

Figure 2.2

Results of priority-rating exercise

Ranking	Indicator number	Indicator
1	Indicator No. 10	Recognition, feedback, reward and evaluation of teachers
2	Indicator No. 11	School leadership
3	Indicator No. 13	Teaching practices, beliefs and attitudes
4	Indicator No. 14	Quality of teachers (experience, qualifications, responsibilities)
5	Indicator No. 7	Satisfaction and effectiveness of education and training
6	Indicator No. 5	Profile of teachers' education and training
7	Indicator No. 12	School climate
8	Indicator No. 15	Division of working time
9	Indicator No. 6	Frequency and distribution of education and training
10	Indicator No. 9	Job satisfaction and human resource measures
11	Indicator No. 3	Motivations and early career experience of new teachers
12	Indicator No. 2	Profile of new teachers
13	Indicator No. 4	Effectiveness of recruitment and selection procedures and incentives
14	Indicator No. 8	Teacher attrition and turnover
15	Indicator No. 1	Adequacy of teacher supply and teacher shortages

Source: OECD.

Participating countries reviewed these results at their meeting in October 2005 and decided on the following main policy themes for the first round of TALIS: recognition, feedback, reward and evaluation of teachers; school leadership; and teaching practices, beliefs and attitudes

In addition, "teacher professional development", drawing on Indicators 5, 6 and 7 and the induction and mentoring aspects of Indicator 4, was also chosen as an important theme in TALIS. In part this was because of its synergies with the three main themes and also because it allowed TALIS to serve as a vehicle for countries of the European Union to collect key information on teachers that the European Commission had identified as important for monitoring progress towards the Lisbon 2010 goals.

Aspects of the lower–rated indicators were also included where they provided important complementary analytical value to the main themes. In particular, this meant that aspects of "school climate" (Indicator 12) and "division of working time" (Indicator 15) and a single item on "job satisfaction" (Indicator 9) were also included in the survey.

The next chapter discusses the development of the TALIS survey instruments around the chosen themes.

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References

OECD (2005), *Teachers Matter: Attracting, Developing and Retaining Effective Teachers*, OECD, Paris.

OECD (2008), *Education at a Glance 2008 – OECD Indicators*, OECD, Paris.

Chapter 3

Development of Teacher and Principal Questionnaires

30 Abstract

30 The role and membership of the OECD TALIS Instrument Development Expert Group

31 Timeline and phases of questionnaire development

31 Frameworks guiding questionnaire development

- 33 Teacher background characteristics and professional development
- 34 Principal and school background characteristics
- 34 School leadership and management
- 35 Appraisal of and feedback to teachers
- 37 Teaching practices, attitudes and beliefs

39 Pilot test

39 Field trial

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Abstract

In order to establish goals for the development of the teacher and principal questionnaires, the TALIS Board of Participating Countries (BPC) conducted a priority rating exercise (see Chapter 2). To translate these goals into survey analysis plans and survey questionnaires (*i.e.* the Teacher and Principal Questionnaires), an Instrument Development Expert Group (IDEG) was established in conjunction with the BPC. This chapter explains in detail the frameworks guiding the questionnaire development for each of the main themes covered by the first TALIS survey: teacher background characteristics and professional development; principal and school background characteristics; school leadership and management; appraisal of and feedback to teachers; and teaching practices, attitudes and beliefs.

THE ROLE AND MEMBERSHIP OF THE OECD TALIS INSTRUMENT DEVELOPMENT EXPERT GROUP

The OECD Secretariat led the work of the IDEG, which reported to the TALIS BPC. The specific tasks of the IDEG were to: review the proposed indicators for the survey to ensure that the variables, indicators and themes provide a logical basis for instrument development, giving consideration to completeness and coherence; review the catalogue of existing questions compiled from national and international studies in order to assess their suitability for measuring the variables within the TALIS analytic framework and to identify other possible sources of exemplary questions; draft suitable questions for the development of the identified indicators and research questions; consider and advise on implications for the sample design arising from the questionnaire development and vice versa; consider and advise on the extent to which the teacher questionnaire in the main survey should be the same as that in the experimental PISA link; review and revise the questionnaires in the light of pilot and field trial (FT) results; contribute to the drafting of the survey analysis plans; and present proposed questionnaires and analysis plans to the BPC.

The persons appointed to the IDEG were chosen for their expertise in the main policy themes selected for TALIS and for their considerable experience in survey-based education policy research and in instrument development in the international context. The four chosen experts were:

- *Dr. David Baker,* Harry and Marion Eberly Professor of Comparative Education and Sociology, Department of Education Policy Studies, Penn State University, USA. Dr. Baker led the development of the school leadership sections of TALIS;
- *Prof. Aletta Grisay*, Consultant, Belgium. Prof. Grisay took a lead role on the teaching attitudes, beliefs and practices sections of TALIS;
- *Prof. Dr. Eckhard Klieme*, Head of the Center for Education Quality and Evaluation, German Institute for International Educational Research, Frankfurt, Germany. Prof. Dr. Klieme led the development of the teaching attitudes, beliefs and practices sections of TALIS; and
- *Prof. Dr. Jaap Scheerens*, Professor of Educational Organisation and management, University of Twente, The Netherlands and chair of the INES Network C, in which the early stages of TALIS were formulated. Prof. Dr. Scheerens led the development of the teacher appraisal and feedback sections of the TALIS survey.

The OECD Secretariat led the drafting of teacher, principal and school background questions as well as questions related to teachers' professional development. Representatives of the international contractor, the International Association for the Evaluation of Educational Achievement (IEA), attended the IDEG meetings to ensure coherence between instrument development and sample design.

The IDEG's responsibility was to develop proposed questionnaire content for review by the TALIS National Project Managers (NPMs) and ultimately the TALIS BPC. TALIS NPMs advised on the validity of the questions nationally, the value of the questions in the intended analysis, and the clarity of the drafting and sequencing of the questions. The TALIS BPC approved the questionnaires at each stage of testing and implementation (pilot, field trial and main survey) and advised on the political relevance of the questionnaire content, its adherence to the goals of TALIS and the validity of the questions nationally.

TIMELINE AND PHASES OF QUESTIONNAIRE DEVELOPMENT

The TALIS NPMs and BPC reviewed each successive draft of the questionnaires. The validity of the questionnaires was first tested through a small-scale pilot in five countries and then more fully in a subsequent FT. While the pilot test was solely focused on testing the questionnaires, the FT had the wider remit of testing the survey operations and further testing the validity of the questionnaires.

In summary, the main steps in the development of the questionnaires were:

- TALIS BPC conducted a priority-rating exercise to determine main themes of TALIS – third quarter of 2005.
- IDEG elaborated these themes into research, questions, variables and constructs – fourth quarter of 2005.
- IDEG drafted questionnaire items – January to March 2006.
- TALIS BPC reviewed first draft of questionnaires – April 2006.
- TALIS BPC reviewed second draft of questionnaires – July 2006.
- NPMs conducted further review of second draft of questionnaires – August 2006.
- Pilot version of questionnaires approved – August 2006.
- Pilot conducted – third quarter 2006.
- OECD and IEA meeting to review pilot results – November 2006.
- NPM meeting reviewed pilot results – November 2006.
- IDEG consultations on proposed changes for the FT – November 2006.
- FT version of questionnaire agreed with BPC – December 2006.
- FT conducted – first and second quarter 2007.
- BPC made a plan for assessing the FT results and actions to be taken– June 2007.
- Extended IDEG meeting (with BPC representation) reviewed FT results and proposed changes for main survey (MS) questionnaires – July 2007.
- Consultations with BPC on finalising MS questionnaires – August 2007.
- MS questionnaires finalised – end August 2007.
- MS began in southern hemisphere countries – October 2007.
- MS began in northern hemisphere countries – February 2008.

FRAMEWORKS GUIDING QUESTIONNAIRE DEVELOPMENT

The basic framework guiding the development of the questionnaires also formed the basis of the priority-rating exercise used to determine the main policy themes for TALIS (see Chapter 2). As noted in Chapter 2, the policy

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themes chosen by the participating countries for the first TALIS were: recognition, feedback, reward and evaluation of teachers; school leadership; and teaching practices, beliefs and attitudes. Teacher professional development was also included as an important theme.

The initial phase of questionnaire development involved assessing the outcomes of the priority-rating exercise and identifying which aspects of the themes could viably be captured through teacher and school principal responses. Each theme was elaborated in terms of the research and analytical questions that could be investigated and the variables and constructs that could be measured. In addition, the IDEG reviewed suitable questionnaire items from other international and national surveys and decided whether they could be used or adapted for TALIS.

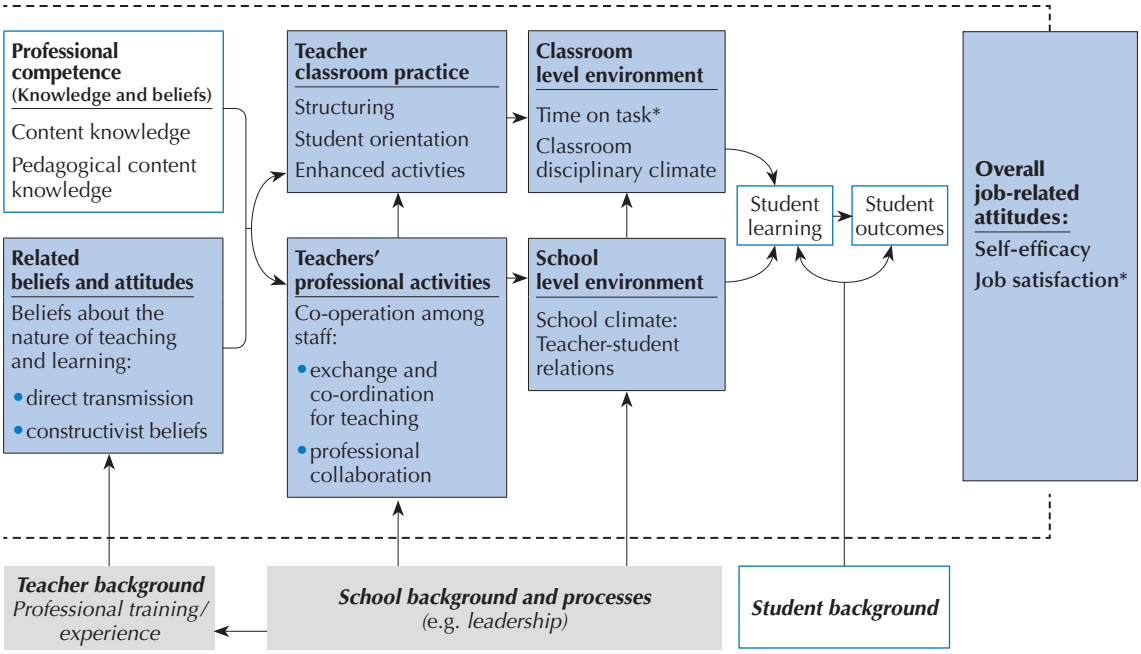
From the outset, a goal for questionnaire development was to ensure that the chosen themes were investigated sufficiently thoroughly to generate valuable policy insights while keeping the questionnaire to a manageable length. To help address this, particular attention was paid to how the themes interrelate, in order to maximise the analytical value of the study.

The TALIS analysis plans outlined the research and analytical questions and how they were to be investigated through analysis of the TALIS data (OECD official document EDU/INES/TALIS(2008)2). The remainder of this section summarises the frameworks that were developed for each section of the TALIS questionnaires and set out in the analysis plans.

By way of an overview, Figure 3.1 represents how the different themes of the TALIS survey fit together.

Figure 3.1

Survey themes for TALIS



Note: Constructs that are covered by the survey are highlighted in blue; single item measures are indicated by an asterisk (*).
Source: *Creating Effective Teaching and Learning Environments: First Results from TALIS* (OECD, 2009).

The shaded elements are those that TALIS measured and the unshaded elements are those that TALIS did not measure. The arrows illustrate different questions that were addressed in the data analysis. The elements relate to each other as follows:

- The quality of the learning environment is the most important causal factor for student learning and student outcomes; important aspects of the **school-level environment** were addressed in the *appraisal and feedback* and *school evaluation* sections of the survey, the *school leadership* sections and in measures of *school climate*.
- The learning environment at the **classroom level** has an even stronger impact on student learning. However, as this environment most often varies between subjects and teachers, it is not easy to identify domain-general indicators. TALIS chose *disciplinary climate* because this variable has a strong impact on student learning in different subjects, and because it has been shown that – unlike other features of classroom climate – there is a high level of agreement between teachers, students and observers with regard to this indicator.
- The quality of the learning environment at the classroom level, in turn, is to a large extent determined by the instructional methods and **classroom practices** used by the teacher.
- A large part of teacher activity occurs in the classroom, through instructing classes of students more or less in isolation from other classes and other teachers. A modern view of teachers also acknowledges **professional activities** at the school level, such as cooperating in teams of teachers, building professional learning communities, participating in school development, and evaluating and changing working conditions. Those activities shape the learning environment at the school level, *i.e.* school climate, ethos and culture, which directly and indirectly (via classroom level processes) impact student learning. In addition to questions on recognition, feedback, reward and appraisal, TALIS covers various aspects of *teacher co-operation.*
- *Teachers' classroom practices* and other professional activities depend on their personal prerequisites. Earlier research identified prerequisites as general teacher characteristics, such as personality traits or styles of interaction. Recent research, however, (see *e.g.* Campbell *et al.*, 2004) focuses on specific characteristics that are the result of the teacher's academic education and socialisation as a professional who understands and teaches a certain subject area.
- Professional competence is believed to be a crucial factor in determining classroom and school practices. In addressing this factor, however, TALIS had to limit its scope. Policy makers from participating countries and the IDEG agreed that it would be impossible to measure professional competence in a broad sense. Covering professional knowledge as described by Lee Shulman's most influential triarchic theory (professional knowledge = content knowledge + pedagogical content knowledge, related to subject specific didactics + general pedagogical knowledge) is beyond the scope of this survey. Just as Seidel and Scheerens (in press, p. 4) did, this heterogeneous and "soft" concept was reduced to a few basic factors. Thus, TALIS focuses on more general types of **teacher attitudes and beliefs,** which have been shown to have some influence on the quality of student learning (Seidel & Scheerens, in press, p. 12).

In addition to these pedagogical beliefs and attitudes, TALIS addresses self-related beliefs, namely *teacher self-efficacy* (measured by a well-established scale) and *job satisfaction* (single item rating).

The next sections present the TALIS teacher and principal questionnaires in more detail.

Teacher background characteristics and professional development

Teacher demographic and employment characteristics were included in TALIS as key teacher variables not only for providing a profile of the ISCED Level 2 teacher population in participating countries but also for the analysis of the policy themes in TALIS. The survey collected information on age, gender and level of educational attainment of teachers, as well as their employment status, years of experience as a teacher and a profile of how they spend their time. Analysis of TALIS data by these characteristics permitted analysis of equity issues.

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Teacher professional development is an important theme for TALIS, providing information on the amount and type of professional development undertaken, its perceived impact on teachers' development, the types of support for teachers undertaking professional development activities and teachers' professional development needs.

In order to capture a broad range of development activities – both formal and informal – professional development was defined as *activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher*. This included more organised activities such as courses and workshops as well as less formal professional development such as reading professional literature such as academic journals.

As well as providing a profile of teachers' professional development activities, the questions were designed to allow an analysis of the relationships between professional development activities, appraisal and feedback that teachers receive, and their teaching practices, beliefs and attitudes. In addition, school principals were asked to report on the organisation of induction and mentoring practices in their school.

The questions on teachers' professional development were newly developed for TALIS or adapted from similar types of questions used in other surveys such as the IEA Progress in International Reading Literacy Study 2001 teacher questionnaire (IEA, 2001); World Education Indicators Survey of Primary Schools 2004 (UNESCO, 2008), The United States Department of Education Schools and Staffing Survey, conducted by the National Center for Education Statistics (U.S. Department of Education, 2004).

Principal and school background characteristics

As in the teacher questionnaire, the principal questionnaire included demographic and employment characteristics (age, gender, educational attainment, length of experience as a principal, profile of how they divide their time between different tasks) to provide context for the analysis of the main policy themes of TALIS.

The school principal questionnaire also included questions on the background characteristics of the school, in order to provide important contextual information for the TALIS analysis. The questions provide information based on school principal reports on the following (sources noted, otherwise items were newly developed for TALIS): public or private status of the school (adapted from the Programme for International School Assessment [PISA] 2006 School Questionnaire); size of community in which the school is located (from the PISA 2006 School Questionnaire); number and type of staff in the school (categories based on those collected through the UNESCO-UIS/OECD/EUROSTAT [UOE] data collection); total school enrolment; socio-economic and linguistic background of students (adapted from questions in the PISA 2003 School Questionnaire and World Education Indicators Survey of Primary Schools 2004); school admission policies (from the PISA 2006 School Questionnaire); school resources (adapted from the PISA 2006 School Questionnaire); and school and teacher autonomy (adapted from the PISA 2006 School Questionnaire).

School leadership and management

The sections of the TALIS questionnaires that relate to school leadership and management were in part framed around the Principal Instructional Management Rating Scale (PIMRS), which provided indicators of principals' emphasis on *instructional leadership* job functions associated with leadership in effective schools (Hallinger, 1994). It was also guided by other work undertaken by the OECD (OECD, 2008b). In addition, items intended to record different forms of *management* (in addition to instructional leadership) are based on work by Quinn *et al.* (1996), which distinguishes between four different managerial models or styles in which managers have different values and goals, fulfilment of other roles and, consequently, the way organisations are steered.

Analysis of the questionnaire items enabled the identification of five scales for management behaviour and styles:

- ***Management of school goals:*** Explicit management via the school's goals and curriculum development.
- ***Instructional management:*** actions to improve teachers' instruction.
- ***Direct supervision of instruction in the school:*** actions to directly supervise teachers' instruction and learning outcomes.
- ***Accountable management:*** managing accountability to shareholders and others.
- ***Bureaucratic management:*** management actions mostly aimed at bureaucratic procedures.

In turn, an analysis of the patterns of association across these five scales, yielded two underlying patterns of management styles among principals in all countries:

- School Management Style A: Instructional Leadership
  - *Management of school goals.*
  - *Instructional management.*
  - *Direct supervision of instruction in the school.*
- School Management Style B: Administrative leadership
  - *Accountable management.*
  - *Bureaucratic management.*

The main scales were constructed from principals' responses about how often they undertake certain tasks and activities in the school and their beliefs about their role in the school. In addition, teacher perceptions on school leadership were obtained through similar questions in the teacher questionnaire.

Appraisal of and feedback to teachers

The framework for the teacher appraisal sections of the TALIS questionnaires and the questionnaire items themselves were, in the main, developed specifically for TALIS. The framework focuses on teacher appraisal and aspects of school evaluation that are related to teacher appraisal. Although the main focus was on teacher appraisal, it was important to set this in the context of school evaluation more generally. School evaluations are often directly related to teacher appraisal (teacher appraisal is often the direct result or a part of school evaluation) and in some countries the system of school evaluation is an important policy-malleable aspect of teacher appraisal.

Figure 3.2 depicts the conceptual framework for evaluating education in schools and the main areas in which data from teachers and school principals were collected. It reflects previous research on the role of evaluation in the development of schools and teachers and on the design of such evaluations to meet education objectives (OECD, 2008a; Sammons *et al.*, 1994; Smith and O'Day, 1991).

Data collected in TALIS are at the school and teacher level from school principals and teachers and therefore focus on the final three aspects of the evaluative framework of school education depicted in Figure 3.2.

TALIS collected data on school evaluations from school principals. The data include the frequency of school evaluations, including school self-evaluations, and the importance placed upon various areas. Data were also obtained on the impacts and outcomes of school evaluations, with a focus on the extent to which these outcomes affect the school principal and the school's teachers. TALIS also collected data from teachers on the focus and outcomes of teacher appraisal and feedback. This information makes it possible to see the extent to which the focus of school evaluations is reflected in teacher appraisal and feedback.

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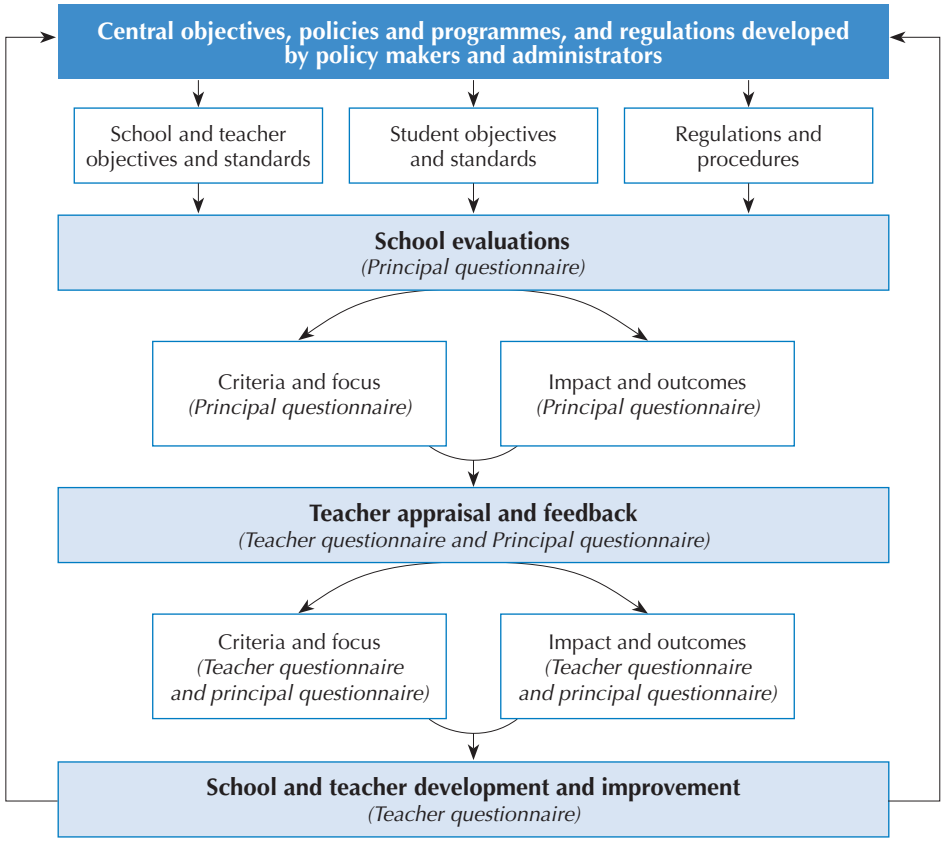
Both school evaluation and teacher appraisal and feedback should aim to influence the development and improvement of schools and teachers. Even a framework for evaluation based on regulations and procedural requirements would focus on maintaining standards that ensure an identified level of quality of education. TALIS therefore collected information on changes in teaching practices and other aspects of school education subsequent to teacher appraisal and feedback. According to the model depicted in Figure 3.2, a focus in school evaluations on specific areas that reflect stated policy priorities should also be a focus of teacher appraisal and feedback. This should in turn affect practices in those areas. Since TALIS did not collect information on student outcomes, teachers' reports of changes in teaching practices are used to assess the impact of the framework of evaluation. In addition, teachers' reports of their development needs provide further information on the relevance and impact of this framework on teachers' development.

Figure 3.2

Structure for evaluation of education in schools: data collected in TALIS



Source: *Creating Effective Teaching and Learning Environments* (OECD, 2009).

Seventeen different aspects of school evaluation and teacher appraisal and feedback were collected. Respondents were asked to identify the importance of each of these criteria in the school evaluation or teacher appraisal and feedback. Links were then made between these criteria and teacher professional development, and the extent to which teacher appraisal and feedback led to changes in these areas.

Data were also collected from teachers on the role of appraisal and feedback in relation to rewards and recognition within schools. The focus on factors associated with school improvement and teachers' development included teachers' perceptions of the recognition and rewards obtained for their effectiveness and innovation in their teaching.

In gathering data in TALIS, the following definitions were applied:

- ***School evaluation*** refers to an evaluation of the whole school rather than of individual subjects or departments.
- ***Teacher appraisal and feedback*** occurs when a teacher's work is reviewed by either the school principal, an external inspector or the teacher's colleagues. This appraisal can be conducted in ways ranging from a more formal, objective approach (*e.g.* as part of a formal performance management system, involving set procedures and criteria) to a more informal, more subjective approach (*e.g.* informal discussions with the teacher).

Teaching practices, attitudes and beliefs

TALIS examines teacher beliefs, attitudes and practices across and between teachers, schools and countries. Although TALIS is not aimed at explaining student achievement, achievement growth, student motivation or motivational change, its study design highlights factors that have been shown to be related to such kinds of student outcome. Figure 3.1 illustrates the choice of constructs for this section of the survey and their supposed interactions.

Based on results from the TIMSS video study, Klieme *et al.* (2006) proposed three basic (second-order) dimensions of instructional quality: clear and well-structured classroom management (which includes key components of direct instruction), student orientation (including a supportive climate and individualised instruction), and cognitive activation (including the use of deep content, higher order thinking tasks and other demanding activities). These dimensions are to be understood as "latent" factors which are related to, but not identical with specific instructional practices (see Lipowsky *et al.*, 2008, for a theoretical foundation and an empirical test of the model). TALIS uses a domain-general version of this triarchic model, identifying structure, student orientation, and enhanced activities as basic dimensions of teaching practices.

Instructional practices, in turn, depend on what teachers bring to the classroom. Professional competence is believed to be a crucial factor in classroom and school practices (Shulman, 1987, Campbell *et al.,* 2004; Baumert and Kunter, 2006). To study this, a number of authors have used, for example, measures of the effects of constructivist compared with "reception/direct transmission" beliefs on teaching and learning, developed by Peterson *et al.* (1989). TALIS uses a domain-general version of two teaching and learning-related indices (constructivist and direct transmission) to cover teachers' beliefs and basic understanding of the nature of teaching and learning.

Teachers' professional knowledge and actual practices may differ not only among countries but also among teachers within a country. To gain an understanding of the prevalence of certain beliefs and practices it is therefore important to examine how they relate to the characteristics of teachers and classrooms. For example, previous research suggests that the beliefs and practices of female and male teachers may systematically differ (*e.g.* Singer, 1996), so that TALIS must control for gender. From the perspective of education policy, however, it is even more relevant to look at the impact on teachers' beliefs, practices and attitudes of professional background factors such as type of training, certification and professional development, subject taught, employment status (part-time versus full-time) and length of tenure. It is important to note that any of these relationships can have different causal interpretations. For example, professional development activities may change beliefs and attitudes, but participation in such activities may itself be due to certain beliefs. As a cross-sectional study, TALIS can describe such relationships, but it cannot disentangle causal direction. Some of the analyses TALIS

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provides on these matters are merely exploratory, because so far there is little research, for example, on beliefs and practices specific to certain subjects.

Good instruction, of course, is not determined just by the teacher's background, beliefs and attitudes; it should also be responsive to students' needs and various student, classroom and school background factors. TALIS looks at whether teaching practices "adapt" to students' social and language background, grade level, achievement level, and class size. TALIS does not allow for examining whether classroom practices are adapted to individual students but instead looks at macro-adaptivity (Cronbach, 1957), *i.e.* the adaptation of teaching practices to characteristics of the class.

Teachers do not act only in the classroom where they instruct students more or less in isolation from other classes and teachers. A modern view of teaching also includes professional activities on the school level, such as co-operating in teams, building professional learning communities, participating in school development, and evaluating and changing working conditions (Darling-Hammond *et al.* 2005). These activities shape the learning environment at the school level, *i.e.* the school climate, ethos and culture, and thus directly and indirectly (*via* classroom-level processes) affect student learning. TALIS distinguishes between two kinds of co-operation by a school's teaching staff: exchange and co-ordination for teaching (*e.g.* exchanging instructional material or discussing learning problems of individual students) versus more general and more innovative kinds of professional collaboration (*e.g.* observing other teachers' classes and giving feedback). It is assumed that both kinds of co-operative activities will be influenced by school-level context variables such as a school's teacher evaluation policies and the school's leadership.

As is known from research on the effectiveness of schools (Scheerens and Bosker, 1997; Hopkins, 2005; Lee and Williams, 2006; Harris and Chrispeels, 2006), the quality of the learning environment is the factor affecting student learning and outcomes that is most readily modified, given that background variables such as cognitive and motivational capacities, socio-economic background, social and cultural capital are mostly beyond the control of teachers and schools. TALIS captures students' background by asking teachers and principals about the social composition and the relative achievement level of the student population they serve. A more important task for TALIS is to assess quality, as perceived by teachers, at the classroom as well as the school level. However, as the environment generally varies between subjects and teachers, it is not easy to identify domain-general indicators. TALIS uses *time on task* – *i.e.* the proportion of lesson time that is actually used for teaching and learning – as a basic indicator for the quality of the learning environment. Also, *classroom climate* is used because of its strong impact on cognitive as well as motivational aspects of student learning in different subjects. The method used here is adapted from PISA and focuses on the disciplinary aspect. For example, the statement "When the lesson begins, I have to wait quite a long time for the students to quiet down" indicates a low level of classroom discipline. It has been shown that classroom discipline, aggregated to the school level, is a core element of instructional quality. In PISA, it is positively related to the school's mean student achievement in many participating countries (Klieme and Rakoczy, 2003). Also, it has been shown that – unlike other features of classroom instruction – there is a high level of agreement about this indicator among teachers, students and observers (Clausen, 2002). In addition to the environment at the classroom level, *school climate* is used as an indicator for the school environment. Here, school climate is defined as the quality of social relations between students and teachers (including the quality of support teachers give to students), which is known to have a direct influence on motivational factors, such as student commitment to school, learning motivation and student satisfaction, and perhaps a more indirect influence on student achievement (see Cohen, 2006, for a review of related research). The triarchic model of instructional quality mentioned above (Klieme *et al.*, 2006; Lipowsky *et al.*, 2008; Rakoczy *et al.*, 2007) suggests specific relations between teaching practices and the two climate factors: structure-oriented teaching practices should primarily relate to high levels of classroom climate, while student-oriented practices should be linked with positive social relations.

TALIS does not address the ultimate effects of classroom and school-level activities and climate on student learning and outcomes. However, because TALIS studies teachers (as opposed to the effectiveness of education), teachers were asked to evaluate what they themselves do. TALIS assessed teachers' beliefs about their efficacy by adopting a construct and a related measurement that is widely used in educational research (*e.g.* Schwarzer, Schmitz and Daytner, 1999). As a second indicator TALIS used a single item for overall job satisfaction. Research has shown that teachers' sense of their efficacy plays a crucial role in sustaining their job satisfaction (*e.g.* Caprara *et al.*, 2006). It has also been found to be associated with constructivist goals and student orientation (Wheatley, 2005) and with successful management of classroom problems and keeping students on task (*e.g.* Chacon, 2005; Podell and Soodak, 1993). Thus, previous research suggests that there are significant relations between teachers' beliefs, attitudes and practices.

PILOT TEST

The purpose of the pilot test was to verify that the questionnaires worked in an international context in the way intended. Five countries volunteered to take part in the pilot test of the questionnaires in November 2006: Brazil, Malaysia, Norway, Portugal and Slovenia (see also section in Chapter 1). Within the participating countries five schools representing rural and urban areas and different education tracks (if applicable) were identified for participation in a non-randomised selection process. Within these schools five teachers – males and females – and the principal were selected. The teachers taught a mixture of subjects.

The pilot test was successful. Statistical analysis of the pilot results showed that the questionnaire items were, in the main, well suited to support the constructs and analysis planned for TALIS. Throughout the questionnaires, the statistical analysis and detailed feedback from respondents was helpful in identifying individual items that could be deleted as well as those that were in need of clarification or rewording, either in the source questionnaire or in their translation into national languages. Questionnaire length was a major issue raised by pilot respondents, who reported an average completion time of 53 minutes for the teacher questionnaire and 60 minutes for the principal questionnaire. The wording of several items was amended and some items were deleted in view of the feedback provided by pilot respondents.

A number of specific changes also arose from the pilot analyses. The questions identifying which subjects the teachers taught and which they had studied were simplified. There was also a simplification of the questions on the family background of students in the school, which had proved difficult and time-consuming to answer. Additionally, the question on the impact of professional development undertaken was modified in order to strengthen the analytical potential of these questions. The focus shifted to the strength of that impact, providing a greater alignment between categories of professional development needs, the areas on which teachers receive feedback and their actual teaching practices. Another change included the adoption of a more generalised definition of "feedback" to make the questions more relevant in different country contexts. The instructions on how to identify a target class, about which teachers should respond regarding their teaching practices, were also improved and clarified.

All of the changes following the pilot test reduced the questionnaire's length for the FT by approximately 15%.

FIELD TRIAL

The main purpose of the FT was to test survey operations (data capture, processing and so on) but it also provided a second opportunity to review the functioning of the questionnaire. The FT was conducted in all 24 participating countries (though the test was conducted later in Bulgaria), aiming for 20 participating schools and 20 teachers within each school, providing a sizeable number of cases for analysis.

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The first stage of the analysis examined whether respondents understood the questionnaires by determining whether they provided appropriate or realistic answers. The analysis focused on missing data, questionnaire instructions, the presence of contradictory responses and the information provided in "other" categories. The second stage of the analysis involved more detailed scrutiny of the data, including analysis of the descriptive statistics, the design of scales and constructs, and analysis of the relationship between relevant indicators, characteristics and policy issues. The TALIS NPMs and the respondents provided feedback and reports that aided these analyses.

The changes to the questionnaires introduced following the pilot worked well. The smaller number of questionnaire items reduced the completion time for both the teacher and principal questionnaires to approximately 45 minutes. Since the respondents made few negative comments about the questionnaires' length, this was deemed acceptable.

There were no significant problems with missing data or misunderstanding of questionnaire instructions. Some issues were addressed by a slight rewording of items or instructions. In addition, an analysis of response patterns led to some response categories being combined and a few items being deleted. Factor analysis of the survey responses supported the proposed constructs as set out in the analysis plan, although a small number of questionnaire items were deemed redundant and therefore deleted.

The most significant issue arising from the FT analysis concerned the questions to school principals about students' social and linguistic background, which the TALIS BPC had agreed were important in order to provide valuable context. Items asking school principals to summarise characteristics of the student population feature in a number of international surveys and the questions developed for TALIS drew on these. The item on students' linguistic background is very similar to a question used in the PISA 2000 and 2003 school background questionnaire (OECD, 2000 and 2003). An item asking about parents' education level was used in the UNESCO World Education Indicators survey of primary schools (UNESCO, 2004).

Nevertheless, the questions proved problematic in the TALIS pilot and despite their being much simplified for the FT, principals again reported difficulty. There were also concerns about the reliability of the information. The FT version of the questions asked principals to "estimate the proportion of <ISCED 2> students who:

- Have a first language that is different from the language of instruction.
- Have at least one parent/guardian who has not completed <ISCED 3> or higher.
- Have at least one parent/guardian who has not completed <ISCED 5> or higher.

To address concerns about accuracy of the response and response burden, the MS question was altered to a "tick box" format rather than asking for specific percentages. Also, because there was evidence that items b and c were misunderstood, the question wording was amended in the MS to ask what percentage "has completed" rather than "has not completed". Figure 3.3 shows the revised question.

To further ensure that the information was obtained successfully, these questions were replicated in the teacher questionnaire. Here, teachers were asked to estimate these characteristics for the class that was the focus of the questions on teaching practices. The percentage of missing responses in the main study for these questions in both the teacher and principal questionnaire ranged from 8% to 12% for the different items in the questions.

Throughout the development of the questionnaires and in the analysis of the survey data, it was important to manage the risk of *cultural bias* in the survey responses. This is a common challenge in international surveys seeking attitudinal information. In the first instance it was addressed through careful review of the wording

of questions and with approved national adaptations of the questions. Analysis of the FT data involved some investigation of cross-cultural equivalence in the survey responses but most of this was carried out in the analysis of the main study data. Chapter 10 discusses this in detail with regard to scale and indicator construction.

Figure 3.3

Principal Questionnaire item on student characteristics, altered for the main survey

Please estimate the broad percentage of students at <ISCED 2> level in this school who have the following characteristics.
It is acceptable to base your replies on rough estimates.
Please mark one choice in each row.

	Less than 10%	10% or more but less than 20%	20% or more but less than 40%	40% or more but less than 60%	60% or more
a) Students whose <first language> is different from the language(s) of instruction or a dialect of this/these.	☐1	☐2	☐3	☐4	☐5
b) Students who have at least one parent/guardian who has completed <ISCED 3> or higher.	☐1	☐2	☐3	☐4	☐5
c) Students who have at least one parent/guardian who has completed <ISCED 5> or higher.	☐1	☐2	☐3	☐4	☐5

Source: OECD.

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Chapter 4

Translation and Cultural Adaptation

46 Abstract

46 Overview

46 Instruments to be translated

47 Cultural and national adaptations

47 Translation procedures

- 48 Identifying the target language
- 49 Engaging translators
- 49 Producing translations
- 50 Submitting materials for external verification

51 International translation verification

- 51 Processes of translation verification
- 51 Translation verification report
- 51 Translation verification summary

52 Feedback from National Project Managers on translation and translation verification

52 International Quality Control Monitor review of translation

52 Layout verification: paper and on line data collection

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Abstract

This chapter details the rigorous approach taken to ensure an accurate and appropriate translation and cultural adaptation of the TALIS survey instruments. Each version of the TALIS questionnaires was subject to a stringent translation procedure and layout verification process prior to both the field trial and the main survey. The chapter explains the rationale for this strict system and describes the responsibilities of the various parties involved in the processes, including the IEA Secretariat, Instrument Development Expert Group, National Project Managers and independent language experts, translators and linguistic verifiers.

OVERVIEW

The TALIS survey instruments were developed by the Instrument Development Expert Group (IDEG) in English (see Chapter 3) and translated into French, the other working language of the OECD. Although countries were free to choose their source language, all participating countries used the international English version as the sole source for translation and adaptations, adhering to the procedures described in the *TALIS Manual for National Project Managers* (MS-01-03). The detailed procedures helped ensure that the 31 national versions of the instruments were as close as possible to the international original, while allowing for appropriate adaptations to the national context.

Each version of the TALIS questionnaires was subject to a stringent independent translation and layout verification process prior to both the field trial (FT) and the main survey (MS). Independent language experts compared the translated instruments side by side with the international version. The verified instruments with verifiers' comments and suggestions were then returned to the National Project Managers (NPMs) for review and improvement of the translation or adaptation. Questionnaires were then sent to the International Study Centre (ISC) for layout verification, before they were finalised for data collection.

INSTRUMENTS TO BE TRANSLATED

The international French translations of the manuals and instruments were verified by independent experts to ensure they were equivalent in meaning to the international English originals, according to the procedures described later in this chapter. Study participants had the choice of using the international English or French materials as source documents; all participants produced their translations using the international English version of the materials. In two cases, participants used the translation produced by another country (introducing necessary national adaptations) instead of translating from the international version.[1]

The following materials were required to be translated or adapted:

- Principal and Teacher Questionnaires (MS-11-01, MS-12-01; described in Chapter 3 of this report).
- Principal and Teacher Cover letters (MS-21-01, MS-22-01; only for countries collecting data on line (ODC).
- *TALIS School Co-ordinator Manual* (MS-03-02).

For both the FT and the MS national translations of the data collection instruments (questionnaires and cover letters) were independently verified in a process co-ordinated by the IEA Secretariat. For the MS, Australia, Austria, Ireland and Malta used English-language instruments. These were also submitted for verification: although they were not translated, they were verified for the appropriateness of the adaptations to the national context and for layout.

CULTURAL AND NATIONAL ADAPTATIONS

The objective of cultural and national adaptations is to adjust the data collection instruments so they are appropriate for each participating country. Adaptations were kept to a minimum but in some cases they were required. The purpose of national and cultural adaptations was to ensure that principals and teachers in each country were responding to questions equivalent to those received by principals and teachers in all other countries.

Each country was required to complete electronic National Adaptation Forms (NAF) for each language of survey administration. The forms themselves provided detailed information on how to make required and optional adaptations, and were to be completed in English.

To facilitate the adaptation process, the international (English and French) versions of the questionnaires were highlighted yellow in several places where adaptations were *always* required. Required national adaptations included the following:

- Items or information in carets < > on the international version of the questionnaires. Changes to such information also needed to be described on the NAFs. For example, <ISCED Level> was replaced with the national name of the level of education according to the International Standard Classification of Education 1997 (UNESCO-UIS, 2006).
- Information in square brackets [ ] indicated required country-specific changes that were not documented on the NAF. This included provisions to comply with national ethical guidelines for studies of this nature, in addition to return procedures, the name of the national centre and so on.
- National conventions such as date formats, punctuation and spelling.

For optional adaptations, the ISC required that a rationale be given and that the change be approved. For the FT, the completed NAFs were sent directly to the IEA Secretariat, together with the translated and adapted instruments, for translation verification (TV). For the MS, these forms were first submitted to the ISC for review, as an additional check to ensure that adaptations fell within acceptable guidelines. When the national instruments differed from the international original this had to be documented on the NAF (with the exception of square-bracketed items, described above). When the ISC had verified the proposed adaptations, the approved NAFs were sent together with the instruments to the IEA Secretariat for translation verification.

In the interests of international comparability, some restrictions were introduced defining what kinds of adaptations to the international instruments were acceptable. Those considered acceptable included an adaptation of <country specific> terms, an adaptation of valid ranges (if necessary), the removal of questions or dimensions (only if not applicable) and the addition of questions,[2] question parts, dimensions or categories (only if absolutely necessary). Those adaptations not considered acceptable included the collapsing or removal of international categories and the modification of the international question stem.

NAFs were updated to reflect any changes at each stage of the verification process: Version I was completed for translation verification; and Version II was completed before layout verification. NPMs were also required to send the final version of their NAFs (implementing all changes required during verification) to the ISC before printing the final version of their instruments.

TRANSLATION PROCEDURES

The IEA Secretariat devised procedures to guide the translation process, as described in the *TALIS Manual for National Project Managers* (MS-01-03). The procedures stipulated the qualifications required for translators and reviewers who developed the national version of the instruments (described later in this section).

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The translation guidelines highlighted the importance of following the target language rules and the country or cultural context, while ensuring that the translated text had the same meaning as the source text. This proviso also applied when adapting from the English used in the international version to the forms of English used in a different country or cultural context. These documents were designed to guide translators towards developing 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.

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

The OECD Secretariat prepared and distributed a glossary with the most critical terms and an annotated version of the questionnaires that clarified the intent behind the questions. It also sent copies to the independent international translation verifiers contracted by the IEA Secretariat. These documents helped ensure that translators and verifiers were interpreting the items in the way intended by the questionnaire developers. Translators contacted the NPM for any clarification of items or intent, and NPMs forwarded these enquiries to the ISC if they could not resolve them internally.

Translators were advised to take special care to ensure that the translations were linguistically appropriate in the target language. This extra emphasis was considered important to enhance the credibility of the TALIS survey among survey respondents.

As explained in earlier in the chapter, during translation, translators were instructed to document any changes made to the original text in an electronic version of the NAF.

Identifying the target language

In the majority of countries participating in TALIS, one dominant language is used throughout the entire educational system or is understood by all teachers and principals. This was the language chosen for the survey. In some countries, educational systems are run autonomously according to region, with regions potentially representing different language groups. An example is Belgium, which has three official languages.

Figure 4.1

Countries and languages participating in TALIS

	Language/s	TV rounds		Language/s	TV rounds		Language/s	TV rounds
Australia	English	2	**Ireland**	English	2	**Portugal**	Portuguese	2
Austria	English	1		Irish	2	**Slovak Republic**	Slovakian	2
	German	2	**Italy**	Italian	2	**Slovenia**	Slovenian	2
	Slovenian	1	**Korea**	Korean	2	**Spain**	Basque	1
Belgium (Fl.)	Dutch	2	**Lithuania**	Lithuanian	2		Catalan	1
Bulgaria	Bulgarian	2	**Malaysia**	Bahasa Malaysia	2		Galician	1
Brazil	Portuguese	2	**Malta**	English	2		Spanish (Castilian)	2
Denmark	Danish	2	**Mexico**	Spanish	2		Valencian	1
Estonia	Estonian	2	**Netherlands**	Dutch	2	**Turkey**	Turkish	2
Hungary	Hungarian	2	**Norway**	Norwegian Bokmål	2			
Iceland	Icelandic	2	**Poland**	Polish	2			

Source: OECD, *TALIS Database.*

Only one educational system (or region) of Belgium, the Flemish, participated in TALIS. Therefore, the survey was developed in Dutch only, since it is the language of instruction in that region and all participating teachers and principals were fluent in it. In other countries such as Ireland, instruments were prepared in two languages and the sampled teachers had the choice between the English and the Irish versions of the instruments.

The languages of survey administration are listed by country in Figure 4.1. Of the 24 participants, 3 countries administered the survey in more than one language (from 2 to 5). All participating countries translated the principal and teacher questionnaires into the languages in Figure 4.1, and participating ODC countries also translated cover letters for ODC administration.[3] Each set of instruments underwent two rounds of translation verification for both the FT and the MS, and one round if translation verification was conducted only for the MS. This was the case for English and Slovenian in Austria, since schools using these languages were sampled only for the MS. Regarding Basque, Catalan, Galician and Valencian in Spain, the NPM decided to administer only the MS in all of the official languages. Given the small number of sampled schools for the FT, it was considered to be too time-consuming and costly to administer the FT in all five official languages. The FT was administered only in Spanish (Castilian).

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 had a familiarity with survey instruments.

The first of these translators was expected to be a language specialist with an excellent understanding of the country's cultural context. This person worked on translating the international English text of the instruments and manuals into the national language. The second translator, known as the reviewer, was someone with experience in the national educational context and who was familiar with the subject of the study. This person reviewed and commented on the initial translation for appropriateness to the national educational context, in addition to accuracy and readability. The NPM then reviewed the translation together with the reviewer's comments, and incorporated changes as appropriate into the final document. Using this method, three independent people compared the translated document against the international English original.

Representatives from countries planning to divide the translation work or to prepare translations for more than one language were reminded of the importance of ensuring consistency within and between 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

Each country produced translations for both the FT and the MS.[4] The bulk of the translating was done before the FT, resulting in translated instruments for each country that had been reviewed externally on two separate occasions. To assist the migration of translations from the FT to the MS, the OECD Secretariat prepared and distributed to all participants a document that outlined all changes to the questionnaires for the MS. Furthermore, diagnostic item statistics from the FT, identifying missing data and unrealistic or contradictory responses, were used to help remedy mistranslated and difficult-to-translate items prior to the main data collection.

The translator received the following materials:

- a basic description of TALIS and a copy of the relevant chapter in the *TALIS Manual for National Project Managers* (MS-01-03);
- international versions of the questionnaires and the instructions for them in electronic form;

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- copies of the international questionnaires with annotations by the OECD Secretariat that explained the intention behind the questions;
- glossary of terms; and
- electronic version of the NAFs.

After the translation was completed, the NPM sent a copy of the materials described in the previous paragraph, together with a copy of the translated questionnaires and instructions, to the reviewer. The reviewer used these documents to compare the translation against the international English documents. The reviewer made any required changes to the translations or NAFs, and these were returned to the NPM to arbitrate the final version.

The *TALIS Manual for National Project Managers* (MS-01-03) outlines guidelines for translation and cultural adaptation, which are described below. These guidelines ensured that national translations were consistent with the international versions of the TALIS instruments, while allowing for cultural adaptations where necessary. Translators were advised to: find words and phrases in the target language that were equivalent to those in the international version; ensure that the essential meaning of the text did not change; ensure that the translated questionnaires asked the same questions as the international versions and that national adaptations were made appropriately; and be mindful of possible changes in the instrument layout due to translation.

For the purposes of international comparison it was important that the questionnaires be equivalent (as far as possible) across languages. The translated texts were meant to flow naturally so that it was not obvious that the document originated in another language. Guidance on language usage for the purposes of translation as outlined in the NPM Manual 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 (for example, subject-verb agreement, prepositions, verb tenses);
- translated passages should neither clarify, omit nor 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; and
- spelling, punctuation and capitalisation in the target text should be appropriate for the target language and the country or cultural context.

Submitting materials for external verification

The TALIS instruments were subject to rigorous independent verification to ensure – as far as possible – that the instruments used in each country asked the same questions of the same concepts, and thus were internationally comparable. Two aspects of the instruments were verified, and NPMs submitted NAFs and translated instruments by email for both translation and cultural adaptations. The latter were also requested for those countries that administered the survey in English.

For the FT, the translation verifier alone reviewed the NAFs prior to translation verification. For the MS, the ISC reviewed the NAFs prior to translation verification, as it required ISC approval before passing to the next stage. This process was designed to eliminate any unacceptable adaptations to the instruments.

During the final stage, verifying layout before printing paper instruments, staff at the ISC compared the layout and formatting of the national instruments against the international source documents. For countries participating in ODC, staff at the ISC reviewed the finalised paper instruments against the on line version of the questionnaires, to ensure the two were isomorphic. These procedures are described in more detail later in the chapter.

INTERNATIONAL TRANSLATION VERIFICATION

The IEA Secretariat co-ordinated the translation verification, engaging the services of native-speaking linguistic verifiers through cApStAn Linguistic Quality Control, based in Brussels, Belgium. These verifiers were experienced in balancing 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 recommended that NPMs carefully consider all verifier recommendations and take care that the original meaning of the phrases was retained in their translation; however, it was emphasised that the final decision regarding document content rested with the NPM. NPMs were asked to explain major differences of opinions between themselves and verifiers (see section below).

Processes 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 questionnaires and NAFs were received as Microsoft® Word files. Verifiers inserted their comments and changes directly into the translations using the "track changes" feature. The verified documents complete with annotations and comments became known as the Translation Verification Report (TVR).

Verifiers were instructed to *i)* check the accuracy and comparability of the translations of the instruments, ensuring that the translation had not affected the meaning or difficulty of the text, the questions were not made easier or more difficult when translated and no information was omitted or added in the translated text; *ii)* document ALL deviations in the participating country's translation, including additions, deletions and mistranslations, according to specific guidelines; and *iii)* suggest alternative translations, if necessary, that would improve the comparability.

Translation verification report

Verifiers returned the TVRs to the IEA Secretariat, which then forwarded them to NPMs. Comments were assigned codes to indicate the severity of the error identified, ranging from Code 1, indicating a major change or error that must be addressed, to Code 4 indicating a change that was acceptable. Verifiers also noted whether changes had been appropriately documented on the NAF. Codes were categorised as follows:

- **Major Change or Error:** Examples included incorrect order of choices in a multiple-choice question; omission of a question; incorrect translation resulting in the answer being suggested by the question; an incorrect translation which changed the meaning or difficulty of the question; incorrect order of questions.
- **Minor Change or Error:** Examples include spelling errors that did not affect comprehension.
- **Suggestion for Alternative**: The translation might be adequate, but the verifier suggested different wording.
- **Acceptable Change:** Change is acceptable and appropriate. An example would be capitalisation or date format as used in the language of translation.

In order to draw the attention of NPMs to unknown or unclassifiable irregularities, verifiers used "Code 1?" when they were unsure of which code to use. Code 1 errors required further follow-up with the IEA Secretariat (see next section).

Translation verification summary

As part of the process of translation verification, NPMs were asked to record and respond to Code 1 (or "Code 1?") verifier suggestions in a separate document, titled "TV Summary". Sixteen of twenty-four participating countries submitted their document and provided the IEA Secretariat with further information about the nature

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of interventions flagged as serious by the verifier. Of the eight countries that did not submit the form, two had no errors marked Code 1 and in another two the IQCM indicated on the TVR that all verifier suggestions had been implemented. Whenever possible, this information was sent to the ISC before instrument finalisation. The IEA Secretariat asked NPMs to justify any Code 1 interventions that were not implemented – they were not obliged to accept the verifiers' suggestions, but they were required to explain important points of difference. The IEA Secretariat also forwarded this feedback to verifiers, both for the FT and MS, in a process that both verifiers and NPMs described as useful.

FEEDBACK FROM NATIONAL PROJECT MANAGERS ON TRANSLATION AND TRANSLATION VERIFICATION

This section gives a brief overview of NPM feedback regarding translation and translation verification. It is based on an analysis of the on line Survey Activities Questionnaire (SAQ) and outlined in more detail in Chapter 7.

NPMs were asked to complete the SAQ, describing their experience with TALIS. The majority (67%) reported it was "not difficult at all" to translate and adapt the paper questionnaires to the national language; however one participant reported the process was "very difficult". Six participants found the process "somewhat difficult". The most frequently reported problem was the difficulty of preparing an accurate translation that precisely conveyed the meaning of the source text and yet read naturally and fluently in the target language. This was especially true for items that did not fit well with the country's national context – *e.g.* concerning principals' authority to hire and fire teachers – for which NPMs had to take special care not to introduce misunderstandings. Of documenting national adaptations, 92% reported it was "not difficult at all". However, several commented that the process was very time-consuming.

In rating the usefulness of the translation verification process, 92% reported it was "very useful", with no participants reporting it was "not useful at all". Furthermore, all respondents were able to make full use of the feedback from translation verifiers when preparing the final version of their instruments. Countries that reported some difficulties with translation mentioned that they resolved these problems with advice from the OECD Secretariat, before translation verification began.

INTERNATIONAL QUALITY CONTROL MONITOR REVIEW OF TRANSLATION

The TVR for each country was sent to the relevant IQCM, who had the task of comparing the TVR against the final version of the data collection instruments. The IQCM marked the verifier comment on the TVR with "yes" if the verifier suggestion was implemented, and "no" if it was not. The IEA Secretariat retained this annotated TVR, together with a copy of the final version of instruments used in schools, for future reference in the event of unusual item characteristics showing in the data. According to these data, across all 31 sets of instruments, there were only two unchanged or unexplained Code 1 errors in the final version of the instruments.

LAYOUT VERIFICATION: PAPER AND ON LINE DATA COLLECTION

The ISC performed layout verification both for paper and for ODC instruments. After translation verification had been finalised, NPMs submitted their questionnaires and cover letters (if ODC was used) together with the latest version of the NAF to the ISC.

The ISC performed a careful check of the national versions of the instruments against the international English version and the 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.

The paper instruments were verified and administered in a total of 31 languages. ISC staff checked each questionnaire for font size, font changes, and adjustment of cells, response options, blank pages, word emphasis,

track changes and comments. All deviations from the source version were listed in a standardised document and sent back to the NPMs for 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 again to ensure that the overall layout had not been affected.

The ODC versions of the instruments were checked for 16 participating countries in a total of 17 languages. ODC instruments were checked against the national paper version after paper layout verification. This was to 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 paper layout verification. For most of the languages up to two rounds were needed to finally approve the ODC instruments. Additionally, the ISC performed technical ODC load checks and load testing to ensure smooth operations. For more details on ODC upload, activation and shut down as managed by the ISC, see Chapter 7.

NOTES

1. Mexico joined the study late and adapted the Spanish instruments from Spain for use in the FT; for the MS, Mexico produced its own translations. Austria produced its own German translations, and adapted the international materials for English-speaking schools; however for Slovenian (a minority language in Austria) the instruments used in the MS were adapted from the translation produced by the TALIS national team in Slovenia.

2. Additional questions for the questionnaires could be placed after all the international questions. However, guidelines stipulated that they should be few in number in order to keep the time it would take respondents to complete the questionnaire to a minimum.

3. The exception was Austria, which prepared ODC cover letters in German only. This is because English and Slovenian are both minority languages, administered in only a small number of Austrian schools.

4. Bulgaria joined the study after the FT was complete and the international instruments for the MS had been released. Therefore, Bulgaria submitted the MS instruments for verification and used them in a single-country FT. The Bulgarian instruments were further refined after the FT, and these revised instruments were submitted for verification again prior to the main data collection.

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Chapter 5

Sample Design

56 Abstract

56 Overview

56 International sampling plan

- 56 Target population and survey population: International requirements and national implementations
- 58 Sample size requirements

58 National sampling strategies

- 59 Sampling frames
- 59 Stratification
- 59 Sample selection
- 60 Sampling for the field trial
- 60 National sampling plans

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Abstract

This chapter offers an overview of the international sampling plan prepared for the participants in TALIS, including the international sampling strategy and sample size. Appendix B presents the characteristics of each national sampling plan. Strategies for estimating population characteristics and their sampling error are covered in detail in Chapter 9. This chapter deals primarily with the TALIS "core survey" of ISCED Level 2 teachers.

OVERVIEW

This chapter concerns only the TALIS "core survey", that is, the survey of ISCED Level 2 teachers. Participating countries were offered the option of linking their TALIS sample to that of PISA 2006 but none chose to pursue this. Participating countries could also opt to survey ISCED Level 1 and Level 3 teachers. Only Iceland chose to cover ISCED Level 1 teachers and none chose to survey ISCED Level 3.

A more detailed description of the survey design and its recommended implementation can be found in the *TALIS Sampling Manual* (MS-02-03).

INTERNATIONAL SAMPLING PLAN

The international sampling plan prepared for the TALIS core survey is a stratified two-stage probability sampling design (Lohr, 1999). This means that teachers (second stage units or secondary sampling units – SSU) were randomly selected from the list of in-scope teachers in each of the randomly selected schools (first stage units, or primary sampling units – PSU).

The universes of interest comprised schools where ISCED Level 2 education is provided, along with the affiliated principals and teachers. Following the Indicators of Education Systems (INES) data collection definitions, "*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).

TARGET POPULATION AND SURVEY POPULATION: INTERNATIONAL REQUIREMENTS AND NATIONAL IMPLEMENTATIONS

TALIS was designed to cover all ISCED Level 2 teachers in a participating country. TALIS identified policy issues that encompass the classroom, the teacher, the school and school management. No subject matter was excluded from the scope of TALIS. Thus, coverage of TALIS extends to all teachers of ISCED Level 2 and to the principals of the schools where they teach.

An ISCED Level 2 teacher is one who, as part of his or her regular duties in school, provides instruction in programmes at ISCED Level 2. Teachers who teach a mixture of programmes at different levels including ISCED Level 2 programmes in the target school are included in the TALIS universe. There is no minimum cut-off for how much ISCED Level 2 teaching these teachers need to be engaged in.

The *international target population* of TALIS restricts the survey to those teachers who teach regular classes in ordinary schools and to the principals of those schools. Teachers teaching to adults and teachers working with children with special needs are not part of the international target population and are deemed "out of scope".

When schools are 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) were not considered as teachers and thus not part of the TALIS international target population.

For national reasons, some participating countries chose 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 were invited to keep these exclusions to a minimum (see MS-02-03, paragraph 38).

Ideally, all the members of the target population ought to be eligible for sampling and data collection. This is the option that TALIS chose and, 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 recognised that attempting to survey teachers in very small schools, those in schools with no more than three teachers at ISCED Level 2, and those teaching in schools located in geographically remote areas could be a costly, time-consuming and statistically inefficient exercise. Therefore, participating countries were allowed to exclude those teachers for TALIS data collection, thus creating a *national survey population* different from the national target population. The NPM was required to document the reasons for exclusion, the size, the location, the clientele and so on for each excluded school. Moreover, as discussed later in this section, during data collection in the selected schools, some teachers could be excused from data collection.

Ultimately, samples of schools and teachers were selected from the national survey population.

Figure 5.1 illustrates how these concepts relate to one another.

Figure 5.1

TALIS international target and survey populations

TALIS out of scope	**TALIS International target population = TALIS International survey population**			
Adult education, special needs	**National out of scope**	**National target population**		
	Entire province, state, sub-population	**National exclusions**	**National survey population**	
		Remote, small schools, etc.	Not sampled	***In sample***

Source: OECD, *TALIS Database*.

Table 5.1 describes how the survey population is defined with respect to the target population (details of how these relate to the TALIS international target population are given in Appendix B); the information was provided by the NPMs using the Sampling Forms (templates for each Sampling Form can be found in Appendix C).

Within a selected in-scope school, the following teachers were to be excluded:

- teachers teaching only to special needs students (out of scope);
- teachers who also act as principals: no teacher data collected, but principal data collected (labelled as NEXCL5 in Chapter 10);

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- 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
- in Malta and Iceland, teachers who had taken part in the TALIS 2007 Field Trial: no teacher data collected and labelled as NEXCL6 in Chapter 10.

Detailed guidelines concerning the application of those categories of exclusion were given to the NPMs in the Sampling Manual or in separate correspondence between Statistics Canada, the ISC and the interested countries. Moreover, the School Co-ordinator Manual provided operational advice to those who had to assign codes.

Teachers who taught at more than one school were not excluded. Rather, the number of schools in which they taught was recorded (see weight adjustments in Chapter 10).

Sample size requirements

To allow for reliable estimation and modelling, while allowing for some amount of non-response, the minimum sample size was set at 20 teachers within each participating school. A minimum sample of 200 schools was to be drawn from the population of in-scope schools. Thus, the nominal international sample size was a minimum of 4 000 teachers. Teachers teaching in the same school might tend 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" and is often measured by the "intracluster correlation coefficient". In essence, the stronger the intracluster correlation, the fewer sampled teachers one needs from one school, as one responding teacher becomes a good predictor of the other teachers of his school. In other words, 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 of information. In preparing TALIS, the working hypothesis, based on previous studies of student achievement, was to use an intracluster correlation coefficient of 0.30, supposing that teachers are as homogeneous as their students. The loss in sample size due to clustering, added to the losses due to non-response, reduces the nominal sample of 4 000 teachers to an effective sample of approximately 400 as depicted in Table 5.2.

Thus, the nominal sample of 4 000 teachers obtained by the complex sampling design is equivalent to a simple random sample of 433 teachers. The precision that is 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 $\pm (1.96) \times (1/\sqrt{433}) = \pm 9.4\%$.

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 to counterbalance the effect of selecting too many schools with fewer than 20 teachers.

The sample size requirement was reduced for some participating countries because of the smaller number of schools available for sampling (see Appendix B). 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 to maintain a minimum total number of participating teachers.

NATIONAL SAMPLING STRATEGIES

Participating countries could suggest variations or adaptations of the international sampling plan to better suit their national needs. The TALIS sampling team reviewed and approved all changes to the international sampling plan.

Sampling frames

Participating countries provided Statistics Canada with a current and complete list of schools providing education at ISCED Level 2. 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 (MOS), preferably the number of ISCED Level 2 teachers, and values for those variables to be used for stratification; whenever possible, the type of funding (private or public) and the type of education stream (academic or vocational) were also to appear on the frame.

Additional sampling frames were required for the sampling of teachers, namely, the list of eligible ISCED Level 2 teachers 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. Participating countries that chose to implement some form of stratification to answer national requirements were invited to discuss their strategy with the TALIS sampling team.

Stratification could be done explicitly (whereby a fixed portion of the total sample is allocated to the stratum) or implicitly (whereby the stratification variable is used to sort the sampling frame prior to sample selection thus giving on average a proportional representation of the implicit strata in the sample).

When explicit stratification was used, the participating country and the TALIS sampling team agreed to a sample allocation scheme.

In most cases, stratification resulted in a combination of some or all of geography, source of financing, type of educational programme and size of schools. Appendix B gives details for each participating country.

Sample selection

Samples of schools were selected by 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 MOS prior to sampling. Sampling frames were always sorted by MOS prior to sampling, whether stratification was applied or not. 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 is useful when creating replication zones for estimation of sampling error (see Chapter 10).

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. Then, a sampling step k is computed as the integer part of $M \div n$. A random starting point d is drawn at random from the interval $[1, \ldots, k]$. The sample is selected by taking 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 in Table 5.3.

Whenever possible, two replacement schools were assigned for each sampled school: the school just above and the school just below the selected school on the sampling frame sorted by implicit strata (where needed) and MOS. The replacement schools 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 replacing originally sampled non-responding schools with schools having similar characteristics. Schools selected for the original sample could not also be selected as replacement schools.

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Although participating countries were given the option of selecting the school sample themselves, in the event the TALIS sampling team performed this task.

At the end of school selection, participating countries were returned a copy of their school sampling frame where the selected schools were identified (marked "S" for the original sample, marked "R1" and "R2" for the replacement schools) and given a standardised TALIS school identification number.

Table 5.3 illustrates how systematic random sampling with PPS may be implemented using an ordinary spreadsheet. In this illustration, explicit stratum "*A*" is comprised of 12 schools and a sample of $n = 3$ schools is needed from this stratum; the sampling step $k = [209 \div 3] = 69.7$ and suppose that the random start is $d = 49$; then the jth 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 down to 118), and finally the pointer is at $118.7 + 69.7 = 188.4$ (rounded down to 188). Replacement schools are selected automatically as the schools immediately before and after a selected school, if available; note that school 12 has no second replacement.

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

As a series of questions within the teacher questionnaire were concerned with events within the classroom setting, the final sampling step was the selection of a reference class or course for each selected teacher. This happened as the teachers were filling in their questionnaires: they were asked to identify the first ISCED Level 2 class or course they typically taught after 11:00 a.m. on Tuesdays.

The sizes of the school and teacher samples for each participating country are listed in Appendix B.

Sampling for the field trial

Prior to the main data collection, each participating country conducted a field trial (FT) during March and April 2007. For that purpose, a sample of twenty schools (plus their one replacement[1]) was selected during sample selection for the main survey (MS). The simultaneous selection of the school samples for the FT and the MS allowed some control of the overlap between the two samples and helped in reducing response burden on participating schools. When the number of schools in an explicit stratum was such that overlap of FT and MS samples was unavoidable, teachers who took part in the FT could be excused from the MS (see Chapter 10 on weighting).

National sampling plans

Table 5.4 gives an overview of the sampling plan for each participating country. More details are given in the country reports found in Appendix B.

NOTE

1. Only one replacement school was selected for the Field Trial to minimise the overlap with the sample for the Main Survey.

Table 5.1 (1/2)

Reasons for and magnitude of school exclusion, by country

	Reasons for exclusion	Schools	%	Teachers	%
Australia	Target Population	2 617	100.0		100.0
	Non mainstream schools, non English language schools, distance, adult education	110	4.2	N / A	
	Survey Population	2 507	95.8		
Austria	Target Population	1 540	100.0	N / A	
	Survey Population	1 540	100.0		
Belgium (Fl.)	Target Population	675	100.0	22 130	100.0
	Survey Population	675	100.0	22 130	100.0
Brazil	Target Population	57 479	100.0	843 951	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	4 636	8.1	10 124	1.4
	Federal schools	34		1 683	
	Survey Population	52 809	91.9	832 144	98.6
Bulgaria	Target Population	2 408	100.0	30 782	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	108	4.5	282	0.9
	Survey Population	2 300	95.5	30 500	99.1
Denmark	Target Population	2 176	100.0	60 905	100.0
	Small schools (fewer than 6 ISCED Level 2 teachers)	70	9.6	274	>0.9
	Public Youth Schools (Ungdomsskoler)	111		300	
	No measurement of size available	29		N / A	
	Survey Population	1 966	90.4	60 331	
Estonia	Target Population	448	100.0	8 747	100.0
	Remote schools	5	7.4	27	5.7
	Small schools (fewer than 7 ISCED Level 2 teachers)	12		65	
	Bilingual schools (15 Estonian / Russian – 1 Estonian / Finnish)	16		410	
	Survey Population	415	92.6	8 245	94.3
Hungary	Target Population	2 897	100.0	46 594	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	45	1.6	103	0.2
	Survey Population	2 852	98.4	46 491	99.8
Ireland	Target Population	702	100.0	N / A	
	Survey Population	702	100.0		
Iceland	Target Population	152	100.0	2 537	100.0
	Survey Population	152	100.0	2 537	100.0
Italy	Target Population	7 894	100.0	191 346	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	262	4.9	604	1.0
	Remote schools	31		233	
	Schools attached to art academies	71		919	
	Private schools outside national education system	21		244	
	Survey Population	7 509	95.1	189 346	
Korea	Target Population	2987	100.0	103 877	100.0
	Survey Population	2987	100.0	103 877	100.0
Lithuania	Target Population	1 296	100.0	47 382	100.0
	Survey Population	1 296	100.0	47 382	100.0
Mexico	Target Population	15 220	100.0	286 379	100.0
	CONAFE	918	6.8	1 050	0.9
	Small schools (fewer than 4 ISCED Level 2 teachers)	87		159	
	Field Trial	23		758	
	Others	8		506	
	Survey Population	14 184	93.2	283 906	99.1
Malta	Target Population	64	100.0	3 013	100.0
	Schools not following mainstream curriculum	3	6.3	88	2.9
	Small schools (fewer than 4 ISCED Level 2 teachers)	1		1	
	Survey Population	60	93.7	2 924	97.1
Malaysia	Target Population	2 361	100.0		100.0
	Language, curriculum	106	9.2	N / A	
	Small schools (less than 100 ISCED Level 2 students)	109			
	Remote schools	2			
	Survey Population	2 144	90.8		

Note: "N/A" appears when the country did not or could not provide the information; in such cases, the corresponding proportions could not be computed and are left blank.
Source: OECD, *TALIS Database.*

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Table 5.1 (2/2)

Reasons for and magnitude of school exclusion, by country

	Reasons for exclusion	Schools	%	Teachers	%
Netherlands	Target Population	587	100.0		100.0
	Vocational schools	42	7.2	N / A	
	Survey Population	545	92.8		
Norway	Target Population	1 212	100.0	21 898	100.0
	Schools outside Norwegian school regulation	4	10.1	69	1.5
	Schools abroad	14		48	
	Small schools (fewer than 10 students or fewer than 3 teachers)	104		211	
	Survey Population	1 090	89.9	21 570	98.5
Poland	Target Population	6 218	100.0	139 290	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	908	14.6	1 816 (est.)	1.3
	Survey Population	5 310	85.4	137 474	98.7
Portugal	Target Population	1 307	100.0	41 807	100.0
	Survey Population	1 307	100.0	41 807	100.0
Slovak Republic	Target Population	1 655	100.0	28 182	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	21	2.1	40	0.6
	Language other than Slovak or Hungarian	14		132	
	Survey Population	1 620	97.8	28 010	99.4
Slovenia	Target Population	446	100.0	9 450	100.0
	Survey Population	446	100.0	9 450	100.0
Spain (excluding Rioja and Canarias)	Target Population	7 106	100.0	235 060	100.0
	Survey Population	7 106	100.0	235 060	100.0
Turkey	Target Population	16 315	100.0	157 635	100.0
	Small schools (fewer than 4 ISCED Level 2 teachers)	3 838	23.5	8 648	5.5
	Survey Population	12 477	76.5	148 987	94.5

Note: "N/A" appears when the country did not or could not provide the information; in such cases, the corresponding proportions could not be computed and are left blank.
Source: OECD, *TALIS Database.*

Table 5.2

Derivation of the required sample size

Schools	a	200
Teachers per school	b	20
Total number of teachers	**c = a × b**	**4 000**
School response rate	d	75%
Teacher response within school	e	75%
Overall response rate	**f = d × e**	**56%**
Net number of responding teachers	**g = c × f**	**2 250**
Intra-cluster correlation	h	0.30
Design effect (*deff*)	*deff* = 1 + {(e ×b) −1} × h	5.2
Effective sample	**= g / *deff***	**433**

Source: OECD, *TALIS Database.*

Table 5.3

Illustration of systematic random sampling with PPS

National school ID	Explicit stratum	Implicit stratum	Measurement of size M_i	Cumulative measurement of size M_i	Sampling steps	Selections and replacements
1	A	1	10	10		
2	A	1	12	22		
3	A	1	15	37		R1
4	A	1	17	54	49	S
5	A	2	20	74		R2
6	A	2	18	92		
7	A	2	16	108		R1
8	A	2	16	124	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	188	S

Source: OECD, *TALIS Database.*

Table 5.4

Overview of the national sampling plans

	Explicit stratification	Number of ISCED Level 2 schools	Number of ISCED Level 2 teachers	School sample size	Teacher sample (expected size)
Australia	Geography (8)	2 507	*	200	4 000
Austria	School type (3)	1 540	*	279	5 580
Belgium (Fl.)	Network (3)	675	22 130	260	5 200
Brazil	School size (3) × School type (3)	52 809	832 144	400	7 161
Bulgaria	School size (4) × School type (3)	2 300	30 500	203	4 133
Denmark	School type (3)	1 966	60 331	200	4 000
Estonia	Region (2) × School type (2)	415	8 245	200	3 316
Hungary	School size (4)	2 852	46 491	200	3 618
Ireland	School size (3)	702	*	200	4 000
Iceland	None	152	2 537	152	2 537
Italy	Geography (3)	7 509	189 346	300	6 000
Korea	None	2 987	103 877	200	4 000
Lithuania	School type (4)	1 296	47 382	220	4 400
Mexico	School size (4) × School type (3)	14 184	283 906	200	4 164
Malta	None	60	2 924	60	1 200
Malaysia	School type (3)	2 144	*	219	4 380
Netherlands	School type (4)	545	*	150	3 000
Norway	School size (4) × Density (2)	1 090	21 570	200	4 875
Poland	Density (3) × Funding (2)	5 310	137 474	200	4 000
Portugal	Funding (2) × Region (5)	1 307	41 807	200	4 000
Slovak Republic	School type (2)	1 620	28 010	200	4 000
Slovenia	None	446	9 450	200	4 000
Spain (excluding Rioja and Canarias)	Group of autonomous communities (2)	7 106	235 060	200	4 000
Turkey	School size (4)	12 477	148 987	200	4 105

Note: "*" appears when the size of the ISCED Level 2 teacher population is unknown.
Source: OECD, *TALIS Database.*

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Chapter 6

Survey Operations Procedures

66 Abstract

66 Manuals and software

67 Contacting schools and within-school sampling procedures

- 67 Identification numbers, Teacher Listing Forms and Teacher Tracking Forms
- 68 Assigning materials to teachers and school principals
- 69 Administering the questionnaires and national quality control
- 69 Monitoring the on line questionnaires

69 Material receipt and preparing for data entry

69 Survey Activities Questionnaire

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Abstract

This chapter focuses on the survey operation procedures implemented for TALIS, including the materials and software that the International Study Centre (ISC) provided to all National Project Managers (NPMs). Other tasks of the NPMs as well as the three phases of the survey were explained in more detail in Chapter 1of this report. The International Association for the Evaluation of Educational Achievement Data Processing Center (IEA DPC) had developed a series software packages for previous IEA surveys, and adapted them to fit the needs of TALIS. The chapter concludes with an explanation of the quality control checks at different levels which ensure the high quality of the TALIS data.

MANUALS AND SOFTWARE

During all phases of the survey NPMs followed the standardised procedures prepared by the ISC and its consortium partners. This section lists only the latest versions of the six manuals and three software packages that were used for the main survey (MS). The ISC provided the following manuals, each in English and French.[1]

- The *TALIS Manual for National Project Managers* (MS-01-03) guided NPMs through all steps of the survey from the production of the national instruments to the submission of data to the ISC. The manual also included information on how to raise participation rates and how to manage confidentiality concerns.
- Statistics Canada prepared the *TALIS Sampling Manual* (MS-02-03), which defined the target population of ISCED Level 2 teachers. The manual described how to establish a national sampling plan, how to prepare the school sampling frame and how to select the school sample.
- The *TALIS School Co-ordinator Manual* (MS-03-02) addressed the school co-ordinator (SC) who played a key role within the school. 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 *TALIS Data Management Manual* (MS-04-02) provided the national data manager with instructions on how to use the software for collecting, capturing and verifying the data. The ISC held a three-day training seminar prior to the field test, giving data managers additional skills in using the software.
- The IEA Secretariat prepared the *TALIS Manual for International Quality Control Monitors* (MS-05-01) and delivered it directly to the International Quality Control Monitors (IQCM) contracted by the IEA. The manual outlined the tasks to be undertaken by the IQCMs in order to check the quality of survey operation procedures within participating countries. IQCMs visited NPMs and schools to document the outcomes of the visits.
- The *TALIS Manual for National Quality Control Monitors* (MS-06-01) guided NPMs in how to conduct a national quality control programme. The procedures were closely related to those for the IQCMs. However, NPMs were free to adapt the manual according to their needs.

Additionally, the ISC supplied NPMs with three software packages to assist with data collection:

- The Windows Within-School Sampling Software (WinW3S) aided national data managers in preparing the survey listing forms, qualifying and randomly sampling teachers in selected schools, and producing tracking forms for the sampled individuals. The software stored all tracking information in a single database so that the 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 Windows Data Entry Manager (WinDEM) 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 WinDEM databases included codebooks for each of the questionnaires, providing all the information necessary for producing data files for each instrument in a standard international format (see Chapter 9).
- The IEA SurveySystem converted paper questionnaires' text passages for on line administration (see Chapter 7) 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 checks and layout verification.

CONTACTING SCHOOLS AND WITHIN-SCHOOL SAMPLING PROCEDURES

Statistics Canada sent all NPMs 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 school level, two replacement schools were sampled in addition to each originally sampled school. The *TALIS Manual for National Project Managers* (MS-0-03) Appendix 8.5 gave detailed instructions about how to secure high participation rates within schools. These suggestions were based on the experiences of NPMs during the field trial.

Once NPMs received the sample, national centres started contacting the designated schools to secure their participation. If one of the sampled schools declined participation the national centre contacted its first replacement school. If this school also refused participation NPMs approached a second replacement school.

Each school nominated an SC to be responsible for carrying out all TALIS-related tasks within the school. Due to confidentiality concerns, it was preferable that the SC be a person other than the principal. Since SCs played a key role within the survey in almost half the participating countries, the NPMs provided them with formal training.

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. National centres produced these forms using WinW3S. The software created hierarchical identification numbers that uniquely identified the sampled schools and teachers within a country. A unique four-digit school identification number was assigned to each sampled school within each participating country. This number was also the identification code for the school principal who answered the principal questionnaire.

According to the instructions in the *TALIS School Co-ordinator Manual* (MS-03-02), SCs listed teachers and their name, year of birth, gender, main teaching domain and exclusion status. The main teaching domain was divided into four groups: *i)* language and arts; *ii)* human sciences; *iii)* mathematics and science; and *iv)* other. The classification of teachers into the appropriate groups was sometimes a demanding task, requiring close co-operation between the SC and the NPM. Although TALIS surveyed ISCED Level 2 teachers, not every teacher teaching at this level was within the scope. For example, teachers teaching only adults or special needs students had to be excluded, as were teachers on long-term leave, and substitute, emergency or occasional teachers.[3]

The national centre entered information from the Teacher Listing Forms into WinW3S and then drew the random within-school teacher sample of 20 teachers per school. After within-school sampling was completed, WinW3S created Teacher Tracking Forms that listed all sampled teachers. The national centre sent the Teacher Tracking Forms to schools so that SCs knew to whom to distribute the instruments.

The Teacher Tracking Forms monitored the participation status of the sampled teachers and included teacher names, teacher ID, year of birth, gender, questionnaire mode (on line or paper) and participation status.

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The ISC did not receive any teacher names, only teacher IDs. (Since the names on the Teacher Tracking Forms could be cut off the form, all names were kept confidential.) Copies of the Teacher Tracking Forms, without names, were sent to the ISC together with the survey data. Appendix C contains blank Teacher Listing Forms and Teacher Tracking Forms.

Assigning materials to teachers and school principals

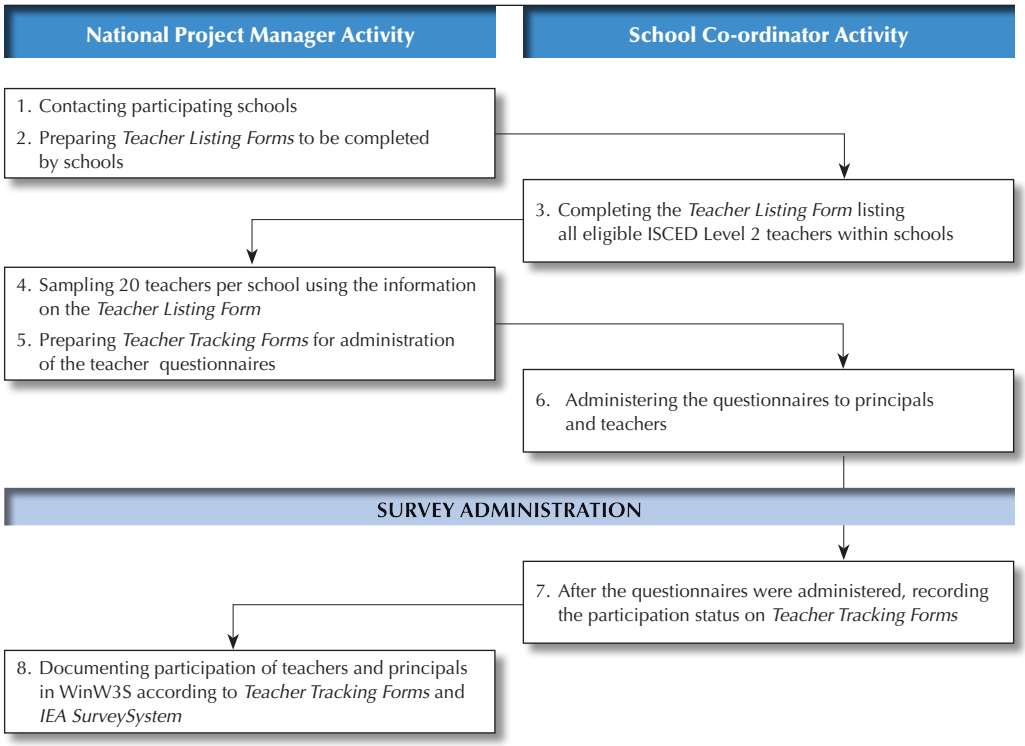
Each school principal was asked to complete one principal questionnaire. The SC assigned a teacher questionnaire to each teacher listed on the Teacher Tracking Forms. Chapter 5 gives detailed information about the sampling algorithm and linkage of teacher lists.

The NPM sent the SC of each school a package containing all paper questionnaires and cover letters for on line administration, the Teacher Tracking Forms and any other relevant materials prepared for briefing the SCs. To address confidentiality concerns, several countries chose to provide teachers with pre-paid envelopes that could be sent directly to the national centre, so that they did not have to return the completed questionnaire to the SC.

Figure 6.1 outlines the different responsibilities of the NPM and the SC for correct assignment of questionnaires to teachers.

Figure 6.1

Responsibilities of NPMs and the SC during survey administration



Source: OECD.

Administering the questionnaires and national quality control

Each country had its own time frame for survey administration, from three days to four months. During this period principals and teachers were free to fill in the questionnaires whenever they chose. It was a demanding task for SCs to monitor the administration of the survey, especially in cases where the teachers could send the completed questionnaires directly to the national centre.

Countries were requested to run a national quality control monitoring programme in order to guarantee high survey standards. Outcomes of national quality control had to be reported in the Survey Activities Questionnaire (SAQ) after survey administration and are discussed in Chapter 7.

Monitoring the on line questionnaires

The SCs recorded the return status of the paper questionnaires on the Teacher Tracking Forms. Naturally, the tracking procedure for on line questionnaires was different. SCs indicated on the Teacher Tracking Forms whether a teacher was assigned an on line questionnaire. National centres tracked the completion status of all on line questionnaires using the IEA SurveySystem Monitor module. Through a secured Internet website only available to the respective NPM, the real-time status of all respondents filling in the questionnaire could be monitored. If a teacher or school principal who was expected to participate was not listed in the monitor, the NPM asked the SCs to follow up.

After survey administration, national centre staff imported the participation information from the IEA SurveySystem Monitor reports into WinW3S to record their participation status.

MATERIAL RECEIPT AND PREPARING FOR DATA ENTRY

Immediately following the administration of TALIS, the major tasks for NPMs included retrieving and collating the materials from schools and verifying their integrity. When they received survey materials from the schools, NPMs were required to *i)* check that the complete and appropriate questionnaires were received for every teacher listed on the Teacher Tracking Form; *ii)* verify that all identification numbers on all paper instruments were accurate and legible; *iii)* check that the participation status recorded on the Teacher Tracking Form matched the availability of questionnaires, the information on the paper questionnaires and the information in the on line monitor; and *iv)* follow up with schools that did not return all the survey materials or for which forms were missing, incomplete or otherwise inconsistent.

At the national centre, 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

NPMs completed the SAQ to report their experiences during all steps of survey preparation and administration. The ISC set up the questionnaire and administered it on line when data collection activities were completed. All data went to the ISC.

The SAQ was built upon 9 content sections with 67 item blocks and a total of 113 items. The questions pertained to problems or unusual occurrences, with respect to within-school sampling, establishing school contact, preparing paper and (if applicable) on line materials, administering paper and (if applicable) on line materials, manual data entry and submission, and the national quality control monitoring programme.

The ISC carefully reviewed responses to the SAQ and the outcomes are discussed in this report. This section covers only within-school sampling, training of SCs and confidentiality issues. All TALIS countries, with the

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exception of one, accepted the definition of "school". In this single case the definition of "school" was clarified with the sampling experts from Statistics Canada. All participating countries used WinW3S for within school-sampling, including Iceland, Malta and Norway, which sampled all teachers within schools.

Nineteen out of 22 NPMs reported that the sampling selection process was not at all difficult; the remaining 3 NPMs reported it to be somewhat difficult due to the amount of paper work in large schools, communication problems with the schools or the fact that sometimes additional explanation was needed. Seventeen out of 22 NPMs found the Teacher Listing Forms and Teacher Tracking Forms easy to work with. Fifteen countries also used other means to list and track teachers, including Excel or Word sheets, email or personal communication to follow up on the process.

Seven out of 22 NPMs held formal training sessions for the SCs prior to survey administration. Thirteen provided information to the SCs through the School Co-ordinator Manual, written instructions or telephone calls.

Due to data protection rules 9 out of 24 participating countries were restricted in their use of teacher names on the questionnaires. They replaced the names with numbers, aliases, codes or symbols. The data did not indicate, nor did the International Quality Control Monitor report that these restrictions jeopardised the random sampling process or the allocation of questionnaires or the quality of data.

NOTES

1. Although they were written exclusively for TALIS, the manuals incorporate procedures, best practices and standards that were set for previous IEA studies such as TIMSS, PIRLS and SITES and that were similar to those used in the OECD PISA study.

2. See Chapter 5 for more details on school sampling.

3. For more details, see Chapter 5.

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Chapter 7

On Line Data Collection

74 Abstract

74 Overview

74 Design and mixed-mode considerations

76 Technical implementation

78 Operations

79 Field trial

80 Main study participation, mode distribution and evaluation

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Abstract

This chapter discusses the on line and electronically delivered questionnaires that have become an increasingly useful option for international large-scale sample surveys and assessments. TALIS offered on line data collection (ODC) with a mixed-mode design as an international option: countries could use the option as a default means to collect data for all schools and respondents, selected schools only or a particular population, *i.e.* school principals or teachers. This chapter provides information on the design, operations, technical solutions, field trial, main study and on line data collection processes.

OVERVIEW

The on line mode of questionnaire delivery can offer operational benefits, significantly reduce paper handling and data entry costs for national centres, as well as yield a more accurate and timely available international analysis database. The Second Information Technology in Education Study (SITES) 2006 (Carstens & Pelgrum, 2009), operated by the International Association for the Evaluation of Educational Achievement (IEA), was one of the first international large-scale surveys of teachers that used on line questionnaires to collect data for the majority of participating countries. More recently, several IEA studies (International Civic and Citizenship Education Study, Trends in International Mathematics and Science Study and Progress in International Reading Literacy Study) and several OECD studies (Programme for International Student Assessment and the Programme for the International Assessment of Adult Competencies) are actively using or planning to use electronic delivery of questionnaires and assessments.

In TALIS, the Board of Participating Countries (BPC) believed that principals and teachers would be receptive to using a more convenient, interesting or simply "up-to-date" mode of survey administration. Most countries participating in TALIS had already used on line data collection (ODC) in some way and for a quite a few of them, the administration of electronic questionnaires to schools and teachers had become commonplace. Previously, large-scale educational surveys at the international level had been based entirely on paper questionnaires. If the alterative approach was to be successful within and across countries, it not only had to meet certain established standards and best practices (see for example Couper, 2000; Dillman and Bowker, 2001; Reips, 2002) but also to address the issue of reliably administering paper-based and on line questionnaires side by side where countries or individual institutions could not guarantee a flawless overall on line delivery. The BPC consequently called for an detailed evaluation of the appropriateness of on line-delivered questionnaires for each participating country, for example with respect to acceptance within the target population of ISECD Level 2 teachers.

DESIGN AND MIXED-MODE CONSIDERATIONS

On line data collection in TALIS was offered as an international option and conducted using a mixed-mode design, meaning that the 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 population, *i.e.* 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 dataset within and across countries. 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. The questionnaires in both modes were self-administered and equally situated in the visual domain, in contrast to mixed-mode surveys that, say, simultaneously employ self-administered questionnaires and telephone or face-to-face interviews. Moreover, respondents were identified by the same sample design and procedures, contact with respondents and their validation was established by equal means, and data from both modes were collected 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 via email or printing out the on line questionnaires and mailing them to the national centre. As the on line data collection option for TALIS was designed specifically with respect to educational surveys and complex operations, a precondition for a successful administration of electronic questionnaires was that countries had to use centrally provided software.

To properly sequence preparation tasks and processes and to ensure comparability of data, the paper versions of the two questionnaire types (*i.e.* principal and teacher) 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. From these final paper versions, the questionnaires were converted for the on line mode followed by final structural, optical and textual verification (see Chapter 3 for more details).

In addition to these considerations, the design had to address certain technical issues. 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, the inclusion of 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 instrumentation, 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: respondents were asked to give several percentage numbers that were supposed to add up to 100%. On 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 their response was still highlighted red, respondents were able to 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 in which respondents were instructed to proceed to the next applicable question. Rather than presenting multiple questions per page, the on line questionnaire proceeded question by question. Vertical scrolling was required for a few questions, particularly the longer questions with multiple yes/no or Likert-type items. No horizontal scrolling was required. The visual or sensory impression of the length and burden of a paper questionnaire can be estimated easily. The on line questionnaires attempted to offer this 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. While it was possible for respondents to change the answer to any other option, it was not possible for them to uncheck an answer completely as they could in the paper questionnaires by crossing out an answer. The consortium considered adding extra "don't know" or "cancel" categories to these questions or utilising JavaScript to uncheck options, but decided against this. The level of "cancelled" responses observed during the TALIS field trial was extremely low and did not warrant the use of these options.

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Overall, a near-identical representation between modes (Denscombe, 2006) was achieved, an accomplishment that yielded identically structured and comparable data with the highest possible response rates, both at the questionnaire and at the variable level. Great care was taken to present questions in ways that were easy to read on screen and self-explanatory to complete. Both the terminology and the technical hurdles were carefully considered and implemented in a way that reduced to a bare minimum the computer skills respondents needed to access and answer the questions.

TECHNICAL IMPLEMENTATION

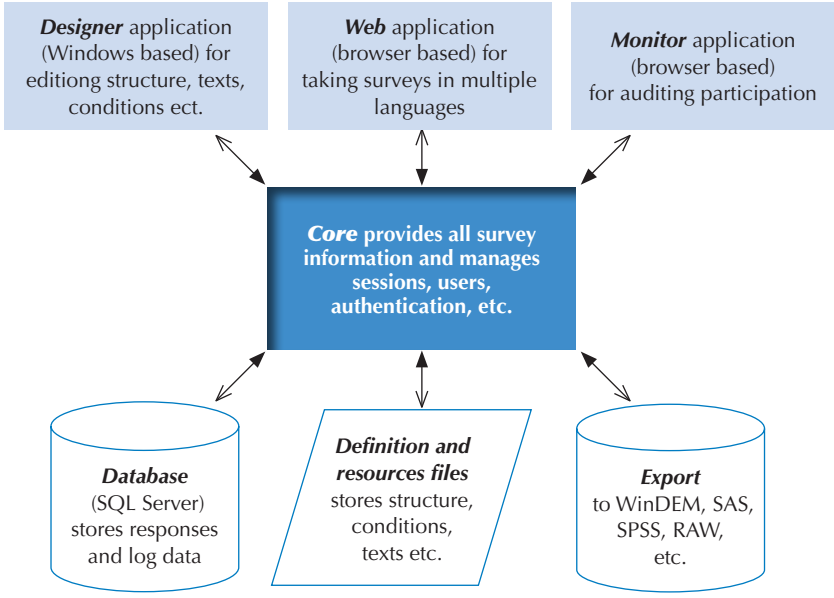
After addressing procedural requirements and methodological necessities, the consortium created a plan for implementation. No single "off-the-shelf" solution could be found that would satisfy all requirements, most importantly in the areas of *i)* decentralised translation, adaptation and verification (see Chapter 4); *ii)* mixed-mode data collection and subsequent data processing; and *iii)* minimal prerequisites on the side of respondents' or schools' computers. The consortium accordingly decided to re-use and extend the "IEA SurveySystem" software which was initially developed in the context of the IEA SITES 2006 survey, although with numerous enhancements and new features.

The SurveySystem software stored the hierarchical model of a survey's instruments and managed all questionnaire-related information, including text passages, translations, adaptations, validation rules, conditions and skip logic, variable names, and other information needed for post-processing. The SurveySystem's consolidation of metadata in a single set of files that the TALIS national and international centres could easily send to one another over the Internet allowed for a consistent way of managing the localised on line versions of the questionnaires.

To serve the different usage scenarios, three distinct components of the *SurveySystem* were developed (see Figure 7.1).

Figure 7.1

Architectural overview of the SurveySystem



Source: OECD.

The *Designer* component was a Microsoft® Windows-based application used to create, delete, disable and adapt survey components (*e.g.* questions and categories) and their properties. It allowed for translation of all text passages in the existing national paper questionnaires and additional system texts, and it included a complete local web server to verify and test-drive the survey as if under live conditions. The *Designer* also supported the export of codebooks to the generic data-entry software used by IEA in TALIS, WinDEM, to allow for isomorphic data entry of on line and paper questionnaires.

The *Web* component was a compiled ASP.NET application that served HTML questionnaires to the respondents for completion using a standard Internet browser. Given the overall goal of securing the maximum possible coverage, no respondents were to be excluded because of incompatible or outdated browsers or disabled features in these. This was especially important, as requirements in terms of connection speed and available software (browsers) were identified as crucial obstacles during initial discussions and the review of literature (see, for example, Reips, 2002). Because computer literacy was likely to vary greatly among respondents, the design sought a balance between minimally desirable capabilities and simplicity. In this sense, the approach taken in TALIS (selected aspects are discussed later in this chapter) was similar to that of the "respondent-friendly design" explicated by Dillman, Tortora and Bowker (1998). For a more recent and thorough discussion, refer to Couper (2008).

In detail, the output was tested to assure near identical representation at minimal (*i.e.* 800 x 600 pixels) as well as typical screen sizes (*i.e.* 1024 x 768, 1280 x 1024) in all supported browsers, which were required to support HTML 4.0 (a standard since 1998), bi-directional Unicode text and cascading style sheets for basic formatting. A few users had browsers that did not meet this requirement (*e.g.* embedded browsers on cell phones or other mobile devices). They received a translated list of supported browsers and information on contacting their national centre.

The *Web* component deliberately made use of plain HTML controls only and therefore did not require advanced technologies such as cookies, JavaScript, Flash or pop-ups that might not be available or activated for all users. With the exception of the welcome screen, no graphics were used. There was no automatic increase of font sizes or question widths for larger screen resolutions.

Finally, the access-secured, web-based *Monitor* component allowed national centres to audit participation in real time, including the respondent's ID number, the first and last date of login, the total number of logins, the current question, the response status for each individual question, and the questionnaire completion status. This allowed the national centres to contact schools regarding incomplete or not returned questionnaires as they did with paper questionnaires.

All systems were programmed at the IEA Data Processing and Research Center (DPC) on the basis of Microsoft®'s .NET framework because of its proven robustness and excellent support for multilingual (Unicode) and Internet applications. The IEA DPC used industry standards and patterns in developing the applications and verified them through embedded unit tests and extensive internal and external testing. The live systems were hosted on dedicated high-performance servers rented from a large and reliable solution provider in Germany. Load and stress testing, simulating far more than the expected number of simultaneous questionnaire sessions, were carried out prior to the production use.

Appropriate measures were taken to secure the data, and these were further strengthened by a professional security audit conducted by an external expert. The IEA DPC developed backup and disaster recovery strategies and constantly monitored the systems for permanent availability during the data-collection periods.

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OPERATIONS

Once the paper questionnaires had successfully been translated and the layout verified (see Chapter 4), national centres used the SurveySystem Designer software to convert the questionnaires into the on line mode. Along with the software, national centres received the international English survey files prepared by the consortium. The IEA DPC provided detailed documentation and training as part of a data management seminar in November 2006. The conversion to the on line mode was based on the concept of *cultures*, meaning a certain language within a certain cultural context, for example "Norwegian (Nynorsk)" in "(Norway)".[1] Because the translation was already verified and finalised for the paper questionnaires, this conversion involved copying and pasting the text passages in both modes. Prior to this, any structural adaptations to the questionnaire (*i.e.* adapted or not administered international variables, additional national variables) had to be reflected in the survey structure. In addition to the questionnaire passages, certain translations were needed exclusively for on line purposes, such as texts on the welcome screen, navigation buttons and error messages. Before submitting the files to the IEA DPC, national centres were required to perform a visual side-by-side comparison of the paper and on line versions using the integrated preview component.

After receiving the files containing all information needed to run the on line survey from the national centre, experts at the IEA DPC performed a comprehensive structural and visual question-by-question check for differences between the on line and paper versions as a quality control measure prior to activating a country's survey. Any detected deviations, such as mistakes in copying passages into the correct location or formatting mistakes, were reported back to the national centres. The IEA DPC approved the on line questionnaires and made them accessible only after any remaining issues had been resolved, thereby ensuring an isomorphic representation of questions in both modes.

The national centres decided whether to assign the on line or the paper questionnaire to respondents based on prior experience gained from participation in similar surveys and in the TALIS field trial. In most participating countries, the default mode was set at the school level. All respondents at each school – the principal and the sampled teachers – were assigned the same mode, either on line or paper. In Ireland and Portugal, respondents received both a paper questionnaire and login instructions for the electronic version, allowing them to choose their preferred mode.

To minimise non-responses resulting from mode assignment, NPMs were required to determine the mode that a specific school or individual preferred and implement procedures to reliably track these requests. NPMs had to ensure that every respondent initially assigned to the on line mode (by default or preference) had the option of requesting and completing a paper questionnaire at any time.

To ensure confidentiality and security, each respondent received individualised login information consisting of a numerical respondent ID and a corresponding password. National centres sent this information, along with a confidentiality statement and information on how to access the on line questionnaire, to respondents in a letter. As with the procedures for the paper questionnaires, the school co-ordinator (SC) distributed the information to the designated individuals. No direct identifiers such as names were used or stored at any time. The anonymous login procedure, together with corresponding provision during the assignment of operational IDs, guaranteed that local data protection laws and provisions were met.

During the administration period, respondents could log in and out as many times as needed and later resume answering the questionnaire at the point at which they had left until the end of the fielding time. Answers were automatically saved whenever respondents moved to another question, and respondents could change any answer at any time before completing the questionnaire. During administration, national centres provided support and could, in turn, contact the IEA DPC if they were unable to solve the problem locally.

National centres were able to monitor the responses to the on line questionnaires in real-time and to dispatch reminders to schools where respondents had not completed their surveys within the expected timeframe. School co-ordinators were then asked to follow up with the individuals concerned.

In summary, the operational procedures needed to support both ODC and the conventional paper-and-pencil track were designed to ensure that standard survey operations typically employed in large-scale surveys could be used with few or no modifications. The main challenges were catering for isomorphic versions of the instrumentation in both modes, reliably administering the resulting mixed-mode survey, and subsequently integrating the two data sources. The overall conclusion is that TALIS was successful in achieving this.

Although countries using the on line mode in TALIS faced parallel workload and complexity before and during data collection, they had the benefit of a reduction in workload afterwards. Because answers to on line questionnaires were already in electronic format, and responses were stored on servers maintained by the IEA DPC, there was also no need for separate hard copy data entry.

FIELD TRIAL

As with all other complex operations, the ODC technology and methodology had to be field trialled prior to implementation in the main survey. All NPMs were asked whether they intended to use ODC for the main data collection. Those who intended to do so were obliged to field trial the ODC procedures.

The field trial took place in 24 countries in early 2007, mainly in a six- to eight-week period between the second week of March and the first week of May. Of these, 16 implemented the ODC option and used a feature-complete ODC software: Australia, Austria, Belgium (Fl.), Denmark, Estonia, Iceland, Ireland (in English and Irish), Italy, Korea, Lithuania, Malaysia, Norway, Portugal, Slovak Republic, Slovenia and Turkey.

Approximately 3000 principal and teacher questionnaires were completed on line, or 53.1% of the school and 50.9% of the teacher data. Within the 16 countries opting for ODC, 73.1% of school questionnaires and 70.0% of teacher questionnaires were administered on line. Using the teacher questionnaire to illustrate this further, 4 countries administered all of their questionnaires on line and another 8 countries achieved rates of more than 50% but less than 100%. Four countries administered fewer than half their questionnaires on line and for two of those, the rate was below 10%. Nonetheless, these countries decided to continue using the option in the main study although they were not likely to be significant reductions in terms of costs or logistics. The rates for the principal questionnaire were similar.

The main goals of the TALIS field trial were to test and evaluate the instruments and their scaling characteristics. The field trial was also designed to yield basic information on both the feasibility and the validity of the on line data collection procedures. However, TALIS did not implement a strict experimental design that allocated respondents randomly to either the paper or on line administration mode and therefore there could be no formal tests of mode differences with respect to response rates, drop-out, response style, variable distributions, reliability or invariance of scales and indicators.

Previous research and statistical analysis carried out on the basis of the IEA SITES 2006 survey, which targeted a similar school and teacher audience, indicated no strong measurement effects or that these, if they existed, were too small to be detected by the available samples (Brečko & Carstens, 2007). For the TALIS field trial, the mode seemed to have no reported or detectable effect on unit and variable non-response (see also Lozar *et al.,* 2008). Partial completion (drop-out) was less than 2% on average. While field trial results did not allow strong assumptions about the main study, they were seen as acceptable estimators.

Overall, the procedures and tasks, supported by manuals, training and direct support, went as intended during the field trial.

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MAIN STUDY PARTICIPATION, MODE DISTRIBUTION AND EVALUATION

The consortium recommended that countries assess their own level of confidence in regard to using the on line mode, based on factors such as the within-country or within-school computer and Internet penetration, on line response rates in previous surveys, and (most importantly) the outcomes of the mandatory field trial. After taking these factors into account, all 16 participating countries that implemented ODC during the field trial opted to do so in the main study, usually as the default mode for collecting data. Again, Ireland administered its questionnaires in both English and Irish. Both Ireland and Portugal allowed their respondent to select the mode by providing both paper and on line materials to all selected schools and teachers.

The surveys were usually active for a period of 7 to 12 weeks between October and November of 2007 for the southern hemisphere countries (Australia, Korea, Malaysia) and between February and May of 2008 for the remaining northern hemisphere countries.

Table 7.1 provides the unweighted counts and percentages of paper and on line principal questionnaires for all participating countries. Four countries managed to collect all data entirely using on line questionnaires without compromising coverage or increasing non-response rates. Another eight countries reached rates of more than 50% but less than 100%. Three more countries returned a significant proportion of on line questionnaires although the rate was less than 50%. Questionnaires in Ireland were administered on line in only 4.2% of all cases and this is reportedly due to the fact that respondents were given both a printed questionnaire and login details and could choose between the two. On average, 50.2% of all completed principal questionnaires were administered on line. Among the 16 countries that opted to use ODC, the majority of completed principal questionnaires (75.3%) were administered on line.

Table 7.2 provides the unweighted counts and percentages of paper and on line teacher questionnaires for all participating countries. Three countries managed to collect all data using on line questionnaires, 8 had rates of more than 50% but less than 100%, 4 had a significant proportion of on line questionnaires for less than half the respondents, and Ireland administered on line questionnaires to a small number of teachers (3.1%). On average, 47.4% of all completed teacher questionnaires were administered on line, with 71.0% of teachers within the 16 countries completing their questionnaires on line. The proportion of paper versus on line mode was highly consistent across questionnaire types as well as with the proportions observed during the field trial.

In the main study, national centres and respondents agreed on the actual administration mode, meaning that TALIS could not formally analyse or test for mode effects. The evaluation of ODC procedures after the main survey was therefore largely based on observations and reports received directly from participating countries or sent via the Survey Activities Questionnaire (SAQ). The following list contains selected aspects of the feedback from the MS:

- NPMs described the conversion and verification procedures as easy to implement although repetitive. There were no major observed or reported problems with respect to translation, conversion and representation of complex scripts, such as Korean. The IEA DPC gave support for the more challenging modifications and adaptations. NPMs reported that the preparation, on average, took about one person week, including any additional time needed to communicate and resolve the differences identified during the side-by-side comparison of instruments at the IEA DPC. All problems were resolved successfully before administration.
- The verification of ODC resource files against paper versions and the corresponding national adaptation forms showed that all initial conversions were in good to very good condition and that typically two to three (to a maximum five) rounds of feedback and corrections were needed to finalise the survey definitions and resources. Minor issues included incorrect or missing line breaks, inconsistent or missing formatting (underline, bold, italic), missing full stops after items, or incomplete translation of system texts such as those

for the "Next" or "Previous" buttons. Only a few substantial issues were flagged and corrected such as inconsistent wording between the paper and on line version, accidentally disabled or re-ordered response categories or missing variable names for national extensions.

- No major technical problems were reported during administration (*e.g.* unplanned down-time as a result of hardware failures or hacking). As with the field trial, a few issues arose with respect to server access, firewalls, virus software, URLs blocked by local networks, page caching, and the reliability of Internet connections in general. A severe problem was only reported for two schools (affecting approx. 30 teachers) in one country which experienced wireless network difficulties that could neither be reproduced nor fully explained by either the IEA DPC or the NPM. Having the paper questionnaires as a fall-back strategy was essential.
- NPMs reported that respondents had several types of difficulties in accessing the questionnaire, including: *i)* entering the access URL given to them in, for example, a search engine box rather than the address bar; *ii)* confusing IDs and passwords during login; and *iii)* losing or misplacing the cover letters with login details. A more detailed review of these difficulties is included below.
- Achieving high response rates was a key challenge for many NPMs and their teams. Reportedly, reluctance to participate in TALIS was not related to the mode of data collection itself, but rather to "survey fatigue" and overburdening of teachers and principals. In those few countries in which some respondents "resisted" the on line mode, doubts about the confidentiality and anonymity of responses were the main reasons reported. These respondents received paper questionnaires and NPMs reported that there were no further challenges to completion. Given the importance of this matter and the numerous questions received, both the NPMs and the consortium emphasised that the information was indeed and would remain stored securely and confidentially at all times and that no direct identifiers or personally identifiable information was stored or accessible to any third party.
- Follow-up procedures were in place in all countries and, typically, school co-ordinators or principals were updated on the least once by phone or email, sometimes even on a continuous basis. National centres made extensive use of the monitor application to facilitate follow up with non-respondents.
- NPMs reported that the actual administration including the work for organising, preparing invitations, monitoring, and following up with non-respondents, on average, took about one person month.

Experiences and reports during the field trial and the main study stimulated more detailed explorations and descriptive analyses using not only the actual response data but also the metadata collected during administration, for example the date and time of the first and last login. The results of these analyses are summarised in the following paragraphs. It should be noted that these analyses make use of unweighted data and hence descriptions of the achieved samples in the final international database. They were not intended to yield population estimates.

Table 7.3 presents the rate of on line administered questionnaires by respondent type (principals and teachers) and gender for all countries participating in the on line data collection option. While the prevalence of on line questionnaire use by country mirrors the data presented in earlier tables, it can also be seen that the administration mode was largely consistent across principals' and teachers' genders. A slightly higher preference for on line questionnaires apparently existed among male teachers, although the result was less consistent among principals.

Given that teachers were able to self-select their preferred administration mode, it was interesting to explore the preference for on line administered questionnaires by age group and to what extent preferences were consistent within schools.

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Table 7.4 presents the percentage of questionnaires administered on line by age group. In some cases, for example in Austria, Estonia, Italy and Slovenia, the preference for the on line mode apparently decreased as the teachers' reported age group increased. For other countries, the values were either more homogeneous or not apparently associated with teachers' age in a uniform way.

Table 7.5 shows, by country, the percentage of schools that administered questionnaires on line to a certain extent. For example, questionnaires in almost all schools in Denmark were administered exclusively on line (97.8%) and only 1.5% (*i.e.* 2 out of 137 schools) used paper questionnaires for all of their teachers. In Portugal, the majority of schools used on line questionnaires for less than half of their teachers and only 4.6% (*i.e.* 8 out of 173 schools) used on line questionnaires for all teachers.

Of particular interest in the domain of self-administered electronic questionnaires is the question of access. Paper questionnaires are immediately accessible whereas electronic questionnaires, unless their access is completely uncontrolled, require some form of validation. In TALIS, validation took the form of a fairly typical numeric ID and password combination. The login procedures and accompanying instructions were concise and straightforward. However, it was expected that some respondents would face difficulties in managing this hurdle. This, in turn, could have had an adverse affect on response rates or introduces bias to the survey results if individuals or certain demographic groups had been unable to access the questionnaire reliably. Although the fall-back-to-paper strategy was designed to address this issue, it was nonetheless of interest to identify access problems and derive ways to minimise these for future surveys.

A labour-intensive manual analysis was conducted during the main study administration in May 2008 and covered the first 40 000 out of approximately 55 000 login attempts recorded in the systems. Of these, about 4 800 were recorded as initially unsuccessful, a number that appeared high. During the analysis, several types of systematic errors were detected and classified into an error typology. The distribution of this failed login typology was not uniform, however. The majority of all failed login attempts were due to four main reasons, listed in Table 7.6; three other reasons existed in small proportions. The analysis continued by attempting to identify corrections that respondents have used and their eventual success following the initial failure. Most respondents were able to correct their initial error immediately by reviewing the login details or requesting help from colleagues, the school co-ordinator or the national centre (help information was included as part of the cover letter given to respondents). Table 6.6 shows that 94.4 to 100% of all initially failed login attempts were corrected and eventually successful.

In summary, the login procedure was not a significant source of non-response or total survey error. For the residual failed attempts, paper questionnaires were most likely issued by the NPMs. The consortium, the NPMs and the OECD considered as acceptable the observed final rate of failed logins for which no immediate or delayed correction was identified or identifiable, *i.e.* 119 out of 40 000. The true level of failed attempts was believed to be even smaller given that it was impossible in the analysis to clarify whether a later login attempt for some error types succeeded. The results indicate that even more simplified login procedures could be explored.

Little is known or documented about how respondents fill out paper-based, self-administered questionnaires in educational surveys. For the on line mode, the complete set of login records described the number of logins per respondent and the duration, defined as the number of days between the first and last login date less one, in which each questionnaire was completed. The actual duration may have been affected by a number of factors. The principal questionnaire asked for factual information that principals had to gather from school databases and other sources. For both teachers and principals, questionnaire completion may have been interrupted by other, school-related activities. NPMs reported that a sizable number of respondents had initially started to complete the questionnaire, left it incomplete, and were later asked to finalise it as part of the national centres' follow-up activities.

Table 7.7 presents some key measures of response duration and login behaviour. While the mean and maximum number of days taken to complete the questionnaires were relatively high (most probably because respondents failed to complete the questionnaire until reminded by the school co-ordinator) the majority of questionnaires were completed within one day (*e.g.* 95% of teachers in Austria) and a higher percentage (*e.g.* 98.9% of teachers in Austria) were completed within a week. On average respondents at all levels logged in slightly fewer than two times. In line with expectations, principals consistently logged in at a higher than average rate and took more time to complete their questionnaires, expressed in lower completion rates within one login, one day and one week. Malaysia is a noteworthy exception to this picture. The Malaysian NPM provided one possible explanation, namely that some schools experienced slow Internet connections or could not access the on line questionnaire. When this happened, they normally tried again on a different day. This seems to be supported by the high average number of logins for both principals and teachers.

Another concern with electronically delivered questionnaires is that they lack a usable overview of the time required for completion. Item non-response in long questionnaires may increase as a function of time, exhaustion or rejection. Such an effect, for example, was observed during the field trial in IEA SITES 2006 (see Brečko & Carstens, 2007) and questionnaires were significantly shortened for the main study. The TALIS questionnaires were also reviewed after the field trial and reduced to such a length that, again on average, required a net response time of 30 to 45 minutes. Drop-out, *i.e.* prematurely leaving the questionnaire before its end, was therefore not expected to be a major concern in TALIS. Analyses investigated the magnitude and the increases in trailing omitted variables in the TALIS main study questionnaires. The result suggested that there was no clear direction of drop-out across countries and administration modes, although differences existed within individual countries. The main conclusion was that the on line mode itself did not systematically increase the amount of drop-out observed in the data.

Overall, on line data collection in TALIS was implemented successfully, due to the commitment and hard work of NPMs and their teams. However, experiences showed that surveys of this type cannot yet go "e" completely and should be rolled out with care. Mixed-mode systems are admissible but if countries or institutions cannot guarantee flawless delivery of electronic questionnaires, a fall-back to paper-based administration is essential to ensure that sampling and coverage principles are not compromised.

Note

1. Culture names follow the RFC 1766 standard in the format «<languagecode2>-<country/regioncode2>», where <languagecode2> is a lowercase two-letter code derived from ISO 639-1 and <country/regioncode2> is an uppercase two-letter code derived from ISO 3166.

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Table 7.1

Extent to which paper and on line administration modes were used for the Principal Questionnaire during the main study (sorted in descending order of on line usage and country name)

	Total	On line		Paper	
	Number of teachers	Number of teachers	%	Number of teachers	%
Iceland	102	102	100.0	0	0.0
Korea	153	153	100.0	0	0.0
Norway	153	153	100.0	0	0.0
Turkey	188	188	100.0	0	0.0
Denmark	117	116	99.1	1	0.9
Australia	148	145	98.0	3	2.0
Malaysia	217	210	96.8	7	3.2
Estonia	193	182	94.3	11	5.7
Belgium (Fl.)	180	168	93.3	12	6.7
Lithuania	204	190	93.1	14	6.9
Slovak Republic	181	113	62.4	68	37.6
Italy	287	149	51.9	138	48.1
Austria	242	110	45.5	132	54.5
Portugal	161	62	38.5	99	61.5
Slovenia	178	48	27.0	130	73.0
Ireland	120	5	4.2	115	95.8
Brazil	377	0	0.0	377	100.0
Bulgaria	197	0	0.0	197	100.0
Hungary	183	0	0.0	183	100.0
Malta	58	0	0.0	58	100.0
Mexico	189	0	0.0	189	100.0
Netherlands	33	0	0.0	33	100.0
Poland	172	0	0.0	172	100.0
Spain	183	0	0.0	183	100.0
Totals and averages	>>	2 094	50.2 (49.7)	2 122	49.8 (50.3)
Totals and averages (ODC using countries only)	2 824	2 094	75.3 (74.2)	730	24.7 (25.8)

Notes: Percentage values in the totals and averages rows represent the averages of the percentages for each country.
Values in parentheses represent the percentages of all individual questionnaires.
Source: OECD, *TALIS Database*.

Table 7.2

Extent to which paper and on line administration modes were used for the Teacher Questionnaire during the main study (sorted in descending order of on line usage and country name)

	Total	On line		Paper	
	Number of teachers	Number of teachers	%	Number of teachers	%
Iceland	1 394	1 394	100.0	0	0.0
Korea	2 970	2 970	100.0	0	0.0
Turkey	3 224	3 224	100.0	0	0.0
Norway	2 458	2 438	99.2	20	0.8
Denmark	1 722	1 702	98.8	20	1.2
Malaysia	4 248	4 156	97.8	92	2.2
Australia	2 275	1 972	86.7	303	13.3
Estonia	3 154	2 698	85.5	456	14.5
Belgium (Fl.)	3 473	2 962	85.3	511	14.7
Lithuania	3 535	2 980	84.3	555	15.7
Slovak Republic	3 157	2 529	80.1	628	19.9
Portugal	3 046	940	30.9	2 106	69.1
Italy	5 263	1 538	29.2	3 725	70.8
Slovenia	3 069	893	29.1	2 176	70.9
Austria	4 265	1 136	26.6	3 129	73.4
Ireland	2 227	69	3.1	2 158	96.9
Brazil	5 834	0	0.0	5 834	100.0
Bulgaria	3 796	0	0.0	3 796	100.0
Hungary	2 934	0	0.0	2 934	100.0
Malta	1 142	0	0.0	1 142	100.0
Mexico	3 368	0	0.0	3 368	100.0
Netherlands	484	0	0.0	484	100.0
Poland	3 184	0	0.0	3 184	100.0
Spain	3 362	0	0.0	3 362	100.0
Totals and averages	73 584	33 601	47.4 (45.7)	39 983	52.6 (54.3)
Totals and averages (ODC using countries only)	49 480	33 601	71.0 (67.9)	15 879	29.0 (32.1)

Notes: Percentage values in the totals and averages rows represent the averages of the country percentages.
Values in parentheses represent the percentages of all individual questionnaires.
Source: OECD, *TALIS Database.*

Table 7.3

Percentage of questionnaires administered on line, by respondent type and gender

	Principals		Teachers	
	Female	Male	Female	Male
Australia	98.1	97.9	86.8	86.5
Austria	43.3	46.3	25.9	28.2
Belgium (Fl.)	91.3	94.5	85.0	86.0
Denmark	100.0	98.7	98.9	98.7
Estonia	93.1	95.6	85.5	85.6
Iceland	100.0	100.0	100.0	100.0
Ireland	7.3	2.6	2.8	3.8
Italy	49.3	54.7	28.0	33.7
Korea	100.0	100.0	100.0	100.0
Lithuania	89.1	97.1	84.4	83.9
Malaysia	96.6	96.9	97.8	97.8
Norway	100.0	100.0	99.2	99.2
Portugal	37.1	38.9	28.5	36.4
Slovak Republic	64.8	58.3	80.3	79.2
Slovenia	22.9	32.9	27.6	35.0
Turkey	100.0	100.0	100.0	100.0

Source: OECD, *TALIS Database.*

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Table 7.4

Percentage of questionnaires administered on line, by teachers' age group

	<25	25-29	30-39	40-49	50-59	60+
	%	%	%	%	%	%
Australia	94.7	90.7	83.7	88.1	83.8	92.4
Austria	37.5	29.5	27.8	28.2	24.3	19.6
Belgium (Fl.)	89.5	89.7	86.1	84.5	80.3	88.2
Denmark	100.0	96.2	98.8	99.5	98.7	100.0
Estonia	97.5	93.9	90.7	89.0	81.4	69.3
Iceland	100.0	100.0	100.0	100.0	100.0	100.0
Ireland	5.2	4.0	3.6	1.2	2.9	5.3
Italy	40.0	38.8	36.4	30.2	27.2	17.1
Korea	100.0	100.0	100.0	100.0	100.0	100.0
Lithuania	84.8	86.2	89.4	87.7	79.1	74.1
Malaysia	100.0	96.5	97.6	98.8	98.2	100.0
Norway	100.0	99.0	99.4	98.8	99.3	99.3
Portugal	17.6	33.1	34.6	29.8	22.3	19.1
Slovak Republic	84.7	85.0	86.4	80.8	75.3	56.8
Slovenia	50.0	38.9	34.0	28.9	19.3	12.2
Turkey	100.0	100.0	100.0	100.0	100.0	100.0

Source: OECD, *TALIS Database.*

Table 7.5

Percentage of schools that administered questionnaires on line, by country

		None on line	Less than half on line	Half or more but less than all on line	All on line
	N	%	%	%	%
Australia	149	2.0	5.4	36.2	56.4
Austria	248	70.6	1.2	2.4	25.8
Belgium (Fl.)	197	4.6	5.1	26.9	63.5
Denmark	137	1.5	0.0	0.7	97.8
Estonia	195	3.1	6.2	31.3	59.5
Iceland	133	0.0	0.0	0.0	100.0
Ireland	142	69.0	31.0	0.0	0.0
Italy	298	36.2	39.6	13.1	11.1
Korea	171	0.0	0.0	0.0	100.0
Lithuania	206	4.9	10.7	15.0	69.4
Malaysia	217	1.4	0.9	0.9	96.8
Norway	156	0.0	0.0	0.6	99.4
Portugal	173	17.9	61.8	15.6	4.6
Slovak Republic	186	11.3	6.5	32.8	49.5
Slovenia	184	45.7	24.5	18.5	11.4
Turkey	193	0.0	0.0	0.0	100.0

Source: OECD, *TALIS Database.*

Table 7.6

Error typology: type, initial percentage of all analysed login attempts, percentage of successful corrections, and percentage of residual failed login attempts (sorted in descending order of magnitude of initial error rate)

	Percentage of all login attempts	Of these, percentage of corrected (ultimately successful) logins	Residual percentage of all login attempts
Respondent typed incorrect password (*e.g.* added or deleted one digit).	3.16	99.76	0.01
Respondent typed his or her name, an e-mail address, the project name, or the school name instead of his or her personal ID.	3.10	94.36	0.18
Respondent used the school ID also printed on the label instead of his or her teacher ID.	3.07	99.18	0.03
Respondent typed incorrect ID (*e.g.* added or deleted one digit).	2.53	96.64	0.09
Respondent confused ID and password.	0.15	100.00	0.00
Respondent confused 0 (digit) and O (letter).	0.12	97.83	0.00
Respondent typed the word "password" or similar.	0.04	92.86	0.00

Source: OECD, *TALIS Database.*

Table 7.7

Maximum, mean, and median duration for completing an on line questionnaire, as well as percentage of completed questionnaires within one login, one day, and one week, by country

	Mean logins		Maximum duration (days)		Mean duration (days)		Completed in one login %		Completed in one day %		Completed in one week %	
	P	T	P	T	P	T	P	T	P	T	P	T
Australia	1.6	1.4	47	57	2.5	2.0	59.9	73.3	83.4	93.1	93.6	96.2
Austria	1.5	1.4	10	21	1.2	1.3	68.0	76.9	94.5	95.0	98.4	98.9
Belgium (Fl.)	1.9	1.4	39	43	2.7	1.7	55.1	74.6	83.0	91.2	91.5	96.2
Denmark	1.4	1.2	45	62	2.7	1.9	73.8	83.5	88.5	95.2	93.1	97.1
Estonia	1.9	1.7	43	35	2.9	2.3	58.6	64.0	82.3	83.4	92.5	93.2
Iceland	1.5	1.3	24	62	1.4	1.3	70.6	78.8	94.5	95.9	98.2	98.8
Ireland	1.7	1.5	1	27	1.0	1.5	63.6	70.1	100.0	94.8	100.0	97.4
Italy	2.2	1.9	63	64	4.7	4.1	48.4	56.8	76.5	76.4	85.6	86.6
Korea	2.0	1.8	28	33	2.4	2.0	44.7	56.4	85.5	89.2	92.5	94.5
Lithuania	2.1	1.8	30	37	2.7	2.2	51.0	57.3	80.7	82.2	91.7	93.3
Malaysia	3.8	3.0	50	53	7.8	6.8	22.2	27.1	50.5	46.6	65.3	68.0
Norway	1.5	1.5	32	52	1.8	1.8	73.6	77.3	91.4	94.3	96.6	96.5
Portugal	2.1	1.7	65	70	5.8	2.6	52.1	59.6	75.3	86.9	82.2	92.3
Slovak Republic	2.3	2.1	27	33	4.0	3.6	44.9	49.8	72.9	72.9	81.4	83.2
Slovenia	1.8	1.6	22	27	2.5	1.8	54.7	63.3	77.4	87.7	90.6	95.6
Turkey	3.4	2.0	52	48	8.5	2.9	30.1	50.2	54.1	80.4	67.3	90.6

Note: P = Principal, T = Teacher
Source: OECD, *TALIS Database.*

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Chapter 8

Quality Assurance

90 **Abstract**

90 **Overview**

90 **Quality control in TALIS survey administration**

- 91 International quality control monitoring programme

91 **Survey anonymity**

92 **School co-ordinator interviews**

- 92 Initial preparations
- 93 Survey administration activities
- 93 General observations

94 **Survey Activities Questionnaire**

- 94 Contacting schools
- 95 Preparing survey materials
- 96 Conversion to on line data collection
- 96 Survey administration
- 97 Data entry and verification
- 97 National quality control monitoring programme

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Abstract

This chapter explores the quality control programme prepared for administering TALIS. It discusses the standardised procedures taken for survey preparation, administration and data entry in order to ensure a high quality collection and processing of TALIS data. Quality control in TALIS comprised three parts: organisation and oversight by the IEA Secretariat of an international programme of school and national centre visits by International Quality Control Monitors (IQCMs); a national quality control programme of school visits operated by National Project Managers; and a follow-up on line Survey Activities Questionnaire seeking experiential information from the National Project Managers.

OVERVIEW

For the TALIS main survey (MS) the IEA Secretariat prepared a standardised quality control programme of school visits. The programme consisted of an international and a national component; its major aim was to document the quality of the survey administration in each country and flag any issues that might influence the comparability of the data. A secondary aim was to learn about experiences with TALIS directly from the people administering it, so as to better understand how to improve procedures for subsequent cycles.

QUALITY CONTROL IN TALIS SURVEY ADMINISTRATION

The materials and procedures developed for the TALIS survey administration were standardised across all participating countries and languages to ensure, as far as possible, that participants in each country received comparable survey materials under comparable survey conditions (see Chapter 6 for more details). The purpose of the TALIS quality control programme was to document the extent to which the standard operating procedures were followed in each country.

Quality control of data collection in TALIS comprised three parts:

- The IEA Secretariat organised and oversaw an international programme of school and national centre visits by International Quality Control Monitors (IQCMs).
- National Project Managers (NPMs) operated a national quality control programme of school visits. The IEA Secretariat supplied a manual template that could be adapted according to countries' needs, and that was used by 19 out of 21 countries that ran a national quality control programme.
- The International Study Centre (ISC) administered an on line Survey Activities Questionnaire (SAQ) to be completed by NPMs after survey administration. NPMs were asked about their experiences with the TALIS survey administration.[1] Outcomes of the national quality control programme were reported in the final section of the SAQ.
- The full quality control programme was administered only for the MS. Quality control for the field trial (FT) at the international level consisted of the Field Trial Operations Checklist, which outlined major steps in survey administration activities: sampling, preparing survey materials, data collection, data entry and data submission. The checklist asked NPMs to fill in the date each task was completed, and to list any comments or any problems they experienced. The ISC used completed checklists to identify weak points in survey administration and to improve survey operation procedures for the MS.

International quality control monitoring programme

For the international programme, the IEA Secretariat, in co-operation with national centres, identified and appointed an IQCM in each country to visit 10% of the sampled TALIS schools and to interview the school co-ordinators (SCs) about aspects of study administration. Since the international sample size for TALIS was 200 schools, IQCMs visited 20 schools in every country except Brazil. The Brazilian IQCM visited 40 schools because Brazil had sampled 400 schools for the MS. IQCMs were asked to select the schools following a standardised procedure. Schools to be visited were randomly selected from a subset of schools that met specific criteria.[2]

In large countries like Australia and Brazil IQCMs were permitted to recruit and train assistants to conduct the school visits in more distant regions of the country. Assistants were also necessary if the survey was conducted within a short timeframe, as in the case of Mexico where all TALIS data were collected within one week. Overall, five IQCMs engaged one assistant; in the case of one country three assistants were necessary. Altogether, the IQCMs and those trained by them successfully visited and interviewed SCs at 500 schools. The results from these school visits are discussed in later in the chapter.

Prior to the MS administration, IQCMs from twenty-four TALIS countries participated in a one-day training seminar in Amsterdam, Netherlands. For southern hemisphere countries the training session took place in September 2007; for northern hemisphere countries, it took place in January 2008.

During training IQCMs received the following materials:

- the *TALIS Manual for International Quality Control Monitors* (MS-05-02), outlining the IQCM's roles and responsibilities;
- the *School Visit Record,* a standardised, structured interview format concerning survey implementation;
- the *Translation Verification Report* from the translation verifier. The IQCMs commented on a comparison between the report from the translation verifier and the final version of instruments used in the country (see Chapter 4 for more details); and
- a CD-ROM containing all TALIS manuals and forms used during data collection.

SURVEY ANONYMITY

A major concern among teachers sampled for participation in TALIS was whether the completed questionnaires and survey results would be anonymous and confidential. While confidentiality was guaranteed in the written introduction to the survey, many respondents remained unconvinced. SCs and NPMs in 50% of participating countries reported teacher questions or concerns regarding the confidentiality of responses. Teacher names were recorded on questionnaires and tracking forms for only 33% of these countries. The others relied on ID numbers, codes or aliases to disguise teacher identities.

The importance of maintaining respondent confidentiality was impressed upon both SCs and QCMs. Many SCs mentioned that the completed questionnaires were in sealed envelopes or did not have teacher names on them. In 58% of countries, NPMs elected to identify teachers on tracking forms and questionnaire or cover letter labels by some means other than name to follow legal requirements or to meet teachers' concerns. Although this procedure was more difficult and more prone to error, informal reports suggested that some respondents felt more comfortable when their name was not on the documents.

When asked about provisions for the security of the Teacher Listing and Tracking Forms, SCs indicated that security and confidentiality were taken very seriously at the school level. Fewer than 2% of Teacher Listing and Teacher Tracking Forms were stored with questionable security, for example that they were left in a staffroom pigeonhole. In 84% of cases SCs indicated that nobody other than themselves had access to the forms.[3]

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SCHOOL CO-ORDINATOR INTERVIEWS

As mentioned earlier, the *School Visit Record* is a structured SC interview covering four topics: the initial preparations of the SC, survey administration activities, the SC's general impressions and the IQCM's general impressions regarding this particular school. In most cases IQCMs were able to complete their tasks successfully; however, IQCMs in three countries encountered at least one unhelpful SC who forgot or refused the appointment.

In most countries SCs were members of the school staff: 29% were vice-principals, 22% were principals, 14% were classroom teachers and 11% were directors or heads of teaching and learning. However, some countries like Brazil, Hungary, Mexico and Spain employed an external surveying organisation to distribute the questionnaires, explain the survey and collect the questionnaires, so the role of the SC there was correspondingly smaller. Approximately 86% of SCs were responsible for one school only. Generally these people held positions within the school. The maximum number of schools for which one SC was responsible was 15 in Spain, where SCs came from an external agency.

Initial preparations

Section A of the School Visit Record asked SCs about the training and other preparations they had completed for their role in TALIS. Formal training sessions were offered in 42% of participating countries to the majority of SCs. Approximately half of all SCs interviewed reported they had received training for their role, and of those who did receive training, more than 95% reported it was adequate. Training typically consisted of formal face-to-face sessions – others described "training" as a combination of email and phone contact and written instructions. The greatest barriers to training were distance and time. Ninety-two percent of SCs described the *TALIS School Co-ordinator Manual* (MS-03-02) as having worked well. Several SCs noted that the checklists were very helpful, and some thought that the manual explained things so well and so clearly that an additional training session was unnecessary.

Prior to the process of within-school sampling, SCs completed Teacher Listing Forms. Page 5 of the *TALIS School Co-ordinator Manual* (MS-03-02) provided SCs with detailed information about whom to include on the form. Among SCs interviewed, 8.6% experienced some difficulty in completing the Teacher Listing Form – the major complaint being that it was a lengthy and time-consuming process to locate and list all the information, especially for large schools. There was only one country where SCs returned Teacher Listing Forms with exactly 20 teachers listed, suggesting that they had not understood procedures properly.

Approximately 87% of SCs reported that they corresponded with their NPM and familiarised themselves with the survey process prior to distributing materials; a proportion of those who did not have contact with the NPM had some other external co-ordinator, such as an external surveying organisation, that they could rely on for advice and support. After national centres sent the materials to schools, SCs had to check their completeness. Fewer than 5% of SCs reported that materials were missing from their shipment – in most cases, these problems were resolved swiftly with the assistance of the national centre. Eighty-seven percent of SCs verified adequate supplies of questionnaires or cover letters prior to questionnaire administration. Only one of those who did not verify adequate supplies had to arrange replacements. In 98% of the total sample, paper questionnaires were of good quality and defective questionnaires were present in only 2%.[4]

School co-ordinators in countries participating in on line data collection (ODC) were asked two additional questions about their effectiveness at explaining the ODC procedures, and whether teachers received the survey in the format they were expecting. In ODC countries, 99.6% of SCs thought they were "very effective" or "somewhat effective" at explaining the ODC procedures; 94% were confident that teachers received the questionnaire in the format they were expecting. Table 8.1 gives an overview of the SC tasks prior to survey administration.

Survey administration activities

Section B of the School Visit Record asked about survey administration activities. Table 8.2 presents SC responses to these questions.

Eighty percent of SCs distributed the Principal Questionnaires as soon as the materials arrived at the school; only 3.4% reported any problems identifying teachers or the principal. About 84% of SCs reported that they explained the purpose of the survey, the estimated time to completion and the survey return procedures.

Seventy-six percent of SCs reported that there were no special instructions or motivational talk or incentives offered to teachers to encourage them to participate. When there were motivational talks or encouragement, these were usually held at a group session for survey distribution, and were usually conducted by the principal or deputy. Some schools published information in their staff newsletter.

When distributing questionnaires to teachers, 54% of respondents claimed they located each teacher at the school and handed the questionnaire to him or her personally. Nineteen percent held a group session for teachers at which they handed out the information individually, and 13% placed the questionnaire in teachers' pigeonhole or other private mailbox. Fourteen percent enlisted the principal's assistance in distributing questionnaires – either relying on the principal to hold a group session, or leaving the questionnaires with the principal to distribute.

Table 8.3 shows the use of forms in survey administration. Ninety-seven percent of SCs interviewed responded that they distributed the questionnaires or cover letters in accordance with the Teacher Tracking Form. Of those who responded in the negative, in most cases the problem was rectified or flagged in co-operation with the NPM.

Among SCs, 87.4% understand the return procedures. Only 4% of those surveyed indicated that they had doubts or problems and usually these were resolved in co-operation with the NPM. External surveyors experienced some difficulties in retrieving completed questionnaires; some had to return to the school more than once to collect them.

Completion of the Teacher Tracking and Reference Class Listing Forms went smoothly in more than 97% of cases. Fewer than 3% of surveyed SCs prepared Teacher Tracking Forms that listed someone who was not a teacher. Just under half of these cases involved pedagogical support staff, and a similar number were teachers who were not yet fully qualified. The remainder referred to principals who were also teachers – in some cases principals were listed on the Teacher Tracking Form but only completed the Principal Questionnaire.

The Reference Class Listing Form proved a little more difficult, and was not collected at approximately 10% of all schools visited by IQCMs. No Reference Class Listing Forms were collected for two participating countries. In eight countries, SCs communicated problems with the Reference Class Listing Form to NPMs. When asked if SCs used a school timetable or other official document to complete the form, 97% who completed the form responded "yes". In 88% of cases, there were no problems completing the form. However, if there were problems, the most common included: recently changed timetables; use of a 6-day or 10-day (or other) timetable; difficulty understanding instructions and the meaning of "after 11 o'clock Tuesday"; and difficulties interpreting subject codes.

General observations

Section C of the *School Visit Record* asked SCs to indicate whether any principals or teachers approached them to discuss any aspect of the survey: 20% of SCs were approached about the purpose of the survey, 9% were asked about the survey return procedures, 21% were asked for clarification of items, 3% were approached about an error spotted and 13% heard other questions about the survey. Only 3% of SCs indicated they were asked questions they could not answer.

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For the most part, teachers were described as co-operative, and 47% of SCs described teachers as "extremely co-operative". None were described as "hardly co-operative at all". Approximately 17% of SCs who had found teachers to be somewhat unco-operative reported that special efforts were made to encourage their co-operation. These efforts consisted of placing the survey into a context, and detailing the purpose of the survey. In many schools, principals also gave short motivational talks or otherwise encouraged teachers to participate.

More than 80% of SCs thought the distribution of surveys went "very well". Fifty-eight percent described the attitude of school staff towards the survey as positive and 40% as neutral. Fewer than 10% of SCs were faced with teachers who refused to participate in the survey. Reasons for non-participation included: lack of time; no motivation; advice from the teachers' union to not co-operate; absence; too many surveys; technical problems or lack of computer skills; and objections to participating in international surveys.

Seventy-five percent of SCs reported that NPMs were responsive to their questions and concerns, although 20% had no need to contact the NPM at all. Ninety-one percent of SCs interviewed said they would be willing to serve as SC in another international survey of this kind.

For 81% of northern hemisphere countries, SCs reported that the survey was conducted at an appropriate time of year; however only 37% of the SCs of the four southern hemisphere countries reported the same. Although for both hemispheres the survey was administered close to the examination period at the end of the school year, some southern hemisphere SCs considered this period too busy for implementing surveys such as TALIS.

IQCM's overall impressions about implementing of TALIS (Section D of the School Visit Record) were positive. In 95% of visited schools they had no doubts about SCs taking their role seriously and being well prepared for their job. No more than 3% of SCs were, in the opinion of the IQCM, unsatisfied with their tasks for reasons that included "too much work" as well as "too little involvement in the project".

SURVEY ACTIVITIES QUESTIONNAIRE

The SAQ covered all aspects of survey administration. The ISC delivered it on line to NPMs after all data had arrived at the ISC. The questionnaire obtained information about activities and the extent to which procedures and guidelines were followed. It also gave NPMs an opportunity to give feedback about all aspects of survey administration, including procedures and manuals.

Contacting schools

First contact with sampled schools[5] was typically made by the NPM or other member of the national team (71%). In 29% of cases, the Ministry of Education made first contact, sometimes in conjunction with the national centre. In cases where an external surveying agency administered the questionnaires (four countries), staff from the agency contacted the schools. Although overall participation rates for TALIS were high, 71% of 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 the participating countries successfully extended the internal survey deadline in order to improve the overall response rate. This was because schools felt "surveyed out", because it was a difficult time of year, because of concerns about confidentiality provisions, or because principals did not wish to place an extra burden on teachers. However, the international deadline for data submission was not affected by these internal extensions.

Half the NPMs reported difficulty in identifying or contacting SCs. In several cases this was because it was not obvious who – other than the principal – should be the SC, or because the prospective SC was difficult to reach by telephone or e-mail.

Formal training sessions for SCs were held in 42% of countries. Those who did not prepare training sessions 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 *School Co-ordinator Manual* (MS-03-01). For 83% of NPMs the adaptation and translation of this manual was "not difficult at all". The remaining 17% found this process "somewhat difficult".

Preparing survey materials

All countries were required to prepare paper instruments, even if they administered the survey on line only. Instruments and cover letters underwent a rigorous process of translation verification and layout verification before printing.[6]

NPMs reported that all versions of the questionnaires were translated or adapted from the international English source. The only exception was Slovenian in Austria,[7] where the Slovenian version from Slovenia was used as template for the Austrian instruments. When selecting translators and reviewers NPMs were advised to employ language specialists who were fluent in English, had the survey language as their mother tongue, were experienced with the country's cultural context (preferably living there) and were familiar with survey instruments (see Chapter 4 for more details). These conditions were met almost without exception.

Sixty-seven percent of NPMs reported that it was "not difficult at all" to translate and adapt the questionnaires to the national language(s). The most frequently reported problem was the difficulty in preparing an accurate translation of items that did not have a good fit with the country's national context – for these NPMs had to take special care not to introduce misunderstandings. Of documenting national adaptations, 92% of participants reported it was "not difficult at all"; however several commented that the process was very time-consuming.

Table 8.4 shows that all NPMs were able to find a translator who was fluent in English and was experienced in the country's cultural context, whereas 95.83% had the survey language as mother tongue. One hundred percent of the reviewers were experienced in the country's educational context and were familiar with survey instruments. These findings underline that the TALIS instruments were translated and reviewed by experienced experts throughout all participating countries.

Instrument verification was conducted over four stages[8] if ODC was used and over three stages if the survey was administered via paper and pencil only (see Chapter 3 for more details). The IEA Secretariat co-ordinated the second stage, translation verification. NPMs were asked in the SAQ about the kinds of changes they made to instruments following each stage of verification. For translation verification, 87% responded that they made changes to their instruments in accordance with verifier suggestions. Three countries made further improvements that were not suggested by the verifier. In one country the NPM identified a translation error in the paper instruments after they had been printed and sent to the schools. The error was corrected in the on line version of instruments prior to the start of survey administration, and an annex was sent to the 6% of principals who had already received the paper instruments. Data analysis has shown that this did not have an impact upon data quality.

In rating the usefulness of the translation verification process organised by the IEA Secretariat, 92% reported it was "very useful", with no participants reporting it was "not useful at all". Furthermore, all national centres were able to make full use of the feedback from translation verifiers when preparing the final version of their instruments. Countries that reported some difficulties with translation mentioned that they resolved these problems with advice from the OECD Secretariat before translation verification began.

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National Adaptation Forms (NAF) approval, layout verification and ODC verification were performed at the ISC. Regarding layout verification, 71% of NPMs reported that they made changes in accordance with verifier suggestions. These suggestions mainly included blank spaces, inappropriate page breaks, changes in the font sizes and so on. However, 21% of NPMs detected and corrected punctuation or typographical errors that had not been identified at earlier stages of the verification process.

Ninety-two percent of national centres experienced no problems during printing. However, one country identified missing pages, and another country had difficulty with the layout of one page in the Principal Questionnaire: the text had become compressed and it was difficult for both respondents and data entry personnel to match the check boxes with the corresponding questions.

Conversion to on line data collection

The 16 countries collecting data on line also required verification for ODC. In order to guarantee comparability of paper and ODC instruments, the ODC check was performed after layout verification of the paper instruments. Sixty-nine percent of NPMs reported making changes to instruments that were suggested by the verifier; 19% made changes not identified by the verifier. As with paper layout verification, changes made after verification – changes that had not been identified by the verifiers – were rather minor, consisting mainly of punctuation or typographical errors.

Most of the 16 countries participating in ODC had few problems with the TALIS administration. Eighty-eight percent of NPMs reported that converting the paper questionnaires into on line questionnaires using the IEA SurveySystem Designer software was "not difficult at all"; the remainder found it "somewhat difficult".

Survey administration

National centres in 42% of participating countries implemented a procedure for schools to confirm receipt of the questionnaires and Teacher Tracking Forms. Thirty-eight percent of NPMs reported difficulty in obtaining a high degree of participation from teachers and principals; 42% had difficulty ensuring questionnaires were returned on time; and 50% found it difficult to ensure schools returned the completed Teacher Tracking Forms.

Among the 16 countries collecting data on line, 12.5% of NPMs reported that they did not supply fall-back paper questionnaires, which they had been requested to do in case of technical problems, or in case respondents refused to complete the survey on line. Thirty-one percent reported severe technical problems that prevented respondents from completing the questionnaires – this included firewalls and Internet connection problems. Login problems were reported by 37.5% of countries, ranging from mistyped URLs and difficulties identifying ID or checksum information.

In ODC countries, 69% of NPMs reported difficulty persuading teachers and principals to participate; 27% of these NPMs considered that the difficulty was related to the on line mode itself. More specifically, a chief concern was the perceived lack of anonymity in the on line mode. In 56% of countries SCs reported teachers and principals who were unwilling or unable to complete the questionnaires on line: within countries this referred to 1 to 68 principals; 10 to 628 teachers; and 4 to 30 schools. In 89% of these countries fall-back paper questionnaires were made available, and this strategy proved successful for increasing participation.

The SurveySystem monitor application was developed to enable national centres to track the completion status of on line questionnaires. Ninety-four percent of NPMs reported that the application was useful, and 75% referred to it several times per week or daily. NPMs reported that they were able to contact SCs with the response rate for their school and encourage SCs to remind teachers about the survey in order to improve participation rates.

Data entry and verification

Data entry was required only for paper questionnaires. Seventy-nine percent of NPMs reported that they entered data manually. In 42% of these cases, staff from the national centre completed all the data entry; 21% of national centres used an external data company; and 21% used a combination of their own staff and external staff. The remaining 16% hired and trained students or other staff to work as data punchers. Only two national centres did not rely on the IEA DPC WinDEM application to enter all data from paper questionnaires: one of these agreed that they were in error and resolved it with the ISC. The other case reflected a split between internal staff that used WinDEM and external staff that did not use WinDEM. However, no countries reported unacceptable levels of error during the double entry of data.

National quality control monitoring programme

Each NPM organised and directed a national quality control monitoring (NQCM) programme. The aim of this programme was to deliver structured feedback to national centres about survey administration in their country. NPMs were asked about their national quality control programmes in the final section of the SAQ, but were not required to supply data collected by National Quality Control Monitors to the ISC.

The IEA Secretariat prepared manual and interview templates for the NQCM programme, which national centres could use either in the original version or adapt for the situation in their country. One country reported it did not conduct an NQCM programme, but maintained close contact with SCs. Hungary developed its own NQCM programme rather than use the template supplied. In Brazil, the survey was administered by an external agency, which in turn was closely supervised by the national centre, and – as agreed with the ISC – no separate NQCM programme was run. Two countries did not respond to the section of the SAQ concerning the NQCM programme.

For the 21 countries that did conduct an NQCM programme, 33% appointed one NQCM. The maximum of 26 NQCMs were appointed in one country. In most countries NQCMs visited an average of 20 schools.[9] Of the 19 countries that used the manual provided by the IEA Secretariat for their NQCM programmes, 16% made minor adaptations (*e.g.* removed a question that was not relevant) to the template supplied.

As previously noted, the school visits formed the central part of the data collection quality control programme and are a primary source of information about how well SCs understood the requirements of their role. Three countries reported suggestions for changing the NQCM procedures. In some cases the programme of school visits highlighted the need to provide more training to SCs.

NPMs were asked if they acted on the results of the NQCM reports. In most cases no action was taken, either because there were no serious problems with the survey or because the NQCM reports reached the national centre too late to make changes. However, in 14% of cases the NQCM programme revealed general problems and this information was fed back to the national centre, which in turn contacted schools, supplied additional information or corrected any misunderstandings. In two countries, for example, the NQCM reported that completed questionnaires were being centrally stored without the additional protection of an envelope. The national centres in these countries were able to contact schools and explain the rationale and procedures for ensuring questionnaire security. In one other country, reports from the NQCM suggested a need to extend the survey window, and this was achieved in agreement with the ISC.

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NOTES

1. As already outlined in Chapter 6, outcomes of the SAQ are reported in different chapters of this report.

2. Schools had to be within a reachable driving distance to allow IQCMs to visit an average of two schools in one working day. Schools selected for the IQCM programme were not to take part in the national quality control monitoring programme. For more details about the school selection process, see Section 3.1 of the *TALIS Manual for International Quality Control Monitors* (MS-05-02).

3. Chapter 9 describes in detail provisions for preserving the anonymity of responses in the international database.

4. There was one country where questionnaires or missing pages had to be replaced for teachers at 7 of the 20 schools visited by the IQCM.

5. Details on within-school sampling are reported in Chapter 6.

6. See Chapter 4 for more details on translation and layout verification.

7. There was one Slovenian school in Austria that participated in TALIS.

8. Verification steps were: NAF approval, translation verification, layout verification and ODC verification.

9. One country reported that the NQCM visited 6 schools; the maximum of schools visited by NQCMs was 87.

Table 8.1

Preliminary activities of the School Co-ordinator

	Yes	No	Not applicable	Total	Missing
	(%)	(%)	(%)	(%)	(%)
Did you receive training for your role as school co-ordinator?	50.2	49.6		99.8	0.2
Was the training you received adequate?	47.4	4.4	32.6	84.4	15.6
Were any of the materials to conduct the stud y missing from your shipment?	4.4	87.4		91.8	8.2
Did you experience any difficulties completing the Teacher Listing Form?	8.6	90.4		99.0	1.0
Prior to distributing materials, did you verify adequate supplies of the questionnaires and cover letters?	87.0	4.0		91.0	9.0
Did you need to arrange replacement questionnaires or cover letters for any reason?	3.4	88.4		91.8	8.2
Did you correspond with the National Project Manager, read the introductory page of the survey and familiarise yourself with the survey and return procedures prior to distributing materials?	86.6	5.6		92.2	7.8

Source: OECD, *TALIS Database.*

Table 8.2

Questionnaire distribution and returns

	Yes	No	Somewhat	Total	Missing
	(%)	(%)	(%)	(%)	(%)
Did you explain the following to each teacher?					
Purpose of the survey	84.6	2.2	4.6	91.4	8.6
Estimated time to complete (approximately 45 minutes)	84.6	3.2	3.4	91.2	8.8
Survey return procedures	84.0	2.4	3.8	90.2	9.8
Were any defective questionnaires/cover letters detected and replaced either before or after the questionnaires had been distributed?	2.2	89.8		92.0	8.0
Did you have any doubts or problems understanding the return procedures?	4.0	87.4		91.4	8.6
Did anyone other than you talk to or otherwise contact the teachers to encourage them to participate?	23.4	76.0		99.4	0.6

Source: OECD, *TALIS Database.*

Table 8.3

Use of forms in survey administration

	Yes	No	Total	Missing
	(%)	(%)	(%)	(%)
Did you distribute the questionnaires/ODC cover letters to the correct teachers in accordance with the *Teacher Tracking Form*?	89.2	2.6	91.8	8.2
Does anyone but you have access to the *Teacher Tracking Form*?	16.0	82.2	98.2	1.8
Does anyone other than you have access to the completed questionnaires and/or tracking forms?	7.8	84.0	91.8	8.2
Is there anyone listed on the *Teacher Tracking Form* who is NOT a teacher?	2.6	88.8	91.4	8.6
Did you refer to an official school document (such as school timetable, database, etc.) to complete the *Reference Class Listing Form*?	73.0	2.6	75.6	24.4
Did you have any problems completing the *Reference Class Listing Form*?	10.6	80.4	91.0	9.0

Source: OECD, *TALIS Database.*

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Table 8.4

Use of specialist translators and reviewers

	Yes (%)	No (%)
Were you able to identify a translator who:		
Is fluent in English.	100.00	0.00
Has the survey language as mother tongue.	95.83	4.17
Is experienced in your country's cultural context.	100.00	0.00
Is familiar with survey instruments.	91.67	8.33
Were you able to identify a reviewer who:		
Is fluent in English.	91.67	8.33
Has the survey language as mother tongue.	95.83	4.17
Is experienced in your country's educational context.	100.00	0.00
Is familiar with survey instruments.	100.00	0.00
Is familiar with the subject of the study.	91.67	8.33

Source: OECD, *TALIS Database*.

References

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Chapter 9

Creating and Checking the International Database

104 Abstract

104 Overview

104 Data entry and verification at national centres

106 Data checking, editing and quality control at the IEA Data Processing and Researcher Center

- 107 Import, documentation and structure check
- 108 Identification variable and linkage cleaning
- 108 Resolving inconsistencies in questionnaire data
- 110 Handling missing data

111 Interim data products

111 Building the international database

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Abstract

This chapter offers an overview of the strategy used to create the TALIS 2008 international database (IDB). It describes the data entry and verification tasks employed by the national centres, the integration of data from the paper and online administration modes, the data-editing and database creation procedures implemented by the International Study Centre, and the steps that all involved centres took to confirm the integrity of the international database.

OVERVIEW

Creating the TALIS 2008 international database (IDB) and ensuring its integrity required close co-ordination and co-operation among the International Study Centre (ISC), Statistics Canada, the OECD and the National Project Managers (NPMs). This chapter describes the data entry and verification tasks that the national centres undertook, the integration of data from the paper and online administration modes, the data-editing and database creation procedures the ISC implemented, and the steps that all involved centres took to confirm the integrity of the international database.

The primary goals were to ensure that any national adaptations to questionnaires were reflected appropriately in the codebooks and corresponding documentation, that all national information eventually conformed to the international data structure and coding scheme, and that errors such as logical inconsistencies or implausible values as a result of the response or data capture process were minimised as much as possible. Quality control measures were applied throughout the process.

DATA ENTRY AND VERIFICATION AT NATIONAL CENTRES

Each national centre was responsible for transcribing into computer data files the information from the principal and teacher questionnaires administered at the school level. The International Association for the Evaluation of Educational Achievement's Data Processing Center (IEA DPC) supplied national centres with the Windows Data Entry Manager software (WinDEM) and supporting documentation in the *TALIS Data Management Manual (MS-04-02)*.

In addition, the IEA DPC held a three-day data management seminar in Hamburg, Germany, in November 2006 covering software usage, procedures for national adaptations, and rules and procedures for data entry (see Chapter 1). The seminar was specifically targeted at the national team member(s) responsible for data management and liaising with the IEA DPC.

National centres entered responses from the principal and teacher questionnaires into data files created from internationally predefined codebooks, which contained information about the names, lengths, locations, 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 two questionnaire types. Before data entry commenced, data managers were required to adapt the codebook structure to reflect any approved adaptations made to the national questionnaire versions, for example a nationally added response category. These adapted codebooks then served as templates for creating the corresponding data entry file(s).

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 WinDEM required national staff to

enter data "as is" without any interpretation, correction, truncation, imputation or cleaning. The resolution of any inconsistencies remaining after the stage of data entry was delayed until the data cleaning stage (see below). The rules for data entry were:

- 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" (checked) or "2" (not checked).
- 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 of the originally expected range, for example if a teacher reported that he or she spent 80 hours a week on teaching students in school.
- 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.* two options in a multiple-choice question were selected), the corresponding variable was coded as "omitted or invalid".
- 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.

When data was entered with WinDEM it was 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 puncher to check the entered values. Additionally, the data verification module of WinDEM identified 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 country, national centres were required to have at least 100 completed principal and 5% or at least 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 reactions, for example, the re-training of staff within national centres. The acceptable level of disagreement between the originally entered and double-entered data was established at 1% or less; above this level a complete re-entry of data would have been requested. The margin of error observed for all countries participating in the main data collection was well below this 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 WinDEM 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, and resolved any inconsistencies and, where possible, corrected problems by looking up the original survey questionnaires. Additionally, data managers verified that all returned and 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.

While the IEA DPC strongly encouraged every country to meet all standards and rules by using the WinDEM software for manual data entry, Spain and Ireland used different data entry systems, such as a system routinely used by an external survey company. Australia and Norway used the online data collection system to enter a small number of paper questionnaires that were returned late. These countries were nonetheless required to conform to all specifications established in the international codebooks and to verify their data using the

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same consistency checks as defined within the WinDEM software. The IEA DPC checked and confirmed the consistency and quality of the data captured by these alternative means and did not detect any systematic or incidental issues.

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 online survey activities questionnaire (SAQ). The DPC already had access to electronic copies of the national versions of all questionnaires and the final national adaptation forms (NAFs) as part of the layout verification process.

While the questionnaire data was being entered, the data manager at each national centre used the information from the Teacher Tracking Forms (see Chapter 6) to verify the completeness of the materials. Participation information, for example 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 (see Chapter 6).

DATA CHECKING, EDITING AND QUALITY CONTROL AT THE IEA DATA PROCESSING AND RESEARCHER CENTER

Once the data were submitted to the ISC, a process referred to as "data cleaning" 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 software designed to standardise a range of operational and data-related tasks, manuals and training.

For instance, 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. Furthermore, the WinDEM software enabled entry of all questionnaire data in a standard, internationally defined format. The software also included a range of checks for data verification.

A complex study such as TALIS requires a correspondingly complex data-cleaning design. The IEA DPC developed processing tools in Statistical Analysis Software (SAS) and, where necessary, in Statistical Package for the Social Sciences (SPSS) for data cleaning. To ensure that programmes ran in the correct sequence, that no special requirements were overlooked and that the cleaning process was implemented independently of the persons in charge, the following steps were undertaken:

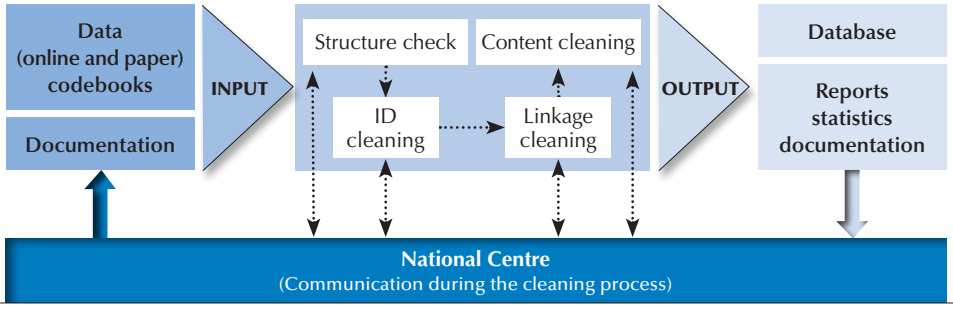
- Before being used with real data, all data-cleaning programmes were thoroughly tested using simulated data sets containing all the expected problems or inconsistencies.
- To document versions and updates, all incoming data and documents were registered in a specific material receipt database. The date 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 both 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 2008 User Guide* (OECD, 2009).
- The cleaning was organised according to rules that were strictly and consistently applied to all national data sets so that deviations in the cleaning sequence were impossible.

- All systematic or manual corrections made to data files were implemented and recorded in specific cleaning reports for consortium and NPM review and approval.
- Once the data cleaning was completed 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 9.1 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 9.1

Overview of iterative data processing at the IEA DPC



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, 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 into SAS databases. Again, each questionnaire type corresponded to one SAS database and one SAS codebook file. In this step, both the data originating from paper questionnaires and the online questionnaires were combined and checked for structural agreement (see Chapter 6 on online data collection). 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.

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 these changes differed greatly across participating countries. While some countries administered the questionnaires without any changes, except for translations and necessary cultural adaptations, others inserted questions or options within existing international variables or added entirely new national

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variables. Given the associated risk of deviating from the international data structure, NPMs wishing to make such changes followed certain strict rules to allow unequivocal integration of nationally adapted variables for international comparison.

In general, very few adaptations were made to the international questionnaires. Where necessary, the IEA DPC modified the codebooks according to the international design or values 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 the deviations. In a few cases, data were not available for certain variables because the corresponding question was not administered nationally (see TALIS User Guide). There was no case in which data had to be removed from the international database because the information was not 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 a unique identification number. The existence of records with duplicate identification (ID) numbers in a file implies an error of some kind. 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 remained 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, and if consultations with the NPM did not resolve the matter, both records were removed from the database. The IEA DPC deleted data in only a very small number of cases. In addition, only a small number of records were present in both the paper and the online data files.

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 and was cross-checked against the tracking forms and corrected when 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 centre in resolving ID or linkage inconsistencies. For this purpose, NPMs and data managers received standardised reports comprising 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 each data file was matched the international standard as specified in the international codebooks, a series of standard cleaning rules was applied to the files. The process was conducted through the SAS programs developed at the IEA DPC, identifying and in many cases automatically correcting 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 2008.

Filter questions, which appear in certain positions in the questionnaires, were used to direct the respondent 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 unambiguous pattern, the dependent variables were set to "logically not applicable" regardless of the value originally recorded in the dependent variable. Questions 4 and 5 in the Teacher Questionnaire (TQ) and questions 8 and 9 in the Principal Questionnaire (PQ) constituted exceptions to this general rule.

For weighting purposes and calculation of the teacher multiplicity factor (WGTADJ4), a special treatment for TQ 4/5 was agreed upon with Statistics Canada. If TQ-4 was "yes" (1) and TQ-5 was omitted or zero (0), then TQ-4 was recoded to "no" (2) and TQ-5 to "logically not applicable". If TQ-4 was "no" (2) and TQ-5 was zero (0) or one (1) then TQ-5 was recoded to "logically not applicable". If TQ-4 was "no" (2) but TQ-5 was two (2) or more then TQ-4 was recoded to "yes" (1).

Split variable checks were applied to "yes/no" lists and "check-all-that-apply" questions where the responses were coded into several variables. For example, question 11 in the Teacher Questionnaire listed a number of developments and asked teachers to mark whether they participated in them with "yes". Occasionally, teachers marked either some "yes" and "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 and, if they fell outside of the 90 to 110 range or if any individual values were larger than 100, they were set to "omitted".

Variables with implausible numerical values were set to "omitted". For example, question 38 in the Teacher Questionnaire asked about the average number of students in the target class. Values that exceeded 100 were set to "omitted".

Finally, variables within and across data files were verified against one another to identify and resolve inconsistent response patterns or multivariate outliers. For example, TQ 12 asked for the total number of days spent on professional development, while TQ 13 asked how many of these days were compulsory. Clearly, the number given for TQ 13 should not exceed the number given for TQ 12; values for TQ 13 were set to the value recorded in TQ 12 in these cases.

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 along with a description of the problem and the automatic action taken by the programme or the manual action taken by DPC staff. Issues that could not be corrected using systematic rules were reported to the 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 then were updated to reflect the agreed-upon solutions. Both systematic corrections as well as those apparent on a case-by-case level were applied directly in SAS program syntax and carried out automatically for each cleaning run.

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

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- PQ-25, PQ-33, TQ-11, TQ-20, TQ-33: For lists that were partially answered with "yes", "no" and "omitted", all omitted responses were recoded to "no".
- PQ-33/34, PQ-35/36, TQ-4/5, TQ-11 (part a vs. b), TQ-17 (part a vs. b): The dependent variables were set to "logically not applicable" if the filter question was answered negatively ("no").
- PQ-8/9: The dependent variables were set to "logically not applicable" if the filter question was answered negatively ("public").
- PQ-17, TQ-41: The entire set of variables was set to "omitted" if the sum of percentages fell outside of 90 to 110 or if any individual variable was larger than 100.
- PQ-11A: The variable was set to "omitted" if the answer was 0 in the questionnaire.
- TQ-12/13: Set affected value to "omitted" if the number of days was higher than a plausible maximum within 18 months (*i.e.* 1.5*365 or ~ 550).
- TQ-12/13: Adjusted number of compulsory days to number of days of professional development attended if number of compulsory days was higher than number of days of professional development attended.
- TQ-38: The variable was set to "omitted" if enrolment was 0 or larger than 100.
- TQ-8A: The variable was set to "omitted" if the number of hours was greater than 50.
- TQ-8A: The variable was set to "omitted" if the number of hours was 0.
- TQ-8A-D: The variables were set to "omitted" if the sum of hours was greater than 80.
- ITBIRTHY (Listing information on respondents' year of birth collected prior to questionnaire administration): the variable was set to "omitted" if it was outside of a plausible range of 1935 to 1989.
- Gender [TQ-1 vs. ITSEX (Listing information on respondents' gender collected prior to questionnaire administration)]: *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 (TQ-2, ITBIRTHY): *a)* believe questionnaire information and delete listing information if inconsistent; *b)* impute missing questionnaire value from listing form.

In some instances in which a clear and unambiguous decision was not possible, the data remained unchanged.

Handling missing data

During the TALIS data entry at the national centres using WinDEM, two types of entries were possible: valid data values and missing data values. Data entry staff were able to 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, two 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.
- 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 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 to run additional plausibility and statistical checks to validate the data. Data products sent out by the IEA DPC to the OECD 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 first version of cleaned and weighted data was sent to the OECD at the end of August 2008, two months after all data have arrived at the IEA DPC. In this data, all known identification, linkage and content issues were resolved. Estimation weights and variables facilitating variance estimation were also included. The OECD used these to produce the first set of draft tables for the international report and presented them at the fourth NPM meeting in Dublin, Ireland in October 2008. 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 two weeks 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 that was sent to the OECD and NPMs in November 2008.

In February 2009 NPMs received an update of their data, reflecting minor issues that had been raised after the November 2008 data release and final cleaning. 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, codebooks, and summary statistics. The latter contained weighted univariate statistics 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.

The interim data products described above and the draft and final (public-use) international databases had two key differences. First of all, 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 (for example, because within-school participation was insufficient) were removed. Secondly, in order to protect the confidentiality of respondents, disclosure avoidance measures were applied at the international level *i)* consistently for all countries and *ii)* concerning only specific national datasets. These measures were implemented for all data versions and exports of the IDB for use by all other countries and public users.

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The measures applied to all international-level datasets included:

- The teacher (IDTEACH) and school identifiers (IDSCHOOL) were scrambled and did thus 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, *i.e.* birth year (ITBIRTHY), gender (ITSEX) and main teaching domain (ITDOMAIN) were removed. Only the gender (BTG01) and age group (BTG02) 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. It should be noted that the stratum information is mostly of interest for national-level analysis and was of course made available to the concerned country. Experience showed that researchers from other countries might also wish to conduct analysis by stratification, in which case the stratification variables could be requested directly from the country.
- Information used in the calculation of final sample and replicate weights was removed (for the school level: WGTFAC1 and WGTADJ1; for the teacher level: WGTFAC1, WGTADJ1, WGTFAC2, WGTADJ2, WGTADJ3, and WGTADJ4) as these could allow the 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.

TALIS BPC members from Belgium (Fl.), Denmark, Ireland, Italy, Malta and the Netherlands requested several confidentiality measures, and these were applied to the respective national datasets. In these cases, the original variables were set to "not administered" in the IDB and in some cases derived variables were created that include grouped (binned) values. All measures and their resulting derived variables are described in detail in the TALIS User Guide.

Iceland decided to withdraw all data from the IDB. It is available directly from the country only (see Appendix B).

All data for the Netherlands were retained as part of the IDB following agreements with the BPC. However, all weight variables for the Netherlands were set to 0 because the achieved participation rates were too low to allow population estimates and comparisons.

Following the data release policy and confidentiality agreements between each NPM and OECD, a draft IDB that included data from all participating countries except Iceland was made available. This occurred in early March 2009, prior to the publication of the international report *Creating Effective Teaching and Learning Environments: First Results from TALIS* in June 2009. This enabled countries to replicate the results presented in the draft chapters of the international report (with the exception of estimates for Iceland) and this data version was also used in an international database training session held by IEA DPC staff in Hamburg, Germany, in April 2009.

The final, public-use international database was scheduled for release in late 2009 and was supplemented by full documentation in the *TALIS 2008 User Guide* (OECD, 2009). It is a unique resource for policy-makers and analysts and contains data from representative samples of schools and ISCED Level 2 teachers in 23 countries across 4 continents.

References

IEA DPC (2007), *TALIS Data Management Manual (MS-04-02),* Hamburg.

OECD (2008), *TALIS 2008 Data Processing and Cleaning Documentation*, OECD, Paris.

OECD (2009), *TALIS 2008 User Guide for the International Database*, OECD, Paris.

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Chapter 10

Estimation Weights, Participation Rates and Sampling Error

116 **Abstract**

116 **Overview**

116 **Elements of the estimation weight (final weight)**

- 117 School base weight (school design weight)
- 117 School non-response adjustment factor
- 118 Final school weight
- 118 Teacher base weight (teacher design weight)
- 119 Teacher non-response adjustment factor
- 119 Teacher adjustment factor for incidental exclusions
- 119 Teacher multiplicity adjustment factor
- 120 Final teacher weight

120 **Participation rates**

- 121 Participation rates for schools
- 121 Participation rate for teachers
- 122 Overall participation rates
- 122 Reporting participation rates
- 122 Meeting participation rates standard for TALIS

123 **Sampling error with Balanced Repeated Replication**

- 123 Creating replicates for Balanced Repeated Replication
- 125 Estimating the sampling error
- 125 Design effect and effective sample size

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Abstract

This chapter covers three important aspects of the quality of the TALIS outcomes: weighting of the data to produce estimates, participation rates and an estimation of the sampling error. It begins by detailing how each component of the final estimation weight is defined and how those components are assembled into the final estimation weight, before describing participation rates and how they were computed.

OVERVIEW

Although the international sampling plan was prepared as a self-weighting design (with each individual having the same final estimation weight), field conditions rendered that plan impossible. In the end, each national sampling plan is a stratified multi-stage probability sampling plan with unequal probabilities of selection. Iceland and Malta are the two exceptions as a census of schools and teachers was organised in those two countries.

The following section details how each component of the final estimation weight is defined and how those components are assembled into the final estimation weight. Following this, there is a description of the participation rates and how they were computed. Results for each participant are given in this section. Because of the unequal weights and the structure of the samples, sampling error was estimated using the design and weights. Any other method would have yielded severely biased estimates of the sampling error. Estimating sampling errors correctly is often a daunting task, but simple and approximately unbiased methods are available. TALIS opted for Balanced Repeated Replication (BRR) for its statistical properties (consistency, asymptotic unbiasedness), its portability (one formula fits all types of parameter estimates) and because it is comparatively easy to compute. Finally, the chapter explains how the replicates were created and how the BRR estimates of the sampling error were computed. These estimates of the sampling error are a 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 5 of this report, the TALIS Sampling Manual (TALIS reference number MS-02), the National Project Manager Manual (TALIS reference number MS-01) and the School Co-ordinator Manual (TALIS reference number MS-04).

ELEMENTS OF THE ESTIMATION WEIGHT (FINAL WEIGHT)

The statistics produced for TALIS are derived from data obtained through samples of schools, school principals and ISCED Level 2 teachers. For these statistics to be meaningful for a country, they need 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, then 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 a 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 unbiased estimates (*e.g.* adjustment for teachers working in more than one school).

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. In cases where countries adapted the general sample design of TALIS to their own conditions, the estimation weights have to conform to the national adaptations.

Following are the conventional notations that are used in this chapter: the letters *h, i,* and *j* are used as subscripts, the lower case letters *k, l, m, n, r, t* refer to the sample, while the upper case letters *H, M, N* refer to the population:

- in each participating country, there are H explicit strata; the index h=1,…, H points to the explicit stratum; if no explicit strata were defined, then $H = 1$;
- in each explicit stratum, a sample of size n_h schools was drawn from the N_h schools comprising stratum h; the index i=1, …, n_h points to the ith sampled school in stratum h;
- each school i=1, …, n_h within the explicit stratum h has a measure of size (MOS) noted MOS_{hi}; the sum of the individual measures of size is noted MOS_h
- in each responding school, the number of eligible ISCED Level 2 teachers is noted M_{hi}
- in each responding school, a sample of m_{hi} teachers was drawn; if the selected school is large enough, m_{hi} = 20 by design; the index j=1, …, m_{hi} points to the teachers; m_{hi} may be different from 20 if local conditions dictate that the sample size should be different (*e.g.* if the MOS is 18, all teachers are selected and m_{hi} = 18).

School base weight (school design weight)

The first stage of sampling is the school sample; in most countries school sampling followed a systematic random sampling scheme with probability proportional to size. Thus, a school base weight is needed to represent the first stage of sampling. If a census sample of schools was implemented in a country or in 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, …, n_h and each explicit stratum h=1, …, H, the school base weight is given by:

$$WGTFAC1_{hi} = \frac{MOS_h}{n_h \times MOS_{hi}}$$

In Iceland and Malta, since all schools were selected, there is only one stratum (h = 1) and $WGTFAC1_{hi}$=1, for all i = 1, ..., n.

School non-response adjustment factor

In spite of 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 must somehow be represented by those that did. Assuming that non-response happens for reasons unrelated to the topic of the study (also referred to as "missing completely at random"), a non-response adjustment factor is required, within each explicit stratum.

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For each explicit stratum $h = 1, \ldots, H$, if r_h schools participated in TALIS out of the n_h selected schools, and if d_h schools are found closed or out-of-scope, then for each school $i = 1, \ldots, n_h$ the non-response adjustment factor is given by:

$$WGTADJ1_{hi} = \begin{cases} \dfrac{n_h - d_h}{r_h}, & \text{for participating schools} \\ 1, & \text{for closed or out-of-scope schools} \\ 0, & \text{for non-participating schools} \end{cases}$$

In Iceland and Malta, the school non-response adjustment factor $WGTADJ1_i = (N\text{-}d)/r$, for all schools $i = 1, \ldots, N$, where N is the total number of schools listed as in-scope in the country, d is the number of schools later 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 the estimation of school-related parameters.

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

$$\begin{aligned} SCHWGT_{hi} &= WGTFAC1_{hi} \times WGTADJ1_h \\ &= \frac{MOS_h}{n_h \times MOS_{hi}} \times \frac{n_h - d_h}{r_h} \end{aligned}$$

In Iceland and Malta, the final school weight is $SCHWGT_{hi} = 1 \times (N\text{-}d)/r = (N\text{-}d)/r$.

Teacher base weight (teacher design weight)

In some countries, or in some smaller schools, school principals also have teaching duties. In an effort to maintain the response burden at a tolerable level, those individuals were considered incidental exclusions while remaining in the scope of the survey. In Iceland and Malta, given the number of teachers in the country, those teachers who had participated in the TALIS Field Trial could be excused for the same reason. These groups of teachers were given exclusion codes of 5 (noted NEXCL5) and 6 (noted NEXCL6) respectively at the time of compiling the school list in WinW3S. Both groups need to be accounted for in the estimates.

In a school where these exclusions happened, the sample of teachers was drawn from a reduced list. Let $M_{hi}^{-} = M_{hi} - NEXCL5_{hi} - NEXCL6_{hi}$ be the reduced size of the list used for teacher sampling, where M_{hi} is the total number of ISCED Level 2 teachers eligible for sampling, as defined earlier. Note that when the measure of size used was the number of eligible ISCED Level 2 teachers, then M_{hi} should be very close to MOS_{hi}.

In each participating school, a systematic random sample with equal probability of ISCED Level 2 teachers was selected. The nominal sample size within each school was set at $m_{hi} = 20$, but the number of in-scope ISCED Level 2 teachers at each selected school could require that the size of the teacher sample be modified. The teacher base weight (or design weight) is used to bring the individual teachers' information to the level of their school.

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

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

Teacher non-response adjustment factor

Unfortunately, not all selected teachers were able or willing to participate in TALIS; the teachers that choose not to participate must be represented by the participating ones. Under the assumption of missing at random, that is achieved by the teacher non-response adjustment factor.

In each participating school i=1,…, r_h of each explicit stratum h=1,…, H, there are three kinds of sampled teachers: those who responded (noted t_{hi}), those who did not respond but who are still at the selected school (noted q_{hi}), and those who left the school permanently after the sample had been selected. Then, for each selected teacher j=1 ,…, m_{hi}, the teacher non-response adjustment factor is given by:

$$WGTADJ2_{hij} = \begin{cases} \dfrac{t_{hi} + q_{hi}}{t_{hi}}, & \text{for responding teachers} \\ 0, & \text{for non-responding teachers} \\ 1, & \text{for those who left the school permanently} \end{cases}$$

While the "teachers who left the school permanently" will not provide data to most of the estimates of interest, they still carry a positive weight as they represent those other "teachers who have left school permanently" who are not in the sample.

Teacher adjustment factor for incidental exclusions

Since some teachers were excluded from sampling while they were in-scope, they need to be represented by the sample. An adjustment factor is required to account for those so-called incidental exclusions.

For each teacher j= 1, ..., m_{hi} in participating school i=1, …, r_h in explicit stratum h=1, …, H, the teacher adjustment factor for incidental exclusions is given by:

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

In this adjustment factor, the numerator is the full teacher list and the denominator is the reduced list from which the sample was actually selected. $M_{hi}^{-} = M_{hi}$ when there were no incidental exclusions and then $WGTADJ3_{hij} = 1$ for all sampled teachers.

Teacher multiplicity adjustment factor

Some teachers work in more than one school at ISCED Level 2. Since the lists of teachers were drawn independently, those teachers could have been listed more than once. Moreover, the samples of teachers being independent between schools, selecting the same teacher more than once was possible (though in practice not very likely). An adjustment is needed to account for the number of schools in which a given teacher works and this information was collected through the teacher questionnaire. For most teachers, the adjustment factor is 1. For the others, it is the inverse of the number of schools in which they teach.

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

$$WGTADJ4_{hij} = \begin{cases} \dfrac{1}{nbr\_schools_{hij}}, & \text{for teachers teaching in more than 1 school} \\ 1, & \text{for teachers teaching in 1 school} \end{cases}$$

where $nbr\_schools_{hij}$ is the number of schools where teacher j teaches.

This factor is set to 1 for teachers who have left the school permanently.

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Final teacher weight

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

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

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

and for each teacher who has left school permanently, the final weight is given by:

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

It can be remarked that, in the simplest of cases, the sampling design prepared for TALIS yields equal weights for all teachers. Assuming that the measure of size is the full list of eligible ISCED Level 2 teachers ($MOS_{hi} = M_{hi}$), that the sample size of 200 schools is distributed among the explicit strata proportionally to the number of teachers in each stratum ($n_h = 200 \times MOS_h / MOS_\bullet$ where $MOS_\bullet$ is the total number of eligible ISCED Level 2 teachers in the country), that samples of 20 teachers can be selected from every selected school, that the school listings contain nobody but in-scope teachers, that no incidental exclusion occurred, that each selected school and teacher participates, that each teacher teaches in only one school, then the final teacher weight is effectively the same for all the teachers in the sample:

$$\begin{aligned} TCHWGT_{hij} &= SCHWGT_{hi} \times WGTFAC2_{hi} \times WGTADJ2_{hi} \times WGTADJ3_{hij} \times WGTADJ4_{hij} \\ &= \left(\frac{MOS_h}{n_h \times MOS_{hi}} \right) \times \left(\frac{M_{hi}}{20} \right) \times (1) \times (1) \times (1) = \frac{MOS_h}{n_h \times 20} \\ &= \frac{MOS_\bullet}{200 \times MOS_h} \frac{MOS_h}{20} = \frac{MOS_\bullet}{4000} \end{aligned}$$

for $h = 1, \ldots, H$; $i = 1, \ldots, n_h$; $j = 1, \ldots, m_{hi}$.

PARTICIPATION RATES

The quality requirements for TALIS translate into participation rates (response rates) for schools and for teachers. Reaching these levels of participation does not preclude that some bias may be present in the results but should minimise the negative impact of non-response biases. As TALIS is one of the first large-scale international surveys of active teachers, little is known of "reasonable" response rates for this population. Hence, when compared to large-scale student-level international surveys on education (*e.g.* Programme for International Student Assessment [PISA], Progress in International Reading Literacy Study [PIRLS], Trends in International Mathematics and Science Study [TIMSS]), the requirements for TALIS may appear somewhat low.

Participation rates for schools

The minimum school participation rate was set at 75% after replacement. Although replacement schools could be called upon as substitutes for non-responding schools, NPMs were encouraged to do all they could to obtain the participation of the schools in the original sample. As the number of replacement schools increases, the sample loses its probabilistic features and becomes increasingly "purposive". This can undermine the reliability, validity and interpretability of the country's results.

Responding schools that yield at least 50% of responding teachers will be considered as "participating" schools; schools that fail to meet that threshold will be considered as "non-participating" even though the number of responding teachers may be enough to contribute to some of the analyses.

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

The unweighted school participation rate is 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 earlier. This represents the crude proportion of schools that achieved at least 50% response from their sample of teachers.

The weighted school participation rate is computed as the proportion of the population of teachers accounted for by participating schools. To better display how the weighted rates are computed, *TWGTinSCL* is defined as the "teacher weight within his or her school", adjusted within school:

$$TWGTinSCL_{hij} = (WGTFAC2_{hij} \times WGTADJ2_{hij} \times WGTADJ3_{hij} \times WGTADJ4_{hij})$$

Then, the weighted school participation rate is defined as:

$$WTDSCPART = \frac{\sum_{h=1}^{H}\sum_{i=1}^{r_h}\sum_{j=1}^{t_{hi}} WGTFAC1_{hi} \times TWGTinSCL_{hij}}{\sum_{h=1}^{H}\sum_{i=1}^{r_h}\sum_{j=1}^{t_{hi}} SCHWGT_{hi} \times TWGTinSCL_{hij}}$$

Note that the numerator is not adjusted for school non-response while the denominator is. In both the numerator and denominator, the full estimated number of teachers in the school is used.

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 expected that at least 75% of selected teachers in participating schools (original sample or replacement schools) would take part in the assessment.

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

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The unweighted teacher participation rate is 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 gives the crude ratio of the number of responding teachers in participating schools with respect to the expected sample size from participating schools.

Again, to better show the structure of the participation rate, a "responding teacher weight" in a school is defined as $RESPinSCL_{hij}$:

$$RESPinSCL_{hij} = WGTFAC2_{hij} \times WGTADJ3_{hij} \times WGTADJ4_{hij}$$

Then the weighted teacher participation rate is given by:

$$WTDSCPART = \frac{\sum_{h=1}^{H}\sum_{i=1}^{r_h}\sum_{j=1}^{t_{hi}} WGTFAC1_{hi} \times RESPinSCL_{hij}}{\sum_{h=1}^{H}\sum_{i=1}^{r_h}\sum_{j=1}^{t_{hi}} WGTFAC1_{hi} \times TWGTinSCL_{hij}}$$

Note that the numerator is not adjusted for teacher non-response while the denominator is. In both the numerator and denominator, schools are not adjusted for non-response.

Overall participation rates

The overall unweighted and weighted participation rates are 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. As well, the weighted and unweighted participation rates for teachers were computed.

The analytical results for each country were annotated (OECD, 2009), based on whether 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 or poor. The "good" rating means that the country's data were included in international comparisons. The "fair" rating means 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%. However, in most cases, evidence was provided by the countries concerned that non-response bias was negligible. Finally, the "poor" rating means that the country's data were not included in the international comparisons. The TALIS Board of Participating Countries made the final decision on whether to include the country's data in international comparisons while taking into account various other factors.

The ratings depend on participation rates before and after replacements and on the apparent severity of the non-response biases; these ratings are summarised in Table 10.1.

Table 10.2 gives 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.

This table is a crude measure of the efficiency or effectiveness of the data collection activities. In all, nearly 74 000 teachers participated, that is, 78% of all teachers sampled. Table 10.3 shows weighted participation rates and thus the estimated proportion of each national population of teachers who took part in TALIS. With this in mind, "TALIS participation rates" might not convey much meaning.

Table 10.3 gives 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 country.

SAMPLING ERROR WITH BALANCED REPEATED REPLICATION

Surveys with complex designs like TALIS require special attention when it comes to estimation, especially estimation of the sampling error. Both the survey design and the unequal weights are needed to obtain (approximately) unbiased estimates of sampling error. Failing 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. In those cases, approximate solutions 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 (Efron) are the best known examples of replication methods (see, for example, Lohr [1999], Rust and Rao [1996], or Wolter [2007] for a review of these methods).

The Balanced Repeated Replication (BRR) was adopted for the estimation of the sampling error of the estimates produced for TALIS. This is similar to what was done for PISA, for example (OECD, 2008). 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 one usually does in simple 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 will give the very same measure of sampling error as the full set would.

Creating replicates for Balanced Repeated Replication

BRR was developed for sample designs using only two PSUs per stratum. Clearly, none of the countries participating in TALIS implemented such a sample design. Fortunately, the implemented sample design can be approximated by a superimposed "BRR-ready" sample plan. Listing the schools in the order in which they appear on the sampling frame, the participating schools (of the original sample or the replacements) are paired within explicit strata and each pair is dubbed "pseudo stratum" or "zone". If the number of participating schools in an explicit stratum is odd, then a triplet is formed with the last three schools. The pairs (or triplets) are then numbered sequentially from 1 to G, spanning the whole sample. Within each pseudo stratum or zone, each school is assigned a random pseudo PSU number 1 or 2 (or 3 for a triplet) as depicted in Table 10.4.

As with the jackknife repeated replication, one of the two pseudo PSUs will be dropped and the remaining pseudo PSU will see its weight doubled and be used to compute an estimate of the parameter of interest. Rather than randomising which pseudo PSU will be dropped, a special matrix (of order $4t$) of +1's and -1's –

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the so-called Hadamard matrix – indicates which pseudo PSU is to be kept from each pseudo stratum in BRR, 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, as was the case in PISA, a variation of the BRR developed by 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 deleting a domain completely.

In cases where there is an odd number of PSUs in an explicit stratum, the last three PSUs are treated as a zone in the following manner: one of the PSUs is randomly designated as "+1" while the remaining two are both designated as "-1". For each replicate, as indicated by the Hadamard matrix, the weight of the selected unit is multiplied by 1.7071 if it is the single unit and the weights of the remaining pair are multiplied by 0.6464. If the matrix indicates that the pair should be selected, then the weights of the paired units are multiplied by 1.3536 and the weight of the single unit is multiplied by 0.2929. This ensures that the sum of the factors is 3. This strategy was developed by Judkins (OECD, 2002).

Since the nominal sample size for TALIS 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 were computed and stored as well.

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 $\hat{\theta}_g$, $g = 1, ..., 100$, be the BRR replicate estimates of the same parameter of interest obtained by using the BRR weights described above. Then, setting $k = 0.5$ and $G = 100$, Fay's BRR estimate of the sampling error of $\hat{\theta}^*$ is given by:

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

Design effect and effective sample size

Complex surveys like TALIS are known to be "less efficient" than simple random samples of the same size. The usual explanation notes 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 is approximated by:

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

Alternatively, the design effect can be regarded as the ratio of sample sizes; then, the term "effective sample size" may be used to describe the sample size of the complex survey adjusted for the design effect:

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

Tables 10.5 and 10.6 give the estimated design effect for selected key variables, the actual and effective sample sizes, by participating country, and for TALIS as a whole.

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Table 10.1

Quality ratings and unweighted participation rates

Before replacement	<75%			≥75%
After replacement	<75%		≥75%	GOOD
Non-response bias	high	low	FAIR	
Quality rating	POOR	FAIR		

Source: OECD, *TALIS Database.*

Table 10.2

Unweighted participation rates, by country

	Number of participating schools	Responding teachers in participating schools	School participation before replacement	School participation after replacement	Teacher participation in participating schools	Overall participation
Australia	149	2 275	45.0	74.5	78.6	58.6
Austria	248	4 265	78.7	89.5	84.8	75.9
Belgium (Fl.)	197	3 473	61.8	76.1	83.8	63.7
Brazil	380	5 834	90.6	96.2	90.6	87.1
Bulgaria	199	3 796	97.5	99.0	95.4	94.5
Denmark	137	1 722	47.0	68.5	79.4	54.4
Estonia	195	3 154	94.9	98.5	96.3	94.8
Hungary	183	2 934	89.4	96.8	91.7	88.8
Ireland	142	2 227	63.5	71.0	76.4	54.2
Iceland	133	1 394	92.4	92.4	79.7	73.6
Italy	298	5 263	87.0	99.3	92.9	92.2
Korea	171	2 970	66.5	85.5	92.5	79.1
Lithuania	206	3 535	96.6	99.5	96.1	95.6
Mexico	192	3 368	95.5	96.0	87.5	84.0
Malta	58	1 142	100.0	100.0	97.2	97.2
Malaysia	217	4 248	98.6	99.1	98.1	97.2
Netherlands	39	484	11.4	26.2	63.7	16.7
Norway	156	2 458	49.2	78.4	75.7	59.4
Poland	172	3 184	85.0	86.0	96.3	82.8
Portugal	173	3 046	81.3	87.4	86.6	75.7
Slovak Republic	186	3 157	86.8	94.4	93.1	87.9
Slovenia	184	3 069	88.5	92.0	88.6	81.5
Spain (excluding Rioja and Canarias)	193	3 362	93.0	97.0	88.7	86.1
Turkey	193	3 224	93.5	96.5	90.9	87.7
TALIS total	4 401	73 584	79.3	88.2	88.4	78.0

Source: OECD, *TALIS Database.*

Table 10.3

Weighted participation rates, by country

	School participation before replacement	School participation after replacement	Teacher participation in participating schools	Overall participation	Estimated size of teacher population
Australia	47.5	75.1	79.0	59.3	92 691
Austria	79.5	89.7	85.3	76.6	42 372
Belgium (Fl.)	56.9	78.0	85.1	66.4	19 580
Brazil	94.4	98.0	91.8	89.9	569 553
Bulgaria	98.1	99.5	96.2	95.7	29 166
Denmark	47.6	68.8	79.6	54.8	25 735
Estonia	94.6	97.7	96.1	93.9	7 567
Hungary	88.7	96.6	92.0	88.9	47 492
Ireland	65.1	72.3	77.6	56.1	22 039
Iceland	92.6	92.6	79.8	73.9	1 916
Italy	84.6	99.2	93.0	92.2	177 539
Korea	66.5	85.5	92.8	79.4	78 052
Lithuania	95.8	99.3	95.9	95.3	28 961
Mexico	95.2	95.5	87.4	83.5	248 197
Malta	100.0	100.0	97.0	97.0	2 618
Malaysia	99.1	99.4	98.3	97.7	81 958
Netherlands	11.8	26.6	63.2	16.8	28 316
Norway	49.3	78.6	76.6	60.2	18 990
Poland	84.9	86.2	96.3	83.0	120 604
Portugal	82.8	88.7	86.4	76.6	48 381
Slovak Republic	90.1	95.9	93.7	89.9	25 738
Slovenia	88.4	92.0	88.8	81.7	7 244
Spain (excluding Rioja and Canarias)	93.2	97.0	88.8	86.2	200 101
Turkey	92.3	95.8	91.0	87.2	148 304

Source: OECD, *TALIS Database.*

Table 10.4

Example of BRR-ready sample design and random assignation 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.*

Table 10.5

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

	BTG10(4)	BTG21A(4)	BTG31A(3)	BTG12	BTG8(A)	Average *design effect*	Participating teachers	Effective sample size
Australia	2.06	2.01	1.06	1.40	2.20	1.74	2 275	1 307
Austria	1.74	2.19	1.23	1.35	1.31	1.56	4 265	2 734
Belgium (Fl.)	2.22	2.41	1.71	1.27	2.30	1.98	3 473	1 754
Brazil	3.51	4.08	4.19	5.33	3.50	4.12	5 834	1 416
Bulgaria	2.39	11.87	5.46	2.96	7.82	6.10	3 796	622
Denmark	1.65	1.82	1.25	1.10	2.07	1.58	1 722	1 090
Estonia	1.09	1.23	1.36	1.35	1.70	1.35	3 154	2 336
Hungary	4.38	10.13	2.33	2.38	2.23	4.29	2 934	684
Ireland	0.99	1.37	1.37	1.37	1.28	1.28	2 227	1 740
Iceland	1.01	1.18	1.09	0.93	1.01	1.04	1 394	1 340
Italy	1.65	3.16	1.27	2.28	2.51	2.17	5 263	2 425
Korea	1.62	1.09	0.98	1.37	2.23	1.46	2 970	2 034
Lithuania	1.43	1.87	1.26	1.51	2.06	1.63	3 535	2 169
Mexico	1.63	2.76	1.55	1.69	3.59	2.25	3 368	1 497
Malta	1.41	1.59	0.99	1.10	1.26	1.27	1 142	899
Malaysia	1.38	3.26	2.16	3.54	3.21	2.71	4 248	1 568
Netherlands	1.51	1.71	0.99	1.15	1.61	1.39	484	348
Norway	0.74	1.93	1.28	1.24	1.46	1.33	2 458	1 848
Poland	1.78	1.80	1.55	1.87	3.67	2.13	3 184	1 495
Portugal	1.93	1.70	1.26	1.41	1.56	1.57	3 046	1 940
Slovak Republic	1.76	2.72	3.09	2.65	2.74	2.59	3 157	1 219
Slovenia	1.64	1.93	1.90	1.75	1.27	1.70	3 069	1 805
Spain (excluding Rioja and Canarias)	1.72	1.94	1.47	1.93	2.61	1.93	3 362	1 742
Turkey	4.69	2.46	4.72	3.95	7.26	4.62	3 224	698
TALIS total							73 584	36 711

Notes:

BTG10(4) How long have you been working as a teacher at this school? (4) 6-10 years.

BTG21A(4) From the following people, how often have you received appraisal *and/or* feedback about your work as a teacher in this school? (A) Principal? (4) once per year.

BTG31A(3) How strongly do you agree or disagree with the following statements about yourself as a teacher in this school? (A) All in all, I am satisfied with my job (3) Agree.

BTG12 In all, how many days of professional development did you attend during the last 18 months?

BTG8A *In a typical school week*, estimate the number of (60-minute) hours you spend on the following for this school (A) Teaching of students in school.

Source: OECD, *TALIS Database.*

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Table 10.6

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

	BCG05	BCG17(A)	Average *design effect*	Participating schools	Effective sample size
Australia	1.59	1.95	1.74	149	84
Austria	1.24	1.42	1.56	248	187
Belgium (Fl.)	1.53	1.46	1.98	197	132
Brazil	1.38	1.15	4.12	380	301
Bulgaria	3.22	2.86	6.10	199	65
Denmark	1.37	3.20	1.58	137	60
Estonia	1.06	1.31	1.35	195	165
Hungary	1.93	1.40	4.29	183	110
Ireland	0.71	0.94	1.28	142	172
Iceland	1.12	1.33	1.04	133	109
Italy	1.79	2.20	2.17	298	150
Korea	2.17	1.96	1.46	171	83
Lithuania	1.00	1.46	1.63	206	168
Mexico	1.30	1.44	2.25	192	140
Malta	0.91	0.90	1.27	58	64
Malaysia	1.40	1.52	2.71	217	149
Netherlands	2.13	2.23	1.39	39	18
Norway	1.06	1.46	1.33	156	124
Poland	1.56	1.84	2.13	172	101
Portugal	1.07	1.21	1.57	173	152
Slovak Republic	1.61	1.65	2.59	186	114
Slovenia	0.86	1.42	1.70	184	162
Spain (excluding Rioja and Canarias)	2.05	1.30	1.93	193	115
Turkey	1.55	5.31	4.62	193	56
TALIS total				4 401	2 979

Notes:

BCG05 How many years' experience do you have working as principal? 3 = "3-5 years", 4 = "6-10 years".

BCG17(A) As principal of this school, on average *throughout the school year,* what percentage of the time do you estimate that you spend on the following tasks in this school? (A) Internal administrative tasks.

Source: OECD, *TALIS Database.*

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Chapter 11

Construction and Validation of Scales and Indices

132 Abstract

132 Overview

132 Simple questionnaire indices, ratios and indicators

132 Student-teacher ratio

135 Validation of complex questionnaire scale indices

135 Indices derived through Principal Components Analysis

145 Description of complex scale indices and their parameters

145 School leadership indices

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Abstract

This chapter outlines the design and validation of scales and indices in TALIS. The TALIS questionnaires were comprised of many items; while some were intended to be used in single item analyses, others were intended to be combined to measure latent constructs. This chapter explains how simple indices were constructed, describes the methodology used for construct validation and scaling and finally 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, teacher perceptions, and perceptions of school principals. Some of the items were designed to be used in analyses as single items (for example, teachers' amount of professional development). However, a large number of questionnaire items were designed to be combined in some way so as to measure latent constructs that cannot be observed directly. For these items, transformations or scaling procedures are 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: these indices were constructed through the scaling of items. Typically, scale scores for these indices are estimates of latent traits derived through scaling of dichotomous or Likert-type items using more complex methodology.

Some indices were already used in previous surveys and are constructed based on similar scaling methodology, whereas others were based on the elaboration of a questionnaire framework (see Chapters 1 and 2).

This chapter outlines how simple indices were constructed, describes the methodology used for construct validation and scaling and proceeds to detail the construction, validation, and computation of each scaled index and its characteristics.

SIMPLE QUESTIONNAIRE INDICES, RATIOS AND INDICATORS

This section describes the simple indices, including ratios, averages and binary indicators, that were constructed through the arithmetical transformation or recoding of one or more items. It discusses these indices at both the school level and individual teacher level.

Student-teacher ratio

This is a school-level ratio derived from school principals' responses to questions about the number of staff (headcounts) currently working in the school and the total number of students (headcounts) of all grades in the school. The measure is not therefore restricted to those teaching or supporting ISCED level 2 education in the school but covers education of all levels provided in the school. The ratio (STRATIO) is derived by dividing the number of students in the school (BCG12) by the number of teachers in the school (those whose main activity is the provision of instruction to students) (BCG11A).

Ratio of students to number of personnel for pedagogical support

This is a school-level ratio derived from school principals' responses to questions about the number of staff (headcounts) currently working in the school and the total number of students (headcounts) of all grades in the school. The measure is not therefore restricted to those teaching or supporting ISCED level 2 education in the school but covers education of all levels provided in the school. The ratio (SPRATIO) is derived by dividing the number of students in the school (BCG12) by the number of personnel for pedagogical support in the school (BCG11B). Pedagogical support personnel include all teacher aides or other non-professional personnel who provide instruction or support teachers in providing instruction, professional curricular/instructional specialists and educational media specialists.

Ratio of students to number of school administrative or management personnel

This is a school-level ratio derived from school principals responses to questions about the number of staff (headcounts) currently working in the whole school and the total number of students (headcounts) of all grades in the school. The measure is therefore not restricted to only those teaching or supporting ISCED level 2 education in the school but covers education of all levels provided in the school. The ratio (SARATIO) is derived by dividing the number of students in the school (BCG12) by the number of school administrative or management personnel in the school (BCG11C). School administrative or management personnel include principals, assistant principals, other management staff, receptionists, secretaries and administration assistants whose main activity is administration or management.

Ratio of teachers to number of personnel for pedagogical support

This is a school-level ratio derived from school principals' responses to a question about the number of staff (headcounts) currently working in the whole school and so is not restricted to only those teaching or supporting ISCED level 2 education in the school. The ratio (TPRATIO) is derived by dividing the number of teachers (those whose main activity is the provision of instruction to students) (BCG11A) by the number of personnel for pedagogical support (BCG11B). Pedagogical support personnel include all teacher aides or other non-professional personnel who provide instruction or support teachers in providing instruction, professional curricular/instructional specialists and educational media specialists.

Ratio of teachers to number of school administrative or management personnel

This is a school-level ratio derived from school principals responses to a question about the number of staff (headcounts) currently working in the whole school and so is not restricted to only those teaching or supporting ISCED level 2 education in the school. The ratio (TARATIO) is derived by dividing the number of teachers (those whose main activity is the provision of instruction to students) (BCG11A) by the number of school administrative or management personnel (BCG11C). School administrative or management personnel include principals, assistant principals, other management staff, receptionists, secretaries and administration assistants whose main activity is administration or management.

Percentage of professional development that is compulsory

This is a percentage at the individual teacher level and was derived from teachers' responses to the questions "In all, how many days of professional development did you attend during the last 18 months?" (rounded to whole days) and "Of these, how many were compulsory for you to attend as part of your job as a teacher?" In the international database, for each teacher, the variable COMPULPD was calculated by dividing the number of compulsory days (BTG13) by the total number of days (BTG12) and multiplying by 100.

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Average class size

In the section of the teacher questionnaire where teachers were asked about their classroom teaching practices, they were asked to report on a "target class" that they taught. This "target class" was defined as the first ISCED level 2 class that the teacher (typically) taught in the school after 11am on Tuesdays. This formulation was used to introduce randomisation in the selection of the "target class". As this approach is less rigorous than a truly randomised selection of classes, some caution is needed in interpreting the results at the teacher level and in the aggregation to the school level.

Among the characteristics of the "target class", teachers were asked to report the number of students in this class on average throughout the year (BTG38). In the international database the AVGCLSIZ is calculated at the school level as the mean of the values reported by teachers in BTG38 for that school.

Language difference

In the section of the teacher questionnaire where teachers were asked about their classroom teaching practices, they were asked to report on a "target class" that they taught. This "target class" was defined as the first ISCED level 2 class that the teacher (typically) taught in the school after 11am on Tuesdays (see cautionary note above).

Among the characteristics of the "target class", teachers were asked to report the percentage of students whose first language is different from the language of instruction (BTG40A). In the international database LANGDIFF is calculated at the school level as the mean of the response categories (rather than the percentages that these response categories represent) reported by teachers in BTG40A for that school.

Education level of parents

In the section of the teacher questionnaire where teachers were asked about their classroom teaching practices, they were asked to report on a "target class" that they taught. This "target class" was defined as the first ISCED level 2 class that the teacher (typically) taught in the school after 11am on Tuesdays.

Among the characteristics of the "target class", teachers were asked to report the percentage of students who have at least one parent/guardian who has completed at least upper secondary education (ISCED level 3 or higher) (BTG40B). In the international database PEDUATT3 is calculated at the school level as the mean of the values reported by teachers in BTG40B for that school.

Teachers were also asked to report the percentage of students who have at least one parent/guardian who has completed higher education (ISCED level 5 or higher) (BTG40C). In the international database PEDUATT5 is calculated at the school level as the mean of the response categories (rather than the percentages that these response categories represent) reported by teachers in BTG40C for that school.

No evaluation of the school

This school-level derived variable (NVREVAL) indicates whether or not a school evaluation has been conducted on the school in the five years prior to the survey (either a school self-evaluation or an external evaluation). The variable is coded "1" if no such evaluation was conducted (BCG18A=1 <u>and</u> BCG18B=1) and "0" otherwise.

No appraisal or feedback received by the teacher

This teacher-level derived variable (NEVERAF) indicates whether or not a teacher has received an appraisal or feedback about their work as a teacher in their current school (either from the school principal, other teachers or members of the school management team or an external individual or body). The variable is coded "1" if no such appraisal or feedback was received by the teacher (BTG21A=1 <u>and</u> BTG21B=1 <u>and</u> BTG21C=1) and "0" otherwise.

VALIDATION OF COMPLEX QUESTIONNAIRE SCALE INDICES

This section explains the construct validation and scaling analyses used to develop the complex questionnaire scale indices, including the Principal Component Analysis and the Confirmatory Factor Analysis. These techniques are employed to search for characteristics and identify patterns within the data.

Indices derived through Principal Components Analysis

Indices for school autonomy and school resources were derived through Principal Components Analysis (PCA). PCA is a variable-reduction procedure but differs from common factor analysis in that it considers the total variability of the variables in the analysis and extracts the variance that is common among the factors identified rather than considering the unique variance of the individual variables.

PCA begins by extracting the maximum variance and allocates that to the first factor and proceeds to extract the maximum of the remaining variance for the second factor and so on until all of the variance in the data has been accounted for. In PCA, the full variance is therefore brought into the factor matrix. The factor matrix in PCA is the matrix that contains the factor loadings of all the variables on all of the factors extracted. The factor loadings in PCA are simply the correlations between the factors and the variables and thus the diagonal of the correlation matrix consists of unities.

PCA is a common technique for searching for patterns in data that consist of a high number of dimensions and is recommended when the researcher's primary concern is to determine the minimum number of factors that will account for the maximum variance in the data in a given multivariate analysis. PCA was chosen over Confirmatory Factor Analysis (CFA) to derive the indices for school autonomy and school resources in TALIS because these scales are based on responses by the principal that are essentially factual reports. This is in contrast to the CFA approach used to derive the scales in the remainder of this chapter, which sought to model underlying traits of the attitudinal data that comprise these scales. Moreover, the indices for school autonomy and school resources were more readily postulated from the questionnaire items and therefore less in need of empirical derivation. For these same reasons, the scales on school autonomy and school resources were not subject to the extent of cross-cultural scrutiny that the other scales were.

List-wise deletion was used to deal with missing teacher and principal questionnaire data and SPSS 17.0 was used for computing component scores.

School autonomy indices

To describe the extent of school autonomy in decision making, indices were derived from question BCG31 of the school principals' questionnaire. For a list of 13 tasks, the question asked the school principal to indicate who, among a range of stakeholders, had a considerable responsibility in the decision making for these tasks. Considerable responsibility could be attributed to one or more of: the principal, teachers, the school governing board, regional or local authority and national education authority (Table 11.1). For a particular task, the extent of school-level autonomy was determined by whether a considerable responsibility lay at the school level (*i.e.* with principal, the teachers or the school governing board) or with other authorities (*i.e.* regional or local authority and national education authority) or shared between both groups. Thus, for example, if BCG31A1=1 or BCG31A2=1 or BCG31A3=1, then this indicates a school-level responsibility.

Table 11.2 shows the rotated component matrix from the PCA of the 13 items of question 31 of the principal questionnaire.

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The rotated component matrix derived from the PCA allows four components to be derived:

- School autonomy in hiring teachers, determining salaries (AUTHIRE).
- School autonomy in budgeting (AUTBUDGT).
- School autonomy in curriculum (AUTCURR).
- School autonomy in student policy and textbooks (AUTSTUDP).

Each of the components has an EIGENVALUE above 1 and together they explained 66% of the total variance of 12 items (respectively 32%, 15%, 10% and 9% for Indices 1, 2, 3, and 4 shown in Table 11.2).

The index AUTHIRE is derived by regrouping five items related to school autonomy in hiring teachers and determining salaries: Selecting teachers for hire (BCG31A); Firing teachers (BCG31B); Establishing teachers' starting salaries (BCG31C); Determining teachers' salary increases (BCG31D); and Allocating funds for teachers' professional development' (BCG31M).

The index AUTSTUDP is derived by regrouping three items related to school autonomy in student policy and textbooks: Establishing student disciplinary policies (BCG31G); Establishing student assessment policies (BCG31H); and Approving students for admission to the school (BCG31I).

The index AUTCURR is from three items related to school autonomy in curriculum: Choosing which textbooks are used (BCG31J); Determining course content (BCG31K); and Deciding which courses are offered (BCG31L) and the index AUTBUDGT is derived from two items related to autonomy in budget: Formulating the school budget (BCG31E); and Deciding on budget allocations within the school (BCG31F).

These four indices were obtained for the first principal component, with zero being the score of an average TALIS country and 1 being the standard deviation across TALIS countries weighted equally with school weight, except in the Netherlands, which was excluded from the weighting. Higher values on the scale of the four indices (AUTHIRE, AUTBUDGT, AUTSTUDP, AUTCURR) indicate relatively higher levels of school responsibility in this area.

Concerning the reliability of the indices, Cronbach's Alpha is acceptable or good for all of the autonomy scales (see Table 11.1211.4). However, given that the reliabilities for the index of school autonomy in budgeting (AUTBUDGT) are below 0.50 for around half of the countries, the reliability of this index is more open to question and care should therefore be taken in its interpretation.

School resources indices

To describe the relative level of resources available in schools, indices were derived from nine items in question BCG29 of the principals' questionnaire in which school principals were asked to indicate the extent ("not at all", "very little", "to some extent" or "a lot") to which the school's capacity to provide instruction was hindered by a shortage or lack of resources in a range of areas (Table 11.5). For the calculation of the indices, responses "not at all" and "very little" were coded to the value of -1 and the responses "to some extent" and "a lot" were recoded to the value of 1.

Table 11.6 shows the rotated component matrix from a Principal Components Analysis (PCA) of the nine items of question 29 of the principal questionnaire.

The rotated component matrix derived from the PCA allows two components to be derived:

- Lack of personnel resources (LACKPERS).
- Lack of material resources (LACKMAT).

The index LACKPERS is derived by regrouping four items of question 29 related to a lack of personnel: Teachers (BCG29A); Laboratory technicians (BCG29B); Instructional support personnel (BCG29C); Other support personnel (BCG29D). The index of LACKMAT is derived by regrouping four variables related to a shortage or inadequacy in materials: Instructional materials (BCG29E); Computers for instruction (BCG29F); Other equipment (BCG29G); and Library materials (BCG29H). The item BCG29I "Other" was dropped due to lack of reliability with the two indices (less than 20% of school principals ticked this option).

The LACKPERS and LACKMAT scores were obtained as component scores for the first principal component with zero being the score of an average TALIS country and one the standard deviation across TALIS countries weighted with school weight except the Netherlands, which was excluded from the weighting. Higher values on the indices LACKPERS or LACKMAT indicate relatively high levels of a lack or inadequacy or resources in these areas.

Table 11.8 shows the scale reliabilities (Cronbach's Alpha) in TALIS countries for the two resource indices. The scale reliabilities for each scale are generally acceptable or good, with only a few countries having reliability indices below 0.50.

Indices developed through Confirmatory factor analysis (CFA)

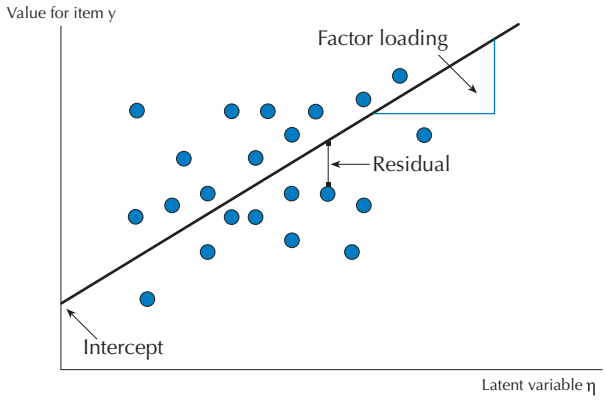
TALIS measures teacher beliefs, attitudes and practices and principals' leadership styles with single items that are combined (reduced) to form scales. The basic advantages of scales are their higher reliability and validity, as well as the possibility to alleviate issues of multicollinearity in models. Confirmatory factor analysis (CFA) with mean and covariance structure (MACS) models was used to confirm and, if necessary, re-specify the expected dimensional structure of the scales. The analysis was carried out with the software Mplus, version 5.1 (Muthén & Muthén, 1998-2007).

CFA treats the constructs of interest as latent response variables. Latent variables are variables that cannot be directly observed but are rather inferred from other variables that are directly measured. In the CFA model the responses to each item y are predicted from the latent factor η. In addition to the observed variables y and the latent factor η the model contains a matrix of factor loadings Λ, a vector of intercepts τ and a vector of residual variances ε.

$$y = \tau_y + \Lambda_y \eta + \varepsilon$$

Figure 11.1

Illustration of CFA parameters



Source: OECD, *TALIS Database.*

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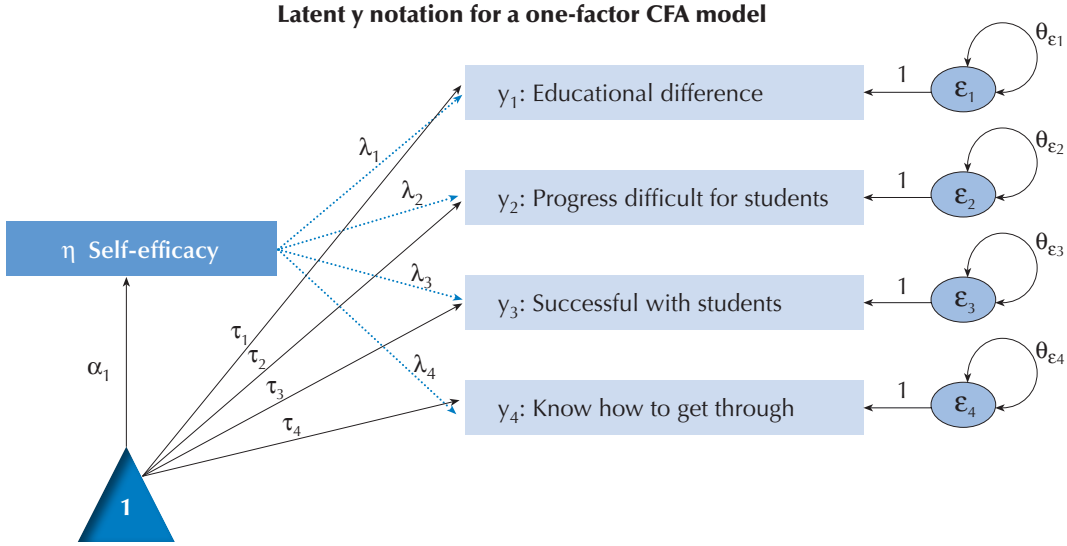
The factor loadings are the regression slopes for predicting each item y from the latent factor. The intercept is the predicted value for item y when the value for the latent trait η is zero. The residual variance is the variance in item y that is not explained by the latent variable η. It is a combination of variance that is specific to the indicator and random error variance. Figure 11.1 further illustrates the meaning of these parameters. The association of 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. 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 θ.

Figure 11.2 illustrates the latent y notation for a CFA-model.[1] Here the latent variable η is represented by an oval, while the manifest items y_1 to y_4 are represented by boxes. The factor loadings describe the relationships between the latent variable η and the items y_1 to y_4 ε_1 to ε_4 are the residuals and the four θs ($\theta_{\varepsilon 1}$ to $\theta_{\varepsilon 4}$) are the residual variances. The triangle represents a mean structure, with the mean vector α_1 and the intercepts τ_1 to τ_4.

Figure 11.2

Latent y notation for a one-factor CFA model



Source: OECD.

The model can also be written in expanded matrix form. Here Σ represents the covariance matrix of the items y, Λ_y is the matrix of factor loadings λ, $\Lambda`_y$ 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 θ.

$$\Sigma = \Lambda_y \Psi \Lambda'_y + \Theta_\varepsilon$$

The mean vector μ of y equals a vector of intercepts τ plus a matrix of factor loadings 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 variance-covariance matrix Σ that best reproduces the input matrix. To minimise the difference between the input and the predicted matrix, a fitting function is used. The most common fitting function is maximum likelihood estimation, which generally requires continuous data and a multivariate normal distribution. However, *e.g.* Muthén & Kaplan (1985) showed that the use of Likert data and skewed items does not significantly influence the probability of incorrect conclusions in CFA. The estimation is an iterative procedure: first, an initial set of starting values for the parameters is selected; next, the difference between input and estimated matrices is computed. The parameters are then refined, with the difference between input and estimated matrices being computed again, and so on, until a set of parameters that cannot be improved substantially is found (*e.g.* Brown, 2006; Muthén, 1998-2004).

For the estimation of parameters in models with missing data, the model based approach for categorical and continuous data implemented in Mplus is used. Model based approaches treat the missing data and estimate the parameters in one step (Lüdtke, Robitzsch, Trautwein & Köller, 2007). Mplus uses the Expectation Maximisation (EM) algorithm (for a detailed description, see Dempster, Laird & Rubin, 1977). The procedure assumes that the data is missing at random (MAR). MAR means that the probability of a missing observation does not depend on the true score of a person with the variable of interest, but can be correlated with other covariates (Schafer & Graham, 2002).

As described in Chapter 4, a two-stage stratified sampling design was used for TALIS, sampling schools within countries and teachers within schools. Because of similar working conditions and a common socialisation, teachers within a school are likely to have more similar responses than teachers in different schools. If this is the case, the variance and standard errors would be underestimated with regular procedures (*e.g.* Hox, 2002; Raudenbush & Bryk, 2002; Snijders & Bosker, 1994). To avoid this, the Mplus "type is complex" procedure was used for CFA and MGCFA, which corrected for cluster effects (Muthén & Muthén, 1998-2007).

In CFA, the constructs are each measured by a number of different items and treated as latent response variables. Because these variables are latent, their metrics (units of measurement) are not determined. It is common to standardise the mean of the latent response to zero and the factor loading of one item to one to give the scale a metric invariance (Bollen, 1989; Kline, 2005). This was also done in TALIS.

To determine whether the theoretically expected model fits the data, different fit indices were used: the Comparative Fit Index (CFI), the Root Mean-Square Error of Approximation (RMSEA) and the Standardized Root Mean-Square Residual (SRMR). These indices all evaluate the correspondence between the observed data with the data pattern that would be expected based on the estimated model (for a more detailed description see *e.g.* Brown, 2006). In accordance with scientific conventions (Hu & Bentler, 1999; Schermelleh-Engel & Moosbrugger, 2002), CFI > 0.90, RMSEA < .08 and SRMR < .08 were seen as indicative of an acceptable model fit.

It is generally desirable to give participating countries an equal impact and contribution on the estimation of model parameters. In the presence of large datasets, smaller calibration samples are drawn from the entire sample to compute international parameters that are equally influenced by all participating countries (*e.g.* OECD, 2009). For the calibration of the TALIS teacher-scales, a sample of 1 000 cases was randomly selected in each country. Records were selected proportional to the final estimation weight (see Chapter 9), *i.e.* giving those cases with relatively larger weights a higher probability of being selected. Likewise a calibration sample of 150 principals per country was drawn, except for those countries who did not reach the minimum sampling standard of 150. Here the whole sample was used.

Analysis of cross-cultural invariance and validity

Cross-national data allows countries to identify other countries facing similar challenges and to learn from other policy approaches. But it also entails special challenges. Flaws in translation, cross-cultural differences in the handling of questionnaires, different meanings of certain aspects of a construct in different cultures and

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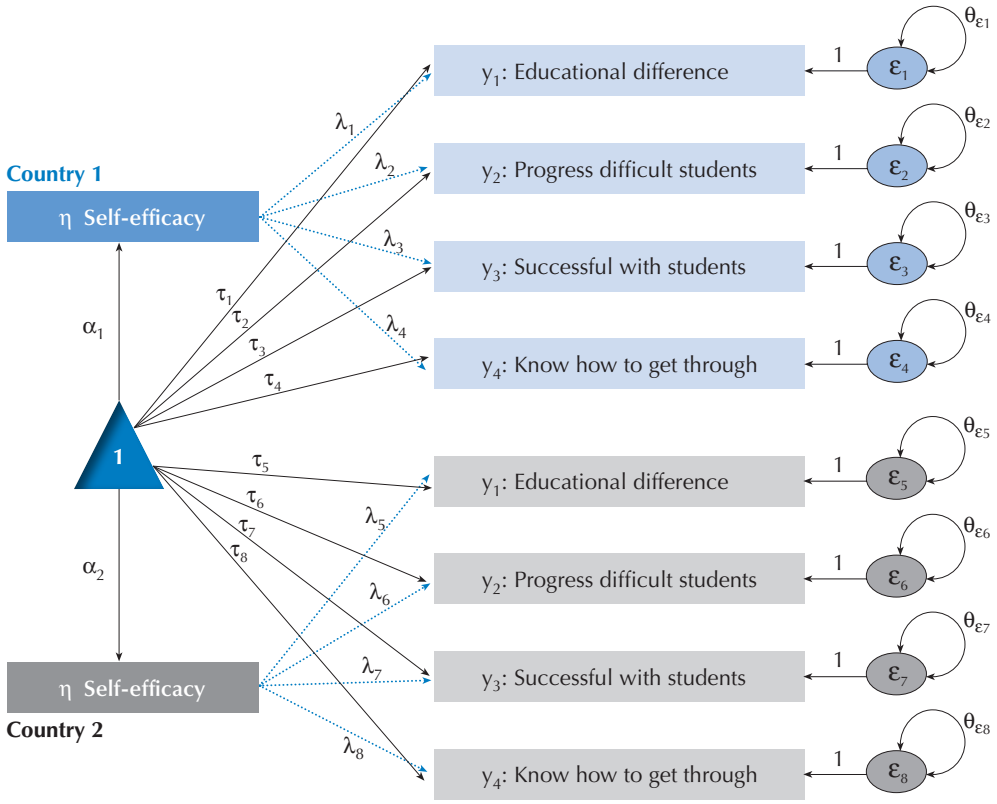
other factors may threaten the validity of cross-cultural comparisons. Countries can only be validly compared if the scales used have an equivalent meaning across all countries (Van de Vijver and Leung, 1997). To assure cross-cultural validity of the TALIS instruments, the translation process was closely monitored. Furthermore, psychometric methods were used to examine cross-cultural equivalence of the measurement and of the measured constructs. Tests of invariance were carried out with multiple group confirmatory factor analysis (MGCFA). In MGCFA models factor loadings, intercepts, residual variances, means and standard deviations are estimated for each country separately. They can be restricted to be equal or they can be allowed to vary across groups. Three levels of invariance were examined: Configural, metric and scalar invariance (*e.g.* Cheung & Rensvold, 2002; Davidov, 2008; Steenkamp & Baumgartner, 1998).

Configural invariance holds if the same number of factors is found in all the participating countries and the same items are associated with each of the underlying factors (Bollen, 1989; Meredith, 1993). This means that the same pattern of zero loadings and loadings different from zero can be found in all countries, while the exact value of the loadings is allowed to vary. Thus configural invariance requires an adequate model fit (CFI > 0.90, RMSEA < 0.08 and SRMR < 0.08) when models for all groups (countries) are estimated simultaneously using the same factor structure, while the model parameters do not need to be equal across countries. Only one factor loading and one intercept need to be restricted to be equal for model identification.[2]

Figure 11.3

Illustration of configural invariance of the construct Self-efficacy across two countries



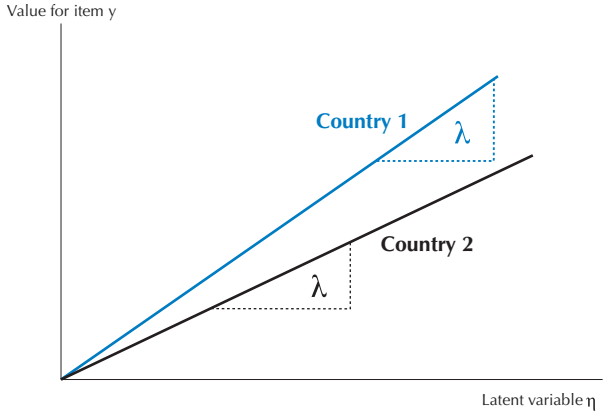
Source: OECD.

Figure 11.3 illustrates configural invariance of the scale Self-efficacy. Here, in both countries 1 and 2, the same four items belong to the scale Self-efficacy, while the factor loadings λ, the intercepts τ and the residual variances θ are allowed to vary.

Factors are metric-invariant, if the same dimensional structure is found across countries and the strength of the associations between the items and the factor they constitute are also equal for all participating countries. Only in the case of equal factor loadings, a change in the value of item y of one unit is associated with the same change in the latent construct for all countries (Steenkamp & Baumgartner, 1998, Meredith, 1993). Figure 11.4 shows a case of metric non-invariance. Here, item y has a larger factor loading in country 1 than in country 2. Comparing correlations or mean scores of these two countries, it would be impossible to separate real attitudinal differences from those that are only due to differences in the relative importance of single responses (Cheung & Rensvold, 1998).

Figure 11.4

Illustration of metric non-invariance for two countries



Source: OECD, *TALIS Database*.

When scales are scalar-invariant, equal intercepts are observed for all countries. Thus, equal values for each item y are predicted for participants from different countries who have a value of zero on the underlying trait η. This means that all items indicate the same cross-cultural differences in latent means (Cheung & Rensvold, 2002; Davidov, 2008; Steenkamp & Baumgartner, 1998). Figure 11.5 illustrates scalar non-invariance. Here, the same slopes are found for both countries, but country 1 has a higher intercept than country 2. With scalar non-invariance it is impossible to decide whether mean score differences are due to differences in the latent construct or to differences that concern single items only.

Equality of residual variances implies that the portion of item variance not attributable to variance in the latent variable is also the same across countries. This means that the items have the same quality as measures of the latent variable in all countries (Cheung & Rensvold, 2002). In Figure 11.6, non-invariance of residual variances for countries 1 and 2 is depicted. The residual variance for country 2 is larger while for country 1, the observed values are closer to the regression line. This level of invariance is a prerequisite for comparing manifest means across countries (Davidov, 2008).

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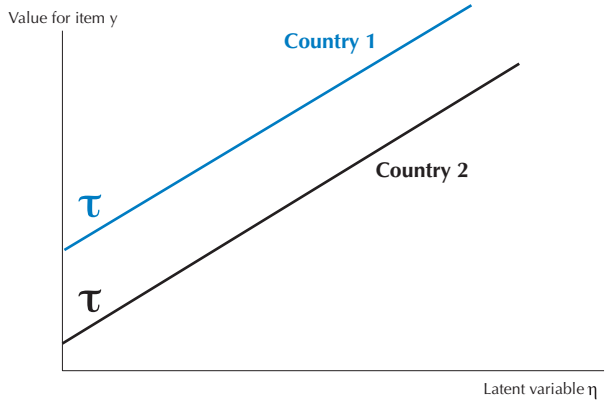
Figure 11.5

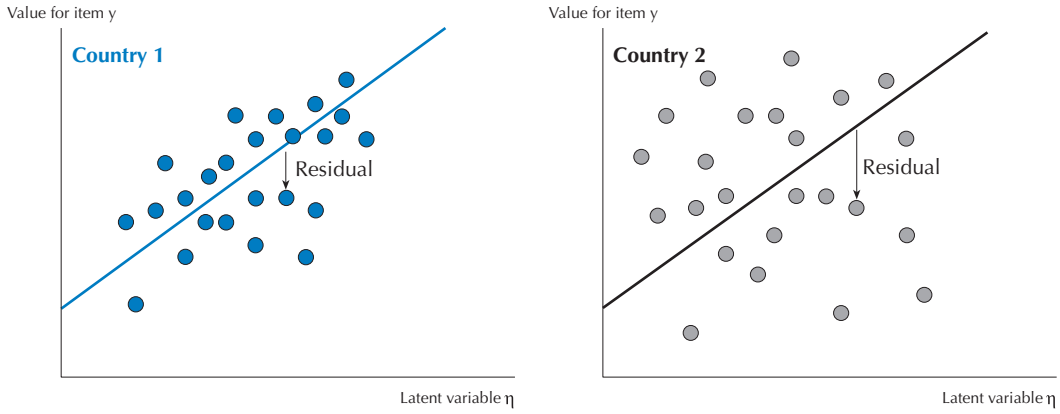
Illustration of scalar non-invariance across two countries



Source: OECD, *TALIS Database*.

Figure 11.6

Illustration of non-invariance of residual variance across two countries



Source: OECD, *TALIS Database*.

The different levels of invariance form a hierarchy. Metric invariance requires configural invariance, and scalar invariance requires metric invariance (*e.g.* Meredith, 1993). Accordingly, models testing the three levels of invariance are nested, and fit indices can be compared across models. To determine whether the model fit significantly decreases, when loadings and intercepts are restricted, differences in CFI, RMSEA and SRMR were compared for the nested models. The χ^2 difference test was not employed because of its strong sensitivity to sample size (*e.g.* Cheung & Rensvold, 1998). A certain level of cross-cultural variation of the parameters is to be expected. Up to now it remains unclear, which difference in model fit and between model parameters is indicative of serious bias and to what extent variations are acceptable (Schulz, 2005). Based on a simulation study, Chen (2007) recommends to view models as invariant if CFI changes < -0.010, RMSEA changes < 0.010 and SRMR changes < 0.005. However, Chen compared two groups only. Given that TALIS examined 23 groups, Chen's recommendation was only considered to be a rough orientation.

Generally, the MGCFA models were specified similar to the simple CFA models, as described above. In addition to fixing the mean to zero and the factor loading of one item to one in one of the countries, one factor loading and one intercept were restricted to be equal across countries for identification purposes (*e.g.* Cheung & Rensvold, 1999). For the estimation of parameters, maximum likelihood and the EM-algorithm were used (see above).

Latent correlations between dimensions of a construct were also compared across countries. It should be noted, though, that differences in the strength of the relationships might be due to real cross-national differences, and do not necessarily indicate bias or inconsistency.

Scaling procedures

Different procedures can be used for the estimation of scale characteristics and composite scores. The simplest method is to compute a sum score or mean score over all items that measure the same construct. Other approaches encompass factor scores that are computed based on the classical test theory or the structural equation modelling (SEM) framework or person parameters that are based on the item response theory (IRT) framework as used in, for example, the scaling of context questionnaire data in PISA using the Partial Credit Model (OECD, 2009). Methods are typically highly correlated but are not completely congruent and all three methods entail advantages as well as disadvantages.

To assure high quality standards for TALIS, the Board or Participating Countries (BPC) requested a description of the different methods and the definition of criteria by which to decide the best scoring procedure for TALIS. Based on analysis carried out using main study data in late 2008, it was found that composite scores computed with different methods were in fact highly correlated and that there were no large differences between mean scores, IRT-scores (using weighted likelihood estimation, WLE) and SEM factor scores. Differences between the factor scores assuming different levels of cross-cultural invariance were highly correlated, while correlations of factor scores and IRT-scores were found to be slightly lower. This suggested that differences between methods were larger than those due to cross-cultural non-invariance of the scales. The scoring methods did influence the comparisons of country means to some extent. Differences were generally small, but larger for those scales, which show a poorer model fit and were less cross-culturally invariant. Given this, it seems more important to consider psychometric and strategic arguments regarding the selection of a method. The TALIS BPC consequently preferred the Structural Equation Modelling (SEM) approach in light of: *i)* the sounder scientific basis and flexibility, given the invariance results for the TALIS scales; *ii)* the fact that SEM and the employed modelling software are better equipped to deal with missing values, and *iii)* the fact that the analysis and scoring could be carried out within one (*i.e.* SEM) instead of two frameworks (SEM and IRT).

For most of the TALIS scales, factor scores were computed as representations of the latent constructs with the program Mplus version 5.1. The use of factor scores minimises measurement error in the items contributing to each of the scales, thus increasing the reliability (and validity) of the computed scale scores, even though – as opposed to latent variables in SEM – factor scores are not completely free of measurement error (Hansen, Rosén & Gustafsson, 2006). Another advantage of factor scores is that – compared to simple sum scores – they contain more information and they are a more realistic approximation of a person's value on the construct of interest, because they account for differences in the relative strength of the relationships between the latent construct and the items (*e.g.* Cheung & Rensvold, 1998).

Factor scores are based on the general structural equation modelling framework. As described above, the items y are predicted from the latent factor η, which is multiplied with the factor loadings λ. The vector of item intercepts τ and the vector of residual variances ε are both added to the product.

$$y = \tau_y + \Lambda_y \eta + \varepsilon$$

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To estimate factor scores, Mplus uses the Bayes method (Muthén, 1998-2004). If all y variables are continuous, this results in the usual factor score estimates based on the regression method with correlated factors (Muthén, 1977). For continuous items, the factor score for individual i is computed from the mean vector of y variables μ, the factor score coefficient matrix C, the vector of observations v_i, the vector of intercepts τ, and the matrix of factor loadings Λ multiplied by the mean vector μ:

$$\hat{\eta}_i = \mu_y + C(v_i - \tau_v - \Lambda_y \mu_y)$$

The score coefficient matrix in turn is based on the item covariance matrix Σ, the matrix of factor loadings Λ and the matrix of residual variances and covariances Θ:

$$C = \Sigma_y \Lambda'_y (\Lambda_y \Sigma_y \Lambda'_y + \Theta_y)^{-1}$$

These formulas imply that higher factor loadings of 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 its influence on the factor score estimate. The mean vector and the variance of the latent variable also affect the estimated scores for different countries in multiple group models.

A score was computed for respondents who answered at least one of the items that belong to the respective scale, using the EM algorithm as described above to deal with missing data. The specification of the MGCFA model depended on the level of invariance established in previous analysis. If metric invariance had been established, a model with equal factor loadings across countries, but different intercepts and residual variances, was used. For each scale, one of the intercepts was restricted to be equal across countries for identification purposes. The choice of the item was based on previous analysis examining the proportion of invariance each individual item adds to the total invariance. This was done by freeing the intercept of each item successively and comparing the model fits for these models to that of a model assuming metric invariance. If scalar invariance had been established, a model with equal factor loadings and intercepts across countries, but different residual variances, was used. Finally, for scales whose uniqueness invariance had been established, a model restricting factor loadings, intercepts and residual variances to be equal across countries was used.

For a given factor analysis, there is an infinite number of sets of factor scores that are consistent with the factor loadings. This phenomenon is called "factor score indeterminacy" (see *e.g.* Grice, 2001). The degree of indeterminacy varies in different CFA models depending on several factors like the general model fit and the number of items included in the model. As an indicator of the quality of factor scores, the degree of indeterminacy can be estimated. For TALIS, validity coefficients are requested in Mplus that inform about the correlation between the factor score estimates and their respective factors (Muthén & Muthén, 1998-2007). In the following, factor score determinacies for complete data will be reported for each of the scales. According to Gorsuch (1983), validity coefficients of > .80 indicate an acceptably small magnitude of indeterminacy.

Once individual factor scores were estimated, each complex questionnaire scale index was transformed to an international metric with an average of zero and a standard deviation of one. The transformation to the scores in the international metric was achieved by subtracting the international mean of factor scores, computed from the pooled data with equally weighted country sub-samples (*i.e.* giving each country a weight of one)[3], from the original factor scores and dividing the remainder by the corresponding international standard deviation. The Netherlands were excluded from all transformations. The means and standard deviations used for the transformation into the international metric are shown in Table 11.9.

DESCRIPTION OF COMPLEX SCALE INDICES AND THEIR PARAMETERS

This section details the construction and computation of a variety of complex scale indices and their characteristics. The indices described take into account school leadership, teacher-student relationships, classroom environments, teachers' self-efficacy and teaching practices and beliefs.

School leadership indices

Five indices describing the school leadership and management styles of school principals in TALIS were derived from questions BCG15 and BCG16, which asked school principals about the frequency with which they engaged in a range of school management activities and behaviours and how strongly they agreed with statements about their role in the school. The five indices are: Framing and communicating the school's goals and the curricular development (FCSGCD) consisting of 6 items; Promoting instructional improvement and professional development (PROIIPD) consisting of 4 items; Supervision of the instruction in the school (SUPINSTR) consisting of 4 items; Accountability role of the principal (ACCROLE) consisting of 4 items; and Bureaucratic rule-following (BURRULEF) consisting of 5 items (Table 11.10). The items BCG15N, BCG16B, BCG16C, BCG16G, BCG16L, and BCG16N (Table 11.11) were excluded due to poor inter-item correlation and poor fit in the different scales. However, these items could be analysed as single items in further analysis.

For the items from BCG15, response options were "never", "seldom", "quite often" and "very often"; while for the items in BCG16, the response options were "strongly disagree", "disagree", "agree", and "strongly agree".

Reliabilities (Cronbach's Alpha) are acceptable or good for all of the leadership scales (see Table 11.12). Only a few countries have reliability indices (for some of the scales) below 0.50 (Bulgaria, Denmark, Estonia, Iceland, Italy, the Netherlands, and Poland). As noted earlier, the Netherlands was excluded from further analysis because it did not meet international sampling standards.

As can be seen from Table 11.13-11.17, model fit was acceptable at the national and international level for each of the scales.

Tables 11.18-11.22 show the results of the tests of cross-cultural invariance of the school leadership scales using multiple group confirmatory factor analysis. The results show that model fit only deteriorates slightly when factor loadings are restricted to be equal. The difference between the models examining configural and metric invariance is small: with ΔCFI ranging from -0.04 (BURRULEF) to -0.01 (FCSGCD) and ΔRMSEA ranging from -0.02 (FCSGCD) to 0.00 (SUPINSTR). These changes in model fit are close to the criteria established by Chen (see earlier section in this chapter).

However, continuing the analysis to test scalar invariance by restricting intercepts to be equal, leads to a noticeable drop in model fit (Tables 11.18-11.22). This suggests that school principals from different countries differ with regards to the relative tendency to endorse each of the single items given the same level of the underlying trait. Thus, while the results confirm the validity of cross-cultural comparisons of correlations of leadership styles with other constructs across countries, mean score comparisons should be interpreted carefully as the mean scores may have a slightly different meaning for each country.

Following the results of the analysis given in Tables 11.18-11.23, for the computation of factor scores, a model assuming metric invariance was used. Thus, the same items with the same factor loadings were used for all participating countries in a multiple group CFA model, but all item intercepts (except for BCG15A for FCSGCD, BCG15G for PROIIPD, BCG15C for SUPINSTR, BCG16A for ACCROLE and BCG16H for BURRULEF, which were restricted to be equal for identification purposes) and all unique variance variances were allowed to vary across countries. The parameters used are detailed in Table 11.23. As can be seen from Table 11.38, the factor score determinacy indicator is acceptable (close to 1 in the majority of countries) for all scales across all participating countries. This indicates good measurement of the latent construct by the observed variables.

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School leadership composite indices

The five different dimensions of school management outlined in the previous sections were further summarised into two indices of leadership styles: Instructional Leadership and Administrative Leadership.

The Instructional Leadership index was defined as the combination of three of the school management indices: *i)* Framing and communicating the school's goals and curricular development; *ii)* Promoting instructional improvements and professional development; and *iii)* Supervision of the instruction in the school. Together, these indices relate to tasks seeking to enhance and improve the learning process in the schools.

The Administrative Leadership index was defined as the combination of the two remaining school management indices: *i)* Accountability role of the principal and *ii)* Bureaucratic rule-following. Together these indices relate to administrative tasks, enforcing rules and procedures, and accountability role of the school principal.

The composite scores for each style of leadership were built by taking a simple average of the component management indices:

$$Y_j = \frac{\sum_{i=1}^{N} X_i}{N}$$

where Y_j is the composite leadership style j, j is the index for each leadership style (instructional and administrative), N is the number of school management scales for each of the composite scores, X_i is the school management scale i, and i is the index for each of the school management scales.

Once the simple average of the three school management scales for Instructional Leadership and the two school management scales for Administrative Leadership were calculated, the scores were transformed to an international metric of mean zero and standard deviation one.

Finally, it was necessary to impute the value for the Administrative Leadership index for Lithuania, as this country did not have complete information to estimate the index for the Accountability role of the school principal. In this case, the Administrative Leadership composite index was derived only from the Bureaucratic rule-following scale.

School climate indices

Three indices describe the climate of the schools that teachers and principals work in. Two of these indices are based on principals' reports: School climate: student delinquency and School climate: teachers' working morale. School climate: student delinquency (SCDELINQ) consists of 6 items and School climate: teachers' working morale (SCTMORAL) of 3 items, that are described in detail in Table 11.39. Response categories were not at all, very little, to some extent and a lot. Item BCG30A, BCG30B, BCG30C, BCG30D, BCG30E were excluded due to their low item-total correlation and a poor fit of a model including all items (see Table 11). These items may be used as single items in further analysis. Additionally teachers were asked to describe Teacher-student relations (TSRELAT). Four items were used to compute this index (see Table 11.41). Response categories were strongly disagree, disagree, agree and strongly agree. The response categories disagree and strongly disagree were collapsed for this scale, because generally only few teachers used the response category strongly disagree and empty cells for some countries hindered further analysis.

Cronbach's Alpha is acceptable or good for all of the scales asking about school climate (see Table 11.42). Only in Estonia and Slovak Republic are the three items measuring School climate: teachers' working morale not substantively intercorrelated with reliabilities below 0.400. Latent correlations between student and

School climate: teachers' working morale (see Table 11.43) are positive and significant in most countries. But the strength of the association between the two scales considerably varies across countries. Table 11.44 shows that a CFA model for the two scales in the Principal questionnaire has an acceptable fit in all but four countries.

Analysis of cross-cultural invariance of the scales shows that model fit hardly deteriorates when factor loadings are restricted to be equal. The difference between the models examining configural and metric invariance is small: with ΔCFI=0.025 and ΔRMSEA = 0.004 the drop in model fit is close to the criteria established by Chen (see earlier in the chapter). Additionally, restricting intercepts to be equal leads to a noticeable drop in model fit (see Table 11.44). This means that the strength of the relations between the scale and each of the items is equal for all countries, while subjects from different countries differ with regards to the relative tendency to endorse each of the single items given the same level of the underlying trait. The results confirm the validity of cross-cultural comparisons of correlations of school climate with other constructs across countries. Mean score comparisons should be interpreted carefully as the mean scores may have a slightly different meaning for each country.

For the computation of factor scores a model assuming metric invariance was used, because only configural and metric invariance have been established for both scales. Thus, the same items with the same factor loadings were used for all participating countries in a multiple group CFA model, but all item intercepts except for one (BCG30G for the scale School climate: student delinquency and BCG30M for the scale School climate: teachers' working morale) and all unique variances were allowed to vary across countries. The parameters used are detailed in Tables 11.45 to 11.50. The factor score determinacy is acceptable for both scales across all participating countries, as can be seen in Table 11.51.

Table 11.53 shows that analysing cross-cultural invariance of the scale "teacher student relations" model fit hardly changes when factor loadings are restricted to be equal across countries compared to a baseline model with free parameters. The drop in model fit is larger when intercepts are additionally restricted to be equal. Consequently, relationships with other scales can be validly compared across countries, but mean score comparisons should be interpreted carefully as the mean scores have a slightly different meaning for each country.

Factor scores are computed based on the model assuming metric invariance, as this is the highest level of invariance that has been established. Thus, all item intercepts except for one (BTG31G) and all unique variances were allowed to vary across countries. The parameters used are detailed in Tables 11.54 to 11.56. The factor score determinacy shown in Table 11.57 is acceptable for all participating countries.

Classroom disciplinary climate index

To describe the classroom level environment, TALIS measures Classroom disciplinary climate (CCLIMATE). Table 11.58 shows the wording of the items belonging to this scale. Response categories were "strongly agree", "agree", "disagree" and "strongly disagree". Items BTG43A, BTG43C and BTG43D are phrased negatively and were inverted for scaling, so that high scores indicate a positive Classroom disciplinary climate and low scores a negative climate.

Table 11.59 shows that the index for Classroom disciplinary climate has a remarkable degree of internal consistency across participating countries. The fit of CFA models is also highly satisfactory at both the national and the international levels (see Table 11.60).

A comparison of multiple group models restricting different parameters across countries generally supports the cross-cultural invariance of this scale (see Table 11.61). Adding restrictions on factor loadings only leads to a small decrease in model fit. The model examining scalar invariance fits worse than the other two models.

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This indicates that mean score comparisons should be interpreted carefully as the mean scores may have a slightly different meaning for each country. Correlations with other constructs can be validly compared across countries.

For the computation of factor scores a model assuming metric invariance was used. All item intercepts except for one (BTG43C) and all unique variance variances were allowed to vary across countries. The parameters used are detailed in Tables 11.62 to 11.64. Table 11.65 shows good a factor score determinacy for all participating countries.

Self-efficacy index

Self-efficacy (SELFEF) was measured with four items. These are described in detail in Table 11.66. Response categories were "strongly agree", "agree", "disagree" and "strongly disagree". Only few teachers used the response category "strongly disagree" and empty cells were found for some countries. Therefore the response categories "disagree" and "strongly disagree" were collapsed.

The scale Self-efficacy shows acceptable reliabilities, both for the international sample and for the country sub-samples (see Table 11.67). Table 11.68 shows the results of confirmatory factor analysis. The model fit is satisfactory for the pooled international sample and for all country sub-samples.

Analysis of cross-cultural invariance of the scale Self-efficacy shows that the scale is valid for international comparisons of relationships with other constructs. The difference in model fit between the models testing configural and metric invariance is small. However, mean score comparisons should be conducted with great care as the drop in model fit adding constraints on the intercepts indicates a slightly different meaning of mean scores across countries. The results of MGCFA are detailed in Table 11.69.

Metric invariance is the highest level of invariance that was established for Self-efficacy. Therefore the corresponding model was used for the computation of factor scores. All item intercepts except for one (BTG31D) and all unique variances were allowed to vary across countries. The parameters used are detailed in Table 11.70 to Table 11.72. The degree of factor score determinacy is acceptable across countries (see Table 11.73).

Beliefs about instruction indices

To describe teachers' and principals' beliefs about instruction three indices were formed: For teachers the index Direct transmission beliefs about instruction (TBTRAD) and for teachers and principals the index Constructivist beliefs about instruction (TBCONS and PBCONS). The item wording of the four items measuring direct transmission beliefs and the four items measuring constructivist beliefs is detailed in Table 11.74. Items BTG29C and BTG29E were not included in the scales (See Table 11.75). These items did not show a clear loading pattern, had low item-total-correlations and model fit could be improved by excluding them. They may still be used as single items in further analysis. Response categories were "strongly agree", "agree", "disagree" and "strongly disagree". The categories "strongly disagree" and "disagree" were collapsed, because "strongly disagree" was only utilised by a few teachers and principals resulting in empty cells for some of the countries.

Reliabilities for the two scales measuring teachers' beliefs tended to be rather poor (see Table 11.76). Furthermore, CFA results (see Table 11.77) show only a moderate fit of the two-dimensional model across sub-samples. In some of the countries the fit of this model is unsatisfactory. Latent correlations between the two scales vary strongly between countries. For Asian, Latin American, Southern European and some of the Eastern European countries direct transmission and constructivist beliefs are moderately positively associated. Non-significant or negative correlations can be found for Northern and Central European countries as well as for Australia.

A comparison between the unrestricted multiple-group model and the model with constrained factor loadings shows a high degree of invariance for these parameters and provides support for the cross-country validity of this model. When additional constraints are imposed on the intercepts, a large drop in model fit can be observed. This signifies that mean score comparisons for these scales cannot unequivocally be interpreted, while there are no objections to comparing relationships with other constructs across countries (see Table 11.78 and Table 11.79).

For the computation of factor scores, a model assuming metric invariance was used. Thus, the same items with the same factor loadings were used for all participating countries in a multiple group CFA model. All item intercepts except for two (BTG29A for the scale Direct transmission beliefs about instruction and BTG29L for the scale Constructivist beliefs about instruction) and all unique variances were allowed to vary across countries. The parameters used are detailed in Tables 11.80 to 11.82. Table 11.83 shows a rather poor factor score determinacy for most of the participating countries. This is due to the comparatively poor fit and the cross-cultural variance of model parameters for these two scales.

For the principals' scale measuring Constructivist beliefs about instruction reliabilities were also comparatively poor, but confirmatory factor analysis shows an excellent fit in all countries, except for Bulgaria and Turkey (see Tables 11.84 and 11.85).

Comparing the multiple group models, the fit indices with constrained factor loadings are only slightly different from those with unconstrained loadings for principals' constructivist beliefs (see Table 11.86). The drop in CFI is above Chen's criterion with ΔCFI = 0.04, but this is still a relatively small drop and the drop in RMSEA is with ΔRMSEA = 0.01 consistent with the rule of thumb. A substantial decrease in model fit is observed when intercepts are additionally restricted. Therefore it must be concluded that principals' constructivist beliefs can be used for comparisons of relationships with other constructs. Mean scores of both scales cannot be unequivocally compared across countries. The poor fit of the models testing scalar invariance indicates that mean scores may have a different meaning across countries.

For the computation of factor scores, a model assuming metric invariance was used. All item intercepts except for BCG32L and all unique variance variances were allowed to vary across countries. The parameters used are detailed in Tables 11.87 to 11.89. Factor score determinancies for the scale Principals' constructivist beliefs about instruction indicate an acceptable correlation between the factor score estimates and their respective factors for most countries. However they are rather poor for 8 of the 23 countries, especially for Lithuania (see Table 11.90).

Classroom teaching practices indices

Thirteen items measuring teachers' instructional practices were administered to the teachers. Three scales were formed: Classroom teaching practice: structuring (TPSTRUC) consisting of five items; Classroom teaching practice: student-oriented (TPSTUD) consisting of four items; and Classroom teaching practice: enhanced activities (TPACTIV) also consisting of four items (Table 11.91). Items BTG42A, BTG42G, BTG42K, BTG42L and BTG42P were not included in the three scales (see Table 11.92). These items either did not show a clear loading pattern or had low item-total-correlations and model fit could be improved by excluding them. They can be used as single items for further analysis. The items were answered on six point ordinal scales. Response categories were "never or hardly ever", "in about one-quarter of lessons", "in about one-half of lessons", "in about three-quarters of lessons" and "in almost every lesson".

Reliabilities for the three scales measuring classroom teaching practices are mostly satisfactory (see Table11.93). Only for the scale Classroom teaching practice: enhanced activities the reliabilities tended to be low for some countries. Table 11.95 further shows an acceptable model fit for most participating countries. In Table11.93,

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reliabilities are presented for the whole sample, but some of the items belonging to the scale Classroom teaching practice: enhanced activities may only be meaningful for teachers of certain subjects. For example it is not very likely that a physical education teacher often holds a debate, while it is for a social science teacher. Therefore, subject specific reliabilities are also detailed in Table 11.94. Furthermore Table 11.96 shows that the model fit is satisfactory for the subjects reading, writing and literature, mathematics, science, social studies and modern foreign languages. But it is rather poor for the other subjects.

Correlations between Classroom teaching practice: student-oriented and Classroom teaching practice: enhanced activities are generally high. Correlations of Classroom teaching practice: structuring and Classroom teaching practice: student-oriented and Classroom teaching practice: structuring and Classroom teaching practice: enhanced activities are non-significant to moderate and markedly vary by country. A similar pattern of correlations can be found for all subject groups.

Tables 11.97, 11.98 and 11.99 show that the fit for multiple group models with unrestricted factor loadings is only marginally superior to the models with constrained factor loadings. This supports the assumption of metric invariance across TALIS countries. However, adding restrictions of intercepts leads to a noticeable drop in model fit for all three scales, indicating that differences in item means are not unequivocally due to differences in the underlying construct.

Thus, for the three scales measuring classroom teaching practices, only configural and metric invariance were established. Therefore a model with similar factor loadings, but different item intercepts (except for the items BTG42M for the scale Classroom teaching practice: structuring, BTG42N for the scale Classroom teaching practice: student-oriented BTG42Q for the scale Classroom teaching practice: enhanced activities, which were restricted to be equal for identification purposes) and unique variances was used for the computation of factor scores. The parameters used are detailed in Tables 11.100 to 11.108. Table 11.109 shows that the factor score determinacy is acceptably small across all participating countries.

Co-operation among staff indices

Co-operation among staff was measured with 12 items. Two scales were formed: Exchange and co-ordination for teaching (TCEXCHAN) and Professional collaboration (TCCOLLAB). Both scales consist of five items. Table 11.110 shows a list of items and constructs. Items BTG30A and BTG30B were not included in the scales (see Table 11.111), because they did not show a clear loading pattern, but rather formed a third factor in many countries. All items were answered on six point ordinal scales. Response categories were “never”, “less than once per year”, “once per year”, “3-4 times per year”, “monthly” and “weekly”.

Reliabilities and model fit were satisfactory for the two scales measuring co-operation among staff (see Table 11.112 and Table 11.113). Only for three of the countries, model fit or reliabilities were noticeably below the common boundaries. Correlations of the two scales measuring co-operation among staff are generally high, showing that both dimensions are closely related. Still model fit indices and loading patterns suggest two factors. The strength of the correlation varies between countries. In Denmark model fit is relatively poor and the latent correlation equals 0.900, showing that the two dimensions are not clearly distinguishable for the Danish sample.

Tables 11.114 and 11.115 show that the two scales measuring co-operation among staff are metric-invariant. Change in model fit is relatively small when additional constraints on factor loadings are added. The drop in model fit is large when the intercepts are also constricted to be equal across countries. For a given level of the latent trait, the probability to endorse each of the single items varies across countries and consequently mean scores for these scales may have a slightly different meaning from one country to the next. This should be considered analysing descriptive data.

For the computation of factor scores, a model assuming metric invariance was used. All item intercepts except for three (BTG30C for the scale Exchange and co-ordination for teaching, BTG30J for the scale Professional collaboration) and all unique variances were allowed to vary across countries. The parameters used are detailed in Table 11.116 to Table 11.121. The factor score determinacy is rather small for both scales and across countries (see Table 11.122).

NOTES

1. The latent y notation treats the items as endogenous variables that are caused by other variables. However, for CFA with Mplus it does not make a difference whether the latent x or the latent y notation is used.

2. Model identification concerns the relative ratio of freely estimated parameters (unknowns) to the number of known parameters. Only when the former exceeds the latter, there is enough information available to obtain a unique set of parameter estimates for each parameter in the model whose value is unknown.

3. Given the *i)* presence of missing data, *ii)* varying levels of missing data in each country, and *iii)* the fact that a single set of scaled equal weights were computed, the effective weight with which each country contributed to the transformation may have been slightly smaller than one.

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Table 11.1

Item wording for school autonomy indices

	BCG31 Regarding this school, who has a considerable responsibility for the following tasks?
BCG31A	Selecting teachers for hire.
BCG31B	Firing teachers.
BCG31C	Establishing teachers' starting salaries.
BCG31D	Determining teachers' salary increases.
BCG31E	Formulating the school budget.
BCG31F	Deciding on budget allocations within the school.
BCG31G	Establishing student disciplinary policies.
BCG31H	Establishing student assessment policies.
BCG31I	Approving students for admission to the school.
BCG31J	Choosing which textbooks are used.
BCG31K	Determining course content.
BCG31L	Deciding which courses are offered.
BCG31M	Allocating funds for teachers' professional development.

Source: OECD, *TALIS Database.*

Table 11.2

Selection of indices – rotated component matrix

		Component			
		1	2	3	4
BCG31A	Selecting teachers for hire.	0.642	0.587	-0.199	0.077
BCG31B	Firing teachers.	0.689	0.533	-0.228	0.063
BCG31C	Establishing teachers' starting salaries.	0.866	-0.040	0.213	0.086
BCG31D	Determining teachers' salary increases.	0.855	-0.074	0.170	0.135
BCG31E	Formulating the school budget.	0.153	-0.039	0.104	0.828
BCG31F	Deciding on budget allocations within the school.	0.073	0.277	0.018	0.768
BCG31G	Establishing student disciplinary policies.	0.012	0.689	0.130	0.051
BCG31H	Establishing student assessment policies.	-0.053	0.622	0.330	0.106
BCG31I	Approving students for admission to the school.	0.185	0.534	0.150	0.219
BCG31J	Choosing which textbooks are used.	0.077	0.633	0.361	0.026
BCG31K	Determining course content.	0.135	0.210	0.805	0.034
BCG31L	Deciding which courses are offered.	0.086	0.281	0.742	0.137
BCG31M	Allocating funds for teachers' professional development.	0.453	0.293	0.205	0.351

Source: OECD, *TALIS Database.*

Table 11.3

Factor loadings used for computation of factor scores for the indices of school autonomy

AUTHIRE		AUTBUDGT		AUTSTUDP		AUTCURR	
BCG31A	0.813	BCG31E	0.834	BCG31G	0.793	BCG31J	0.720
BCG31B	0.834	BCG31F	0.834	BCG31H	0.790	BCG31K	0.819
BCG31C	0.785			BCG31I	0.663	BCG31L	0.817
BCG31D	0.772						
BCG31M	0.635						

Source: OECD, *TALIS Database.*

Table 11.4

Reliabilities for indices of school autonomy

	AUTHIRE	AUTSTUDP	AUTCURR	AUTBUDGT
Australia	0.848	0.587	0.239	0.135
Austria	0.699	0.293	0.619	0.244
Belgium (Fl.)	0.379	0.361	0.517	0.466
Brazil	0.944	0.631	0.658	0.696
Bulgaria	0.473	0.381	0.480	0.585
Denmark	0.647	0.560	0.630	0.264
Estonia	0.315	0.529	0.192	0.530
Hungary	0.653	0.651	0.310	0.672
Iceland	0.494	0.309	0.327	0.122
Ireland	0.566	0.691	0.185	0.509
Italy	0.673	0.378	0.377	0.557
Korea	0.768	0.483	0.688	0.379
Lithuania	0.473	0.519	0.682	0.420
Malaysia	0.822	0.659	0.626	0.655
Malta	0.813	0.636	0.854	0.465
Mexico	0.969	0.539	0.854	0.831
Norway	0.567	0.318	0.509	No data
Poland	0.544	0.691	0.678	0.313
Portugal	0.728	0.346	0.411	0.524
Slovak Republic	0.595	0.379	0.648	0.376
Slovenia	0.494	0.668	0.700	0.211
Spain	0.749	0.386	0.591	0.410
Turkey	0.962	0.678	0.684	0.818

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.5

Item wording for school resource indices

	BCG29 Is this school's capacity to provide instruction hindered by any of the following?
BCG29A	Lack of qualified teachers.
BCG29B	Lack of laboratory technicians.
BCG29C	Lack of instructional support personnel.
BCG29D	Lack of other support personnel.
BCG29E	Shortage or inadequacy of instructional materials.
BCG29F	Shortage or inadequacy of computers for instruction.
BCG29G	Shortage or inadequacy of other equipment.
BCG29H	Shortage or inadequacy of library materials.
BCG29I	Other (Please specify).

Source: OECD, *TALIS Database.*

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Table 11.6

Selection of indices-rotated component matrix

		Component	
		1	2
BCG29A	Lack of qualified teachers.	0.167	0.562
BCG29B	Lack of laboratory technicians.	0.284	0.629
BCG29C	Lack of instructional support personnel.	0.149	0.862
BCG29D	Lack of other support personnel.	0.177	0.823
BCG29E	Shortage or inadequacy of instructional materials.	0.723	0.231
BCG29F	Shortage or inadequacy of computers for instruction.	0.802	0.248
BCG29G	Shortage or inadequacy of other equipment.	0.858	0.204
BCG29H	Shortage or inadequacy of library materials.	0.796	0.161

Source: OECD, *TALIS Database.*

Table 11.7

Factor loadings used for computation of factor scores for the indices of school resources

LACKPERS		LACKMAT	
BCG29A	0.594	BCG29E	0.762
BCG29B	0.706	BCG29F	0.845
BCG29C	0.859	BCG29G	0.885
BCG29D	0.830	BCG29H	0.807

Source: OECD, *TALIS Database.*

Table 11.8

Reliabilities for indices of school resources

	LACKPERS	LACKMAT
Australia	0.898	0.925
Austria	0.376	0.631
Belgium (Fl.)	0.857	0.945
Brazil	0.789	0.868
Bulgaria	0.716	0.909
Denmark	0.864	0.942
Estonia	0.832	0.906
Hungary	0.610	0.814
Iceland	0.975	0.977
Ireland	0.494	0.679
Italy	0.537	0.775
Korea	0.961	0.943
Lithuania	0.671	0.823
Malaysia	0.934	0.897
Malta	0.808	0.499
Mexico	0.830	0.885
Norway	0.800	0.856
Poland	0.832	0.776
Portugal	0.721	0.794
Slovak Republic	0.686	0.751
Slovenia	0.760	0.779
Spain	0.790	0.879
Turkey	0.881	0.907

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.9

International means and standard deviations of school- and teacher-level factor score estimates using equally weighted pooled data

	Mean	Standard deviation
School-level indices		
PBCONS	-0.113	0.269
SCDELINQ	0.000	0.626
SCTMORAL	-0.137	0.693
FCSGCD	-0.247	0.388
PROIIPD	0.284	0.379
SUPINSTR	0.097	0.483
ACCROLE	0.069	0.310
BURRULEF	0.332	0.351
ADMINL	-0.004	0.897
INSTRL	0.000	0.744
Teacher-level indices		
CCLIMATE	-0.029	0.658
TSRELAT	-0.071	0.297
SELFEF	-0.107	0.335
TPSTRUC	-0.069	0.615
TPSTUD	0.221	0.770
TPACTIV	0.087	0.608
TBTRAD	-0.072	0.203
TBCONS	0.049	0.235
TCEXCHAN	-0.327	0.516
TCCOLLAB	-0.308	0.789

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.10

Item wording of school leadership indices and dimensions

Please indicate the frequency of these activities and behaviours in this school during the current year (BCG15); How strongly do you agree or disagree with these statements as applied to this school, your job and the teachers at this school (BCG16)

Framing and communicating the school's goals and curricular development scale	BCG15A	I make sure that the professional development activities of teachers are in accordance with the teaching goals of the school.
	BCG15B	I ensure that teachers work according to the school's educational goals.
	BCG15D	I use student performance results to develop the school's educational goals.
	BCG15J	I take exam results into account in decisions regarding curriculum development.
	BCG15K	I ensure that there is clarity concerning the responsibility for co-ordinating the curriculum.
	BCG16M	In this school, we work on goals and/or a school development plan.
Promoting instructional improvements and professional development	BCG15G	When a teacher has problems in his/her classroom, I take the initiative to discuss matters.
	BCG15H	I inform teachers about possibilities for updating their knowledge and skills.
	BCG15L	When a teacher brings up a classroom problem, we solve the problem together.
	BCG15M	I pay attention to disruptive behaviour in classrooms.
Supervision of the instruction in the school scale	BCG15C	I observe instruction in classrooms.
	BCG15E	I give teachers suggestions as to how they can improve their teaching.
	BCG15F	I monitor students' work.
	BCG15I	I check to see whether classroom activities are in keeping with our educational goals.
Accountability role of the principal	BCG16A	An important part of my job is to ensure that ministry-approved instructional approaches are explained to new teachers, and that more experienced teachers are using these approaches.
	BCG16D	A main part of my job is to ensure that the teaching skills of the staff are always improving.
	BCG16E	An important part of my job is to ensure that teachers are held accountable for the attainment of the school's goals.
	BCG16F	An important part of my job is to present new ideas to the parents in a convincing way.
Bureaucratic Rule-Following scale	BCG16H	It is important for the school that I see to it that everyone sticks to the rules.
	BCG16I	It is important for the school that I check for mistakes and errors in administrative procedures and reports.
	BCG16J	An important part of my job is to resolve problems with the timetable and/or lesson planning.
	BCG16K	An important part of my job is to create an orderly atmosphere in the school.
	BCG16O	I stimulate a task-oriented atmosphere in this school.

Source: OECD, *TALIS Database.*

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Table 11.11

Single items measuring school leadership and management behaviours

Please indicate the frequency of these activities and behaviours in this school during the current year (BCG15). How strongly do you agree or disagree with these statements as applied to this school, your job and the teachers at this school (BCG16)

Single items	BCG15N	I take over lessons from teachers who are unexpectedly absent.
	BCG16B	Using test scores of students to evaluate a teacher's performance devalues the teacher's professional judgment.
	BCG16C	Giving teachers too much freedom to choose their own instructional techniques can lead to poor teaching.
	BCG16G	I influence decisions about this school taken at a higher administrative level.
	BCG16L	I have no way of knowing whether teachers are performing well or badly in their teaching duties.
	BCG16N	I define goals to be accomplished by the staff of this school.

Source: OECD, *TALIS Database.*

Table 11.12

Reliabilities for indices of school leadership

	FCSGCD	PROIIPD	SUPINSTR	ACCROLE	BURRULEF
Australia	0.777	0.700	0.682	0.700	0.694
Austria	0.681	0.596	0.533	0.558	0.616
Belgium (Fl.)	0.739	0.677	0.607	0.632	0.569
Brazil	0.823	0.664	0.734	0.668	0.685
Bulgaria	0.649	0.455	0.628	0.563	0.669
Denmark	0.631	0.652	0.402	0.517	0.394
Estonia	0.692	0.668	0.612	0.644	0.440
Hungary	0.647	0.586	0.670	0.634	0.693
Iceland	0.748	0.634	0.464	0.671	0.654
Ireland	0.739	0.649	0.638	0.627	0.635
Italy	0.653	0.597	0.739	0.605	0.477
Korea	0.688	0.681	0.671	0.627	0.782
Lithuania	0.763	0.622	0.597	m	0.743
Malaysia	0.817	0.780	0.761	0.642	0.726
Malta	0.715	0.631	0.687	0.621	0.674
Mexico	0.762	0.639	0.676	0.678	0.715
Norway	0.744	0.662	0.520	0.575	0.500
Poland	0.730	0.679	0.537	0.470	0.446
Portugal	0.699	0.607	0.728	0.683	0.683
Slovak Republic	0.714	0.737	0.589	0.539	0.590
Slovenia	0.681	0.607	0.673	0.529	0.558
Spain	0.720	0.619	0.737	0.687	0.729
Turkey	0.832	0.797	0.749	0.712	0.789
International sample	0.799	0.724	0.745	0.650	0.694
Netherlands	0.488	0.747	0.546	0.447	0.590

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
m = missing
Source: OECD, *TALIS Database.*

Table 11.13

Model fit for the scale Framing and communicating the school's goals and curricular development

	CFI	TLI	RMSEA	SRMR
Australia	0.946	0.911	0.086	0.055
Austria	1.000	1.023	0.000	0.035
Belgium (Fl.)	0.981	0.959	0.057	0.035
Brazil	0.976	0.954	0.070	0.043
Bulgaria	0.878	0.797	0.107	0.056
Denmark	0.905	0.821	0.099	0.064
Estonia	0.956	0.927	0.064	0.046
Hungary	0.834	0.689	0.127	0.073
Iceland	0.986	0.973	0.047	0.041
Ireland[1]	0.929	0.867	0.094	0.050
Italy[1]	0.926	0.877	0.067	0.047
Korea[1]	1.000	1.012	0.000	0.036
Lithuania	1.000	1.014	0.000	0.028
Malaysia	1.000	1.032	0.000	0.022
Malta	0.944	0.880	0.103	0.079
Mexico	0.943	0.905	0.079	0.050
Norway	0.947	0.900	0.086	0.044
Poland	0.976	0.955	0.071	0.038
Portugal	0.995	0.990	0.027	0.040
Slovak Republic	1.000	1.037	0.000	0.029
Slovenia[1]	1.000	0.999	0.004	0.038
Spain	0.942	0.876	0.084	0.047
Turkey[1]	0.981	0.959	0.073	0.030
International Sample	0.999	0.997	0.013	0.008
Netherlands	0.853	0.755	0.073	0.093

1. The model estimation terminated normally but the standard errors are not trustworthy.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.14

Model fit for the scale Promoting instructional improvements and professional development

	CFI	TLI	RMSEA	SRMR
Australia	0.991	0.973	0.052	0.027
Austria	0.955	0.864	0.109	0.034
Belgium (Fl.)	0.916	0.747	0.151	0.045
Brazil[1]	1.000	1.077	0.000	0.007
Bulgaria	0.943	0.828	0.078	0.032
Denmark	0.978	0.933	0.052	0.030
Estonia	1.000	1.082	0.000	0.006
Hungary	0.911	0.734	0.153	0.051
Iceland[1]	0.956	0.868	0.102	0.038
Ireland	1.000	1.005	0.000	0.027
Italy	0.967	0.900	0.077	0.035
Korea	1.000	1.009	0.000	0.019
Lithuania	0.948	0.845	0.113	0.034
Malaysia	0.929	0.788	0.186	0.039
Malta[1]	1.000	1.075	0.000	0.034
Mexico	1.000	1.067	0.000	0.012
Norway	1.000	1.039	0.000	0.016
Poland	0.888	0.664	0.151	0.061
Portugal[1]	0.951	0.852	0.090	0.036
Slovak Republic	0.989	0.966	0.068	0.025
Slovenia	0.916	0.748	0.132	0.040
Spain	0.969	0.907	0.069	0.032
Turkey	0.952	0.855	0.138	0.045
International Sample	0.995	0.986	0.032	0.010
Netherlands	1.000	1.109	0.000	0.006

1. The model estimation terminated normally but the standard errors are not trustworthy.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.15

Model fit for the scale Supervision of instruction in the school

	CFI	TLI	RMSEA	SRMR
Australia	0.914	0.742	0.152	0.037
Austria	1.000	1.144	0.000	0.015
Belgium (Fl.)	0.997	0.980	0.039	0.011
Brazil	1.000	1.023	0.000	0.015
Bulgaria	1.000	1.073	0.000	0.011
Denmark[1]	1.000	1.095	0.000	0.025
Estonia	1.000	1.083	0.000	0.019
Hungary	0.930	0.581	0.233	0.036
Iceland	1.000	1.194	0.000	0.024
Ireland	1.000	1.108	0.000	0.015
Italy	0.982	0.947	0.087	0.022
Korea	1.000	1.017	0.000	0.017
Lithuania	0.980	0.939	0.064	0.028
Malaysia	0.976	0.929	0.099	0.026
Malta	0.902	0.707	0.162	0.057
Mexico	1.000	1.029	0.000	0.016
Norway	0.953	0.858	0.099	0.040
Poland	0.998	0.994	0.013	0.030
Portugal	1.000	1.025	0.000	0.016
Slovak Republic	1.000	1.025	0.000	0.021
Slovenia	1.000	1.080	0.000	0.012
Spain	0.988	0.963	0.064	0.019
Turkey	1.000	1.008	0.000	0.015
International Sample	1.000	1.001	0.000	0.004
Netherlands	1.000	2.754	0.000	0.032

1. The model estimation terminated normally but the standard errors are not trustworthy.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.16

Model fit for the scale Accountability role of the principal

	CFI	TLI	RMSEA	SRMR
Australia	1.000	1.020	0.000	0.017
Austria	0.802	0.407	0.175	0.044
Belgium (Fl.)	0.977	0.931	0.065	0.030
Brazil	0.865	0.596	0.154	0.040
Bulgaria	1.000	1.030	0.000	0.012
Denmark	1.000	1.197	0.000	0.009
Estonia	0.981	0.943	0.059	0.028
Hungary[1]	0.999	0.998	0.013	0.023
Iceland	1.000	1.096	0.000	0.016
Ireland	0.872	0.617	0.162	0.039
Italy[1]	0.989	0.966	0.051	0.033
Korea	0.995	0.986	0.036	0.022
Lithuania	m	m	m	m
Malaysia	1.000	1.097	0.000	0.009
Malta	0.867	0.602	0.151	0.050
Mexico	0.979	0.938	0.079	0.026
Norway	1.000	1.083	0.000	0.029
Poland	0.990	0.971	0.042	0.021
Portugal	0.940	0.819	0.123	0.044
Slovak Republic[1]	0.972	0.917	0.066	0.040
Slovenia	1.000	1.023	0.000	0.026
Spain	1.000	0.999	0.012	0.020
Turkey[1]	1.000	1.045	0.000	0.005
International Sample	0.998	0.993	0.020	0.008
Netherlands	0.591	-0.227	0.232	0.090

1. The model estimation terminated normally but the standard errors are not trustworthy.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
m= missing
Source: OECD, *TALIS Database.*

Table 11.17

Model fit for the scale Bureaucratic rule-following

	CFI	TLI	RMSEA	SRMR
Australia	0.910	0.821	0.104	0.047
Austria	0.938	0.876	0.086	0.047
Belgium (Fl.)	0.882	0.764	0.102	0.105
Brazil	0.990	0.979	0.030	0.036
Bulgaria[1]	0.983	0.957	0.062	0.034
Denmark[1]	0.712	0.423	0.155	0.069
Estonia	0.931	0.861	0.062	0.042
Hungary[1]	0.993	0.983	0.033	0.026
Iceland[1]	1.000	1.167	0.000	0.018
Ireland[1]	1.000	1.025	0.000	0.035
Italy[1]	0.646	0.292	0.124	0.055
Korea	0.972	0.930	0.097	0.034
Lithuania[1]	1.000	1.032	0.000	0.017
Malaysia	0.969	0.938	0.059	0.040
Malta	1.000	1.158	0.000	0.037
Mexico[1]	0.982	0.963	0.044	0.035
Norway	0.964	0.929	0.050	0.037
Poland	0.834	0.667	0.097	0.050
Portugal	0.970	0.941	0.070	0.036
Slovak Republic	0.896	0.792	0.089	0.046
Slovenia	1.000	1.003	0.000	0.032
Spain	0.940	0.849	0.103	0.041
Turkey	1.000	1.005	0.000	0.021
International Sample	1.000	1.001	0.000	0.004
Netherlands	0.938	0.876	0.068	0.070

1. The model estimation terminated normally but the standard errors are not trustworthy.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.18

Multiple group CFA examining different levels of cross-cultural invariance of the scale Framing and communicating the school's goals and curricular development

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural Invariance	**0.824**	**0.710**	**0.143**	**0.067**	-	-
Metric Invariance	**0.810**	**0.794**	**0.121**	**0.145**	**-0.014**	**-0.022**
Scalar Invariance	0.458	0.562	0.186	0.281	-0.352	0.065
Uniqueness	0.000	0.264	0.241	1.166	-0.458	0.055

Note: Model estimates based on international calibration sample (1 000 teachers per country).
Source: OECD, *TALIS Database.*

Table 11.19

Multiple group CFA examining different levels of cross-cultural invariance of the scale Promoting instructional improvements and professional development

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural Invariance	[1]	[1]	[1]	[1]	-	-
Metric Invariance	**0.907**	**0.885**	**0.097**	**0.139**	-	-
Scalar Invariance	0.509	0.619	0.177	0.213	-0.398	0.080
Uniqueness	0.000	0.036	0.282	1.088	-0.509	0.105

1. The model estimation terminated normally but the standard errors are not trustworthy and the model fit index are not used for comparison purposes.
Note: Model estimates based on international calibration sample (1 000 teachers per country).
Source: OECD, *TALIS Database.*

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Table 11.20

Multiple group CFA examining different levels of cross-cultural invariance of the scale Supervision of instruction in the school

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural Invariance	**0.974**	**0.922**	**0.080**	**0.030**	**-**	**-**
Metric Invariance	**0.937**	**0.922**	**0.080**	**0.099**	**-0.037**	**0.000**
Scalar Invariance	0.243	0.413	0.220	0.276	-0.694	0.140
Uniqueness	0.000	-0.241	0.321	1.106	-0.243	0.101

Note: Model estimates based on international calibration sample (1 000 teachers per country).
Source: OECD, *TALIS Database.*

Table 11.21

Multiple group CFA examining different levels of cross-cultural invariance of the scale Accountability role of the principal

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural Invariance	*	*	*	*	**-**	**-**
Metric Invariance	**0.892**	**0.866**	**0.098**	**0.145**	**-**	**-**
Scalar Invariance	0.235	0.406	0.207	0.242	-0.657	0.109
Uniqueness	0.000	-0.312	0.307	1.117	-0.235	0.100

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
"*" appears when model estimation terminated normally but the standard errors are not trustworthy and the model fit index are not used for comparison purposes.
Source: OECD, *TALIS Database.*

Table 11.22

Multiple group CFA examining different levels of cross-cultural invariance of principals' Bureaucratic rule-following

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural Invariance	**0.879**	**0.759**	**0.120**	**0.051**	**-**	**-**
Metric Invariance	**0.838**	**0.817**	**0.105**	**0.133**	**-0.041**	**-0.015**
Scalar Invariance	0.258	0.413	0.188	0.338	-0.580	0.083
Uniqueness	0.000	-0.304	0.280	1.225	-0.258	0.092

Note: Model estimates based on international calibration sample (1 000 teachers per country).
Source: OECD, *TALIS Database.*

Table 11.23

Factor loadings used for the computation of factor scores for the indicator Framing and communicating the school's goals and curricular development

	BCG15A	BCG15B	BCG15D	BCG15J	BCG15K	BCG16M
International sample	1.000	0.908	0.840	0.973	0.951	0.631

Source: OECD, *TALIS Database.*

Table 11.24

Item intercepts used for the computation of factor scores for the indicator Framing and communicating the school's goals and curricular development, by country

	BCG15A	BCG15B	BCG15D	BCG15J	BCG15K	BCG16M
Australia		3.537	3.423	2.997	3.537	3.493
Austria		3.783	3.248	2.612	3.449	3.876
Belgium (Fl.)		3.697	2.986	3.167	3.260	3.543
Brazil		3.657	3.609	3.375	3.524	3.544
Bulgaria		3.771	3.256	2.841	3.441	3.567
Denmark		3.589	2.908	2.832	3.619	3.609
Estonia		3.584	3.366	2.950	3.468	3.507
Hungary		3.728	3.332	2.864	3.079	3.314
Iceland		3.470	2.848	2.880	3.308	3.458
Ireland		3.627	2.964	3.065	3.456	3.574
Italy		3.942	3.490	3.527	3.725	3.723
Korea	3.608	3.670	3.339	3.029	3.584	3.594
Lithuania		3.736	3.473	3.117	3.598	3.599
Malaysia		3.872	3.459	3.827	3.746	3.923
Malta		3.526	3.029	3.139	3.119	3.659
Mexico		3.696	3.465	3.328	3.428	3.613
Norway		3.600	3.294	3.042	3.436	3.757
Poland		3.743	3.460	3.097	3.113	3.274
Portugal		3.675	3.557	3.498	3.425	3.343
Slovak Republic		3.615	3.067	2.817	3.401	3.584
Slovenia		3.796	2.982	2.943	3.053	3.301
Spain		3.732	3.469	3.160	3.589	3.503
Turkey		3.740	3.465	3.161	3.553	3.635
Netherlands		3.514	3.065	3.109	3.445	3.382

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.25

Unique variances used for the computation of factor scores for the indicator Framing and communicating the school's goals and curricular development, by country

	BCG15A	BCG15B	BCG15D	BCG15J	BCG15K	BCG16M
Australia	0.131	0.144	0.320	0.424	0.178	0.319
Austria	0.354	0.259	0.286	0.294	0.388	0.269
Belgium (Fl.)	0.147	0.129	0.311	0.499	0.262	0.186
Brazil	0.137	0.125	0.200	0.286	0.253	0.235
Bulgaria	0.130	0.120	0.245	0.592	0.259	0.182
Denmark	0.169	0.225	0.432	0.543	0.297	0.254
Estonia	0.126	0.157	0.262	0.431	0.323	0.300
Hungary	0.200	0.172	0.289	0.643	0.364	0.225
Iceland	0.216	0.212	0.326	0.236	0.351	0.258
Ireland	0.241	0.191	0.385	0.419	0.212	0.191
Italy	0.260	0.168	0.404	0.384	0.245	0.248
Korea	0.095	0.117	0.231	0.388	0.223	0.250
Lithuania	0.171	0.155	0.154	0.347	0.270	0.202
Malaysia	0.214	0.158	0.224	0.175	0.133	0.213
Malta	0.257	0.195	0.223	0.518	0.231	0.246
Mexico	0.244	0.161	0.248	0.256	0.153	0.365
Norway	0.216	0.149	0.234	0.399	0.224	0.288
Poland	0.107	0.076	0.188	0.550	0.377	0.239
Portugal	0.176	0.119	0.238	0.332	0.232	0.245
Slovak Republic	0.264	0.178	0.351	0.321	0.246	0.208
Slovenia	0.188	0.124	0.271	0.248	0.223	0.210
Spain	0.446	0.207	0.383	0.417	0.273	0.290
Turkey	0.117	0.119	0.290	0.523	0.149	0.251
Netherlands	0.206	0.140	0.412	0.292	0.390	0.403

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.26

Factor loadings used for the computation of factor scores for the indicator Promoting instructional improvements and professional development

	BCG15G	BCG15H	BCG15L	BCG15M
International sample	1.000	0.730	1.073	0.888

Source: OECD, *TALIS Database.*

Table 11.27

Item intercepts used for the computation of factor scores for the indicator Promoting instructional improvements and professional development, by country

	BCG15G	BCG15H	BCG15L	BCG15M
Australia		3.210	2.989	3.265
Austria		2.919	3.073	3.130
Belgium (Fl.)		3.070	3.171	3.166
Brazil		3.142	3.033	3.198
Bulgaria		3.308	3.091	3.342
Denmark		2.799	2.816	2.919
Estonia		3.375	3.396	3.197
Hungary		3.059	2.510	3.205
Iceland		3.247	3.435	2.896
Ireland		3.186	3.327	3.505
Italy		3.223	3.061	3.034
Korea	2.860	2.973	3.223	3.007
Lithuania		3.215	3.127	3.050
Malaysia		3.193	3.239	3.458
Malta		2.808	3.008	3.200
Mexico		3.300	3.359	3.444
Norway		2.820	3.083	3.119
Poland		3.069	3.128	3.080
Portugal		3.070	3.244	3.398
Slovak Republic		3.397	3.457	3.316
Slovenia		3.116	3.061	2.901
Spain		2.920	3.203	3.483
Turkey		2.862	2.877	3.136
Netherlands		2.908	2.865	2.482

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.28

Unique variances used for the computation of factor scores for the indicator Promoting instructional improvements and professional development, by country

	BCG15G	BCG15H	BCG15L	BCG15M
Australia	0.262	0.282	0.235	0.294
Austria	0.248	0.368	0.242	0.214
Belgium (Fl.)	0.248	0.314	0.157	0.178
Brazil	0.211	0.204	0.058	0.100
Bulgaria	0.291	0.254	0.165	0.247
Denmark	0.228	0.205	0.156	0.217
Estonia	0.240	0.282	0.192	0.366
Hungary	0.239	0.353	0.244	0.199
Iceland	0.230	0.317	0.114	0.368
Ireland	0.238	0.261	0.130	0.144
Italy	0.285	0.233	0.123	0.198
Korea	0.210	0.174	0.154	0.122
Lithuania	0.188	0.271	0.137	0.453
Malaysia	0.215	0.216	0.161	0.232
Malta	0.176	0.365	0.105	0.157
Mexico	0.414	0.254	0.166	0.187
Norway	0.181	0.217	0.164	0.216
Poland	0.261	0.263	0.187	0.305
Portugal	0.284	0.368	0.141	0.115
Slovak Republic	0.376	0.207	0.201	0.223
Slovenia	0.222	0.238	0.169	0.242
Spain	0.481	0.483	0.219	0.182
Turkey	0.158	0.240	0.152	0.207
Netherlands	0.256	0.116	0.104	0.291

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.29

Factor loadings used for the computation of factor scores for the indicator Supervision of instruction in the school

	BCG15C	BCG15E	BCG15F	BCG15I
International sample	1.000	0.965	0.960	1.015

Source: OECD, *TALIS Database.*

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Table 11.30

Item intercepts used for the computation of factor scores for the indicator Supervision of instruction in the school, by country

	BCG15C	BCG15E	BCG15F	BCG15I
Australia		2.704	2.382	2.741
Austria		2.760	3.236	2.949
Belgium (Fl.)		2.721	2.681	2.705
Brazil		2.775	2.327	2.714
Bulgaria		2.439	2.716	2.930
Denmark		2.814	3.493	3.169
Estonia		2.844	2.957	2.752
Hungary		2.829	3.065	2.818
Iceland		2.743	2.926	2.609
Ireland		2.930	3.071	3.169
Italy		2.501	1.906	2.671
Korea	2.486	2.835	3.030	2.628
Lithuania		3.010	2.520	2.997
Malaysia		2.905	2.523	3.019
Malta		2.795	2.572	2.986
Mexico		2.714	2.520	2.779
Norway		2.833	2.387	2.914
Poland		2.515	2.667	2.527
Portugal		3.405	3.231	3.353
Slovak Republic		2.209	2.425	2.422
Slovenia		2.371	2.598	2.295
Spain		2.836	2.466	2.846
Turkey		2.699	2.989	2.883
Netherlands		2.664	1.414	2.599

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.31

Unique variances used for the computation of factor scores for the indicator Supervision of instruction in the school, by country

	BCG15C	BCG15E	BCG15F	BCG15I
Australia	0.188	0.292	0.369	0.315
Austria	0.310	0.248	0.280	0.336
Belgium (Fl.)	0.178	0.234	0.394	0.227
Brazil	0.339	0.270	0.297	0.204
Bulgaria	0.178	0.375	0.136	0.248
Denmark	0.239	0.335	0.218	0.300
Estonia	0.206	0.289	0.317	0.329
Hungary	0.211	0.318	0.305	0.257
Iceland	0.208	0.333	0.214	0.212
Ireland	0.283	0.354	0.465	0.342
Italy	0.402	0.316	0.230	0.277
Korea	0.218	0.175	0.157	0.188
Lithuania	0.251	0.164	0.273	0.227
Malaysia	0.241	0.205	0.240	0.267
Malta	0.299	0.258	0.251	0.191
Mexico	0.232	0.242	0.340	0.147
Norway	0.216	0.248	0.208	0.268
Poland	0.231	0.138	0.299	0.193
Portugal	0.313	0.256	0.493	0.318
Slovak Republic	0.384	0.342	0.342	0.202
Slovenia	0.233	0.187	0.183	0.199
Spain	0.371	0.291	0.415	0.288
Turkey	0.345	0.227	0.323	0.089
Netherlands	0.341	0.208	0.377	0.239

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.32

Factor loadings used for the computation of factor scores for the indicator Accountability role of the principal

	BCG16A	BCG16D	BCG16E	BCG16F
International sample	1.000	1.182	1.301	1.173

Source: OECD, *TALIS Database.*

Table 11.33

Item intercepts used for the computation of factor scores for the indicator Accountability role of the principal, by country

	BCG16A	BCG16D	BCG16E	BCG16F
Australia	3.021	3.642	3.324	3.371
Austria		2.875	2.743	3.127
Belgium (Fl.)		3.396	3.345	3.059
Brazil		3.245	2.880	3.015
Bulgaria		2.854	2.811	2.583
Denmark		3.622	3.670	3.523
Estonia		3.466	2.923	2.988
Hungary		3.562	3.280	3.428
Iceland		3.118	3.425	3.372
Ireland		3.206	2.962	3.199
Italy		3.249	3.434	3.099
Korea		3.435	3.483	2.995
Lithuania	m	m	m	m
Malaysia	3.021	3.079	3.259	2.741
Malta		3.574	3.251	3.384
Mexico		3.230	3.404	3.159
Norway		3.260	2.928	2.934
Poland		3.056	3.131	3.150
Portugal		2.985	3.297	3.029
Slovak Republic		2.557	3.303	3.086
Slovenia		2.782	3.258	3.123
Spain		3.295	3.667	3.497
Turkey		3.079	3.341	3.181
Netherlands	-	-	-	-

Notes: The Netherlands was excluded due to stability problems with the scale.
Lithuania did not administer item BCG16A and was therefore excluded from this scale.
m = missing
Source: OECD, *TALIS Database.*

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Table 11.34

Unique variances used for the computation of factor scores for the indicator Accountability role of the principal, by country

	BCG16A	BCG16D	BCG16E	BCG16F
Australia	0.423	0.168	0.151	0.153
Austria	0.510	0.410	0.400	0.335
Belgium (Fl.)	0.228	0.158	0.144	0.304
Brazil	0.307	0.167	0.232	0.217
Bulgaria	0.491	0.199	0.106	0.236
Denmark	0.539	0.184	0.189	0.356
Estonia	0.441	0.311	0.396	0.353
Hungary	0.320	0.148	0.158	0.206
Iceland	0.434	0.368	0.085	0.149
Ireland	0.316	0.201	0.210	0.211
Italy	0.308	0.160	0.090	0.376
Korea	0.148	0.175	0.141	0.198
Lithuania	m	m	m	m
Malaysia	0.294	0.182	0.134	0.246
Malta	0.324	0.187	0.205	0.254
Mexico	0.455	0.221	0.118	0.160
Norway	0.352	0.171	0.381	0.303
Poland	0.503	0.338	0.142	0.243
Portugal	0.291	0.171	0.167	0.224
Slovak Republic	0.276	0.377	0.130	0.201
Slovenia	0.314	0.317	0.187	0.223
Spain	0.389	0.290	0.168	0.216
Turkey	0.242	0.122	0.166	0.211
Netherlands	-	-	-	-

Notes: The Netherlands was excluded due to stability problems with the scale.
Lithuania did not administer item BCG16A and was therefore excluded from this scale.
m = missing
Source: OECD, *TALIS Database.*

Table 11.35

Factor loadings used for the computation of factor scores for the indicator Bureaucratic rule-following

	BCG16H	BCG16I	BCG16J	BCG16K	BCG16O
International sample	1.000	1.208	1.063	0.823	0.539

Source: OECD, *TALIS Database.*

Table 11.36

Item intercepts used for the computation of factor scores for the indicator Bureaucratic rule-following, by country

	BCG16H	BCG16I	BCG16J	BCG16K	BCG16O
Australia		2.850	2.426	3.421	3.021
Austria		2.510	2.485	3.189	3.014
Belgium (Fl.)		2.771	2.326	3.011	2.916
Brazil		2.990	2.721	3.162	2.916
Bulgaria		2.628	2.729	3.226	3.048
Denmark		2.900	2.647	3.937	3.436
Estonia		2.688	1.596	2.989	3.237
Hungary		2.634	2.648	3.202	3.277
Iceland		2.659	3.020	3.176	3.026
Ireland		2.758	3.102	3.452	2.745
Italy		2.829	2.311	3.371	3.141
Korea	3.025	2.940	2.594	3.158	3.082
Lithuania		2.761	2.295	3.188	3.300
Malaysia		2.701	2.749	3.201	2.930
Malta		2.707	2.800	3.524	2.984
Mexico		2.868	2.905	3.230	3.374
Norway		2.852	2.537	3.221	3.340
Poland		2.544	2.840	3.268	2.927
Portugal		2.640	2.635	3.362	3.146
Slovak Republic		2.570	2.431	3.460	3.264
Slovenia		2.675	2.416	3.335	3.032
Spain		3.106	2.748	3.166	3.213
Turkey		2.668	2.423	3.233	2.902
Netherlands		2.908	2.290	2.950	2.902

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.37

Unique variances used for the computation of factor scores for the indicator Bureaucratic rule-following, by country

	BCG16H	BCG16I	BCG16J	BCG16K	BCG16O
Australia	0.254	0.272	0.383	0.316	0.309
Austria	0.269	0.311	0.708	0.341	0.349
Belgium (Fl.)	0.183	0.187	0.482	0.316	0.187
Brazil	0.218	0.102	0.365	0.284	0.259
Bulgaria	0.165	0.121	0.248	0.118	0.229
Denmark	0.295	0.314	0.525	0.141	0.248
Estonia	0.278	0.328	0.442	0.341	0.254
Hungary	0.175	0.130	0.351	0.183	0.226
Iceland	0.170	0.326	0.370	0.328	0.216
Ireland	0.240	0.263	0.187	0.135	0.430
Italy	0.199	0.240	0.391	0.137	0.238
Korea	0.155	0.096	0.330	0.202	0.259
Lithuania	0.135	0.173	0.333	0.168	0.207
Malaysia	0.181	0.129	0.239	0.128	0.238
Malta	0.209	0.233	0.472	0.165	0.368
Mexico	0.199	0.239	0.245	0.235	0.195
Norway	0.326	0.197	0.572	0.207	0.305
Poland	0.155	0.493	0.275	0.361	0.212
Portugal	0.203	0.204	0.354	0.179	0.212
Slovak Republic	0.234	0.260	0.402	0.170	0.255
Slovenia	0.162	0.299	0.412	0.191	0.162
Spain	0.283	0.136	0.478	0.282	0.288
Turkey	0.183	0.086	0.341	0.122	0.222
Netherlands	0.151	0.123	0.538	0.289	0.077

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.38

Factor score determinacy for the scales related to school principal's leadership, by country

	FCSGCD	PROIIPD	SUPINSTR	ACCROLE	BURRULEF
Australia	0.896	0.855	0.853	0.865	0.835
Austria	0.830	0.798	0.724	0.783	0.830
Belgium (Fl.)	0.866	0.817	0.794	0.808	0.795
Brazil	0.914	0.864	0.866	0.832	0.890
Bulgaria	0.845	0.798	0.827	0.856	0.870
Denmark	0.828	0.805	0.611	0.765	0.680
Estonia	0.876	0.826	0.758	0.784	0.698
Hungary	0.785	0.816	0.809	0.809	0.864
Iceland	0.875	0.831	0.727	0.858	0.836
Ireland	0.862	0.822	0.805	0.817	0.833
Italy	0.833	0.804	0.832	0.850	0.720
Korea	0.874	0.849	0.829	0.833	0.925
Lithuania	0.870	0.854	0.822	m	0.883
Malaysia	0.908	0.887	0.861	0.780	0.856
Malta	0.863	0.846	0.816	0.789	0.845
Mexico	0.888	0.823	0.843	0.872	0.853
Norway	0.867	0.851	0.740	0.777	0.804
Poland	0.905	0.858	0.785	0.754	0.769
Portugal	0.871	0.798	0.857	0.835	0.865
Slovak Republic	0.844	0.879	0.825	0.783	0.785
Slovenia	0.811	0.794	0.820	0.747	0.781
Spain	0.876	0.803	0.874	0.832	0.852
Turkey	0.897	0.871	0.878	0.870	0.892
Netherlands	0.655	0.907	0.688	-	0.830

Notes: The Netherlands was excluded due to stability problems with the scale.
Lithuania did not administer item BCG16A and was therefore excluded from this scale.
m = missing
Source: OECD, *TALIS Database.*

Table 11.39

Item wording of school climate items and dimensions – Principal Questionnaire

In this school, to what extent is the learning of students hindered by the following behaviours?

School climate: ctudent delinquency	**BCG30F**	Vandalism.
	BCG30G	Theft.
	BCG30H	Intimidation or verbal abuse of other students (or other forms of bullying).
	BCG30I	Physical injury to other students.
	BCG30J	Intimidation or verbal abuse of teachers or staff.
	BCG30K	Use/possession of drugs and/or alcohol.
School climate: teachers' working morale	**BCG30L**	Arriving late at school.
	BCG30M	Absenteeism.
	BCG30N	Lack of pedagogical preparation.

Source: OECD, *TALIS Database.*

Table 11.40

Single items measuring aspects of school climate

In this school, to what extent is the learning of students hindered by the following behaviours?

Single items	BCG30A	Arriving late at school.
	BCG30B	Absenteeism (*i.e.* unjustified absences).
	BCG30C	Classroom disturbance.
	BCG30D	Cheating.
	BCG30E	Profanity/Swearing.

Source: OECD, *TALIS Database.*

Table 11.41

Item wording of school climate items and dimensions – Teacher Questionnaire

How strongly do you agree or disagree with the following statements …
… about what happens in this school?

Teacher-student relations	BTG31G	In this school, teachers and students usually get on well with each other.
	BTG31H	Most teachers in this school believe that students' well-being is important.
	BTG31I	Most teachers in this school are interested in what students have to say.
	BTG31J	If a student from this school needs extra assistance, the school provides it.

Source: OECD, *TALIS Database.*

Table 11.42

Reliabilities for school climate indices, by country

	SCDELINQ (PQ)	SCTMORAL (PQ)	TSRELAT (TQ)
Australia	0.846	0.669	0.815
Austria	0.877	0.752	0.779
Belgium (Fl.)	0.839	0.671	0.780
Brazil	0.887	0.733	0.741
Bulgaria	0.824	0.626	0.802
Denmark	0.901	0.860	0.813
Estonia	0.779	0.367	0.723
Hungary	0.862	0.751	0.819
Iceland	0.899	0.564	0.756
Ireland	0.864	0.613	0.802
Italy	0.882	0.778	0.741
Korea	0.947	0.909	0.723
Lithuania	0.939	0.837	0.782
Malaysia	0.927	0.863	0.772
Malta	0.883	0.741	0.732
Mexico	0.955	0.949	0.784
Norway	0.819	0.600	0.702
Poland	0.898	0.616	0.775
Portugal	0.910	0.718	0.729
Slovak Republic	0.818	0.260	0.717
Slovenia	0.873	0.769	0.711
Spain	0.952	0.854	0.748
Turkey	0.942	0.966	0.811
International sample	0.925	0.854	0.763
Netherlands	0.761	0.688	0.800

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.43

Model fit and latent correlations for factors influencing school climate, by country

	Model fit				Latent correlations between
	CFI	TLI	RMSEA	SRMR	SCDELINQ/ SCTMORAL
Australia	0.951	0.932	0.074	0.052	0.549
Austria	0.991	0.988	0.033	0.039	0.572
Belgium (Fl.)	0.884	0.840	0.120	0.060	0.781
Brazil	0.966	0.952	0.072	0.043	0.672
Bulgaria	0.828	0.762	0.129	0.079	0.547
Denmark	0.971	0.960	0.090	0.035	0.885
Estonia	0.985	0.980	0.030	0.055	0.194
Hungary	0.793	0.713	0.191	0.100	0.545
Iceland	0.933	0.907	0.103	0.077	0.351
Ireland	0.930	0.902	0.085	0.044	0.432
Italy	0.953	0.935	0.093	0.044	0.769
Korea	0.929	0.902	0.147	0.041	0.923
Lithuania	0.975	0.965	0.071	0.033	0.839
Malaysia	0.919	0.888	0.141	0.053	0.730
Malta	0.950	0.931	0.088	0.058	0.798
Mexico	0.959	0.943	0.100	0.031	0.718
Norway	0.868	0.818	0.125	0.062	0.525
Poland	0.922	0.891	0.106	0.056	0.651
Portugal	0.913	0.879	0.124	0.048	0.565
Slovak Republic	0.887	0.844	0.098	0.064	0.276
Slovenia	0.956	0.940	0.080	0.044	0.688
Spain	0.931	0.904	0.144	0.042	0.762
Turkey	0.854	0.798	0.196	0.057	0.894
International sample	0.950	0.931	0.093	0.038	0.725
Netherlands	*Model fit could not be computed due to the small sample size*				

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

$p < 0.05$
$p < 0.01$

Table 11.44

Multiple group CFA examining different levels of cross-cultural invariance of factors influencing school climate

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.924**	**0.894**	**0.116**	**0.055**	**-**	**-**
Metric invariance	**0.899**	**0.889**	**0.120**	**0.106**	**-0.025**	**0.004**
Scalar invariance	0.747	0.768	0.172	0.184	-0.152	0.052
Uniqueness invariance	0.691	0.766	0.173	0.199	-0.056	0.001

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.45

Factor loadings used for the computation of factor scores for the indicator School climate: student delinquency

	BCG30F	BCG30G	BCG30H	BCG30I	BCG30J	BCG30K
International sample	1.078	1.000	1.018	1.105	1.125	0.907

Source: OECD, *TALIS Database.*

Table 11.46

Item intercepts used for the computation of factor scores for the indicator School climate: student delinquency, by country

	BCG30F	BCG30G	BCG30H	BCG30I	BCG30J	BCG30K
Australia	1.834		2.258	1.702	1.845	1.645
Austria	2.139		2.275	1.682	1.565	1.404
Belgium (Fl.)	1.899		2.310	1.543	1.883	1.808
Brazil	2.152		2.255	1.890	1.971	1.675
Bulgaria	2.555		2.540	2.000	1.849	1.501
Denmark	1.905		2.283	1.837	1.860	1.532
Estonia	2.079		2.675	1.663	2.369	1.887
Hungary	2.404		2.279	2.048	1.577	1.255
Iceland	2.034		2.205	1.964	2.015	1.573
Ireland	1.901		2.413	1.663	2.028	1.859
Italy	2.122		2.441	2.095	1.874	1.479
Korea	1.912	1.830	2.125	1.903	1.744	1.413
Lithuania	1.896		2.371	1.854	1.818	1.728
Malaysia	1.987		1.809	1.552	1.329	1.421
Malta	2.086		2.661	1.747	1.837	1.398
Mexico	1.833		1.812	1.806	1.575	1.831
Norway	2.111		2.302	1.784	1.959	1.395
Poland	2.332		2.289	2.217	1.595	1.488
Portugal	1.763		2.078	1.936	1.670	1.472
Slovak Republic	2.100		2.088	1.685	1.506	1.401
Slovenia	2.177		2.420	1.659	1.743	1.377
Spain	1.963		2.209	1.849	1.888	1.740
Turkey	2.050		1.897	1.951	1.588	1.657
Netherlands	1.747		2.007	1.224	1.521	1.706

Notes: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.47

Unique variances used for the computation of factor scores for the indicator School climate: student delinquency, by country

	BCG30F	BCG30G	BCG30H	BCG30I	BCG30J	BCG30K
Australia	0.163	0.179	0.197	0.122	0.213	0.183
Austria	0.276	0.215	0.315	0.123	0.240	0.232
Belgium (Fl.)	0.125	0.116	0.235	0.192	0.187	0.205
Brazil	0.295	0.228	0.248	0.159	0.187	0.297
Bulgaria	0.382	0.244	0.257	0.163	0.103	0.155
Denmark	0.205	0.198	0.192	0.135	0.156	0.328
Estonia	0.306	0.204	0.156	0.163	0.207	0.299
Hungary	0.411	0.311	0.238	0.234	0.300	0.415
Iceland	0.213	0.172	0.199	0.138	0.141	0.168
Ireland	0.133	0.125	0.208	0.181	0.266	0.347
Italy	0.255	0.312	0.190	0.198	0.159	0.223
Korea	0.304	0.224	0.210	0.102	0.186	0.380
Lithuania	0.343	0.214	0.349	0.202	0.211	0.364
Malaysia	0.231	0.146	0.107	0.131	0.247	0.380
Malta	0.340	0.206	0.201	0.150	0.168	0.220
Mexico	0.414	0.290	0.231	0.138	0.385	0.484
Norway	0.243	0.182	0.229	0.125	0.174	0.132
Poland	0.267	0.201	0.174	0.159	0.289	0.237
Portugal	0.179	0.227	0.197	0.178	0.238	0.304
Slovak Republic	0.363	0.232	0.246	0.141	0.175	0.244
Slovenia	0.228	0.217	0.236	0.245	0.232	0.196
Spain	0.222	0.210	0.166	0.170	0.212	0.313
Turkey	0.246	0.094	0.340	0.366	0.237	0.487
Netherlands	0.095	0.208	0.217	0.192	0.145	0.099

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.48

Factor loadings used for the computation of factor scores for the indicator School climate: teachers' working morale

	BCG30L	BCG30M	BCG30N
International sample	1.000	1.058	0.958

Source: OECD, *TALIS Database.*

Table 11.49

Item intercepts used for the computation of factor scores for the indicator School climate: teachers' working morale, by country

	BCG30L	BCG30M	BCG30N
Australia	1.723		2.234
Austria	1.860		2.020
Belgium (Fl.)	2.331		2.389
Brazil	2.069		2.092
Bulgaria	2.265		2.260
Denmark	2.555		2.519
Estonia	2.238		2.366
Hungary	1.575		1.861
Iceland	1.627		2.079
Ireland	1.686		1.943
Italy	1.806		2.556
Korea	2.044	2.075	2.530
Lithuania	2.318		2.725
Malaysia	1.999		2.345
Malta	1.782		1.851
Mexico	2.052		2.163
Norway	1.590		1.767
Poland	1.155		0.864
Portugal	1.930		1.925
Slovak Republic	1.901		2.144
Slovenia	1.435		1.729
Spain	2.043		2.249
Turkey	2.030		2.311
Netherlands	1.594		1.710

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.50

Unique variances used for the computation of factor scores for the indicator School climate: teachers' working morale, by country

	BCG30L	BCG30M	BCG30N
Australia	0.150	0.267	0.366
Austria	0.219	0.348	0.272
Belgium (Fl.)	0.164	0.174	0.202
Brazil	0.240	0.293	0.529
Bulgaria	0.172	0.058	0.233
Denmark	0.161	0.244	0.122
Estonia	0.255	0.170	0.387
Hungary	0.218	0.404	0.295
Iceland	0.206	0.357	0.275
Ireland	0.183	0.349	0.344
Italy	0.185	0.397	0.481
Korea	0.118	0.171	0.283
Lithuania	0.170	0.283	0.597
Malaysia	0.162	0.257	0.230
Malta	0.176	0.303	0.438
Mexico	0.169	0.082	0.253
Norway	0.267	0.398	0.186
Poland	0.276	0.313	0.192
Portugal	0.165	0.106	0.335
Slovak Republic	0.195	0.317	0.294
Slovenia	0.233	0.316	0.253
Spain	0.238	0.321	0.433
Turkey	0.109	0.080	0.365
Netherlands	0.173	0.175	0.140

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.51

Factor score determinacy for the indicators School climate: student delinquency and School climate: teachers' working morale, by country

	SCDELINQ	SCTMORAL
Australia	0.932	0.875
Austria	0.938	0.860
Belgium (Fl.)	0.943	0.873
Brazil	0.956	0.906
Bulgaria	0.921	0.851
Denmark	0.969	0.953
Estonia	0.887	0.681
Hungary	0.940	0.871
Iceland	0.951	0.773
Ireland	0.933	0.832
Italy	0.960	0.924
Korea	0.981	0.971
Lithuania	0.971	0.950
Malaysia	0.970	0.936
Malta	0.953	0.906
Mexico	0.977	0.977
Norway	0.926	0.817
Poland	0.943	0.821
Portugal	0.959	0.900
Slovak Republic	0.905	0.649
Slovenia	0.944	0.889
Spain	0.977	0.940
Turkey	0.982	0.985
Netherlands	0.890	0.885

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.52

Model fit of Teacher-student relations (TQ), by country

	CFI	TLI	RMSEA	SRMR
Australia	0.991	0.974	0.064	0.019
Austria	0.990	0.969	0.072	0.015
Belgium (Fl.)	0.999	0.997	0.024	0.010
Brazil	0.999	0.997	0.018	0.009
Bulgaria	1.000	1.001	0.000	0.009
Denmark	0.988	0.964	0.095	0.018
Estonia	1.000	1.005	0.000	0.006
Hungary	0.995	0.984	0.044	0.012
Iceland	0.998	0.995	0.029	0.010
Ireland	0.998	0.994	0.031	0.009
Italy	0.998	0.995	0.022	0.009
Korea	0.999	0.997	0.017	0.011
Lithuania	0.996	0.989	0.036	0.011
Malaysia	1.000	1.003	0.000	0.007
Malta	0.990	0.969	0.079	0.018
Mexico	0.996	0.989	0.041	0.011
Norway	0.982	0.946	0.079	0.019
Poland	0.970	0.909	0.097	0.025
Portugal	0.995	0.986	0.040	0.015
Slovak Republic	0.984	0.951	0.063	0.019
Slovenia	1.000	1.008	0.000	0.005
Spain	0.978	0.935	0.089	0.021
Turkey	0.980	0.939	0.107	0.023
International sample	0.998	0.995	0.034	0.012
Netherlands	0.955	0.866	0.144	0.033

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.53

Multiple group CFA examining different levels of cross-cultural invariance of Teacher-student relations

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.992**	**0.977**	**0.054**	**0.015**	**-**	**-**
Metric invariance	**0.985**	**0.982**	**0.049**	**0.060**	**-0.007**	**-0.005**
Scalar invariance	0.840	0.876	0.126	0.113	-0.145	0.077
Uniqueness invariance	0.774	0.883	0.123	0.228	-0.066	-0.003

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.54

Factor loadings used for the computation of factor scores for the indicator Teacher-student relations

	BTG31G	BTG31H	BTG31I	BTG31J
International sample	1.000	1.413	1.395	1.098

Source: OECD, *TALIS Database.*

Table 11.55

Item intercepts used for the computation of factor scores for the indicator Teacher-student relations, by country

	BTG31G	BTG31H	BTG31I	BTG31J
Australia		2.395	2.188	2.237
Austria		2.158	1.981	2.111
Belgium (Fl.)		2.305	2.156	2.452
Brazil		2.370	2.154	1.964
Bulgaria		2.329	2.279	2.457
Denmark		2.261	2.038	1.901
Estonia		2.298	2.139	2.384
Hungary		2.266	2.227	2.301
Iceland		2.449	2.244	2.111
Ireland		2.287	2.073	2.194
Italy		2.380	2.294	2.228
Korea	2.183	2.229	2.276	2.141
Lithuania		2.448	2.393	2.420
Malaysia		2.606	2.385	2.437
Malta		2.407	2.181	2.241
Mexico		2.463	2.184	2.141
Norway		2.174	1.922	1.721
Poland		2.265	2.271	2.421
Portugal		2.429	2.223	2.256
Slovak Republic		2.421	2.260	2.448
Slovenia		2.377	2.207	2.545
Spain		2.327	2.151	2.208
Turkey		2.242	2.161	2.199
Netherlands		2.203	2.064	2.231

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.56

Unique variances used for the computation of factor scores for the indicator Teacher-student relations, by country

	BTG31G	BTG31H	BTG31I	BTG31J
Australia	0.139	0.103	0.095	0.219
Austria	0.200	0.134	0.140	0.287
Belgium (Fl.)	0.118	0.074	0.084	0.198
Brazil	0.144	0.107	0.124	0.341
Bulgaria	0.129	0.081	0.100	0.156
Denmark	0.116	0.073	0.112	0.279
Estonia	0.144	0.083	0.112	0.188
Hungary	0.103	0.072	0.088	0.166
Iceland	0.149	0.098	0.112	0.322
Ireland	0.139	0.070	0.119	0.239
Italy	0.108	0.096	0.081	0.236
Korea	0.122	0.126	0.079	0.154
Lithuania	0.119	0.092	0.086	0.144
Malaysia	0.189	0.113	0.122	0.167
Malta	0.155	0.123	0.134	0.287
Mexico	0.210	0.154	0.157	0.296
Norway	0.197	0.063	0.180	0.440
Poland	0.129	0.083	0.075	0.203
Portugal	0.128	0.114	0.109	0.224
Slovak Republic	0.139	0.087	0.116	0.188
Slovenia	0.110	0.093	0.102	0.195
Spain	0.123	0.086	0.130	0.222
Turkey	0.199	0.093	0.111	0.206
Netherlands	0.126	0.067	0.090	0.163

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.57

Factor score determinacy for the indicators Teacher-student relations, by country

	TSRELAT
Australia	0.919
Austria	0.906
Belgium (Fl.)	0.911
Brazil	0.901
Bulgaria	0.911
Denmark	0.925
Estonia	0.876
Hungary	0.922
Iceland	0.904
Ireland	0.927
Italy	0.893
Korea	0.873
Lithuania	0.899
Malaysia	0.883
Malta	0.884
Mexico	0.901
Norway	0.894
Poland	0.896
Portugal	0.881
Slovak Republic	0.869
Slovenia	0.860
Spain	0.895
Turkey	0.934
Netherlands	0.909

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.58

Item wording of Classroom disciplinary climate items and dimensions

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

Classroom disciplinary climate	BTG43A	When the lesson begins, I have to wait quite a long time for students to quieten down.
	BTG43B	Students in this class take care to create a pleasant learning atmosphere.
	BTG43C	I lose quite a lot of time because of students interrupting the lesson.
	BTG43D	There is much noise in this classroom.

Source: OECD, *TALIS Database.*

Table 11.59

Reliabilities for Classroom disciplinary climate, by country

	CCLIMATE
Australia	0.827
Austria	0.854
Belgium (Fl.)	0.867
Brazil	0.837
Bulgaria	0.815
Denmark	0.852
Estonia	0.879
Hungary	0.857
Iceland	0.803
Ireland	0.855
Italy	0.850
Korea	0.760
Lithuania	0.809
Malaysia	0.841
Malta	0.830
Mexico	0.696
Norway	0.835
Poland	0.840
Portugal	0.871
Slovak Republic	0.858
Slovenia	0.875
Spain	0.877
Turkey	0.839
International sample	0.837
Netherlands	0.779

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.60

Model fit Classroom disciplinary climate, by country

	CFI	TLI	RMSEA	SRMR
Australia	0.999	0.996	0.028	0.010
Austria	1.000	1.003	0.000	0.004
Belgium (Fl.)	0.999	0.996	0.031	0.006
Brazil	1.000	1.007	0.000	0.003
Bulgaria	1.000	0.999	0.012	0.007
Denmark	0.994	0.982	0.056	0.012
Estonia	1.000	0.999	0.016	0.005
Hungary	0.998	0.994	0.035	0.008
Iceland	1.000	1.006	0.000	0.003
Ireland	0.999	0.996	0.026	0.010
Italy	1.000	1.000	0.000	0.006
Korea	1.000	1.005	0.000	0.005
Lithuania	0.989	0.968	0.063	0.016
Malaysia	0.998	0.995	0.025	0.009
Malta	1.000	1.001	0.000	0.006
Mexico	1.000	1.000	0.000	0.006
Norway	1.000	1.000	0.000	0.006
Poland	0.996	0.989	0.041	0.011
Portugal	0.995	0.984	0.055	0.012
Slovak Republic	1.000	1.005	0.000	0.002
Slovenia	1.000	1.003	0.000	0.003
Spain	0.999	0.996	0.027	0.008
Turkey	0.995	0.985	0.042	0.015
International sample	1.000	1.000	0.005	0.002
Netherlands	1.000	1.011	0.000	0.009

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.61

Multiple group CFA examining different levels of cross-cultural invariance of Classroom disciplinary climate

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.999**	**0.996**	**0.025**	**0.008**	**-**	**-**
Metric invariance	**0.981**	**0.976**	**0.064**	**0.087**	**-0.018**	**0.039**
Scalar invariance	0.883	0.909	0.125	0.124	-0.098	0.061
Uniqueness invariance	0.831	0.912	0.123	0.162	-0.052	-0.002

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.62

Factor loadings used for the computation of factor scores for the indicator Classroom disciplinary climate

	BTG43A	BTG43B	BTG43C	BTG43D
International sample	0.890	0.606	1.000	0.919

Source: OECD, *TALIS Database.*

Table 11.63

Item intercepts used for the computation of factor scores for the indicator Classroom disciplinary climate, by country

	BTG43A	BTG43B	BTG43C	BTG43D
Australia	2.971	2.764		2.695
Austria	3.015	2.838		3.058
Belgium (Fl.)	2.967	2.683		3.012
Brazil	2.774	2.842		2.802
Bulgaria	3.088	2.887		3.040
Denmark	2.993	2.968		2.983
Estonia	2.864	2.443		2.931
Hungary	2.859	2.653		2.939
Iceland	2.262	2.858		2.948
Ireland	3.062	2.728		2.965
Italy	3.030	2.938		3.213
Korea	2.794	2.939	2.890	2.954
Lithuania	3.024	2.858		2.941
Malaysia	2.987	2.931		3.060
Malta	2.967	2.708		3.163
Mexico	3.058	2.959		2.935
Norway	2.680	2.839		3.145
Poland	3.125	2.803		3.048
Portugal	2.905	2.968		3.159
Slovak Republic	3.031	2.883		2.969
Slovenia	2.911	2.727		2.953
Spain	2.940	2.845		2.964
Turkey	3.057	2.761		2.938
Netherlands	2.506	3.108		3.072

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.64

Unique variances used for the computation of factor scores for the indicator Classroom disciplinary climate, by country

	BTG43A	BTG43B	BTG43C	BTG43D
Australia	0.232	0.309	0.160	0.377
Austria	0.264	0.468	0.188	0.254
Belgium (Fl.)	0.203	0.348	0.138	0.123
Brazil	0.290	0.285	0.125	0.162
Bulgaria	0.256	0.321	0.185	0.205
Denmark	0.227	0.318	0.212	0.203
Estonia	0.213	0.360	0.090	0.154
Hungary	0.328	0.309	0.149	0.182
Iceland	0.448	0.350	0.179	0.289
Ireland	0.234	0.394	0.166	0.223
Italy	0.202	0.293	0.160	0.188
Korea	0.281	0.321	0.126	0.150
Lithuania	0.208	0.254	0.146	0.258
Malaysia	0.254	0.266	0.174	0.163
Malta	0.228	0.355	0.195	0.215
Mexico	0.370	0.334	0.187	0.305
Norway	0.522	0.502	0.214	0.270
Poland	0.220	0.242	0.149	0.150
Portugal	0.279	0.257	0.162	0.163
Slovak Republic	0.208	0.246	0.113	0.187
Slovenia	0.172	0.236	0.083	0.129
Spain	0.285	0.333	0.151	0.219
Turkey	0.275	0.394	0.150	0.161
Netherlands	0.348	0.246	0.165	0.242

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.65

Factor score determinacy for the indicators Classroom disciplinary climate, by country

	CCLIMATE
Australia	0.930
Austria	0.937
Belgium (Fl.)	0.952
Brazil	0.935
Bulgaria	0.924
Denmark	0.934
Estonia	0.960
Hungary	0.936
Iceland	0.924
Ireland	0.942
Italy	0.932
Korea	0.921
Lithuania	0.919
Malaysia	0.929
Malta	0.932
Mexico	0.873
Norway	0.940
Poland	0.932
Portugal	0.939
Slovak Republic	0.939
Slovenia	0.959
Spain	0.948
Turkey	0.938
Netherlands	0.901

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.66

Item wording of the scale Self-efficacy

How strongly do you agree or disagree with the following statements about yourself as a teacher in this school?

	BTG31B	I feel that I am making a significant educational difference in the lives of my students.
	BTG31C	If I try really hard, I can make progress with even the most difficult and unmotivated students.
	BTG31D	I am successful with the students in my class.
	BTG31E	I usually know how to get through to students.

Source: OECD, *TALIS Database.*

Table 11.67

Reliabilities for Self-efficacy, by country

	SELFEF
Australia	0.817
Austria	0.752
Belgium (Fl.)	0.787
Brazil	0.771
Bulgaria	0.702
Denmark	0.805
Estonia	0.648
Hungary	0.670
Iceland	0.762
Ireland	0.815
Italy	0.771
Korea	0.744
Lithuania	0.710
Malaysia	0.783
Malta	0.745
Mexico	0.746
Norway	0.717
Poland	0.706
Portugal	0.674
Slovak Republic	0.713
Slovenia	0.613
Spain	0.738
Turkey	0.771
International sample	0.763
Netherlands	0.715

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.68

Model fit for Self-efficacy, by country

	CFI	TLI	RMSEA	SRMR
Australia	0.949	0.847	0.154	0.038
Austria	0.993	0.978	0.050	0.015
Belgium (Fl.)	0.996	0.989	0.036	0.011
Brazil	0.947	0.842	0.140	0.035
Bulgaria	1.000	1.008	0.000	0.005
Denmark	0.996	0.987	0.043	0.012
Estonia	0.981	0.942	0.060	0.019
Hungary	0.958	0.874	0.097	0.028
Iceland	0.944	0.832	0.135	0.039
Ireland	0.987	0.962	0.075	0.018
Italy	0.970	0.910	0.095	0.031
Korea	0.911	0.734	0.164	0.039
Lithuania	0.975	0.926	0.074	0.024
Malaysia	0.959	0.876	0.119	0.028
Malta	0.976	0.927	0.109	0.032
Mexico	0.992	0.975	0.055	0.015
Norway	0.965	0.896	0.105	0.028
Poland	0.995	0.986	0.031	0.013
Portugal	0.998	0.994	0.024	0.011
Slovak Republic	0.995	0.984	0.029	0.015
Slovenia	0.962	0.887	0.078	0.024
Spain	0.998	0.994	0.024	0.011
Turkey	0.995	0.985	0.046	0.013
International sample	0.978	0.934	0.082	0.022
Netherlands	0.959	0.876	0.093	0.034

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.69

Multiple group CFA examining different levels of cross-cultural invariance of Self-efficacy

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.977**	**0.931**	**0.086**	**0.024**	**-**	**-**
Metric invariance	**0.966**	**0.958**	**0.067**	**0.061**	**-0.011**	**-0.019**
Scalar invariance	0.773	0.824	0.136	0.141	-0.193	0.069
Uniqueness invariance	0.712	0.851	0.126	0.208	-0.061	-0.01

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.70

Factor loadings used for the computation of factor scores for the indicator Self-efficacy

	BTG31B	BTG31C	BTG31D	BTG31E
International sample	0.882	0.897	1.000	0.933

Source: OECD, *TALIS Database.*

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Table 11.71

Item intercepts used for the computation of factor scores for the indicator Self-efficacy, by country

	BTG31B	BTG31C	BTG31D	BTG31E
Australia	2.228	2.097		2.218
Austria	2.165	2.056		2.313
Belgium (Fl.)	2.332	2.042		2.181
Brazil	2.244	2.238		2.291
Bulgaria	2.291	2.008		2.256
Denmark	2.311	1.935		2.291
Estonia	2.199	2.092		2.308
Hungary	2.151	1.999		2.493
Iceland	2.001	2.138		2.219
Ireland	2.245	2.146		2.170
Italy	2.173	2.112		2.216
Korea	2.279	2.313	2.237	2.309
Lithuania	2.164	2.036		2.205
Malaysia	2.418	2.491		2.338
Malta	2.270	2.183		2.296
Mexico	2.406	2.449		2.365
Norway	2.597	2.246		2.377
Poland	2.276	2.197		2.158
Portugal	2.200	1.920		2.385
Slovak Republic	2.279	2.163		2.247
Slovenia	2.033	2.225		2.402
Spain	2.238	2.007		2.287
Turkey	2.226	2.212		2.319
Netherlands	2.340	2.052		2.267

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.72

Unique variances used for the computation of factor scores for the indicator Self-efficacy, by country

	BTG31B	BTG31C	BTG31D	BTG31E
Australia	0.166	0.213	0.062	0.075
Austria	0.184	0.322	0.089	0.132
Belgium (Fl.)	0.142	0.222	0.062	0.095
Brazil	0.142	0.291	0.082	0.105
Bulgaria	0.156	0.336	0.068	0.090
Denmark	0.142	0.289	0.074	0.076
Estonia	0.230	0.291	0.077	0.094
Hungary	0.152	0.223	0.099	0.193
Iceland	0.230	0.229	0.088	0.100
Ireland	0.150	0.242	0.055	0.084
Italy	0.128	0.243	0.084	0.088
Korea	0.152	0.207	0.107	0.078
Lithuania	0.114	0.257	0.075	0.118
Malaysia	0.148	0.207	0.085	0.128
Malta	0.161	0.272	0.086	0.106
Mexico	0.143	0.204	0.101	0.201
Norway	0.141	0.280	0.146	0.161
Poland	0.123	0.238	0.072	0.093
Portugal	0.180	0.324	0.072	0.126
Slovak Republic	0.115	0.197	0.098	0.109
Slovenia	0.194	0.196	0.064	0.162
Spain	0.158	0.299	0.079	0.114
Turkey	0.178	0.301	0.113	0.118
Netherlands	0.154	0.295	0.051	0.072

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.73

Factor score determinacy for the indicators Self-efficacy, by country

	SELFEF
Australia	0.928
Austria	0.886
Belgium (Fl.)	0.907
Brazil	0.906
Bulgaria	0.910
Denmark	0.924
Estonia	0.819
Hungary	0.835
Iceland	0.895
Ireland	0.928
Italy	0.897
Korea	0.881
Lithuania	0.876
Malaysia	0.896
Malta	0.888
Mexico	0.880
Norway	0.861
Poland	0.861
Portugal	0.869
Slovak Republic	0.833
Slovenia	0.830
Spain	0.879
Turkey	0.898
Netherlands	0.886

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.74

Item wording of teachers' and principals' Beliefs items and dimensions

We would like to ask about your personal beliefs on teaching and learning. Please indicate how much you disagree or agree with each of the following statements.

Direct transmission beliefs about instruction	**BTG29A**	Effective/good teachers demonstrate the correct way to solve a problem.
	BTG29G	Instruction should be built around problems with clear, correct answers, and around ideas that most students can grasp quickly.
	BTG29H	How much students learn depends on how much background knowledge they have – that is why teaching facts is so necessary.
	BTG29K	A quiet classroom is generally needed for effective learning.
Constructivist beliefs about instruction	BTG29D/ BCG32D	My role as a teacher is to facilitate students' own inquiry.
	BTG29F/ BCG32F	Students learn best by finding solutions to problems on their own
	BTG29I/ BCG32I	Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.
	BTG29L/ BCG32L	Thinking and reasoning processes are more important than specific curriculum content.

Source: OECD, *TALIS Database.*

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Table 11.75

Single items measuring teachers' and principals' Beliefs about instruction

We would like to ask about your personal beliefs on teaching and learning. Please indicate how much you disagree or agree with each of the following statements.

Single items measuring an internal frame of reference	**BTG29B/ BCG32B**	When referring to a "poor performance", I mean a performance that lies below the previous achievement level of the student.
	BTG29J/ BCG32J	When referring to a "good performance", I mean a performance that lies above the previous achievement level of the student.
Single items	BTG29C/ BCG32C	It is better when the teacher – not the student – decides what activities are to be done.
	BTG29E/ BCG32E	Teachers know a lot more than students; they shouldn't let students develop answers that may be incorrect when they can just explain the answers directly.
Single items measuring direct transmission beliefs about instruction	BCG32A	Effective/good teachers demonstrate the correct way to solve a problem.
	BCG32G	Instruction should be built around problems with clear, correct answers, and around ideas that most students can grasp quickly.
	BCG32H	How much students learn depends on how much background knowledge they have – that is why teaching facts is so necessary.
	BCG32K	A quiet classroom is generally needed for effective learning.

Source: OECD, *TALIS Database.*

Table 11.76

Reliabilities for indices of teachers' Beliefs about instruction, by country

	TBTRAD	TBCONS
Australia	0.493	0.599
Austria	0.477	0.648
Belgium (Fl.)	0.422	0.629
Brazil	0.526	0.625
Bulgaria	0.533	0.586
Denmark	0.415	0.517
Estonia	0.499	0.580
Hungary	0.481	0.648
Iceland	0.535	0.660
Ireland	0.525	0.611
Italy	0.459	0.557
Korea	0.440	0.667
Lithuania	0.589	0.544
Malaysia	0.488	0.618
Malta	0.440	0.583
Mexico	0.496	0.534
Norway	0.504	0.441
Poland	0.451	0.625
Portugal	0.497	0.603
Slovak Republic	0.515	0.525
Slovenia	0.418	0.501
Spain	0.432	0.571
Turkey	0.515	0.715
International sample	0.467	0.607
Netherlands	0.488	0.579

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.77

Model fit and latent correlations for teachers' Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country

	Model fit				Latent correlations
	CFI	TLI	RMSEA	SRMR	TBTRAD/TBCONS
Australia	0.897	0.848	0.057	0.047	0.008
Austria	0.977	0.966	0.027	0.029	-0.129
Belgium (Fl.)	0.877	0.819	0.063	0.049	-0.083
Brazil	0.982	0.973	0.026	0.025	0.515
Bulgaria	0.921	0.883	0.053	0.042	0.487
Denmark	0.818	0.732	0.068	0.055	0.073
Estonia	0.898	0.850	0.051	0.038	0.074
Hungary	0.886	0.833	0.067	0.054	0.083
Iceland	0.919	0.881	0.059	0.051	-0.166
Ireland	0.945	0.920	0.040	0.037	0.060
Italy	0.878	0.820	0.057	0.052	0.219
Korea	0.876	0.817	0.072	0.051	0.517
Lithuania	0.947	0.922	0.042	0.035	0.295
Malaysia	0.952	0.929	0.051	0.035	0.990
Malta	0.852	0.782	0.061	0.050	0.231
Mexico	0.870	0.809	0.065	0.047	0.578
Norway	0.979	0.969	0.021	0.024	0.142
Poland	0.870	0.809	0.065	0.059	0.109
Portugal	0.977	0.966	0.026	0.029	0.233
Slovak Republic	0.832	0.752	0.071	0.050	0.259
Slovenia	0.847	0.775	0.059	0.048	0.209
Spain	0.904	0.858	0.049	0.041	0.204
Turkey	0.962	0.944	0.046	0.033	0.643
International sample	0.940	0.912	0.040	0.031	0.262
Netherlands	0.880	0.823	0.065	0.052	-0.397

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

$p < 0.05$
$p < 0.01$

Table 11.78

Multiple group CFA examining different levels of cross-cultural invariance of teachers' Direct transmission beliefs about instruction

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.978**	**0.935**	**0.047**	**0.018**	**-**	**-**
Metric invariance	**0.939**	**0.925**	**0.050**	**0.041**	**-0.039**	**0.003**
Scalar invariance[1]	0.000	-0.179	0.199	0.205	-0.939	0.149
Uniqueness invariance	0.000	-0.005	0.183	0.222	0.000	-0.016

1. Latent correlation in Malaysia > 1.0 for this model. Therefore the latent variable covariance matrix for Malaysia is not positive definite.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.79

Multiple group CFA examining different levels of cross-cultural invariance of teachers' Constructivist beliefs about instruction

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.995**	**0.985**	**0.028**	**0.014**	**-**	**-**
Metric invariance	**0.976**	**0.971**	**0.039**	**0.041**	**-0.019**	**0.011**
Scalar invariance[1]	0.431	0.559	0.152	0.147	-0.545	0.113
Uniqueness invariance	0.283	0.622	0.141	0.200	-0.148	-0.011

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands were excluded because they did not meet international sampling standards.
1. Latent correlation in Malaysia > 1.0 for this model. Therefore the latent variable covariance matrix for Malaysia is not positive definite.
Source: OECD, *TALIS Database.*

Table 11.80

Factor loadings used for the computation of factor scores for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction

	Direct transmission beliefs				Constructivist beliefs			
	BTG29A	BTG29G	BTG29H	BTG29K	BTG29D	BTG29F	BTG29I	BTG29L
International sample	1.000	1.985	1.791	1.249	1.001	1.462	1.427	1.000

Source: OECD, *TALIS Database.*

Table 11.81

Item intercepts used for the computation of factor scores for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country

	Direct transmission beliefs				Constructivist beliefs			
	BTG29A	BTG29G	BTG29H	BTG29K	BTG29D	BTG29F	BTG29I	BTG29L
Australia		1.582	1.469	1.325	2.163	2.029	2.196	
Austria		1.755	1.690	2.367	2.317	2.187	2.069	
Belgium (Fl.)		1.852	1.646	2.028	2.287	2.376	2.346	
Brazil		2.636	2.583	2.565	2.274	2.358	2.379	
Bulgaria		2.152	1.912	2.195	1.943	1.847	1.980	
Denmark		1.613	1.702	2.193	2.106	2.296	2.320	
Estonia		1.984	2.065	2.314	2.083	1.732	2.071	
Hungary		1.398	1.753	1.656	2.210	2.058	2.117	
Iceland		1.409	1.373	1.513	2.506	2.111	2.117	
Ireland		1.959	1.695	1.625	2.159	2.240	2.406	
Italy		2.301	2.629	2.369	1.979	1.527	1.636	
Korea	2.174	2.141	2.271	2.054	2.099	2.394	2.297	2.061
Lithuania		2.504	2.331	2.174	2.233	1.577	1.855	
Malaysia		1.703	1.563	1.404	2.189	1.964	2.348	
Malta		1.839	1.568	1.594	2.009	1.900	2.150	
Mexico		2.269	2.269	1.443	2.375	2.438	2.590	
Norway		1.623	1.986	2.071	2.575	2.075	2.626	
Poland		1.778	1.852	1.906	2.073	2.037	2.083	
Portugal		2.117	2.015	2.474	2.262	1.939	2.342	
Slovak Republic		2.373	1.898	1.866	2.241	1.831	2.218	
Slovenia		1.893	1.631	1.900	1.886	2.349	2.170	
Spain		1.656	1.818	1.730	2.172	2.037	2.106	
Turkey		2.083	1.946	2.103	1.961	2.154	2.180	
Netherlands		1.637	1.777	1.945	2.543	2.630	2.624	

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.82

Unique variances used for the computation of factor scores for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country

	Direct transmission beliefs				Constructivist beliefs			
	BTG29A	BTG29G	BTG29H	BTG29K	BTG29D	BTG29F	BTG29I	BTG29L
Australia	0.349	0.272	0.230	0.243	0.249	0.276	0.173	0.308
Austria	0.455	0.327	0.273	0.328	0.277	0.222	0.239	0.301
Belgium (Fl.)	0.250	0.295	0.232	0.339	0.192	0.200	0.151	0.250
Brazil	0.388	0.326	0.230	0.388	0.265	0.231	0.191	0.387;
Bulgaria	0.296	0.202	0.230	0.405	0.258	0.317	0.149	0.327
Denmark	0.290	0.205	0.271	0.381	0.295	0.245	0.155	0.308
Estonia	0.409	0.202	0.218	0.349	0.220	0.361	0.194	0.293
Hungary	0.335	0.261	0.238	0.325	0.241	0.218	0.143	0.266
Iceland	0.384	0.208	0.192	0.313	0.200	0.211	0.169	0.270
Ireland	0.312	0.242	0.256	0.370	0.290	0.293	0.143	0.321
Italy	0.289	0.261	0.235	0.377	0.199	0.288	0.211	0.267
Korea	0.254	0.326	0.234	0.306	0.177	0.193	0.126	0.228
Lithuania	0.352	0.203	0.251	0.385	0.257	0.318	0.188	0.291
Malaysia	0.224	0.145	0.253	0.490	0.201	0.329	0.145	0.240
Malta	0.282	0.278	0.318	0.406	0.265	0.335	0.173	0.243
Mexico	0.451	0.377	0.298	0.317	0.452	0.346	0.226	0.417
Norway	0.446	0.242	0.312	0.427	0.342	0.327	0.264	0.353
Poland	0.282	0.221	0.189	0.355	0.190	0.215	0.163	0.243
Portugal	0.300	0.206	0.234	0.351	0.208	0.337	0.159	0.279
Slovak Republic	0.219	0.246	0.239	0.353	0.209	0.325	0.172	0.241
Slovenia	0.270	0.310	0.250	0.374	0.302	0.218	0.160	0.222
Spain	0.318	0.303	0.281	0.465	0.259	0.288	0.230	0.320
Turkey	0.408	0.265	0.258	0.425	0.307	0.167	0.132	0.249
Netherlands	0.260	0.175	0.256	0.357	0.184	0.205	0.139	0.270

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database*.

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Table 11.83

Factor score determinacy for the indicators Direct transmission beliefs about instruction and Constructivist beliefs about instruction, by country

	TBTRAD	TBCONS
Australia	0.747	0.794
Austria	0.723	0.814
Belgium (Fl.)	0.679	0.821
Brazil	0.780	0.815
Bulgaria	0.798	0.818
Denmark	0.684	0.765
Estonia	0.762	0.765
Hungary	0.738	0.834
Iceland	0.789	0.834
Ireland	0.762	0.811
Italy	0.711	0.777
Korea	0.709	0.852
Lithuania	0.799	0.741
Malaysia	0.854	0.860
Malta	0.700	0.787
Mexico	0.760	0.802
Norway	0.742	0.669
Poland	0.749	0.805
Portugal	0.769	0.800
Slovak Republic	0.722	0.738
Slovenia	0.681	0.775
Spain	0.711	0.770
Turkey	0.806	0.885
Netherlands	0.741	0.806

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.84

Reliabilities for indices of principals' Constructivist beliefs about instruction, by country

	PBCONS
Australia	0.653
Austria	0.674
Belgium (Fl.)	0.649
Brazil	0.637
Bulgaria	0.251
Denmark	0.655
Estonia	0.419
Hungary	0.563
Iceland	0.517
Ireland	0.650
Italy	0.617
Korea	0.714
Lithuania	0.456
Malaysia	0.668
Malta	0.696
Mexico	0.659
Norway	0.489
Poland	0.508
Portugal	0.640
Slovak Republic	0.609
Slovenia	0.470
Spain	0.608
Turkey	0.463
International sample	0.621
Netherlands	0.698

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.85

Model fit for principals' Constructivist beliefs about instruction, by country

	CFI	TLI	RMSEA	SRMR
Australia	0.876	0.629	0.161	0.040
Austria	1.000	1.067	0.000	0.014
Belgium (Fl.)	1.000	1.092	0.000	0.006
Brazil	0.976	0.928	0.082	0.030
Bulgaria[1]	1.000	1.115	0.000	0.029
Denmark	1.000	1.119	0.000	0.002
Estonia	0.531	-0.407	0.215	0.040
Hungary	1.000	1.110	0.000	0.009
Iceland	0.993	0.980	0.029	0.045
Ireland	1.000	1.063	0.000	0.021
Italy	0.978	0.935	0.074	0.025
Korea	1.000	1.053	0.000	0.014
Lithuania	1.000	1.205	0.000	0.016
Malaysia	0.978	0.933	0.074	0.031
Malta	1.000	1.097	0.000	0.025
Mexico	1.000	1.061	0.000	0.008
Norway	1.000	1.182	0.000	0.011
Poland	1.000	1.182	0.000	0.016
Portugal	1.000	1.100	0.000	0.002
Slovak Republic	0.985	0.956	0.054	0.030
Slovenia	0.981	0.943	0.047	0.026
Spain	1.000	1.197	0.000	0.010
Turkey	0.144	-1.569	0.321	0.077
International sample	0.999	0.996	0.015	0.007
Netherlands	*Model fit could not be computed due to the small sample size*			

1. Unique variance of item BCG32L was fixed at zero, to avoid model non-convergence.
Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.86

Multiple group CFA examining different levels of cross-cultural invariance of principals' Constructivist beliefs about instruction

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.990**	**0.969**	**0.042**	**0.028**	**-**	**-**
Metric invariance	**0.958**	**0.949**	**0.054**	**0.078**	**-0.032**	**0.012**
Scalar invariance	0.317	0.470	0.174	0.192	-0.641	0.120
Uniqueness invariance	0.106	0.529	0.164	0.285	-0.211	-0.010

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.87

Factor loadings used for the computation of factor scores for the indicator principals' Constructivist beliefs about instruction

	BCG32D	BCG32F	BCG32I	BCG32L
International sample	0..948	1.332	1.226	1.000

Source: OECD, *TALIS Database.*

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Table 11.88

Item intercepts used for the computation of factor scores for the indicator principals' Constructivist beliefs about instruction, by country

	BCG32D	BCG32F	BCG32I	BCG32L
Australia	2.200	2.098	2.254	
Austria	2.529	2.529	2.366	
Belgium (Fl.)	2.680	2.589	2.544	
Brazil	2.677	2.821	2.770	
Bulgaria	2.138	2.161	2.269	
Denmark	2.504	2.768	2.701	
Estonia	2.462	2.080	2.240	
Hungary	2.451	2.451	2.485	
Iceland	2.765	2.404	2.321	
Ireland	2.285	2.358	2.432	
Italy	2.265	1.803	1.919	
Korea	2.513	2.721	2.606	2.297
Lithuania	2.656	1.959	2.535	
Malaysia	2.550	2.367	2.719	
Malta	2.366	2.430	2.705	
Mexico	2.652	2.837	2.859	
Norway	2.904	2.500	3.039	
Poland	2.466	2.474	2.398	
Portugal	2.325	2.031	2.527	
Slovak Republic	2.530	2.217	2.596	
Slovenia	2.197	2.669	2.577	
Spain	2.399	2.211	2.289	
Turkey	2.457	2.667	2.610	
Netherlands	2.974	2.901	2.923	

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.89

Unique variances used for the computation of factor scores for the indicator principals' Constructivist beliefs about instruction, by country

	BCG32D	BCG32F	BCG32I	BCG32L
Australia	0.270	0.279	0.194	0.230
Austria	0.180	0.202	0.220	0.241
Belgium (Fl.)	0.210	0.192	0.166	0.232
Brazil	0.220	0.138	0.178	0.329
Bulgaria	0.348	0.356	0.269	0.199
Denmark	0.245	0.177	0.163	0.337
Estonia	0.190	0.367	0.224	0.265
Hungary	0.274	0.193	0.148	0.287
Iceland	0.164	0.195	0.249	0.277
Ireland	0.240	0.341	0.189	0.254
Italy	0.215	0.258	0.219	0.235
Korea	0.234	0.130	0.146	0.208
Lithuania	0.224	0.278	0.254	0.357
Malaysia	0.234	0.360	0.183	0.205
Malta	0.224	0.302	0.120	0.327
Mexico	0.356	0.258	0.168	0.452
Norway	0.352	0.272	0.201	0.318
Poland	0.271	0.325	0.219	0.272
Portugal	0.208	0.332	0.175	0.253
Slovak Republic	0.291	0.323	0.111	0.267
Slovenia	0.462	0.183	0.201	0.241
Spain	0.323	0.254	0.233	0.259
Turkey	0.339	0.123	0.221	0.265
Netherlands	0.205	0.153	0.098	0.251

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.90

Factor score determinacy for the indicators principals' Constructivist beliefs about instruction, by country

	PBCONS
Australia	0.810
Austria	0.829
Belgium (Fl.)	0.829
Brazil	0.861
Bulgaria	0.717
Denmark	0.835
Estonia	0.720
Hungary	0.822
Iceland	0.759
Ireland	0.818
Italy	0.832
Korea	0.868
Lithuania	0.674
Malaysia	0.815
Malta	0.855
Mexico	0.828
Norway	0.734
Poland	0.741
Portugal	0.797
Slovak Republic	0.843
Slovenia	0.749
Spain	0.796
Turkey	0.802
Netherlands	0.879

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.91

Item wording of classroom teaching practices items and dimensions

How often do each of the following activities happen in this <target class> throughout the school year?

Classroom teaching practice: structuring	**BTG42B**	I explicitly state learning goals.
	BTG30C	I review with the students the homework they have prepared.
	BTG42H	I ask my students to remember every step in a procedure.
	BTG42I	At the beginning of the lesson I present a short summary of the previous lesson.
	BTG42M	Students evaluate and reflect upon their own work.
Classroom teaching practice: student-Oriented	BTG42D	Students work in small groups to come up with a joint solution to a problem or task.
	BTG42E	I give different work to the students that have difficulties learning and/or to those who can advance faster.
	BTG42F	I ask my students to suggest or to help plan classroom activities or topics.
	BTG42N	Students work in groups based upon their abilities.
Classroom teaching practice: enhanced activities	BTG42J	Students work on projects that require at least one week to complete.
	BTG42O	Students make a product that will be used by someone else.
	BTG42Q	I ask my students to write an essay in which they are expected to explain their thinking or reasoning at some length.
	BTG42S	Students hold a debate and argue for a particular point of view which may not be their own.

Source: OECD, *TALIS Database.*

Table 11.92

Single items measuring classroom teaching practices items and dimensions

How often do each of the following activities happen in this <target class> throughout the school year?

Single items	**BTG42A**	I present new topics to the class (lecture-style presentation).
	BTG42G	I ask my students to remember every step in a procedure.
	BTG42K	I work with individual students.
	BTG42L	Students evaluate and reflect upon their own work.
	BTG42P	I administer a test or quiz to assess student learning.

Source: OECD, *TALIS Database.*

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Table 11.93

Reliabilities for indices of classroom teaching practices, by country

	TPSTRUC	TPSTUD	TPACTIV
Australia	0.699	0.691	0.598
Austria	0.642	0.701	0.602
Belgium (Fl.)	0.616	0.640	0.515
Brazil	0.763	0.731	0.708
Bulgaria	0.698	0.759	0.734
Denmark	0.622	0.601	0.606
Estonia	0.695	0.678	0.595
Hungary	0.665	0.666	0.610
Iceland	0.711	0.512	0.501
Ireland	0.669	0.638	0.533
Italy	0.712	0.611	0.575
Korea	0.771	0.814	0.825
Lithuania	0.747	0.724	0.704
Malaysia	0.841	0.786	0.764
Malta	0.609	0.701	0.563
Mexico	0.711	0.643	0.663
Norway	0.660	0.483	0.575
Poland	0.719	0.684	0.642
Portugal	0.683	0.690	0.640
Slovak Republic	0.750	0.723	0.575
Slovenia	0.716	0.685	0.621
Spain	0.670	0.655	0.633
Turkey	0.742	0.777	0.794
International sample	0.733	0.702	0.723
Netherlands	0.590	0.634	0.477

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.94

Reliabilities for indices of classroom teaching practices, by subject

	TPSTRUC	TPSTUD	TPACTIV
Reading, writing and literature	0.745	0.702	0.730
Mathematics	0.699	0.698	0.731
Science	0.694	0.711	0.757
Social studies	0.709	0.690	0.721
Modern foreign languages	0.681	0.679	0.706
Technology	0.726	0.696	0.673
Arts	0.725	0.658	0.608
Physical education	0.746	0.683	0.718
Religion	0.778	0.771	0.747
Practical and vocational skills	0.756	0.731	0.668
Other	0.767	0.764	0.715
International Sample	0.590	0.634	0.729

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.95

Model fit and latent correlations for classroom teaching practices, by country

	Model fit				Latent correlations		
	CFI	TLI	RMSEA	SRMR	TPSTRUC/ TPSTUD	TPSTRUC/ TPACTIV	TPSTUD/ TPACTIV
Australia	0.862	0.827	0.068	0.052	0.374	0.412	0.666
Austria	0.782	0.725	0.083	0.069	0.229	0.108	0.735
Belgium (Fl.)	0.817	0.770	0.068	0.060	0.199	0.141	0.809
Brazil	0.911	0.887	0.066	0.051	0.465	0.499	0.852
Bulgaria	0.886	0.857	0.069	0.056	0.444	0.369	0.721
Denmark	0.849	0.810	0.066	0.051	0.608	0.535	0.746
Estonia	0.830	0.787	0.078	0.062	0.371	0.358	0.727
Hungary	0.849	0.811	0.062	0.056	0.190	0.366	0.745
Iceland	0.835	0.792	0.060	0.052	0.549	0.520	0.775
Ireland	0.757	0.695	0.083	0.065	0.129	-0.114	0.562
Italy	0.829	0.785	0.072	0.059	0.378	0.382	0.759
Korea	0.903	0.878	0.081	0.077	0.470	0.380	0.853
Lithuania	0.858	0.821	0.082	0.066	0.459	0.297	0.779
Malaysia	0.943	0.928	0.061	0.042	0.680	0.420	0.862
Malta	0.829	0.785	0.070	0.051	0.303	0.208	0.757
Mexico	0.924	0.904	0.050	0.038	0.580	0.528	0.829
Norway	0.827	0.783	0.059	0.053	0.646	0.481	0.693
Poland	0.831	0.788	0.074	0.060	0.557	0.521	0.700
Portugal	0.830	0.786	0.076	0.072	0.022	0.078	0.749
Slovak Republic	0.881	0.850	0.071	0.054	0.480	0.381	0.773
Slovenia	0.869	0.835	0.065	0.051	0.376	0.267	0.663
Spain	0.857	0.821	0.064	0.053	0.425	0.321	0.803
Turkey	0.906	0.882	0.070	0.058	0.642	0.500	0.857
International sample	0.899	0.873	0.060	0.043	0.436	0.363	0.786
Netherlands	0.801	0.749	0.070	0.066	0.380	0.296	0.778

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

$p < 0.05$
$p < 0.01$

Table 11.96

Model fit and latent correlations for classroom teaching practices, by subject

	Model fit				Latent correlations		
	CFI	TLI	RMSEA	SRMR	TPSTRUC/ TPSTUD	TPSTRUC/ TPACTIV	TPSTUD/ TPACTIV
Reading, writing and literature	0.921	0.901	0.057	0.042	0.480	0.349	0.828
Mathematics	0.912	0.889	0.054	0.046	0.373	0.220	0.788
Science	0.913	0.891	0.056	0.046	0.506	0.349	0.849
Social studies	0.901	0.876	0.064	0.044	0.502	0.376	0.846
Modern foreign languages	0.920	0.900	0.054	0.041	0.511	0.308	0.792
Technology	0.881	0.851	0.067	0.046	0.496	0.514	0.796
Arts	0.888	0.859	0.063	0.046	0.596	0.512	0.867
Physical education	0.850	0.811	0.081	0.065	0.704	0.772	0.659
Religion	0.879	0.848	0.073	0.051	0.606	0.537	0.861
Practical and vocational skills	0.883	0.852	0.067	0.050	0.421	0.341	0.847
Other	0.891	0.863	0.072	0.054	0.539	0.441	0.899
International Sample	0.899	0.873	0.060	0.043	0.436	0.363	0.786

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

$p < 0.05$
$p < 0.01$

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Table 11.97

Multiple group CFA examining different levels of cross-cultural invariance of Classroom teaching practice: structuring

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.925**	**0.853**	**0.101**	**0.039**	**-**	**-**
Metric invariance	**0.895**	**0.882**	**0.090**	**0.070**	**-0.030**	**-0.011**
Scalar invariance	0.485	0.593	0.167	0.171	-0.410	0.077
Uniqueness invariance	0.338	0.616	0.163	0.275	-0.147	-0.004

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.98

Multiple group CFA examining different levels of cross-cultural invariance of Classroom teaching practice: student-oriented

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.986**	**0.959**	**0.056**	**0.018**	**-**	**-**
Metric invariance	**0.966**	**0.958**	**0.056**	**0.045**	**-0.020**	**0.000**
Scalar invariance	0.607	0.695	0.153	0.142	-0.359	0.097
Uniqueness invariance	0.382	0.675	0.158	0.159	-0.225	0.005

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.99

Multiple group CFA examining different levels of cross-cultural invariance of Classroom teaching practice: enhanced activities

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.859**	**0.557**	**0.161**	**0.049**	**-**	**-**
Metric invariance	**0.868**	**0.837**	**0.100**	**0.064**	**0.009**	**-0.061**
Scalar invariance	0.460	0.581	0.160	0.137	-0.408	0.060
Uniqueness invariance	0.183	0.570	0.162	0.225	-0.277	0.002

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.100

Factor loadings used for the computation of factor scores for the indicator Classroom teaching practice: structuring

	BTG42B	BTG42C	BTG42H	BTG42I	BTG42M
International sample	0.899	1.245	1.233	1.219	1.000

Source: OECD, *TALIS Database.*

Table 11.101

Item intercepts used for the computation of factor scores for the indicator Classroom teaching practice: structuring, by country

	BTG42B	BTG42C	BTG42H	BTG42I	BTG42M
Australia	3.533	2.895	3.481	2.977	
Austria	3.412	3.197	3.604	2.936	
Belgium (Fl.)	3.118	2.600	3.545	2.186	
Brazil	3.507	3.685	3.680	3.748	
Bulgaria	4.303	3.252	3.943	2.912	
Denmark	2.797	3.157	3.156	2.478	
Estonia	4.140	3.575	3.392	2.739	
Hungary	4.657	4.074	3.747	3.091	
Iceland	3.173	2.900	2.901	3.279	
Ireland	3.507	3.755	3.426	3.399	
Italy	3.349	3.508	3.600	3.048	
Korea	4.455	3.566	4.450	3.709	4.218
Lithuania	4.365	3.858	3.969	3.044	
Malaysia	3.940	3.954	3.583	4.123	
Malta	3.252	3.031	3.532	3.050	
Mexico	3.935	3.914	3.541	3.674	
Norway	3.359	3.110	3.568	3.112	
Poland	4.019	3.123	3.217	2.426	
Portugal	3.575	3.467	3.779	2.685	
Slovak Republic	3.798	3.377	3.966	2.972	
Slovenia	3.939	3.394	3.666	2.660	
Spain	3.263	4.058	3.497	3.080	
Turkey	3.612	2.843	3.739	2.896	
Netherlands	3.209	3.729	3.565	3.498	

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.102

Unique variances used for the computation of factor scores for the indicator Classroom teaching practice: structuring, by country

	BTG42B	BTG42C	BTG42H	BTG42I	BTG42M
Australia	1.228	1.141	1.106	0.974	0.661
Austria	1.415	2.083	1.442	1.247	0.921
Belgium (Fl.)	1.390	1.423	1.188	1.195	0.681
Brazil	1.322	0.952	1.037	1.036	0.620
Bulgaria	0.493	1.407	0.536	1.154	0.447
Denmark	1.178	1.189	1.518	0.814	0.964
Estonia	1.144	1.428	1.384	1.024	0.756
Hungary	0.770	1.539	1.194	1.047	0.836
Iceland	1.113	1.213	1.068	1.188	1.073
Ireland	1.331	0.978	1.191	0.899	0.536
Italy	1.522	1.092	1.051	1.217	0.398
Korea	1.104	0.922	0.959	0.955	0.874
Lithuania	0.630	1.004	0.822	1.082	0.621
Malaysia	0.843	0.478	0.787	0.793	0.683
Malta	1.558	1.292	1.245	1.063	0.562
Mexico	0.989	0.962	1.276	1.143	0.719
Norway	1.140	0.863	1.313	1.007	0.895
Poland	1.328	1.487	1.756	1.114	0.819
Portugal	1.473	1.501	1.093	1.295	0.569
Slovak Republic	1.429	1.442	0.905	1.040	0.715
Slovenia	1.003	1.700	0.990	1.087	0.542
Spain	1.325	1.218	1.737	1.315	0.808
Turkey	1.262	1.274	1.175	1.261	0.732
Netherlands	1.501	1.842	1.451	1.714	1.060

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.103

Factor loadings used for the computation of factor scores for the indicator Classroom teaching practice: student-oriented

	BTG42D	BTG42E	BTG42F	BTG42N
International sample	0.949	0.990	0.880	1.000

Source: OECD, *TALIS Database.*

Table 11.104

Item intercepts used for the computation of factor scores for the indicator Classroom teaching practice: student-oriented, by country

	BTG42D	BTG42E	BTG42F	BTG42N
Australia	2.587	2.696	1.946	
Austria	2.520	2.396	1.736	
Belgium (Fl.)	2.641	2.423	1.929	
Brazil	2.253	1.729	1.429	
Bulgaria	2.122	2.390	2.055	
Denmark	2.817	2.401	1.638	
Estonia	2.335	2.649	1.719	
Hungary	2.157	2.385	1.542	
Iceland	2.773	3.041	2.211	
Ireland	2.296	2.538	1.923	
Italy	2.170	2.802	2.963	
Korea	2.257	2.096	2.270	2.078
Lithuania	2.287	2.913	1.423	
Malaysia	2.272	1.742	1.679	
Malta	2.415	2.037	1.816	
Mexico	2.763	2.106	1.334	
Norway	3.010	3.474	2.054	
Poland	2.064	2.497	1.484	
Portugal	2.600	2.455	1.838	
Slovak Republic	2.167	2.440	1.818	
Slovenia	2.103	2.315	1.878	
Spain	2.391	2.787	1.522	
Turkey	2.201	2.450	2.585	
Netherlands	2.981	2.375	2.063	

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.105

Unique variances used for the computation of factor scores for the indicator Classroom teaching practice: student-oriented, by country

	BTG42D	BTG42E	BTG42F	BTG42N
Australia	0.771	1.268	0.568	0.996
Austria	0.774	1.177	0.610	0.876
Belgium (Fl.)	0.720	0.898	0.440	0.629
Brazil	0.833	1.332	1.028	1.131
Bulgaria	0.812	0.847	1.199	0.848
Denmark	0.912	1.301	0.527	1.016
Estonia	0.712	1.214	0.498	0.855
Hungary	0.486	0.848	0.484	0.896
Iceland	1.248	1.753	0.729	0.995
Ireland	0.673	1.438	0.533	0.881
Italy	0.686	1.287	1.695	0.926
Korea	0.492	0.547	0.648	0.733
Lithuania	0.643	1.174	0.743	0.831
Malaysia	0.517	0.634	0.648	0.658
Malta	0.804	0.793	0.500	0.859
Mexico	0.905	1.393	1.081	1.486
Norway	0.992	1.697	0.605	0.945
Poland	0.722	1.132	1.054	1.060
Portugal	0.952	1.157	0.720	1.044
Slovak Republic	0.590	0.986	0.829	0.905
Slovenia	0.589	0.863	0.788	0.865
Spain	1.120	1.671	0.440	1.244
Turkey	0.812	1.132	1.187	0.986
Netherlands	1.317	0.962	0.508	0.741

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.106

Factor loadings used for the computation of factor scores for the indicator Classroom teaching practice: enhanced activities

	BTG42J	BTG42O	BTG42Q	BTG42S
International sample	1.147	1.134	1.000	1.192

Source: OECD, *TALIS Database.*

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Table 11.107

Item intercepts used for the computation of factor scores for the indicator Classroom teaching practice: enhanced activities, by country

	BTG42J	BTG42O	BTG42Q	BTG42S
Australia	2.629	1.698		1.729
Austria	2.221	1.726		2.204
Belgium (Fl.)	2.289	1.786		2.062
Brazil	1.202	0.975		1.808
Bulgaria	1.935	1.808		2.476
Denmark	1.605	1.256		1.677
Estonia	1.708	1.807		2.105
Hungary	1.972	1.607		2.162
Iceland	2.344	2.286		1.529
Ireland	2.165	1.560		1.761
Italy	2.236	1.828		2.720
Korea	1.801	1.735	1.704	1.754
Lithuania	1.714	1.453		2.117
Malaysia	1.945	1.439		1.444
Malta	2.083	1.336		2.013
Mexico	1.649	1.007		1.492
Norway	1.696	1.233		1.784
Poland	1.642	1.632		2.557
Portugal	2.087	1.739		1.857
Slovak Republic	2.115	1.739		2.837
Slovenia	2.106	1.742		2.339
Spain	1.753	1.120		1.618
Turkey	2.227	2.055		1.859
Netherlands	2.041	1.421		1.728

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.108

Unique variances used for the computation of factor scores for the indicator Classroom teaching practice: enhanced activities, by country

	BTG42J	BTG42O	BTG42Q	BTG42S
Australia	1.241	0.975	0.535	0.504
Austria	0.894	0.456	0.379	0.851
Belgium (Fl.)	1.201	0.376	0.280	0.506
Brazil	1.062	1.096	1.103	1.189
Bulgaria	0.587	0.579	0.568	0.847
Denmark	0.665	0.574	0.674	0.990
Estonia	0.542	0.554	0.463	0.746
Hungary	0.517	0.275	0.277	0.612
Iceland	1.409	1.193	0.380	0.234
Ireland	1.178	0.380	0.527	0.434
Italy	1.283	0.935	0.719	1.245
Korea	0.720	0.480	0.509	0.363
Lithuania	0.457	0.625	0.544	0.848
Malaysia	0.872	0.653	1.009	0.490
Malta	1.053	0.277	0.730	0.910
Mexico	1.324	1.197	1.313	1.197
Norway	0.865	0.513	0.666	0.759
Poland	0.585	0.731	0.695	1.255
Portugal	1.006	0.662	0.486	0.587
Slovak Republic	0.566	0.464	0.501	1.242
Slovenia	0.484	0.265	0.211	0.747
Spain	1.013	0.387	0.712	1.014
Turkey	1.067	0.779	0.810	0.934
Netherlands	1.232	0.206	0.349	0.457

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.109

Factor score determinacy for the indicators of Classroom teaching practice, by country

	TPSTRUC	TPSTUD	TPACTIV
Australia	0.838	0.866	0.840
Austria	0.819	0.859	0.830
Belgium (Fl.)	0.808	0.863	0.840
Brazil	0.894	0.898	0.893
Bulgaria	0.861	0.890	0.875
Denmark	0.815	0.838	0.842
Estonia	0.849	0.858	0.834
Hungary	0.827	0.852	0.835
Iceland	0.851	0.789	0.829
Ireland	0.829	0.832	0.794
Italy	0.866	0.850	0.827
Korea	0.888	0.926	0.931
Lithuania	0.874	0.895	0.885
Malaysia	0.928	0.928	0.913
Malta	0.805	0.873	0.832
Mexico	0.859	0.862	0.866
Norway	0.835	0.792	0.800
Poland	0.862	0.857	0.840
Portugal	0.850	0.858	0.841
Slovak Republic	0.888	0.882	0.840
Slovenia	0.862	0.853	0.827
Spain	0.838	0.858	0.850
Turkey	0.889	0.915	0.913
Netherlands	0.790	0.835	0.805

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.110

Item wording of Co-operation among staff

How often do you do the following in this school?

Exchange and co-ordination for teaching	BTG30C	Discuss and decide on the selection of instructional media (*e.g.* textbooks, exercise books).
	BTG30D	Exchange teaching materials with colleagues.
	BTG30E	Attend team conferences for the age group I teach.
	BTG30F	Ensure common standards in evaluations for assessing student progress.
	BTG30G	Engage in discussion of the learning developments of specific students.
Professional collaboration	BTG30H	Teach jointly as a team in the same class.
	BTG30I	Take part in professional learning activities (*e.g.* team supervision).
	BTG30J	Observe other teachers' classes and provide feedback.
	BTG30K	Engage in joint activities across different classes and age groups (*e.g.* projects).
	BTG30L	Discuss and coordinate homework practice across subjects.

Source: OECD, *TALIS Database.*

Table 11.111

Single items measuring Co-operation among staff

How often do you do the following in this school?

Exchange and co-ordination for teaching	BTG30A	Attend staff meetings to discuss the vision and mission of the school.
	BTG30B	Develop a school curriculum or part of it.

Source: OECD, *TALIS Database.*

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Table 11.112

Reliabilities for indices of Co-operation among staff, by country

	TCEXCHAN	TCCOLLAB
Australia	0.650	0.740
Austria	0.689	0.658
Belgium (Fl.)	0.646	0.503
Brazil	0.772	0.739
Bulgaria	0.488	0.603
Denmark	0.732	0.660
Estonia	0.628	0.631
Hungary	0.645	0.677
Iceland	0.685	0.710
Ireland	0.670	0.555
Italy	0.612	0.592
Korea	0.716	0.808
Lithuania	0.664	0.686
Malaysia	0.761	0.760
Malta	0.655	0.633
Mexico	0.663	0.682
Norway	0.611	0.631
Poland	0.704	0.714
Portugal	0.633	0.572
Slovak Republic	0.723	0.711
Slovenia	0.680	0.652
Spain	0.595	0.600
Turkey	0.754	0.722
International sample	0.700	0.689
Netherlands	0.421	0.593

Notes: Reliabilities (Cronbach's Alpha) computed with weighted national samples.
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database*.

Table 11.113

Model fit and latent correlations for indices of Co-operation among staff, by country

	Model fit				Latent correlations
	CFI	TLI	RMSEA	SRMR	TCEXCHAN/TCCOLLAB
Australia	0.914	0.886	0.066	0.048	0.670
Austria	0.929	0.905	0.061	0.038	0.768
Belgium (Fl.)	0.913	0.885	0.049	0.038	0.668
Brazil	0.926	0.902	0.072	0.050	0.716
Bulgaria	0.863	0.818	0.060	0.045	0.752
Denmark	0.866	0.823	0.086	0.053	0.902
Estonia	0.934	0.913	0.049	0.036	0.779
Hungary	0.953	0.937	0.039	0.032	0.753
Iceland	0.926	0.902	0.059	0.043	0.678
Ireland	0.897	0.863	0.062	0.042	0.828
Italy	0.922	0.896	0.053	0.038	0.820
Korea	0.916	0.889	0.082	0.055	0.690
Lithuania	0.923	0.899	0.061	0.043	0.826
Malaysia	0.944	0.926	0.056	0.036	0.709
Malta	0.941	0.922	0.044	0.039	0.699
Mexico	0.923	0.898	0.057	0.039	0.762
Norway	0.892	0.858	0.061	0.043	0.788
Poland	0.916	0.888	0.062	0.043	0.762
Portugal	0.902	0.870	0.057	0.042	0.666
Slovak Republic	0.938	0.918	0.055	0.035	0.767
Slovenia	0.928	0.905	0.055	0.039	0.601
Spain	0.917	0.891	0.046	0.037	0.569
Turkey	0.891	0.856	0.090	0.055	0.856
International sample	0.949	0.932	0.042	0.028	0.764
Netherlands	0.897	0.863	0.050	0.044	0.809

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database*.

$p < 0.05$
$p < 0.01$

Table 11.114

Multiple group CFA examining different levels of cross-cultural invariance of Exchange and co-ordination for teaching

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.953**	**0.905**	**0.072**	**0.031**	**-**	**-**
Metric invariance	**0.904**	**0.891**	**0.077**	**0.083**	**-0.049**	**0.005**
Scalar invariance	0.044	0.244	0.204	0.326	-0.860	0.127
Uniqueness invariance	0.000	0.199	0.210	0.419	-0.044	0.006

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.115

Multiple group CFA examining different levels of cross-cultural invariance of Professional collaboration

	Model fit				Difference	
	CFI	TLI	RMSEA	SRMR	Δ CFI	Δ RMSEA
Configural invariance	**0.952**	**0.904**	**0.074**	**0.031**	**-**	**-**
Metric invariance	**0.908**	**0.896**	**0.077**	**0.064**	**-0.044**	**0.003**
Scalar invariance	0.152	0.330	0.196	0.268	-0.756	0.119
Uniqueness invariance	0.000	0.368	0.190	0.263	-0.152	-0.006

Notes: Model estimates based on international calibration sample (1 000 teachers per country).
The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.116

Factor loadings used for the computation of factor scores for the indicator Exchange and co-ordination for teaching

	BTG30C	BTG30D	BTG30E	BTG30F	BTG30G
International sample	1.000	1.649	1.576	1.636	1.631

Source: OECD, *TALIS Database.*

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Table 11.117

Item intercepts used for the computation of factor scores for the indicator Exchange and co-ordination for teaching, by country

	BTG30C	BTG30D	BTG30E	BTG30F	BTG30G
Australia		5.153	3.487	4.290	4.924
Austria		5.337	4.121	3.439	5.275
Belgium (Fl.)		5.269	4.298	3.960	4.587
Brazil		4.516	4.887	4.927	5.139
Bulgaria		4.895	3.731	5.735	5.221
Denmark		3.315	3.650	2.124	3.124
Estonia		4.810	4.875	4.689	5.942
Hungary		4.739	4.721	4.624	4.625
Iceland		4.023	4.787	3.548	4.599
Ireland		5.015	3.645	3.965	4.787
Italy		4.019	3.987	3.770	4.747
Korea	3.481	4.997	4.638	4.707	4.010
Lithuania		4.610	3.900	4.644	4.703
Malaysia		4.172	3.613	4.095	3.899
Malta		5.319	3.352	4.639	5.220
Mexico		4.290	4.663	5.198	4.579
Norway		5.919	6.733	5.561	5.959
Poland		5.044	4.901	4.687	5.880
Portugal		5.161	2.333	4.409	4.493
Slovak Republic		4.862	4.194	3.906	4.428
Slovenia		5.277	5.102	4.599	4.633
Spain		4.977	4.641	4.282	4.606
Turkey		4.988	3.684	4.600	5.004
Netherlands		4.972	4.081	4.522	5.339

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.118

Unique variances used for the computation of factor scores for the indicator Exchange and co-ordination for teaching, by country

	BTG30C	BTG30D	BTG30E	BTG30F	BTG30G
Australia	1.126	0.781	2.357	0.805	0.792
Austria	0.406	0.956	1.731	1.327	1.078
Belgium (Fl.)	0.715	1.087	1.226	1.138	0.644
Brazil	0.899	1.774	1.322	0.790	0.653
Bulgaria	0.485	1.468	1.075	0.639	1.304
Denmark	0.898	0.702	0.683	1.021	0.861
Estonia	0.603	1.210	1.012	2.042	0.828
Hungary	0.351	1.504	1.307	1.308	1.083
Iceland	1.435	1.752	2.103	1.706	1.308
Ireland	0.547	1.136	1.460	1.024	1.495
Italy	0.856	1.265	1.373	0.959	0.345
Korea	1.499	1.067	2.006	0.437	1.294
Lithuania	0.741	0.868	1.108	1.696	0.794
Malaysia	1.046	0.713	1.398	0.389	0.608
Malta	1.485	1.949	1.729	1.355	1.704
Mexico	1.941	1.465	0.775	1.313	1.092
Norway	0.863	1.043	0.833	0.910	0.861
Poland	0.399	1.014	0.942	0.922	0.822
Portugal	0.752	0.957	1.114	0.729	1.071
Slovak Republic	0.707	0.908	0.843	0.629	0.857
Slovenia	0.414	1.544	0.763	0.893	0.565
Spain	1.221	1.297	1.916	0.962	1.106
Turkey	1.275	1.886	1.012	0.816	1.093
Netherlands	0.736	1.319	2.745	1.497	0.589

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.119

Factor loadings used for the computation of factor scores for the indicator Professional collaboration

	BTG30H	BTG30I	BTG30J	BTG30K	BTG30L
International sample	1.449	1.360	1.000	1.249	1.510

Source: OECD, *TALIS Database.*

Table 11.120

Item intercepts used for the computation of factor scores for the indicator Professional collaboration, by country

	BTG30H	BTG30I	BTG30J	BTG30K	BTG30L
Australia	3.073	3.275		2.711	2.668
Austria	4.369	2.601		4.025	3.298
Belgium (Fl.)	3.106	3.286		4.476	3.530
Brazil	3.972	3.409		4.126	3.901
Bulgaria	1.787	3.394		2.884	3.959
Denmark	5.129	3.297		3.911	3.603
Estonia	3.219	3.755		3.015	3.457
Hungary	1.433	2.306		2.910	3.123
Iceland	3.548	2.971		3.554	3.608
Ireland	3.727	5.115		3.773	4.064
Italy	4.509	3.587		4.288	4.072
Korea	2.528	1.662	2.389	1.243	1.221
Lithuania	3.112	2.430		2.551	2.270
Malaysia	3.080	3.011		3.156	3.783
Malta	3.365	3.553		3.510	3.857
Mexico	4.534	3.843		3.775	3.269
Norway	4.410	2.577		3.421	4.687
Poland	1.904	2.227		2.462	1.792
Portugal	4.230	3.243		4.228	3.881
Slovak Republic	2.587	1.724		2.509	3.169
Slovenia	3.766	2.796		3.873	3.429
Spain	3.645	3.508		3.721	4.104
Turkey	2.706	3.144		3.357	4.365
Netherlands	2.411	3.131		3.433	2.088

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Table 11.121

Unique variances used for the computation of factor scores for the indicator Professional collaboration, by country

	BTG30H	BTG30I	BTG30J	BTG30K	BTG30L
Australia	2.373	1.348	1.547	1.430	1.847
Austria	3.267	0.865	1.458	0.826	1.379
Belgium (Fl.)	1.644	1.060	0.709	1.011	1.564
Brazil	2.144	1.654	1.280	1.042	2.369
Bulgaria	1.945	1.073	1.369	1.381	3.166
Denmark	1.155	1.948	2.091	1.081	1.675
Estonia	2.633	1.170	1.245	1.045	2.301
Hungary	1.318	1.469	1.566	1.127	1.986
Iceland	3.604	1.660	1.567	1.430	1.920
Ireland	2.631	0.858	0.511	1.517	1.462
Italy	4.708	0.962	1.506	2.040	1.940
Korea	2.056	0.737	0.553	0.672	0.834
Lithuania	2.617	0.789	0.926	0.869	1.842
Malaysia	1.876	1.002	1.365	1.131	1.709
Malta	1.747	1.418	0.673	1.199	1.814
Mexico	3.634	1.748	1.343	1.290	1.696
Norway	3.128	1.533	2.071	1.197	1.537
Poland	2.843	1.081	1.257	0.873	2.085
Portugal	3.259	1.248	1.151	1.495	2.511
Slovak Republic	1.974	1.040	1.378	1.017	1.463
Slovenia	2.639	1.177	0.914	1.064	1.876
Spain	2.716	1.469	0.723	1.519	3.009
Turkey	1.650	0.888	1.081	1.208	1.752
Netherlands	2.808	2.531	1.473	0.821	2.039

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

Table 11.122

Factor score determinacy for the indicators of co-operation among staff, by country

	TCEXCHAN	TCCOLLAB
Australia	0.870	0.874
Austria	0.869	0.858
Belgium (Fl.)	0.843	0.782
Brazil	0.908	0.889
Bulgaria	0.770	0.843
Denmark	0.894	0.882
Estonia	0.846	0.850
Hungary	0.834	0.850
Iceland	0.860	0.874
Ireland	0.854	0.814
Italy	0.833	0.836
Korea	0.887	0.923
Lithuania	0.867	0.876
Malaysia	0.893	0.894
Malta	0.837	0.840
Mexico	0.861	0.868
Norway	0.834	0.842
Poland	0.870	0.876
Portugal	0.840	0.814
Slovak Republic	0.892	0.881
Slovenia	0.844	0.836
Spain	0.805	0.805
Turkey	0.911	0.907
Netherlands	0.776	0.815

Note: The Netherlands was excluded because it did not meet international sampling standards.
Source: OECD, *TALIS Database.*

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Annex A

TALIS Consortium, Experts and Consultants

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IEA Data Processing and Research Center (Hamburg, Germany)

Dirk Hastedt (International Project Co-Director)

Steffen Knoll (International Project Co-Director)

Friederike Westphal (International Project Co-ordinator, field operations)

Ralph Carstens (International Project Manager, data and analysis)

Alena Becker (International Deputy Project Manager, data and analysis)

At the ISC Mr. Dirk Hastedt and Dr. Steffen Knoll acted as co-directors of TALIS. Mr. Hastedt was responsible for the overall budget, contractual agreements and consulting, while Dr. Knoll took care of the international schedules, co-ordinating the consortium and the internal budget. As study co-ordinator Ms. Friederike Westphal maintained close contact with the National Project Managers (NPMs) and co-ordinated the survey administration at the international level. Mr. Ralph Carstens acted as director of data management and was involved in the analysis of the TALIS data. As deputy data manager Ms. Alena Becker was responsible for the everyday business of data processing in co-operation with the national data managers.

Simone Uecker (layout verification, national adaptations)
Daniel Radtke (layout verification, national adaptations)
Sebastian Meyer (layout verification, national adaptations)
Laura Romero de Rosenbusch (layout verification, national adaptations)

Dirk Oehler (data processing)
Tim Daniel (data processing)
Michael Jung (data processing)
Keith Hanmer (data processing)
Limiao Duan (data processing)

Plamen Mirazchiyski (data analysis and quality control)
Leslie Rutkowski (data analysis and quality control)

Stephan Petzchen (software development)
Harpreet Singh Choudry (software development)
Siddharth Somasundaram (software development)
Martin Olszewski (software development)
Bastian Deppe (software development)
Christian Harries (software development)
Alexander Konn (software development)
Lukas Bujara (software development)
Hauke Heyen (software development)

Bettina Wietzorek (meeting organisation)

IEA Secretariat (Amsterdam, Netherlands)

Barbara Malak-Minkiewicz (translation verification and international quality control)

Suzanne Morony (translation verification and international quality control)

At the IEA Secretariat Dr. Barbara Malak-Minkiewicz and Dr. Suzanne Morony 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 24 participants in a total of 31 languages. The IEA Secretariat appointed, contracted and trained independent quality control monitors to watch over survey implementation in each participating country.

Statistics Canada (Ottawa, Canada)

Jean Dumais (sampling referee)

Sylvie LaRoche (sampling and 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 of all participating countries prior to the field trial and performed the weighting and sample adjudication for the main survey prior to data analysis.

TALIS Expert Groups

Instrument Development Expert Group

David Baker (Pennsylvania State University, United States)

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Annex B

Characteristics of National Samples

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AUSTRALIA

In Australia, the education system is the responsibility of each individual state or territory. 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.

Sample design

	ISCED Level 2	
	Schools	Students
International target population	2 617	969 509
Out of scope	-	-
National target population	2 617	969 509
Exclusions		
Non mainstream schools (correctional, hospital, environment, distance education, language support centres, mature age, non-English curriculum and special schools)	110	3 852
Survey population	2 507	965 657
Coverage rate	95.8%	99.6%

Sample allocation: Proportional to the number of schools, then adjusted to have a minimum of four 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: Probability proportional to size.

Measure of size (MOS): Count of ISCED Level 2 students in school.

Explicit stratification: Explicit stratification was organised by state and territory, for a total of eight explicit strata.

Implicit stratification: Implicit stratification was organised by sector (Catholic, Government or Independent), geography (nine categories from metropolitan to remote areas) and Quintiles of the Education and Occupation index from SEIFA (Socio-Economic Index for Areas) based on the postal code of the school (five categories).

Allocation of school sample in Australia

	Population counts		Field trial		Main survey	
State or territory	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Australian Capital Territory	36	19 475	1	20	4	80
New South Wales	802	346 593	4	80	63	1 260
Northern Territory	44	7 552	1	20	4	80
Queensland	456	164 472	4	80	36	720
South Australia	223	58 138	2	40	18	360
Tasmania	93	26 969	1	20	7	140
Victoria	542	257 638	4	80	43	860
Western Australia	311	84 820	3	60	25	500
Total	2 507	965 657	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The Australian Council for Educational Research (ACER) developed the school sampling frame by coordinating information from multiple sources including the Australian Bureau of Statistics (ABS) and commonwealth, state and territory education department databases, from the school year 2005.

AUSTRIA

In Austria, ISCED Level 2 education covers Grades 5 to 8. There are two major tracks (AHS – *Allgemeinbildende höhere Schulen*/Academic secondary school and HS – *Hauptschulen*/General secondary school) and another, smaller category of privately organised schools. For sampling purposes, tracks within schools are considered as separate sampling units.

Sample design

	ISCED Level 2	
	School tracks	Students
International target population	1 540	385 402
Out of scope	-	-
National target population	1 540	385 402
Exclusions	-	-
Survey population	1 540	385 402
Coverage rate	100%	100%

Sample allocation: Disproportional allocation to allow some data comparisons between the two larger strata.

Sample sizes: 20 school tracks selected for the field trial and 279 school tracks selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 students in school track.

Explicit stratification: Explicit stratification was organised by school type (the two school tracks AHS and HS and an additional category "other"), for a total of three explicit strata.

Implicit stratification: Implicit stratification was organised by district categories, for a total of 96 implicit strata.

Allocation of school sample in Austria

	Population counts		Field trial		Main survey	
District	Schools	MOS (ISCED Level 2 students)	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
AHS	269	116 691	5	100	109	2 180
HS	1 181	264 221	13	260	160	3 200
OTHER	90	4 490	2	40	10	200
Total	1 540	385 402	20	400	279	5 580

* Calculated using an estimate of 20 selected teachers per school.

Data sources

Statistics Austria created the school sampling frame with information from the official school database.

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BELGIUM (Flanders)

In Belgium (Flanders), ISCED Level 2 education corresponds to the first stage of secondary education. It consists of the first and the second year of secondary education. There are 789 schools offering ISCED Level 2 education.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	789	26 127
Out of scope		
Schools exclusively devoted to special needs students	114	3 997
National target population	675	22 130
Exclusions	-	-
Survey population	675	22 130
Coverage rate	100%	100%

Sample allocation: Disproportional allocation to allow comparison between educational networks (3).

Sample sizes: 20 schools selected for the field trial and 260 schools selected for the main survey.

Method of sample selection: Probability proportional to size.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by educational networks. There are three educational networks in Flanders: community-run education subsidised publicly run education and subsidised privately run education, for a total of three explicit strata.

Implicit stratification: No implicit variable used.

Allocation of school sample in Belgium (Flanders)

	Population counts		Field trial		Main survey	
Educational networks	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Subsidized privately run education	467	15 764	14	280	132	2 640
Community-run education	149	4 398	4	80	83	1 660
Subsidized publicly run education	59	1 968	2	40	45	900
Total	675	22 130	20	400	260	5 200

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The school sampling frame was a combination of three Access data files from the Flemish Ministry of Education, including schools, number of teachers (double counts) and number of teachers (without double counts) respectively, from school year 2005-06 (June 2006).

BRAZIL

Target Population

In Brazil, elementary education includes both ISCED Level 1 and ISCED Level 2 programmes. The ISCED Level 2 regular programme lasts either eight or nine years. It covers Grades 5 to 8 in elementary education, offering eight years of schooling, and Grades 6 to 9 in elementary education, offering nine years of schooling.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	57 704	847 423
Out of scope		
Schools exclusively devoted to special needs students	225	3 472
National target population	57 479	843 951
Exclusions		
Schools with fewer than four ISCED Level 2 teachers	4 636	10 124
Federal schools	34	1 683
Survey population	52 809	832 144
Coverage rate	91.9%	98.6%

Sample allocation: Proportional allocation to the number of schools per type but not to the number of schools by school size groups.

Sample sizes: 20 schools selected for the field trial and 400 schools selected for the main survey.

Method of sample selection: Probability proportional to size with equal probability sampling in small school strata.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by school type (private, municipal or state) and school size groups (4-19, 20- 29 or 30+), for a total of nine explicit strata.

Implicit stratification: Implicit stratification was organised by region (North, Northeast, Middle West, South, Southeast), location (urban, rural) and State Federal District (27 districts).

Allocation of school sample in Brazil

	Population counts		Field trial		Main survey	
Explicit strata (school size and type)	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
1.4-19 teachers, Private	8 923	95 795	1	11	52	558
1.4-19 teachers, Municipal	17 279	157 913	1	9	54	494
1.4-19 teachers, State	12 163	144 749	1	12	34	402
2.20-29 teachers, Private	890	20 604	2	49	46	1 053
2.20-29 teachers, Municipal	2 632	62 559	3	72	47	1 123
2.20-29 teachers, State	5 121	122 549	3	68	51	1 211
3.30+ teachers, Private	309	11 780	3	75	32	640
3.30+ teachers, Municipal	1 817	74 441	3	75	34	680
3.30+ teachers, State	3 675	141 754	3	75	50	1 000
Total	52 809	832 144	20	446	400	7 161

* Calculated using the average number of teachers in each strata and an estimate of 20 selected teachers for the "30+ teachers" strata.

Data sources

INEP/MEC (INEP – *Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixiera*, MEC – Ministry of Education) developed the school sampling frame. The data were taken from the 2006 School Census on Basic Education, carried out by INEP/MEC.

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BULGARIA

Target Population

In Bulgaria, ISCED Level 2 education corresponds to the second stage of basic education and covers Grades 5 to 8. There are 2 520 schools offering ISCED Level 2 education.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	2 520	31 765
Out of scope		
Schools exclusively devoted to special needs students	112	983
National target population	2 408	30 782
Exclusions	-	-
Small schools with fewer than 4 ISCED Level 2 teachers	108	282
Survey population	2 300	30 500
Coverage rate	95.5%	99%

Sample allocation: Allocation proportional to the number of schools per type but not to the number of schools by school size groups.

Sample sizes: 20 schools selected for the field trial and 203 schools selected for the main survey.

Method of sample selection: Probability proportional to size with equal probability sampling in small school stratum.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by school type (general, vocational or profiled) and school size groups (4-9, 10-19, 20-29 or 30+), for a total of 12 explicit strata.

Implicit stratification: Implicit stratification was organised by location (capital, large city or other location).

Allocation of school sample in Bulgaria

	Population counts		Field trial		Main survey	
Explicit strata (school size and type)	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
1. 4-9 teachers, General	1 137	6 822	1	6	16	98
2. 4-9 teachers, Vocational	58	348	1	8	4	33
3. 4-9 teachers, Profiled	21	126	1	6	4	26
4. 10-19 teachers, General	439	6 363	1	14	32	464
5. 10-19 teachers, Vocational	83	1 078	1	13	4	52
6. 10-19 teachers, Profiled	55	839	2	31	4	61
7. 20-29 teachers, General	273	6 502	5	119	56	1 334
8. 20-29 teachers, Vocational	15	358	1	24	5	119
9. 20-29 teachers, Profiled	10	246	0	0	10	246
10. 30+ teachers, General	188	6 964	6	150	56	1 400
11. 30+ teachers, Vocational	13	540	1	25	4	100
12. 30+ teachers, Profiled	8	314	0	0	8	200
Total	2 300	30 500	20	396	203	4 133

* Calculated using the average number of teachers as the number of teachers selected for the first 9 strata and a total of 25 teachers selected for "30+ teachers" strata.

Data sources

The National Center for Informatics Coverage of Education developed the school sampling frame. Data from the school year 2006-07 were used.

DENMARK

Target Population

In Denmark, education is compulsory for nine years: first to ninth form. Approximately 40% of pupils in the ninth form continue in a voluntary one-year tenth form. ISCED Level 2 education covers the seventh to tenth forms.

Sample design

	ISCED Level 2	
	Schools	Teachers[1]
International target population	2 509	62 105
Out of scope		
Schools exclusively devoted to special needs students	333	1 200[2]
National target population	2 176	60 905
Exclusions		
Schools with five or fewer teachers (either ISCED Levels 1 or 2)	70	274
No information available	29	N/A
Public Youth schools (Ungdomsskoler): Very special schools offering only a small proportion of activities at ISCED Level 2 (activities like cooking)	111	300
Survey population	1 966	60 331
Coverage rate	90,3%	<99,1%

1. Includes all teachers from Grade 1 to Grade 10. ISCED Level 2 is from Grade 7 to Grade 10.
2. Number of teachers is underestimated because it is known for only 91 out of 333 schools for students with special needs.

Sample allocation: Proportional to the number of schools per stratum.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 students in school.

Explicit stratification: Explicit stratification was organised by school type (Continuation, Public and Private Schools), for a total of three explicit strata.

Implicit stratification: Implicit stratification was organised by geographical categories: city around Greater Copenhagen, city outside Greater Copenhagen and country municipal, for a total of three implicit strata.

Allocation of school sample in Denmark

	Population counts		Field trial		Main survey	
School type	Schools	MOS[1]	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Continuation Schools (C)	205	20 966	2	40	21	420
Public schools (P)	1 346	174 297	14	280	137	2 740
Private Schools (R)	415	31 621	4	80	42	840
Total	1 966	226 884	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.
1. Includes all teachers from Grades 1 to 10. ISCED Level 2 is from Grade 7 to Grade 10.

Data sources

The information used to create of the school sampling frame came from UNI-C, a government institution under the Danish Ministry of Education, which collects data from all schools at the beginning of each school year. The data provided refer to the school year 2005-06.

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ESTONIA

In Estonia, ISCED Level 2 education covers Grades 7 to 9.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	508	9 624
Out of scope		
Schools devoted to students with special needs	44	719
Institutions providing adult education (adult gymnasiums)	16	158
National target population	448	8 747
Exclusions		
Very small schools with fewer than 7 ISCED Level 2 teachers*	12	65
Remote schools	5	27
Bilingual schools (Estonian/Russian (15) Finnish/Estonian (1))	16	410
Survey population	415	8 245
Coverage rate	92.6%	94.3%

* At the time of sample preparation, these schools were expected to be closed at the time of data collection.

Sample allocation: Proportional to the number of schools.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by region (city and municipality) and by school type (schools providing lower secondary education *(põhikool)* and schools providing lower and upper secondary education *(Gûmnaasium))*, for a total of four explicit strata.

Implicit stratification: Implicit stratification was organised by socio-economic status (poor and rich), school size (fewer than 120 pupils and 120 pupils or more) and language of instruction (Estonian and Russian).

Allocation of school sample in Estonia

	Population counts		Field trial		Main survey	
Region by school type	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Municipality – *Põhikool*	176	1 869	8	88	85	935
Municipality – *Gûmnaasium*	73	1 654	3	69	35	805
City – *Põhikool*	24	432	2	36	12	216
City –*Gûmnaasium*	142	4 290	7	140	68	1 360
Total	415	8 245	20	333	200	3 316

* Calculated using the average number of teachers as the number of teachers selected for the first three strata and an average of 20 teachers per selected school for the last stratum.

Data sources

The Estonian Educational Information System (EEJS / EHIS) collected information for the school sampling frame for the school year 2005-06.

HUNGARY

In Hungary, ISCED Level 2 education corresponds to Grades 5 to 8. It is offered in both primary and secondary schools. Primary schools offer education from Grade 1 to Grade 8. Some secondary schools cover Grade 5 to Grade 12 while others cover only Grade 7 to Grade 12. Some schools also offer both primary and secondary schooling.

Sample design

	ISCED Level 2	
	Schools	Teachers*
International target population	3 078	49 045
Out of scope		
Schools devoted to students with special needs	174	2 436
Schools devoted to adult education	7	15
National target population	2 897	46 594
Exclusions		
Very small schools with fewer than four ISCED Level 2 teachers	45	103
Survey population	2 852	46 491
Coverage rate	98.4%	99.8%

* Estimated from the number of ISCED Level 1 and ISCED Level 2 classes and the number of teaching staff.

Sample allocation: Disproportional.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by school size groups (4-9, 10-19, 20-29, 30 or more).

Implicit stratification: Implicit stratification was organised by type of school (primary, secondary and mixed), type of settlement (capital, town and village) and school ownership (public/state, church and private).

Allocation of school sample in Hungary

	Population counts		Field trial [2]		Main survey	
	Schools	MOS [1]	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers [3]
4 to 9 teachers	831	6 136	20	400	16	118
10 to 19 teachers	1 173	16 288			70	969
20 to 29 teachers	591	13 941			70	1650
30 or more teachers	257	10 126			44	880
Total	2 852	46 491	20	400	200	3618

* Calculated using an estimate of 20 selected teachers per school.
1. Estimated from the number of ISCED Level 1 and ISCED Level 2 classes and the number of teaching staff.
2. No explicit stratification done for the Field Test.
3. Calculated using the average number of teachers as the number of teachers selected for the first three strata and an average of 20 teachers per selected school for the last stratum.

Data sources

The school sampling frame comes from the Annual Statistical Database of the Ministry of Education, for school year 2007-08 (for the field trial, the frame used was based on data from the school year 2004-05).

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ICELAND

The Icelandic education system covers Grades 1 to 10. ISCED Level 1 corresponds to Grades 1 to 7 (typically starting at 6 years of age) while ISCED Level 2 covers Grades 8 to 10 (typically starting at 13 years of age).

Iceland chose to survey all ISCED Level 2 teachers. As a national option, all ISCED Level 1 teachers in Iceland were also surveyed.

Sample design

	ISCED Level 2	
	School tracks	Teachers
International target population	146	2 315
Out of scope: Special needs	2	12
National target population	144	2 303
Exclusions	-	-
Survey population	144	2 303
Coverage rate	100%	100%

Sample allocation: Not applicable.

Sample sizes: The 10 largest schools were selected for the field trial and all schools were selected for the main survey.

Measure of size (MOS): Not applicable.

Explicit stratification: Not applicable.

Implicit stratification: Not applicable.

Allocation of school sample in Iceland

	Population counts		Field trial		Main survey	
District	Schools	MOS (ISCED Level 2 teachers)	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
All	144	2 303	10	200	144	2 303
Total	144	2 303	10	200	144	2 303

* All teachers are selected in the sample.

Data sources

The Icelandic statistical bureau provided the information for the creation of the school frame. A centralized database with information on both teachers and students was used to create the school frame.

IRELAND

In Ireland, ISCED Level 2 education covers the first, second and third years of post-primary education. It corresponds to the seventh, eighth and ninth years of education.

Sample design

	ISCED Level 2	
	School tracks	Students[1]
International target population	702	170 387
Out of scope	-	-
National target population	702	170 387
Exclusions	-	-
Survey population	702	170 387
Coverage rate	100%	100%

1. Country was able to provide only counts of ISCED Level 2 students.

Sample allocation: Proportional to the number of schools by school size group.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 students in school.

Explicit stratification: Explicit stratification variable was organised by school size groups (small, medium and large) according to the number of ISCED Level 2 students in the school.

Implicit stratification: Implicit stratification variable was organised by school type (secondary, vocational and community/ comprehensive), student gender (boys, girls and mixed) and school socio-economic status (schools classified as socio-economically disadvantaged and other schools that do not meet this criteria).

Allocation of school sample in Ireland

	Population counts		Field trial		Main survey	
School size	Schools	MOS[1]	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Small – Up to 120 students	127	9 776	4	80	36	720
Medium - 121 to 240 students	246	44 954	7	140	70	1 400
Large – 240 students or more	329	115 657	9	180	94	1 880
Total	702	170 387	20	400	200	4 000

* Calculated using an estimate of 20 teachers selected per school.
1. Counts of ISCED Level 2 students.

Data sources

The school sampling frame comes from the Irish Department of Education and Science Database of Post-Primary Schools, for the school year 2005-06.

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ITALY

In Italy, ISCED Level 2 education corresponds to 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 (in two regions only) and private schools.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	7 941	191 725
Out of scope		
Schools exclusively devoted to special needs students	43	256
Laboratory schools with special ordinance (different from other regular schools)	4	123
National target population	7 894	191 346
Exclusions		
Schools with fewer than 4 ISCED Level 2 teachers	262	604
Private schools outside the national education system	21	244
Schools attached to art academies	71	919
Remote schools	31	233
Survey population	7 509	189 346
Coverage rate	95.1%	99%

Sample allocation: Fixed allocation of 100 schools per geographical region (North Italy, Central Italy and combined South and Insular Italy) to allow comparison between the three geographical areas.

Sample sizes: 20 schools selected for the field trial and 300 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: The explicit stratification variable was organised by geographical region as described above.

Implicit stratification: The implicit stratification variable was organised by school outcomes measured as the ratio of students who passed with a sufficient evaluation over the total of students who passed (five categories).

Allocation of School Sample in Italy

	Population counts		Field trial		Main survey	
Geography	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
North Italy	3 200	75 293	8	160	100	2 000
South and Insular Italy	3 036	82 067	4	80	100	2 000
Central Italy	1 273	31 986	8	160	100	2 000
Total	7 509	189 346	20	400	300	6 000

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The school sampling frame was created by combining data from different sources: administrative data owned by the Ministry of Education (for public schools managed by the central government), data from the census survey managed by the Ministry of Education's Statistics Office (for public schools managed by the local government and other administrative data for private schools.

KOREA

In Korea, ISCED Level 2 education is offered in middle schools (also called junior high school) and covers Grade 7 to Grade 9.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	2 987	103 877
Out of scope	-	-
National target population	2 987	103 877
Exclusions	-	-
Survey population	2 987	103 877
Coverage rate	100%	100%

Sample allocation: Not applicable.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: None.

Implicit stratification: Implicit stratification variable was organised by region (16) and by type of funding (private, public and national).

Allocation of School Sample in Korea

	Population counts		Field trial		Main survey	
Geography	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
All	2 987	103 877	20	400	200	4 000
Total	2 987	103 877	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The Center for Education Statistics and Information (Korean Educational Development Institution) provided the school frame as designated by Ministry of Education and Human Resource Development.

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LITHUANIA

In Lithuania, ISCED Level 2 education corresponds to Grades 5 to 10. It is offered in basic schools (from Grade 1 to Grade 10, covering ISCED Levels 1 and 2), secondary schools (from Grade 1 to Grade 12, covering ISCED Levels 1 to 3), Gymnasium (from Grade 9 to Grade 12, covering ISCED Levels 2 and 3) and vocational schools (also covering ISCED Levels 2 and 3).

Sample design

	ISCED Level 2	
	Schools	Teachers*
International target population	1 361	49 154
Out of scope		
Schools exclusively devoted to special needs students	65	1 772
National target population	1 296	47 382
Survey population	1 296	47 382
Coverage rate	95.2%	96.4%

*Includes the total number of teachers in the school.

Sample allocation: Proportional to the number of schools in each stratum.

Sample sizes: 20 schools selected for the field trial and 220 schools selected for the main survey.

Measure of size (MOS): Total number of teachers in the school.

Explicit stratification: Explicit stratification was organised by school type in four categories (basic, secondary, gymnasium and vocational).

Implicit stratification: Implicit stratification was organised by urbanisation (city, town or village) and type of funding (public and private).

Allocation of school sample in Lithuania

	Population counts		Field trial		Main survey	
School type	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Basic	630	12 998	9	180	107	2 140
Secondary	128	7 220	2	40	22	440
Gymnasium	465	22 564	7	140	79	1 580
Vocational	73	4 600	2	40	12	240
Total	1 296	47 382	20	400	220	4 400

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The information used to create the school sampling frame came from the database of schools from the Ministry of Education and Science of Lithuania from the school year 2005-06.

MALAYSIA

In Malaysia, ISCED Level 2 education covers Forms 1, 2 and 3, which are equivalent to Grades 7, 8 and 9 respectively. It is offered in government schools (MOE), MARA schools and religious schools (SMAR/SMAN).

Sample design

	ISCED Level 2	
	Schools	Students[1]
International target population	2 363	1 408 601[2]
Out of scope		
Schools exclusively devoted to special needs students	2	175
National target population	2 361	1 408 426[2]
Exclusions		
Schools with different curriculum (expatriate schools, international schools and Chinese private schools)	106	N/A
Very small schools (fewer than 100 enrolled ISCED Level 2 students)	109	6,554
Remote schools	2	591
Survey population	2 144	1 401 281
Coverage rate	90.8%	<99.5%*

1. Country was able to provide counts of ISCED Level 2 students only.
2. Does not account for the unavailable figures.

Sample allocation: Proportional to the number of schools, with the exception of the smaller stratum in which all schools were selected.

Sample sizes: 20 schools selected for the field trial and 219 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 students in school.

Explicit stratification: Explicit stratification variable was organised by school type (government schools [MOE], MARA schools and religious schools [SMAR/SMAN]), for a total of 3 explicit strata.

Implicit stratification: Implicit stratification variables was organised by State (14) and location (urban and rural).

Allocation of school sample in Malaysia

	Population counts		Field trial		Main survey	
Type of school	Schools	MOS[1]	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Government schools (MOE)	1 945	1 336 257	17	340	183	3 660
MARA schools	20	8 608	1	20	19	380
Religious schools (SMAR/SMAN)	179	56 416	2	40	17	340
Total	2 144	1 401 281	20	400	219	4 380

* Calculated using an estimate of 20 selected teachers per school.
1. Counts of ISCED Level 2 students.

Data sources

The information used to create the school sampling frame came from the Ministry of Education (MOE) for government schools, MARA Junior Science Colleges for MARA schools and from the EPDR Database for the Religious Schools, for the school year 2006 (January).

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MALTA

Target Population

In Malta, ISCED Level 2 lasts five years, from Form I to Form V. Children are typically 11 years of age when they start ISCED Level 2 education. Sixty-four schools offer ISCED Level 2 education.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	64	3 013
Out of scope	-	-
National target population	64	3 013
Exclusions		
Schools not following the mainstream curriculum	3	88
Very small schools	2	>1
International Baccalaureate	1	>1
Survey population	58	<2 924
Coverage rate	93,7%	<97%

Sample allocation: Not applicable.

Sample sizes: Four largest schools selected for the field trial and all schools selected for the main survey.

Measure of size (MOS): Not applicable.

Explicit stratification: Not applicable.

Implicit stratification: Not applicable.

Allocation of school sample in Malta

	Population counts		Field trial		Main survey	
Malta	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
All	58	2 924	4	80	58	1 160
Total	58	2 924	4	80	58	1 160

* Calculated using an average of 20 teachers per school.

Data sources

The Ministry of Education, Youth and Employment - Education Division provided information from the school year 2007-08 for the creation of the school sampling frame.

MEXICO

In Mexico, ISCED Level 2 is compulsory and corresponds to lower secondary education. It comprises 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 in *Telesecundaria* schools did not meet the TALIS definition of an ISCED Level 2 teacher. These schools and their teachers were classified as out of the scope for TALIS, but were part of a national option for Mexico.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	32 079	351 454
Out of scope		
Telesecundaria schools [1]	16 529	60 493
Secondary schools (Secundaria) for workers	330	4 582
National target population	15 220	286 379
Exclusions		
Very small schools (fewer than 4 teachers)	87	159
Schools selected for the Field Test	23	758
CONAFE	918	1 050
Others	8	506
Survey population	14 184	283 906
Coverage rate	93.2%	99.1%

1. Distance learning schools.

Sample allocation: Proportional to the number of schools, then adjusted to have a minimum of four schools selected in the smaller strata.

Sample sizes: 24 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of the number of teachers in the school.

Explicit stratification: Explicit stratification was organised by school size group based on the number of teachers in the school (4 to 9, 10 to 19, 20 to 29 and 30 or more) and by school type (*General*, *Particular* and *Técnica*), for a total of 12 explicit strata.

Implicit stratification: Implicit stratification was organised by state, for a total of 32 implicit strata.

Allocation of school sample in Mexico

	Population counts		Field trial [1]		Main survey	
	Schools	MOS	Schools	Expected sample size	Schools	Expected sample size*
1. 4-9 teachers – General	816	5 741	n/a	n/a	5	35
2. 4-9 teachers – Particular	813	6 530	n/a	n/a	4	32
3. 4-9 teachers – Técnica	479	3 618	n/a	n/a	4	30
4. 10-19 teachers – General	2 044	29 271	n/a	n/a	24	344
5. 10-19 teachers – Particular	2 422	31 747	n/a	n/a	11	144
6. 10-19 teachers – Técnica	1 490	21 298	n/a	n/a	15	214
7. 20-29 teachers – General	1 839	44 970	n/a	n/a	39	954
8. 20-29 teachers – Particular	339	7 824	n/a	n/a	13	300
9. 20-29 teachers – Técnica	1 248	30 325	n/a	n/a	20	486
10. 30+ teachers – General	1 877	72 749	n/a	n/a	37	925
11. 30+ teachers – Particular	75	2 917	n/a	n/a	9	225
12. 30+ teachers – Técnica	742	26 916	n/a	n/a	19	475
Total	14 184	283 906	24	480	200	4 164

* Calculated using the average number of teachers per school in the first 9 strata and an estimate of 25 selected teachers in "30+ teachers" strata.
n/a = not applicable
1. A convenience sample was selected by Mexico for the Field trial.

Data sources

The government's annual Census of Schools was the source of information for the school frame.

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NORWAY

In Norway, ISCED Level 2 corresponds to lower secondary education and covers Grades 8 to 10.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	1 271	22 337
Out of scope		
Schools exclusively devoted to special needs students	59	439
National target population	1 212	21 898
Exclusions		
Small schools (fewer than ten students or fewer than three ISCED Level 2 teachers	104	211
Schools outside Norwegian school regulation	4	69
Schools abroad	14	48
Survey population	1 090	21 570
Coverage rate	89.9%	98.5%

Sample allocation: Proportional to the number of school per type but not to the number of schools by school size group.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey. All teachers in the selected schools will be surveyed to compensate for the large proportion of very small schools.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by school size groups crossed by urban/rural categories, for a total of eight explicit strata (see below).

Implicit stratification: Implicit stratification was organised by 20 county categories.

Allocation of school sample in Norway

	Population counts		Field trial		Main survey	
School size by urban/rural	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
3-9 teachers – Urban	61	364	1	20	9	54
3-9 teachers – Rural	236	1 372	4	80	38	221
10-19 teachers – Urban	82	1 202	1	20	12	176
10-19 teachers – Rural	220	3 099	3	60	31	437
20-29 teachers – Urban	83	2 064	1	20	15	733
20-29 teachers – Rural	151	3 628	3	60	27	648
30-62 teachers – Urban	133	5 170	4	80	37	1 438
30-62 teachers – Rural	124	4 671	3	60	31	1 168
Total	1 090	21 570	20	400	200	4 875

* Calculated using the average number of teachers per strata.

Data sources

The information used to create of the school sampling frame came from the Primary and Lower Secondary School Information System (GSI / *Grunnskolens informasjons system*) for the school year 2006-07.

POLAND

Target Population

In Poland, ISCED Level 2 education is referred to as *gimnazjum* (junior high and lower secondary). It covers three grades (first, second and third) which generally correspond to the seventh, eighth, and ninth years in school.

Sample design

	ISCED Level 2	
	Schools	Teachers[1]
International target population	7 156	146 730
Out of scope		
Schools exclusively devoted to special needs students	816	7 025
Adult education schools	122	415
National target population	6 218	139 290
Exclusions		
Very small schools (fewer than three ISCED Level 2 teachers)	908	1 816[2]
Survey population	5 310	137 474
Coverage rate	85.4%	98.7%[1]

1. Poland was able to provide aggregated counts of teachers but did not have that information at the school level, which explains why the measure of size is based on student counts.
2. Estimated due to some missing information about the number of ISCED Level 2 teachers in excluded schools. An average of two ISCED Level 2 teachers per school was used to estimate the number of excluded ISCED Level 2 teachers.

Sample allocation: Proportional to the number of schools per strata, then adjusted to have a minimum of four schools selected in the smaller strata.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 students in school.

Explicit stratification: Explicit stratification was organised by location type (rural, urban, rural-urban) and by type of funding (public and private), for a total of six explicit strata.

Implicit stratification: Implicit stratification was organised by region (16 categories).

Allocation of school sample in Poland

	Population counts		Field trial		Main survey	
Type of school	Schools	MOS(1)	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Rural – Public	2 302	415 775	9	180	84	1 680
Rural – Private	28	1 802	0	0	4	80
Urban – Public	1 479	572 387	5	100	55	1 100
Urban – Private	294	18 062	1	20	11	220
Urban – Rural – Public	1 158	331 359	4	80	42	840
Urban – Rural – Private	49	3 519	1	20	4	80
Total	5 310	1 342 904	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.
1. Count of ISCED Level 2 students in school.

Data sources

The information used to create the school sampling frame came from the the Ministry of National Education's System of Information on Education (*System Informacji Oświatowej*) for the school year 2006-07.

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PORTUGAL

In Portugal compulsory education includes ISCED Levels 1 and 2. ISCED Level 1 has two cycles: the first cycle lasts four years and the second cycle, two years. ISCED Level 2 covers three years of schooling.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	1 310	41 807*
Out of scope		
Schools exclusively devoted to special needs students	3	N/A
National target population	1 307	41 807
Exclusions	-	-
Survey population	1 307	41 807
Coverage rate	100%	100%

* Does not account for the unavailable figures.

Sample allocation: Proportional to the number of schools, then adjusted to select all schools in two very small strata.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit Stratification: Explicit stratification was organised by type of funding (private and public) and by region (*Alentejo, Algarve, Centro, Lisboa, Norte*), for a total of 10 explicit strata.

Implicit Stratification: Implicit stratification was organised by school size (fewer than 31 teachers, 31 to 44 teachers, 45 or more teachers).

Allocation of school sample in Portugal

	Population counts		Field trial		Main survey	
Explicit strata (school type and region)	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
1 Publico – Alentejo	118	3 105	3	60	18	360
2 Publico – Algarve	56	1 641	2	40	9	180
3 Publico – Centro	289	9 140	3	60	41	820
4 Publico – Lisboa	242	9 320	3	60	35	700
5 Publico – Norte	391	14 455	3	60	55	1100
6 Privado – Alentejo	9	167	0	0	9	180
7 Privado – Algarve	3	43	0	0	3	60
8 Privado – Centro	54	1 361	2	40	8	160
9 Privado – Lisboa	74	1 187	2	40	11	220
10 Privado – Norte	71	1 388	2	40	11	220
Total	1 307	41 807	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The information used to create the school sampling frame is taken from the Annual School Census, for the school year 2006-07.

SLOVAK REPUBLIC

In the Slovak Republic, ISCED Level 2 education is offered in elementary and grammar schools. It covers Grades 5 to 9 in elementary schools and Grades 1 to 4 in grammar schools.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	1 863	30 724
Out of scope		
Schools exclusively devoted to special needs students	208	2 542
National target population	1 655	28 182
Exclusions		
Language other than Slovak or Hungarian	14	132
Very small schools (fewer than 100 enrolled ISCED Level 2 students)	21	40
Survey population	1 620	28 010
Coverage rate	97.9%	99.4%

Sample allocation: Disproportional allocation to allow some comparison between the elementary and grammar schools.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by school type (elementary and grammar).

Implicit stratification: Implicit stratification was organised by language of instruction (Slovak and Hungarian), region (8 categories) and school size (small, medium and large).

Allocation of school sample in the Slovak Republic

	Population counts		Field trial		Main survey	
School type	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Elementary Schools	1 455	21 940	18	360	130	2 600
Grammar Schools	165	6 070	2	40	70	1 400
Total	1 620	28 010	20	400	200	4 000

* Calculated using an average of 20 teachers per school.

Data sources

The information used to create the school sampling frame was drawn from the UIPS schools databases for the school year 2005-06.

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SLOVENIA

Target Population

In Slovenia, ISCED Level 2 corresponds to Grades 7 to 9.

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	478	9 722
Out of scope		
Schools exclusively devoted to special needs students	32	272
National target population	446	9 450
Exclusions	-	-
Survey population	446	9 450
Coverage rate	100%	100%

Allocation: Not applicable.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: No explicit stratification variable.

Implicit stratification: No implicit stratification variable.

Allocation of school sample in Slovenia

	Population counts		Field trial		Main survey	
Slovenia	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
All	446	9 450	20	400	200	4 000
Total	446	9 450	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.

Data sources

The Slovene Ministry of Education and Sports provided the information used to createthe school sampling frame. It corresponds to the school year 2005-06.

SPAIN (Excluding La Rioja, Canarias)

In Spain, the education system is under the responsibility of 18 autonomous communities. The national target population in Spain covers 16 communities: the Rioja and Canary Islands communities did not take part in the TALIS Survey.

ISCED Level 2 education consists of four grades, from First Compulsory Secondary to Fourth Compulsory Secondary. There are 7 106 schools offering ISCED Level 2 education in the covered autonomous communities.

Sample design

	ISCED Level 2 [1]	
	Schools	Teachers [2]
International target population	7 106	235 060
Out of scope	-	-
National target population	7 106	235 060
Exclusions	-	-
Survey population	7 106	235 060
Coverage rate	100%	100%

1. All counts exclude *La Rioja* and *Canarias* communities, which are not covered by the national target population.
2. The reported number of teachers covers both ISCED Level 2 and 3 teachers. NPM reports that 80% of those teachers are ISCED Level 2.

Allocation: Proportional to the number of schools in each stratum for the main survey.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Levels 2 and 3 teachers in school. Approximately 80% of these teachers teach at ISCED Level 2.

Explicit stratification: Since the field trial was done in only two autonomous communities, the explicit stratification was organised in two groups: field trial communities and all other communities.

Implicit stratification: Implicit stratification was organised by autonomous communities (16), school type (public and private) and school size groups (less than 18, 18 to 41, and 42 or more ISCED Level 2 and 3 teachers.

Allocation of school sample in Spain

	Population counts		Field trial		Main survey	
District	Schools	MOS [1]	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Field Test communities	846	27 687	20	400	24	480
All other communities	6 260	207 373	0	0	176	3 520
Total	7 106	235 060	20	400	200	4 000

* Calculated using an estimate of 20 selected teachers per school.
1. Counts of ISCED Level 2 and 3 teachers.

Data sources

The school sampling frame was created using data provided by the 16 autonomous communities.

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THE NETHERLANDS

In the Netherlands, ISCED Level 2 consists of lower secondary education (the first three years of pre-university education (six years total), the first three years of senior secondary education (five years total) and all four years of pre-vocational secondary education.

Sample design

	ISCED Level 2	
	Schools	Students [1]
International target population	697	722 122
Out of scope		
Schools exclusively devoted to special needs students	110	27 212
National target population	587	694 910
Exclusions		
Schools for vocational training almost exclusively at ISCED Level 3 (limited education at ISCED Level 2 representing 5% of total enrolment in these schools)	42	23 900[1]
Survey population	545	671 010
Coverage rate	92.8%	96.6%*

1. Country was able to provide counts of ISCED Level 2 students only.
2. Estimated.

Sample allocation: Proportional to the number of schools in each stratum.

Sample sizes: Ten schools selected for the field trial and 150 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 students in school.

Explicit stratification: Explicit stratification was organised by education stream categories (mainly vocational with examination at ISCED Level 2 only, academic with examination at ISCED Level 3 only, academic with examination at ISCED Levels 2 and 3, academic and vocational with examination at ISCED Levels 2 and 3), for a total of four explicit strata.

Implicit stratification: None.

Allocation of school sample in the Netherlands

	Population counts		Field trial		Main survey	
Education stream	Schools	MOS [1]	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
Mainly vocational / examination only at ISCED Level 2	75	45 621	2	40	21	420
Academic / examination only at ISCED Level 3	79	38 599	2	40	22	440
Academic / examination at ISCED Levels 2 and 3	107	90 454	2	40	30	600
Academic as well as vocational / examination at ISCED Levels 2 and 3	284	496 336	4	80	77	1 540
Total	545	671 010	10	200	150	3 000

* Calculated using an estimate of 20 selected teachers per school.
1. Counts of ISCED Level 2 students.

Data sources

The Ministry of Education provided the information used for the school sampling frame from the school year 2005-06.

TURKEY

In Turkey, ISCED Level 2 education covers Grades 6 to 8. Education at that level is compulsory. Schools can offers different combinations of ISCED levels. For example, some schools offer primary and lower secondary education only. Others offer ISCED Levels 1 to 3 or ISCED Levels 2 and 3 only (lower and upper secondary).

Sample design

	ISCED Level 2	
	Schools	Teachers
International target population	16 626	161 552
Out of scope		
Schools exclusively devoted to special needs students	311	3 917
National target population	16 315	157 635
Exclusions		
Very small schools (fewer than 4 ISCED Level 2 teachers)	3 838	8 648
Survey population	12 477	148 987
Coverage rate	76 5%	94.5%

Sample allocation: Disproportional.

Sample sizes: 20 schools selected for the field trial and 200 schools selected for the main survey.

Measure of size (MOS): Count of ISCED Level 2 teachers in school.

Explicit stratification: Explicit stratification was organised by school size group defined according to the number of ISCED Level 2 teachers in the school (4 to 9, 10 to 19, 20 to 29 and 30 or more).

Implicit stratification: Implicit stratification was organised by region (12 regions based on the socio-economic development index) and type of funding (private and public).

Allocation of school sample in Turkey

	Population counts		Field trial[1]		Main survey	
Explicit stratification (school size)	Schools	MOS	Schools	Expected number of sampled teachers*	Schools	Expected number of sampled teachers*
4 to 9 teachers	6 899	41 373	5	30	20	120
10 to 19 teachers	3 850	51 678	10	134	35	470
20 to 29 teachers	937	22 060	1	24	75	1 766
30 or more teachers	791	33 876	4	100	70	1 750
Total	12 477	148 987	20	288	200	4 105

* Calculated using an average number of teachers in the three smaller strata and an estimate of 25 selected teachers in the last category.

1. The field trial sample was selected using region as the explicit strata. The strategy for the main survey sample was changed to take into account the large proportion of small schools in Turkey.

Data sources

The source of information used to create the school sampling frame was the ILSIS DATABASE from the school year 2006-07.

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Annex C

Sampling Forms

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Sampling Form 1 **PARTICIPATION**

TALIS 2008 participant: _____

National project manager: _____

1. Please specify the usual start date of the school year, the expected date of surveying for the Main Survey.

   Start of school year: _____ Survey Administration period: _____ End of school year: _____

2. Describe the grade structure through ISCED Level 2

   _____

   _____

3. Has your country chosen to survey teachers of 15-year-old students in schools selected for PISA 2006? *(Please enter 'X' in the appropriate box)*

   ☐ Yes ☐ No

4. Does your country/institution have some experience with other, similar international surveys (*e.g.* PISA, TIMSS, SITES, PIRLS)? *(Please enter "X" in the appropriate box)*

   ☐ Yes ☐ No

5. Indicate the language(s) in which the survey will be administered.

   _____

6. Would you be interested in using online data collection? *(Please enter "X" in the appropriate box)*

   ☐ Yes ☐ No

7. Do you plan to outsource all or parts of survey operations to a third party? *(Please enter "X" in the appropriate box)*

   ☐ Yes ☐ No

   If yes, which parts :

   _____

Sampling Form 2 **NATIONAL TARGET POPULATION**

TALIS 2008 participant: _____

National project manager: _____

1. Total number of schools and ISCED Level 2 teachers in the target population:

	Number of schools	Number of teachers at ISCED Level 2
[a]		

School-level exclusions

2. Describe the reasons for school exclusion from the national target population *(if applicable)*.

Reason for exclusion	Number of schools	Number of teachers at ISCED Level 2
TOTAL		

		Number of schools	Number of teachers at ISCED Level 2
3. Total number of schools and ISCED Level 2 teachers excluded from the national target population:	[b]		
4. Total number of schools and ISCED Level 2 teachers in the national target population: *(box [a] – box [b])*	[c]		
5. Percentage of coverage of the national target population in terms of number of schools of ISCED Level 2 teachers: *(box [c] ÷ box [a])*	[d]		

6. Describe your data sources *(provide copies of relevant tables)*.

_____

_____

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Sampling Form 3 **STRATIFICATION**

TALIS 2008 participant: _____

National project manager: _____

Explicit stratification of schools

1. List and describe the variables used for explicit stratification:

Explicit stratification variables			
	Name	Description	Number of levels
1			
2			
3			
4			
5			

2. Total number of explicit strata: [ ]

Implicit stratification of schools

3. List and describe the variables used for implicit stratification:
(Please list variables in the order you want them to be used)

Implicit stratification variables			
	Name	Description	Number of levels
1			
2			
3			
4			
5			

4. Total number of implicit strata: [ ]

Sampling Form 4 **SAMPLING FRAME DESCRIPTION**

TALIS 2008 participant: _____

National project manager: _____

1. Specify the school measure of size (MOS) to be used. *(Please enter "X" in the appropriate box)*

   ☐ **Number of ISCED Level 2 teachers in school**

   ☐ Number of ISCED Level 2 students in school

   ☐ Total number of teachers in school

   ☐ Total number of students in school

   ☐ Other *(please describe)*

   _____

   _____

2. Specify the school year for which employment data will be used for the school MOS.

   _____

3. Describe the source of information used in creating the school sampling frame.

   _____

   _____

   _____

4. Define the units used in the sampling frame (*i.e.* whole schools, shifts, tracks, programmes, etc.).

   _____

   _____

   _____

5. If your country also surveys teachers of 15-year-olds in schools selected for PISA 2006, please define the units used in the PISA 2006 sampling frame (*i.e.* whole schools, shifts, tracks, programmes, etc.).

   _____

   _____

   _____

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Sampling Form 5 **EXCLUDED SCHOOLS**

TALIS 2008 participant: ______________________________

National project manager: ______________________________

School ID	Reason for exclusion	School MOS

page ______ of ______ *(Use additional sheets if necessary)*

Sampling Form 6 **POPULATION COUNTS BY STRATA**

TALIS 2008 participant: ______________________ **Target population**

National project manager: ______________________ **ISCED:** ________

Explicit strata	Implicit strata	Population counts	
		Schools	MOS
1	2	3	4

page ______ of ________ *(Use additional sheets if necessary)*

Sampling Form 7 **SAMPLE ALLOCATION**

TALIS 2008 participant: _____ **Target population**

National project manager: _____ **ISCED:** _____

Explicit Strata	MCS	Sample Allocation			
		Main Survey		Field Trial	
		Schools	MOS	Schools	MOS
1	2	3	4	5	6
	Country Total:				

page _____ of _____ *(Use additional sheets if necessary)*

Annex D

TALIS Principal and Teacher Questionnaire

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[Placeholder
for identification label]
(105 x 35 mm)

OECD Teaching and Learning International Survey (TALIS)

Principal Questionnaire

Main study version (MS-11-01)

[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

The first Teaching and Learning International Survey (TALIS) 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 some 23 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.

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 of its 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 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 it or the study, you can reach us by phone at the following numbers: [National Center Contact Information]

Thank you very much for your co-operation!

Background information

These questions are about you, your education and your position as school principal. In responding to the questions, please mark the appropriate box.

1	What is your gender?	
Female	Male	
☐1	☐2	

2	How old are you?			
Under 40	40-49	50-59	60+	
☐1	☐2	☐3	☐4	

3	Do you have principal responsibilities for more than one school?
Yes	No
☐1	☐2

4	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 Bachelor degree>
☐4	<ISCED Level 5A Masters degree>
☐5	<ISCED Level 6>

5	How many years experience do you have working as a principal?						
This is my first year	1-2 years	3-5 years	6-10 years	11-15 years	16-20 years	More than 20 years	
☐1	☐2	☐3	☐4	☐5	☐6	☐7	

6	How many years experience do you have working as a principal <u>at this school</u>?						
This is my first year	1-2 years	3-5 years	6-10 years	11-15 years	16-20 years	More than 20 years	
☐1	☐2	☐3	☐4	☐5	☐6	☐7	

7	How many years did you spend as a subject/class teacher before you became a principal?						
None	Less than 3 years	3-5 years	6-10 years	11-15 years	16-20 years	More than 20 years	
☐1	☐2	☐3	☐4	☐5	☐6	☐7	

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School background information

8	Is this school a public or private school?
	Please mark one choice.
☐1	A public school → **Please go to question 10.** *(This is a school managed directly or indirectly by a public education authority, government agency, or governing board appointed by government or elected by public franchise.)*
☐2	A private school → **Please go to question 9.** *(This is a school managed directly or indirectly by a non-government organisation; e.g. a church, trade union, business or other private institution.)*

9	Thinking about the funding of this school in a typical year, which of the following applies?		
	Please only answer this question if you marked "private school" in question 8 before. *Please mark one choice in each row.*		
		Yes	No
	a) 50% or more of the school's funding comes from the <government> (Includes departments, local, regional, state and national)	☐1	☐2
	b) Teaching personnel are funded by the <government> (Includes departments, local, regional, state and national)	☐1	☐2

10	Which of the following best describes the community in which this school is located?
	Please mark one choice.
☐1	A <village, hamlet or rural area> (fewer than 3 000 people)
☐2	A <small town> (3 000 to about 15 000 people)
☐3	A <town> (15 000 to about 100 000 people)
☐4	A <city> (100 000 to about 1 000 000 people)
☐5	A large <city> with over 1 000 000 people

11	For each type of position listed below, indicate the number of staff currently working in this school.
	Please indicate the number of persons (in head counts) who work at this school. *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 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-professional personnel who provide instruction or support teachers in providing instruction, professional curricular/instructional specialists and educational media specialists)*
c) ☐☐☐	School administrative or management personnel *(Including principals, assistant principals, other management staff, receptionists, secretaries, administration assistants whose main activity is administration or management)*

12	**What is the current school enrolment (number of students of all grades in this school)?**
	Please write a number.
	☐☐☐☐ Number of students

13	**Please estimate the broad percentage of students at <ISCED 2> level in this school who have the following characteristics.**
	It is acceptable to base your replies on rough estimates. *Please mark one choice in each row.*

	Less than 10%	10% or more but less than 20%	20% or more but less than 40%	40% or more but less than 60%	60% or more
a) Students whose <first language> is different from the language(s) of instruction or a dialect of this/these.	☐1	☐2	☐3	☐4	☐5
b) Students who have at least one parent/guardian who has completed <ISCED 3> or higher.	☐1	☐2	☐3	☐4	☐5
c) Students who have at least one parent/guardian who has completed <ISCED 5> or higher.	☐1	☐2	☐3	☐4	☐5

14	**How much consideration is given to the following factors when students are considered for admission to this school?**
	Please mark one choice in each row.

	Not considered	Considered	High priority	Prerequisite
a) Residence in a particular area.	☐1	☐2	☐3	☐4
b) Students' academic record (including placement tests).	☐1	☐2	☐3	☐4
c) Recommendation of feeder schools.	☐1	☐2	☐3	☐4
d) Parents' endorsement of the instructional or religious philosophy of the school.	☐1	☐2	☐3	☐4
e) Students' need or desire for a special programme.	☐1	☐2	☐3	☐4
f) Attendance of other family members at the school (past or present).	☐1	☐2	☐3	☐4

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School management

15 Below you can find statements about your management of this school. Please indicate the frequency of these activities and behaviours in this school during the current school year.

Please mark one choice in each row.

	Never	Seldom	Quite often	Very often
a) I make sure that the professional development activities of teachers are in accordance with the teaching goals of the school.	☐1	☐2	☐3	☐4
b) I ensure that teachers work according to the school's educational goals.	☐1	☐2	☐3	☐4
c) I observe instruction in classrooms.	☐1	☐2	☐3	☐4
d) I use student performance results to develop the school's educational goals.	☐1	☐2	☐3	☐4
e) I give teachers suggestions as to how they can improve their teaching.	☐1	☐2	☐3	☐4
f) I monitor students' work.	☐1	☐2	☐3	☐4
g) When a teacher has problems in his/her classroom, I take the initiative to discuss matters.	☐1	☐2	☐3	☐4
h) I inform teachers about possibilities for updating their knowledge and skills.	☐1	☐2	☐3	☐4
i) I check to see whether classroom activities are in keeping with our educational goals.	☐1	☐2	☐3	☐4
j) I take exam results into account in decisions regarding curriculum development.	☐1	☐2	☐3	☐4
k) I ensure that there is clarity concerning the responsibility for co-ordinating the curriculum.	☐1	☐2	☐3	☐4
l) When a teacher brings up a classroom problem, we solve the problem together.	☐1	☐2	☐3	☐4
m) I pay attention to disruptive behaviour in classrooms.	☐1	☐2	☐3	☐4
n) I take over lessons from teachers who are unexpectedly absent.	☐1	☐2	☐3	☐4

16 [1/2] How strongly do you agree or disagree with these statements as applied to this school, your job, and the teachers at this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) An important part of my job is to ensure ministry-approved instructional approaches are explained to new teachers, and that more experienced teachers are using these approaches.	☐1	☐2	☐3	☐4
b) Using test scores of students to evaluate a teacher's performance devalues the teacher's professional judgment.	☐1	☐2	☐3	☐4
c) Giving teachers too much freedom to choose their own instructional techniques can lead to poor teaching.	☐1	☐2	☐3	☐4
d) A main part of my job is to ensure that the teaching skills of the staff are always improving.	☐1	☐2	☐3	☐4

16 [2/2] How strongly do you agree or disagree with these statements as applied to this school, your job, and the teachers at this school?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
e) An important part of my job is to ensure that teachers are held accountable for the attainment of the school's goals.	☐1	☐2	☐3	☐4
f) An important part of my job is to present new ideas to the parents in a convincing way.	☐1	☐2	☐3	☐4
g) I influence decisions about this school taken at a higher administrative level.	☐1	☐2	☐3	☐4
h) It is important for the school that I see to it that everyone sticks to the rules.	☐1	☐2	☐3	☐4
i) It is important for the school that I check for mistakes and errors in administrative procedures and reports.	☐1	☐2	☐3	☐4
j) An important part of my job is to resolve problems with the timetable and/or lesson planning.	☐1	☐2	☐3	☐4
k) An important part of my job is to create an orderly atmosphere in the school.	☐1	☐2	☐3	☐4
l) I have no way of knowing whether teachers are performing well or badly in their teaching duties.	☐1	☐2	☐3	☐4
m) In this school, we work on goals and/or a school development plan.	☐1	☐2	☐3	☐4
n) I define goals to be accomplished by the staff of this school.	☐1	☐2	☐3	☐4
o) I stimulate a task-oriented atmosphere in this school.	☐1	☐2	☐3	☐4

17 As principal of this school, on average throughout the school year, what percentage of time do you estimate that 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) ☐☐☐☐ %	Internal administrative tasks (including human resource/personnel issues, regulations, reports, school budget, timetable).
b) ☐☐☐☐ %	Curriculum and teaching-related tasks (including teaching, lesson preparation, classroom observations, mentoring teachers).
c) ☐☐☐☐ %	Responding to requests from district, state, or national education officials.
d) ☐☐☐☐ %	Representing the school at meetings or in the community and networking.
e) ☐☐☐☐ %	Other.
100 %	**Total**

18 How often during the last 5 years did this school produce a school self-evaluation document and/or was the school evaluated by an external agency or body (*e.g.* external inspector)?

This refers to an evaluation of the whole school rather than of individual subjects or departments.
Please mark one choice in each row.

	Never	Once	2-4 times	Once per year	More than once per year
a) A school self-evaluation report was produced.	☐1	☐2	☐3	☐4	☐5
b) An external evaluation was conducted.	☐1	☐2	☐3	☐4	☐5

If you replied "Never" to both parts a) and b) above → Please go to question 23.

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19 In your opinion, how important were the following aspects considered to be in these school evaluations?

Please consider both school self-evaluation and external evaluation. We realise these evaluations may have attached different importance to various aspects, but please consider both types of evaluations in your response to each row. Please mark one choice in each row.

	I do not know if it was considered	Not considered at all	Considered with low importance	Considered with moderate importance	Considered with high importance
a) Student test scores.	☐1	☐2	☐3	☐4	☐5
b) Retention and pass rates of students.	☐1	☐2	☐3	☐4	☐5
c) Other student learning outcomes.	☐1	☐2	☐3	☐4	☐5
d) Student feedback on the teaching they receive.	☐1	☐2	☐3	☐4	☐5
e) Feedback from parents.	☐1	☐2	☐3	☐4	☐5
f) How well teachers work with you, the principal, and their colleagues.	☐1	☐2	☐3	☐4	☐5
g) Direct appraisal of classroom teaching.	☐1	☐2	☐3	☐4	☐5
h) Innovative teaching practices.	☐1	☐2	☐3	☐4	☐5
i) Relations between teachers and students.	☐1	☐2	☐3	☐4	☐5
j) Professional development undertaken by teachers.	☐1	☐2	☐3	☐4	☐5
k) Teachers' classroom management.	☐1	☐2	☐3	☐4	☐5
l) Teachers' knowledge and understanding of their main subject field(s).	☐1	☐2	☐3	☐4	☐5
m) Teachers' knowledge and understanding of instructional practices (knowledge mediation) in their main subject field(s).	☐1	☐2	☐3	☐4	☐5
n) Teaching of students with special learning needs.	☐1	☐2	☐3	☐4	☐5
o) Student discipline and behaviour.	☐1	☐2	☐3	☐4	☐5
p) Teaching in a multicultural setting.	☐1	☐2	☐3	☐4	☐5
q) Extra-curricular activities with students (*e.g.* school plays and performances, sporting activities).	☐1	☐2	☐3	☐4	☐5

20 To what extent did these school evaluations have an influence upon the following?

Please mark one choice in each row.

	No influence at all	Low level of influence	Moderate influence	High level of influence
a) The school budget.	☐1	☐2	☐3	☐4
b) The performance feedback to this school.	☐1	☐2	☐3	☐4
c) The performance appraisal of the school management.	☐1	☐2	☐3	☐4
d) The performance appraisals of individual teachers.	☐1	☐2	☐3	☐4
e) The assistance provided to teachers to improve their teaching skills.	☐1	☐2	☐3	☐4
f) The remuneration and bonuses received by teachers.	☐1	☐2	☐3	☐4

21	Are these school evaluations published?
Yes	No
☐1	☐2

22	Are these school evaluations used by <government> in the publication of tables that compare the performance of individual schools?
Yes	No
☐1	☐2

Teacher appraisal

We would like to ask you about the appraisal (defined below) of teachers in this school.

In this survey, **appraisal** is defined as when a teacher's work is reviewed by the principal, an external inspector or by his or her colleagues. This appraisal can be conducted in a range of ways from a more formal, objective approach (*e.g.* as part of a formal performance management system, involving set procedures and criteria) to the more informal, more subjective approach (*e.g.* through informal discussions with the teacher).

23 How often is the work of teachers in this school appraised by either you, other colleagues in the school, or an external individual or body (*e.g.* inspector)?

	Never	Less than once every 2 years	Once every 2 years	Once per year	Twice or more per year
a) You (the principal)	☐1	☐2	☐3	☐4	☐5
b) Other teachers or members of the school management team	☐1	☐2	☐3	☐4	☐5
c) External individual or body (*e.g.* external inspector)	☐1	☐2	☐3	☐4	☐5

If you answered "Never" to all of the above (a, b, and c) → Please go to question 29.

24 [1/2] In your opinion, how important were the following aspects considered to be in these appraisals?

Please mark one choice in each row.

	I do not know if it was considered	Not considered at all	Considered with low importance	Considered with moderate importance	Considered with high importance
a) Student test scores.	☐1	☐2	☐3	☐4	☐5
b) Retention and pass rates of students.	☐1	☐2	☐3	☐4	☐5
c) Other student learning outcomes.	☐1	☐2	☐3	☐4	☐5
d) Student feedback on the teaching they receive.	☐1	☐2	☐3	☐4	☐5
e) Feedback from parents.	☐1	☐2	☐3	☐4	☐5
f) How well the teacher works with you, the principal, and their colleagues.	☐1	☐2	☐3	☐4	☐5
g) Direct appraisal of classroom teaching.	☐1	☐2	☐3	☐4	☐5
h) Innovative teaching practices.	☐1	☐2	☐3	☐4	☐5
i) Relations between the teacher and students.	☐1	☐2	☐3	☐4	☐5

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24 [2/2] **In your opinion, how important were the following aspects considered to be in these appraisals?**

Please mark one choice in each row.

	I do not know if it was considered	Not considered at all	Considered with low importance	Considered with moderate importance	Considered with high importance
j) Professional development undertaken by the teacher.	☐1	☐2	☐3	☐4	☐5
k) Teacher's classroom management.	☐1	☐2	☐3	☐4	☐5
l) Teacher's knowledge and understanding of their main subject field(s).	☐1	☐2	☐3	☐4	☐5
m) Teacher's knowledge and understanding of instructional practices (knowledge mediation) in their main subject field(s).	☐1	☐2	☐3	☐4	☐5
n) Teaching of students with special learning needs.	☐1	☐2	☐3	☐4	☐5
o) Student discipline and behaviour in the teacher's classes.	☐1	☐2	☐3	☐4	☐5
p) Teaching in a multicultural setting.	☐1	☐2	☐3	☐4	☐5
q) Extra-curricular activities with students (*e.g.* school plays and performances, sporting activities).	☐1	☐2	☐3	☐4	☐5

25 **When teachers' work is appraised in this school, can these appraisals directly lead to any of the following for the teacher?**

Please mark one choice in each row.

	Can result from an appraisal of teachers' work	Can **not** result from an appraisal of teachers' work
a) A change in salary.	☐1	☐2
b) A financial bonus or another kind of monetary reward.	☐1	☐2
c) A change in the likelihood of career advancement.	☐1	☐2
d) Opportunities for professional development activities.	☐1	☐2
e) Changes in teachers' work responsibilities that make their job more attractive.	☐1	☐2
f) A development or training plan to improve their teaching.	☐1	☐2

26 **We would like to ask your opinion on the objectives of the appraisal of teachers' work at this school. Can you please rate the importance of each of the following objectives in the appraisal of teachers' work?**

Please mark one choice in each row.

	No importance	Low importance	Moderate importance	High importance
a) To determine the career advancement of individual teachers.	☐1	☐2	☐3	☐4
b) To inform an administrative level above the school (school board, municipality, school district, school inspectorate).	☐1	☐2	☐3	☐4
c) To evaluate the performance of the whole school.	☐1	☐2	☐3	☐4
d) To evaluate the teaching in a particular subject.	☐1	☐2	☐3	☐4
e) To address a crisis or problem in the school.	☐1	☐2	☐3	☐4
f) To identify the professional development needs of teachers.	☐1	☐2	☐3	☐4
g) To take decisions about remuneration and bonuses of teachers.	☐1	☐2	☐3	☐4
h) To take decisions about school improvement.	☐1	☐2	☐3	☐4

27 How often are appraisals of teachers' work conducted that include a written report that is kept as a record? Please also indicate who provides this report.

Please mark one choice in each row.

	Never	Less than once every 2 years	Once every 2 years	Once per year	Twice or more per year
a) You (the principal)	☐1	☐2	☐3	☐4	☐5
b) Other teachers or members of the school management team	☐1	☐2	☐3	☐4	☐5
c) External individual or body (*e.g.* external inspector)	☐1	☐2	☐3	☐4	☐5

28 Please indicate the frequency with which each of the following occurs if an appraisal of teachers' work identifies weaknesses or you consider a teacher to be underperforming in their teaching duties.

Please mark one choice in each row.

	Never	Sometimes	Most of the time	Always
a) I ensure that the outcome is reported to the teacher.	☐1	☐2	☐3	☐4
b) I ensure measures to remedy the weaknesses in teaching are discussed with the teacher.	☐1	☐2	☐3	☐4
c) I, or others in the school, establish a development or training plan for the teacher to address the weaknesses in their teaching.	☐1	☐2	☐3	☐4
d) I, or others in the school, impose material sanctions on the teacher (*e.g.* reduced annual increases in pay).	☐1	☐2	☐3	☐4
e) I, or others in the school, report the underperformance to another body to take action (*e.g.* governing board, local authority, school inspector).	☐1	☐2	☐3	☐4
f) I ensure the teacher has more frequent appraisals of their work.	☐1	☐2	☐3	☐4
g) Other (please specify below).	☐1	☐2	☐3	☐4

School resources

29 Is this school's capacity to provide instruction hindered by any of the following?

Please mark one choice in each row.

	Not at all	Very little	To some extent	A lot
a) A lack of qualified teachers.	☐1	☐2	☐3	☐4
b) A lack of laboratory technicians.	☐1	☐2	☐3	☐4
c) A lack of instructional support personnel.	☐1	☐2	☐3	☐4
d) A lack of other support personnel.	☐1	☐2	☐3	☐4
e) Shortage or inadequacy of instructional materials (*e.g.* textbooks).	☐1	☐2	☐3	☐4
f) Shortage or inadequacy of computers for instruction.	☐1	☐2	☐3	☐4
g) Shortage or inadequacy of other equipment.	☐1	☐2	☐3	☐4
h) Shortage or inadequacy of library materials.	☐1	☐2	☐3	☐4
i) Other (please specify below).	☐1	☐2	☐3	☐4

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30 In this school, to what extent is the learning of students hindered by the following behaviours?

Please mark one choice in each row.

By students in this school:	Not at all	Very little	To some extent	A lot
a) Arriving late at school.	☐1	☐2	☐3	☐4
b) Absenteeism (*i.e.* unjustified absences).	☐1	☐2	☐3	☐4
c) Classroom disturbance.	☐1	☐2	☐3	☐4
d) Cheating.	☐1	☐2	☐3	☐4
e) Profanity/Swearing.	☐1	☐2	☐3	☐4
f) Vandalism.	☐1	☐2	☐3	☐4
g) Theft.	☐1	☐2	☐3	☐4
h) Intimidation or verbal abuse of other students (or other forms of bullying).	☐1	☐2	☐3	☐4
i) Physical injury to other students.	☐1	☐2	☐3	☐4
j) Intimidation or verbal abuse of teachers or staff.	☐1	☐2	☐3	☐4
k) Use/possession of drugs and/or alcohol.	☐1	☐2	☐3	☐4
By teachers in this school:	Not at all	Very little	To some extent	A lot
l) Arriving late at school.	☐1	☐2	☐3	☐4
m) Absenteeism.	☐1	☐2	☐3	☐4
n) Lack of pedagogical preparation.	☐1	☐2	☐3	☐4

31 Regarding this school, who has a considerable responsibility for the following tasks?

A "considerable responsibility" is one where an active role is played in decision making.
Please mark as many choices as appropriate in each row.

	Principal	Teachers	School governing board	Regional or local education authority	National education authority
a) Selecting teachers for hire.	☐1	☐1	☐1	☐1	☐1
b) Firing teachers.	☐1	☐1	☐1	☐1	☐1
c) Establishing teachers' starting salaries.	☐1	☐1	☐1	☐1	☐1
d) Determining teachers' salary increases.	☐1	☐1	☐1	☐1	☐1
e) Formulating the school budget.	☐1	☐1	☐1	☐1	☐1
f) Deciding on budget allocations within the school.	☐1	☐1	☐1	☐1	☐1
g) Establishing student disciplinary policies.	☐1	☐1	☐1	☐1	☐1
h) Establishing student assessment policies.	☐1	☐1	☐1	☐1	☐1
i) Approving students for admission to the school.	☐1	☐1	☐1	☐1	☐1
j) Choosing which textbooks are used.	☐1	☐1	☐1	☐1	☐1
k) Determining course content.	☐1	☐1	☐1	☐1	☐1
l) Deciding which courses are offered.	☐1	☐1	☐1	☐1	☐1
m) Allocating funds for teachers' professional development.	☐1	☐1	☐1	☐1	☐1

32	How strongly do you agree or disagree with each of the following statements about teaching and learning in general?				
	Please mark one choice in each row.	Strongly disagree	Disagree	Agree	Strongly agree
	a) Effective/good teachers demonstrate the correct way to solve a problem.	☐1	☐2	☐3	☐4
	b) When referring to a "poor performance", I mean a performance that lies below the previous achievement level of the student.	☐1	☐2	☐3	☐4
	c) It is better when the teacher – not the student – decides what activities are to be done.	☐1	☐2	☐3	☐4
	d) The role of teachers is to facilitate students' own inquiry.	☐1	☐2	☐3	☐4
	e) Teachers know a lot more than students; they shouldn't let students develop answers that may be incorrect when they can just explain the answers directly.	☐1	☐2	☐3	☐4
	f) Students learn best by finding solutions to problems on their own.	☐1	☐2	☐3	☐4
	g) Instruction should be built around problems with clear, correct answers, and around ideas that most students can grasp quickly.	☐1	☐2	☐3	☐4
	h) How much students learn depends on how much background knowledge they have – that is why teaching facts is so necessary.	☐1	☐2	☐3	☐4
	i) Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.	☐1	☐2	☐3	☐4
	j) When referring to a "good performance", I mean a performance that lies above the previous achievement level of the student.	☐1	☐2	☐3	☐4
	k) A quiet classroom is generally needed for effective learning.	☐1	☐2	☐3	☐4
	l) Thinking and reasoning processes are more important than specific curriculum content.	☐1	☐2	☐3	☐4

33	When a teacher begins teaching at this school, does he/she undertake a formal <induction> process?
	Please mark one choice.
☐1	Yes, for all teachers who are new to this school.
☐2	Yes, but only for teachers for whom this is their first teaching job.
☐3	No, there is no <induction> process for teachers who are new to this school → **Go to question 35.**

34	If "Yes" in the previous question, who organises the <induction> process?
	Please mark one choice.
☐1	The school alone.
☐2	The school together with agencies or institutions outside of the school.
☐3	Outside agencies or institutions alone.

35	When a teacher begins teaching at this school, is there a programme or policy by which he/she works with an experienced teacher or teachers who act as their mentor?
	Please mark one choice.
☐1	Yes, for all teachers who are new to this school.
☐2	Yes, but only for teachers for whom this is their first teaching job.
☐3	No, there is no mentoring programme or policy in this school → **Go to question 37.**

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36	If "Yes" in the previous question, is the mentor teacher's main subject area(s) usually the same as that of the new teacher?		
	Yes	No	
	☐1	☐2	

37	How would you rate the importance of mentoring new teachers in helping them to improve their instructional effectiveness?				
	Please mark one choice.				
	Not important at all	Of low importance	Of moderate importance	Of high importance	
	☐1	☐2	☐3	☐4	

This is the end of the questionnaire.

Thank you very much for your co-operation!

Please [National Return Procedures and Date]

[Placeholder
for identification label]
(105 x 35 mm)

OECD Teaching and Learning International Survey (TALIS)

Teacher Questionnaire

Main study version (MS-12-01)

[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

The first Teaching and Learning International Survey (TALIS) 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 some 23 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.

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 of its 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.
- This questionnaire should take approximately 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 it or the study, you can reach us by phone at the following numbers: [National Center Contact Information]

Thank you very much for your co-operation!

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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 box.

1	What is your gender?	
	Female	Male
	☐1	☐2

2	How old are you?					
	Under 25	25-29	30–39	40-49	50-59	60+
	☐1	☐2	☐3	☐4	☐5	☐6

3	What is your employment status as a teacher?	
	Part-time employment is where the contracted hours of work represent less than 90 per cent of the normal or statutory number of hours of work for a full-time employee over a complete school year. Please consider your employment status for all of your teaching jobs combined.	
	☐1	Full-time
	☐2	Part-time (50-90% of full-time hours)
	☐3	Part-time (less than 50% of full-time hours)

4	Do you work as a teacher of <ISCED level 2> at another school as well as this school?	
	☐1	Yes
	☐2	No → **Please go to question 6.**

5	If "Yes" in the previous question, please indicate in how many other schools you work as a <ISCED level 2> teacher.
	Please write in a number.
	☐☐ Schools

6	What is your employment status as a teacher at this school?	
	Please do not consider the probationary period of a contract as a separate contract.	
	☐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	What is the highest level of formal education that you have completed?
	Please mark one choice.
☐1	<Below ISCED Level 5>
☐2	<ISCED Level 5B>
☐3	<ISCED Level 5A Bachelor degree>
☐4	<ISCED Level 5A Masters degree>
☐5	<ISCED Level 6>

8	**In a typical school week, estimate the number of (60-minute) hours you spend on the following for this school.**
	This question concerns your work for this school only. Please do not include the work you do for other schools. *Please write a number in each row and round to the nearest hour in your responses.* *Write 0 (zero) if none.*
a) ☐☐	Teaching of students in school (either whole class, in groups or individually)
b) ☐☐	Planning or preparation of lessons either in school or out of school (including marking of student work)
c) ☐☐	Administrative duties either in school or out of school (including school administrative duties, paperwork and other clerical duties you undertake in your job as a teacher)
d) ☐☐	Other (please specify):

9	How long have you been working as a teacher?						
	Where possible exclude extended periods of absence (e.g. career breaks).						
This is my first year	1-2 years	3-5 years	6-10 years	11-15 years	16-20 years	More than 20 years	
☐1	☐2	☐3	☐4	☐5	☐6	☐7	

10	How long have you been working as a teacher at this school?						
	Where possible exclude extended periods of absence (e.g. career breaks).						
This is my first year	1-2 years	3-5 years	6-10 years	11-15 years	16-20 years	More than 20 years	
☐1	☐2	☐3	☐4	☐5	☐6	☐7	

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Professional development

In this survey, professional development is defined as activities that 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.

11 During the last 18 months, did you participate in any of the following kinds of professional development activities, and what was the impact of these activities on your development as a teacher?

For each question below, please mark one choice in part (A). If you answer "Yes" in part (A) then please mark one choice in part (B) to indicate how much impact it had upon your development as a teacher.

	(A) Participation		(B) Impact			
	Yes	No	No impact	A small impact	A moderate impact	A large impact
a) Courses/workshops (*e.g.* on subject matter or methods and/or other education-related topics).	☐1	☐2	☐1	☐2	☐3	☐4
b) Education conferences or seminars (where teachers and/or researchers present their research results and discuss educational problems).	☐1	☐2	☐1	☐2	☐3	☐4
c) Qualification programme (*e.g.* a degree programme).	☐1	☐2	☐1	☐2	☐3	☐4
d) Observation visits to other schools.	☐1	☐2	☐1	☐2	☐3	☐4
e) Participation in a network of teachers formed specifically for the professional development of teachers.	☐1	☐2	☐1	☐2	☐3	☐4
f) Individual or collaborative research on a topic of interest to you professionally.	☐1	☐2	☐1	☐2	☐3	☐4
g) Mentoring and/or peer observation and coaching, as part of a formal school arrangement.	☐1	☐2	☐1	☐2	☐3	☐4

12 In all, how many days of professional development did you attend during the last 18 months?

Please round to whole days. Write 0 (zero) if none.

☐☐☐ Days

If you answered "0" (zero) → Please go to question 17.

13 Of these, how many days were compulsory for you to attend as part of your job as a teacher?

Please round to whole days. Write 0 (zero) if none.

☐☐☐ Days

14 For the professional development in which you participated in the last 18 months, how much did you personally have to pay for?

Please mark one choice.

None	Some	All
☐1	☐2	☐3

15	**For the professional development in which you participated in the last 18 months, did you receive scheduled time for undertaking the professional development that took place during regular work hours?**
	Please mark one choice.
☐1	Yes
☐2	No
☐3	Did not take place during regular work hours

16	**For the professional development in which you participated in the last 18 months, did you receive a salary supplement for undertaking the professional development activities that took place outside regular work hours?**
	Please mark one choice.
☐1	Yes
☐2	No
☐3	Did not take place outside of regular work hours

17 Thinking about less formal professional development, during the last 18 months, did you participate in any of the following activities, and what was the impact of these activities on your development as a teacher?

For each question below, please mark one choice in part (A). If you answer "Yes" in part (A) then please mark one choice in part (B) to indicate how much impact it had upon your development as a teacher.

	(A) Participation		(B) Impact			
	Yes	No	No impact	A small impact	A moderate impact	A large impact
a) Reading professional literature (*e.g.* journals, evidence-based papers, thesis papers).	☐1	☐2	☐1	☐2	☐3	☐4
b) Engaging in informal dialogue with your colleagues on how to improve your teaching.	☐1	☐2	☐1	☐2	☐3	☐4

18 Thinking of your own professional development needs, please indicate the extent to which you have such needs in each of the areas listed.

Please mark one choice in each row.

	No need at all	Low level of need	Moderate level of need	High level of need
a) Content and performance standards in my main subject field(s).	☐1	☐2	☐3	☐4
b) Student assessment practices.	☐1	☐2	☐3	☐4
c) Classroom management.	☐1	☐2	☐3	☐4
d) Knowledge and understanding of my main subject field(s).	☐1	☐2	☐3	☐4
e) Knowledge and understanding of instructional practices (knowledge mediation) in my main subject field(s).	☐1	☐2	☐3	☐4
f) ICT skills for teaching.	☐1	☐2	☐3	☐4
g) Teaching students with special learning needs.	☐1	☐2	☐3	☐4
h) Student discipline and behaviour problems.	☐1	☐2	☐3	☐4
i) School management and administration.	☐1	☐2	☐3	☐4
j) Teaching in a multicultural setting.	☐1	☐2	☐3	☐4
k) Student counselling.	☐1	☐2	☐3	☐4

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19	In the last 18 months, did you want to participate in more professional development than you did?
☐1	Yes
☐2	No → **Please go to question 21.**

20	If "Yes" in the previous question, which of the following reasons best explain what prevented you from participating in more professional development than you did?
	Please mark as many choices as appropriate.
☐1	I did not have the pre-requisites (*e.g.* qualifications, experience, seniority).
☐1	Professional development was too expensive/I could not afford it.
☐1	There was a lack of employer support.
☐1	Professional development conflicted with my work schedule.
☐1	I didn't have time because of family responsibilities.
☐1	There was no suitable professional development offered.
☐1	Other (please specify):

Teacher appraisal and feedback

We would like to ask you about the appraisal (defined below) of your work as a teacher and the feedback (defined below) you receive about your work in this school.

In this survey, Appraisal is defined as when a teacher's work is reviewed by the principal, an external inspector or by his or her colleagues. This appraisal can be conducted in a range of ways from a more formal, objective approach (*e.g.* as part of a formal performance management system, involving set procedures and criteria) to the more informal, more subjective approach (*e.g.* through informal discussions with the teacher).

In this survey, Feedback is defined as the reporting of the results of a review of your work (however formal or informal that review has been) back to the teacher, often with the purpose of noting good performance or identifying areas for development. Again, the feedback may be provided formally (*e.g.* through a written report) or informally (*e.g.* through discussions with the teacher).

21 From the following people, how often have you received appraisal and/or feedback about your work as a teacher in this school?

Please mark one choice in each row.

	Never	Less than once every two years	Once every two years	Once per year	Twice per year	3 or more times per year	Monthly	More than once per month
a) Principal	☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
b) Other teachers or members of the school management team	☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
c) External individual or body (*e.g.* external inspector)	☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8

If you answered "Never" for all of the above (a, b, and c) → Please go to question 28.

22 In your opinion, how important were the following aspects considered to be when you received this appraisal and/or feedback?

Please mark one choice in each row.

	I do not know if it was considered	Not considered at all	Considered with low importance	Considered with moderate importance	Considered with high importance
a) Student test scores.	☐1	☐2	☐3	☐4	☐5
b) Retention and pass rates of students.	☐1	☐2	☐3	☐4	☐5
c) Other student learning outcomes.	☐1	☐2	☐3	☐4	☐5
d) Student feedback on my teaching.	☐1	☐2	☐3	☐4	☐5
e) Feedback from parents.	☐1	☐2	☐3	☐4	☐5
f) How well I work with the principal and my colleagues.	☐1	☐2	☐3	☐4	☐5
g) Direct appraisal of my classroom teaching.	☐1	☐2	☐3	☐4	☐5
h) Innovative teaching practices.	☐1	☐2	☐3	☐4	☐5
i) Relations with students.	☐1	☐2	☐3	☐4	☐5
j) Professional development I have undertaken.	☐1	☐2	☐3	☐4	☐5
k) Classroom management.	☐1	☐2	☐3	☐4	☐5
l) Knowledge and understanding of my main subject field(s).	☐1	☐2	☐3	☐4	☐5
m) Knowledge and understanding of instructional practices (knowledge mediation) in my main subject field(s).	☐1	☐2	☐3	☐4	☐5
n) Teaching students with special learning needs.	☐1	☐2	☐3	☐4	☐5
o) Student discipline and behaviour.	☐1	☐2	☐3	☐4	☐5
p) Teaching in a multicultural setting.	☐1	☐2	☐3	☐4	☐5
q) Extra-curricular activities with students (*e.g.* school plays and performances, sporting activities).	☐1	☐2	☐3	☐4	☐5
r) Other (please specify below).	☐1	☐2	☐3	☐4	☐5

23 Concerning the appraisal and/or feedback you have received at this school, to what extent have they directly led to any of the following?

Please mark one choice in each row.

	No change	A small change	A moderate change	A large change
a) A change in salary.	☐1	☐2	☐3	☐4
b) A financial bonus or another kind of monetary reward.	☐1	☐2	☐3	☐4
c) Opportunities for professional development activities.	☐1	☐2	☐3	☐4
d) A change in the likelihood of career advancement.	☐1	☐2	☐3	☐4
e) Public recognition from the principal and/or your colleagues.	☐1	☐2	☐3	☐4
f) Changes in your work responsibilities that make the job more attractive.	☐1	☐2	☐3	☐4
g) Role in school development initiatives (*e.g.* curriculum development group, development of school objectives).	☐1	☐2	☐3	☐4

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24 Concerning the appraisal and/or feedback you have received at this school, to what extent have they directly led to or involved changes in any of the following?

Please mark one choice in each row.

	No change	A small change	A moderate change	A large change
a) Your classroom management practices.	☐1	☐2	☐3	☐4
b) Your knowledge and understanding of your main subject field(s).	☐1	☐2	☐3	☐4
c) Your knowledge and understanding of instructional practices (knowledge mediation) in you main subject field(s).	☐1	☐2	☐3	☐4
d) A development or training plan to improve your teaching.	☐1	☐2	☐3	☐4
e) Your teaching of students with special learning needs.	☐1	☐2	☐3	☐4
f) Your handling of student discipline and behaviour problems.	☐1	☐2	☐3	☐4
g) Your teaching of students in a multicultural setting.	☐1	☐2	☐3	☐4
h) The emphasis you place upon improving student test scores in your teaching.	☐1	☐2	☐3	☐4

25 How would you describe the appraisal and/or feedback you received?

Please mark one choice in each row.

	Yes	No
a) The appraisal and/or feedback contained a judgment about the quality of my work.	☐1	☐2
b) The appraisal and/or feedback contained suggestions for improving certain aspects of my work.	☐1	☐2

26 Regarding the appraisal and/or feedback you received at this school, to what extent do you agree or disagree with the following statements?

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) I think the appraisal of my work and/or feedback received was a fair assessment of my work as a teacher in this school.	☐1	☐2	☐3	☐4
b) I think the appraisal of my work and/or feedback received was helpful in the development of my work as a teacher in this school.	☐1	☐2	☐3	☐4

27 Concerning the appraisal and/or feedback you have received at this school, to what extent have they directly led to any of the following?

Please mark one choice in each row.

	A large decrease	A small decrease	No change	A small increase	A large increase
a) Changes in your job satisfaction.	☐1	☐2	☐3	☐4	☐5
b) Changes in your job security.	☐1	☐2	☐3	☐4	☐5

28 **We would like to ask you about appraisal and/or feedback to teachers in this school more generally. To what extent do you agree or disagree with the following statements?**

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) In my opinion, in this school the principal takes steps to alter the monetary rewards of a persistently underperforming teacher.	☐1	☐2	☐3	☐4
b) In my opinion, in this school the sustained poor performance of a teacher would be tolerated by the rest of the staff.	☐1	☐2	☐3	☐4
c) In this school, teachers will be dismissed because of sustained poor performance.	☐1	☐2	☐3	☐4
d) In my opinion, in this school the principal uses effective methods to determine whether teachers are performing well or badly.	☐1	☐2	☐3	☐4
e) In my opinion, in this school a development or training plan is established for teachers to improve their work as a teacher.	☐1	☐2	☐3	☐4
f) In my opinion, the most effective teachers in this school receive the greatest monetary or non-monetary rewards.	☐1	☐2	☐3	☐4
g) If I improve the quality of my teaching at this school, I will receive increased monetary or non-monetary rewards.	☐1	☐2	☐3	☐4
h) If I am more innovative in my teaching at this school, I will receive increased monetary or non-monetary rewards.	☐1	☐2	☐3	☐4
i) In my opinion, in this school the review of teachers' work is largely done to fulfil administrative requirements.	☐1	☐2	☐3	☐4
j) In my opinion, in this school the review of teachers' work has little impact upon the way teachers teach in the classroom.	☐1	☐2	☐3	☐4

Teaching practices, beliefs and attitudes

29 [1/2] **We would like to ask about your personal beliefs on teaching and learning. Please indicate how much you disagree or agree with each of the following statements.**

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
a) Effective/good teachers demonstrate the correct way to solve a problem.	☐1	☐2	☐3	☐4
b) When referring to a "poor performance", I mean a performance that lies below the previous achievement level of the student.	☐1	☐2	☐3	☐4
c) It is better when the teacher – not the student – decides what activities are to be done.	☐1	☐2	☐3	☐4
d) My role as a teacher is to facilitate students' own inquiry.	☐1	☐2	☐3	☐4
e) Teachers know a lot more than students; they shouldn't let students develop answers that may be incorrect when they can just explain the answers directly.	☐1	☐2	☐3	☐4
f) Students learn best by finding solutions to problems on their own.	☐1	☐2	☐3	☐4
g) Instruction should be built around problems with clear, correct answers, and around ideas that most students can grasp quickly.	☐1	☐2	☐3	☐4

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29 [2/2] We would like to ask about your personal beliefs on teaching and learning. Please indicate how much you disagree or agree with each of the following statements.

Please mark one choice in each row.

	Strongly disagree	Disagree	Agree	Strongly agree
h) How much students learn depends on how much background knowledge they have – that is why teaching facts is so necessary.	☐1	☐2	☐3	☐4
i) Students should be allowed to think of solutions to practical problems themselves before the teacher shows them how they are solved.	☐1	☐2	☐3	☐4
j) When referring to a "good performance", I mean a performance that lies above the previous achievement level of the student.	☐1	☐2	☐3	☐4
k) A quiet classroom is generally needed for effective learning.	☐1	☐2	☐3	☐4
l) Thinking and reasoning processes are more important than specific curriculum content.	☐1	☐2	☐3	☐4

30 How often do you do the following in this school?

Please mark one choice in each row.

	Never	Less than once per year	Once per year	3-4 times per year	Monthly	Weekly
a) Attend staff meetings to discuss the vision and mission of the school.	☐1	☐2	☐3	☐4	☐5	☐6
b) Develop a school curriculum or part of it.	☐1	☐2	☐3	☐4	☐5	☐6
c) Discuss and decide on the selection of instructional media (*e.g.* textbooks, exercise books).	☐1	☐2	☐3	☐4	☐5	☐6
d) Exchange teaching materials with colleagues.	☐1	☐2	☐3	☐4	☐5	☐6
e) Attend team conferences for the age group I teach.	☐1	☐2	☐3	☐4	☐5	☐6
f) Ensure common standards in evaluations for assessing student progress.	☐1	☐2	☐3	☐4	☐5	☐6
g) Engage in discussion about the learning development of specific students.	☐1	☐2	☐3	☐4	☐5	☐6
h) Teach jointly as a team in the same class.	☐1	☐2	☐3	☐4	☐5	☐6
i) Take part in professional learning activities (*e.g.* team supervision).	☐1	☐2	☐3	☐4	☐5	☐6
j) Observe other teachers' classes and provide feedback.	☐1	☐2	☐3	☐4	☐5	☐6
k) Engage in joint activities across different classes and age groups (*e.g.* projects).	☐1	☐2	☐3	☐4	☐5	☐6
l) Discuss and co-ordinate homework practice across subjects.	☐1	☐2	☐3	☐4	☐5	☐6

31 How strongly do you agree or disagree with the following statements …

Please mark one choice in each row.

… about yourself as a teacher in this school?	Strongly disagree	Disagree	Agree	Strongly agree
a) All in all, I am satisfied with my job.	☐1	☐2	☐3	☐4
b) I feel that I am making a significant educational difference in the lives of my students.	☐1	☐2	☐3	☐4
c) If I try really hard, I can make progress with even the most difficult and unmotivated students.	☐1	☐2	☐3	☐4
d) I am successful with the students in my class.	☐1	☐2	☐3	☐4
e) I usually know how to get through to students.	☐1	☐2	☐3	☐4
f) Teachers in this local community are well respected.	☐1	☐2	☐3	☐4
… about what happens in this school?	Strongly Disagree	Disagree	Agree	Strongly Agree
g) In this school, teachers and students usually get on well with each other.	☐1	☐2	☐3	☐4
h) Most teachers in this school believe that students' well-being is important.	☐1	☐2	☐3	☐4
i) Most teachers in this school are interested in what students have to say.	☐1	☐2	☐3	☐4
j) If a student from this school needs extra assistance, the school provides it.	☐1	☐2	☐3	☐4

32 Below you can find statements about the management of your school. Please indicate your perceptions of the frequency with which these activities took place during the current school year.

Please mark one choice in each row.

	Never	Seldom	Quite often	Very often
a) In meetings, the principal discusses educational goals with teachers.	☐1	☐2	☐3	☐4
b) The principal ensures that teachers work according to the school's educational goals.	☐1	☐2	☐3	☐4
c) The principal or someone else in the management team observes teaching in classes.	☐1	☐2	☐3	☐4
d) The principal gives teachers suggestions as to how they can improve their teaching.	☐1	☐2	☐3	☐4
e) When a teacher has problems in his/her classroom, the principal takes the initiative to discuss the matter.	☐1	☐2	☐3	☐4
f) The principal ensures that teachers are informed about possibilities for updating their knowledge and skills.	☐1	☐2	☐3	☐4
g) The principal compliments teachers for special effort or accomplishments.	☐1	☐2	☐3	☐4
h) In this school, the principal and teachers work on a school development plan.	☐1	☐2	☐3	☐4
i) The principal defines goals to be accomplished by the staff of this school.	☐1	☐2	☐3	☐4
j) The principal ensures that a task-oriented atmosphere is fostered in this school.	☐1	☐2	☐3	☐4
k) In this school, the principal and teachers act to ensure that education quality issues are a collective responsibility.	☐1	☐2	☐3	☐4

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33	We would like to ask you about the main <ISCED Level 2> subjects that you teach in this school in this school year.		
	*Please indicate the **<ISCED Level 2>** subjects that you teach in this school (indicate only those that individually account for at least **20%** of your teaching time in this school). The exact name of your subjects may not appear in the list below each category. If it does not, please mark the category you think best fits the subject.*		
		Yes	No
	a) Reading, writing and literature *Includes reading and writing (and literature) in the mother tongue, reading and writing (and literature) in the language of instruction, reading and writing in the tongue of the country (region) as a second language (for non-natives), language studies, public speaking, literature.*	☐1	☐2
	b) Mathematics *Includes mathematics, mathematics with statistics, geometry, algebra etc.*	☐1	☐2
	c) Science *Includes science, physics, physical science, chemistry, biology, human biology, environmental science, agriculture/horticulture/forestry.*	☐1	☐2
	d) 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.*	☐1	☐2
	e) Modern foreign languages *Includes languages different from the language of instruction.*	☐1	☐2
	f) Technology *Includes orientation in technology, including information technology, computer studies, construction/surveying, electronics, graphics and design, keyboard skills, word processing, workshop technology / design technology.*	☐1	☐2
	g) Arts *Includes arts, music, visual arts, practical art, drama, performance music, photography, drawing, creative handicraft, creative needlework.*	☐1	☐2
	h) Physical education *Includes physical education, gymnastics, dance, health.*	☐1	☐2
	i) Religion and/or ethics *Includes religion, history of religions, religion culture, ethics.*	☐1	☐2
	j) 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.*	☐1	☐2
	k) Other (please specify below)	☐1	☐2

Your teaching in a particular <class> at this school

The following questions ask you about a particular<ISCED Level 2> <class> that you teach in one of the main subjects you identified in question 33.

The <class> that we would like you to respond about is the first <ISCED Level 2> <class> that you (typically) teach in this school in one of these subjects after 11am on Tuesdays. Please note that the <class> can occur on a day following Tuesday if you do not teach the <class> on Tuesday.

In the questions below, this <class> will be referred to as the <target class>.

34	**Into which subject category in question 33 does this <target class> fall?**
	Please mark one choice.
☐1	a) Reading, writing and literature
☐2	b) Mathematics
☐3	c) Science
☐4	d) Social studies
☐5	e) Modern foreign languages
☐6	f) Technology
☐7	g) Arts
☐8	h) Physical education
☐9	i) Religion
☐10	j) Practical and vocational skills
☐11	k) Other

35	**What is the actual name of the subject you teach in this <target class>?**
	Please write the name of the subject as it is used within this school.

36	**Was the teaching of this subject part of your academic training?**	
	Yes	No
	☐1	☐2

37	**What is the year/grade level of this <target class>?**
	Please mark one choice.
☐1	<ISCED level 2 grade 1>
☐2	<ISCED level 2 grade 2>
☐3	<ISCED level 2 grade 3>
☐4	<ISCED level 2 grade 4>
☐5	<ISCED level 2 grade 5>

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38	**On average throughout the year how many students are in this <target class>?**
	Please write a number.
	☐☐ Number of students

39	**How would you describe the ability of students in this <target class>?**					
	Please mark one choice in each row.	Much lower than average ability	Slightly lower than average ability	Average ability	Slightly higher than average ability	Much higher than average ability
	a) Compared to other students in the same grade/year level **in this school**?	☐1	☐2	☐3	☐4	☐5
	b) Compared to other students in the same grade/year level more generally?	☐1	☐2	☐3	☐4	☐5

40	**For this <target class>, please estimate the broad percentage of students who have the following characteristics.**					
	It is acceptable to base your replies on rough estimates. *Please mark one choice in each row.*	Less than 10%	10% or more but less than 20%	20% or more but less than 40%	40% or more but less than 60%	60% or more
	a) Students whose <first language> is different from the language(s) of instruction or a dialect of this/these	☐1	☐2	☐3	☐4	☐5
	b) Students who have at least one parent/guardian who has completed <ISCED 3> or higher	☐1	☐2	☐3	☐4	☐5
	c) Students who have at least one parent/guardian who has completed <ISCED 5> or higher	☐1	☐2	☐3	☐4	☐5

41	**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**

42 How often do each of the following activities happen in this <target class> throughout the school year?

Please note that not all questions in this section are fully adapted to all sorts of teachers. Therefore, please just answer as best you can.

	Never or hardly ever	In about one-quarter of <lessons>	In about one-half of <lessons>	In about three-quarters of <lessons>	In almost every <lesson>
a) I present new topics to the class (lecture-style presentation).	☐1	☐2	☐3	☐4	☐5
b) I explicitly state learning goals.	☐1	☐2	☐3	☐4	☐5
c) I review with the students the homework they have prepared.	☐1	☐2	☐3	☐4	☐5
d) Students work in small groups to come up with a joint solution to a problem or task.	☐1	☐2	☐3	☐4	☐5
e) I give different work to the students that have difficulties learning and/or to those who can advance faster.	☐1	☐2	☐3	☐4	☐5
f) I ask my students to suggest or to help plan classroom activities or topics.	☐1	☐2	☐3	☐4	☐5
g) I ask my students to remember every step in a procedure.	☐1	☐2	☐3	☐4	☐5
h) At the beginning of the lesson I present a short summary of the previous lesson.	☐1	☐2	☐3	☐4	☐5
i) I check my students' exercise books.	☐1	☐2	☐3	☐4	☐5
j) Students work on projects that require at least one week to complete.	☐1	☐2	☐3	☐4	☐5
k) I work with individual students.	☐1	☐2	☐3	☐4	☐5
l) Students evaluate and reflect upon their own work.	☐1	☐2	☐3	☐4	☐5
m) I check, by asking questions, whether or not the subject matter has been understood.	☐1	☐2	☐3	☐4	☐5
n) Students work in groups based upon their abilities.	☐1	☐2	☐3	☐4	☐5
o) Students make a product that will be used by someone else.	☐1	☐2	☐3	☐4	☐5
p) I administer a test or quiz to assess student learning.	☐1	☐2	☐3	☐4	☐5
q) I ask my students to write an essay in which they are expected to explain their thinking or reasoning at some length.	☐1	☐2	☐3	☐4	☐5
r) Students work individually with the textbook or worksheets to practice newly taught subject matter.	☐1	☐2	☐3	☐4	☐5
s) Students hold a debate and argue for a particular point of view which may not be their own.	☐1	☐2	☐3	☐4	☐5

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43	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 <quieten down>.	☐1	☐2	☐3	☐4
	b) Students in this class take care to create a pleasant learning atmosphere.	☐1	☐2	☐3	☐4
	c) I lose quite a lot of time because of students interrupting the lesson.	☐1	☐2	☐3	☐4
	d) There is much noise in this classroom.	☐1	☐2	☐3	☐4

This is the end of the questionnaire.

Thank you very much for your co-operation!

Please [National Return Procedures and Date]

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TALIS 2008 Technical Report

The OECD's new 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 Technical Report* describes the development of the TALIS instruments and methods used in sampling, data collection, scaling and data analysis phases of the first 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 first international report from TALIS, *Creating Effective Teaching and Learning Environments: First Results from TALIS* (OECD, 2009) and the *User Guide for the TALIS International Database* (available for download from *www.oecd.org/edu/talis/*).

Further reading:

Education at a Glance 2009: OECD Indicators (OECD, 2009)
Teachers Matter: Attracting, Developing and Retaining Effective Teachers (OECD, 2008)
Improving School Leadership (OECD, 2008)
PISA 2006: Science Competencies for Tomorrow's World (OECD, 2007)

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