IEA International Computer and Information Literacy Study 2018

USER GUIDE FOR THE INTERNATIONAL DATABASE

Ekaterina Mikheeva
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Editors

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User Guide for the International Database

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IEA
Researching education, improving learning

The International Association for the Evaluation of Educational Achievement (IEA), with headquarters in Amsterdam, is an independent, international cooperative of national research institutions and governmental research agencies. It conducts large-scale comparative studies of educational achievement and other aspects of education, with the aim of gaining in-depth understanding of the effects of policies and practices within and across systems of education.

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CHAPTER 1:

Overview of ICILS 2018, its data, and implications for analysis

Ekaterina Mikheeva and Sebastian Meyer

1.1 Main objectives and scope

The International Computer and Information Literacy Study (ICILS) 2018, conducted by the International Association for the Evaluation of Educational Achievement (IEA), studied how students in different countries[1] develop the knowledge, understanding, attitudes, dispositions, and skills that comprise computer and information literacy (CIL). Students need this form of literacy in order to participate effectively in this digital age. ICILS 2018 builds on the methodology and findings from the first cycle of ICILS, conducted in 2013.

The 2018 cycle of ICILS also provided an option for countries to assess their students' computational thinking (CT) abilities. CT is the type of thought process used when programming a computer or developing an application for another type of digital device. Developing this form of systems thinking to find computer-based solutions is essential for students' future professional development in the digital era. Using data collected from the countries that participated in the CT assessment, ICILS 2018 investigated the associations between students' CIL and CT skills.

As acknowledged by policymakers in many countries, ICILS 2018 was based on the premise that preparing students to use digital technology in all its forms secures future economic and social benefits. The aim of ICILS 2018 was to report on student preparation and achievement by way of an authentic computer-based assessment, the first of its kind in international comparative research. These concepts were put forward in the ICILS 2018 assessment framework (Fraillon et al. 2019).

The ICILS 2018 international report (Fraillon et al. 2020a) established the core findings of the study. The report documented variations across the participating countries in a wide range of different CIL- and CT-related outcomes, actions, and dispositions. It also described the extent to which these outcomes were associated with various characteristics of the participating countries, student characteristics, and school contexts.

ICILS 2018 was based around research questions that focused on the following for CIL (in all countries) and CT (in countries where CT was also assessed):

- Variations in CIL and CT within and across countries;
- Aspects of schools and education systems that are related to student achievement in CIL and CT;
- Relationships of CIL and CT with students' levels of access to, familiarity with, and self-reported proficiency in using computers;
- Aspects of students' personal and social backgrounds (such as gender and socioeconomic background) that are related to students' CIL and CT; and
- The relationship between CIL and CT.

ICILS 2018 gathered data from about 46,561 grade 8 (or equivalent) students in more than 2226 schools from 12 countries and two benchmarking participants. These student data were augmented by data from over 26,530 teachers in those schools and by contextual data collected from school ICT coordinators, principals, and the ICILS 2018 national research centers. Eight of the countries and one benchmarking participant participated in the optional CT assessment.

1 In this guide, we use the terms country and education system interchangeably. Some of the entities that participated were countries and others were education systems that did not cover the whole of a country (e.g., the German state of North Rhine-Westphalia and the city of Moscow in the Russian Federation).

The following 12 countries and two benchmarking participants participated in ICILS 2018:

Countries:

- Chile (CIL)
- Denmark (CIL and CT)
- Finland (CIL and CT)
- France (CIL and CT)
- Germany (CIL and CT)
- Italy (CIL)
- Kazakhstan (CIL)
- Korea, Republic of (CIL and CT)
- Portugal (CIL and CT)
- The United States (CIL and CT)
- Uruguay (CIL)

Benchmarking participants:

- Moscow, Russian Federation (CIL)
- North Rhine-Westphalia, Germany (CIL and CT)[2]

1.2 The design in brief

The ICILS 2018 international database (IDB) offers researchers and analysts a rich and innovative environment for examining student achievement in computer and information literacy and computational thinking in an international context. The database includes:

- Extensive data on CIL and CT that enable in-depth study of the quality of education in terms of preparedness and learning outcomes;
- Data for 12 countries and two benchmarking participants from around the world that can be used to develop an international perspective from which to examine educational practices and student outcomes in CIL education;
- Data from eight countries and one benchmarking participant from around the world that can be used to assess educational practices and student skills in CT;
- Student achievement in CIL and CT, linked to questionnaire information from students, school principals, and ICT coordinators, providing a source of policy-relevant contextual information on the antecedents of achievement;
- Scales for measuring students' behavioral and emotional engagement with regard to ICT; and
- Teacher questionnaire data that provide additional contextual information about the organization and culture of the sampled schools and information on general aspects of teaching pertaining to CIL and CT.

The ICILS 2018 student target population comprised students in the grade that represents eight years of schooling, counting from Level 1 of the International Standard Classification of Education (ISCED), provided that the average age of students in this grade was at least 13.5 years at the time of the assessment.

2 Data from North Rhine-Westphalia, Germany were included in the data for the whole of Germany.

The population for the ICILS 2018 teacher questionnaire was defined as consisting of all teachers teaching regular school subjects to the students in the target grade at each sampled school. It included only those teachers who were teaching the target grade during the testing period and who had been employed at the school since the beginning of the school year. ICILS 2018 also administered separate questionnaires to principals and nominated ICT coordinators in each school.

Representative samples drawn by means of a systematic random sampling approach that involved multiple sampling stages, clustering, and stratification were selected for both target populations. In most participating countries, about 150 schools were sampled and, within schools, 20 students and 15 teachers were sampled. Minimum exclusion and target response rates were determined in order to secure high-quality data.

A walk-through demonstration of one of the student test modules from the ICILS 2018 assessment, the Band Competition test module, can be found on the RM Results Assessment Master website (RM Results 2020). This module required students to plan a website, edit an image, and use a simple website builder to create a webpage with information about a school-band competition.

1.3 Analyzing the data

The ICILS 2018 design and operations resembled procedures used in past and current educational surveys and student achievement studies, such as, for example, the IEA Trends in International Mathematics and Science Study (TIMSS), the IEA Progress in International Reading Literacy Study (PIRLS), and the IEA International Civic and Citizenship Education Study (ICCS). However, the themes of the study imposed a number of additional requirements on data collection and analysis. ICILS 2018 was thus an ambitious and demanding study, involving complex procedures for drawing samples, collecting data, and analyzing and interpreting findings. Researchers using the database need to understand the characteristics of the study in order to work effectively with the information it contains.

1.3.1 Resources and requirements

This user guide describes the organization, content, and use of the international database from a practical perspective. It is imperative that it is used in conjunction with the ICILS 2018 technical report (Fraillon et al. 2020b), which provides a comprehensive account of the conceptual, methodological, and analytical implementation of the study. The international report (Fraillon et al. 2020a) is another key resource. Using all three publications in combination will allow analysts to understand and confidently replicate the procedures used, as well as to correctly undertake new analyses in areas of special interest.

At a minimum, an analyst carrying out statistical analysis will need to have a good understanding of the conceptual foundations of ICILS 2018, the themes addressed, the populations targeted, the samples selected, the instruments used, and the production of the international database. All of this information is covered and explained in detail in the ICILS 2018 technical report (Fraillon et al. 2020b) and sketched in practical terms in this user guide. Researchers using the database also need to make themselves familiar with the database structure and its included variables (Chapter 2 in this user guide). While it is not critically necessary to be fully knowledgeable about the methods used to construct, validate, and compute the derived scales, analysts must be aware of any possible limitations (see Chapters 11 and 12 in the ICILS 2018 technical report; Fraillon et al. 2020b).

There are other important aspects to keep in mind when working with ICILS 2018 data:

- ICILS 2018 is an observational, non-experimental study that collected cross-sectional data. For this reason, causal inferences and language of the type "condition A caused effect B,"

"factor A influenced outcome B," and "variable A impacted on variable B" cannot and should not be established with ICILS 2018 data alone. The report containing the international results of the study (Fraillon et al. 2020a) refrains from making such inferences or drawing conclusions about causality.

- The ICILS 2018 questionnaires included a variety of factual information questions, as well as questions that collected data on attitudes, beliefs, and perceptions. All this information was self-reported by the principals, teachers, ICT coordinators, and students. Furthermore, because population features were not observed but estimated using sample data, wording such as "the estimated proportion of students with X is …" is preferable to writing "X percent of students are …".
- ICILS 2018 was carried out in countries with diverse education systems, sometimes further divided within a country by jurisdiction and cultural contexts. Thus, the perception of questions or the terminology used in them might not be fully equivalent across these or other boundaries. This effect became evident in the analysis of cross-cultural measurement invariance (see Chapter 10 in the ICILS 2018 technical report; Fraillon et al. 2020b).
- Nearly all variables in ICILS 2018 are categorical in nature (nominal or ordered). Analysts may therefore need to consider using categorical, nonparametric analysis methods for these types of variable.

Techniques for continuous variables (provided that the required assumptions hold) should only be used on counts and on the derived scales obtained through data reduction or scaling methods such as factor analysis, structural equation modeling, or item response theory. Analysts also need to have a working knowledge of SPSS or SAS (or any other software of choice) and knowledge of basic inferential statistics, such as estimating means, correlations, and linear regression parameters. Appropriate theoretical knowledge will be needed to conduct advanced analyses such as logistic regressions.

1.3.2 Estimation requirements

Researchers familiar with population estimation in large-scale education survey databases such as TIMSS, PIRLS, ICCS, or other IEA studies, will have little difficulty analyzing ICILS 2018 data once they have familiarized themselves with the study's conceptual foundation and its methodological, operational, and analytical details. If users of the ICILS 2018 international database are not accustomed to working with complex survey sample data, this guide should provide sufficient technical information to enable them to conduct correct basic analysis.

The three main design features of ICILS 2018 that need to be taken into account during any secondary analysis of the study's data are:

(1) The unequal selection probabilities of the sampling units that necessitate the use of sampling weights during computation of estimates;

(2) The complex multistage cluster sample design that was implemented to ensure a balance between the research goals and cost-efficient operations; and

(3) The rotated design of the CIL assessment test, wherein students completed only samples of the test items rather than the full set of test items. The CT assessment tests consists of two test modules which were rotated but administered to all students within countries participating in CT.

Chapter 3 of this guide includes a brief account of the weights and variance estimation techniques intended for ICILS 2018, whereas Chapters 6, 7, and 13 of the ICILS 2018 technical report (Fraillon et al. 2020b) provide a more detailed description of the sample design and of the estimation and replication weights found in the international database.

ICILS 2018 used item response theory (IRT) scaling to summarize student results from the CIL and CT assessment. This scaling approach uses multiple imputation ("plausible values") methodology to obtain CIL and CT proficiency scores for all students. Because each imputed score is a prediction based on limited information, it is subject to estimation error. To allow analysts to account for this error when analyzing the achievement data, the international database provides five separate imputed scores for both CIL and CT scales, respectively. Any analysis involving CIL or CT scores needs to be replicated five times, using a different plausible value each time, with the results then combined into a single result that includes information on standard errors that incorporate both sampling and imputation error.[3]

As previously mentioned, this user guide is principally tailored to SPSS (IBM Corporation 2016), one of the most widely used statistical packages in the social sciences and educational research. Unfortunately, the base SPSS to date (i.e., Version 25) does not support complex survey designs such as those used in ICILS 2018 and cannot be used "out of the box" for methodologically correct estimation of sampling errors and test statistics. The base SPSS assumes that data come from a single-stage, simple random sample, which is not the case in ICILS 2018 or most, if not all, other large-scale assessments in education. A "complex samples" module for SPSS is available; however, this module supports only one of many variance estimation approaches, namely Taylor series linearization, and does not handle jackknife replication for estimating sampling errors, which was the technique used for estimating sampling error in ICILS 2018.

This gap has been filled by IEA's International Database (IDB) Analyzer (IEA 2020), which is available free of charge to analysts and researchers using the ICILS 2018 database. The IDB Analyzer employs SPSS (IBM Corporation 2016) and SAS (SAS Institute Inc. 2013) as an engine to compute population estimates and design-based standard errors using replication for a variety of international large-scale assessments. IEA developed the IDB Analyzer as a tool to support correct analysis of two of its large-scale student assessments (TIMSS and PIRLS), and adapted it for use with data from its other studies (such as ICILS 2018). The IDB Analyzer allows users to compute estimates of percentages, means, percentiles, correlations, and linear regression parameters, including their respective standard errors, and, more recently, logistic regressions. It also simplifies management of the ICILS 2018 international database by providing a module for selecting subsets of countries and variables, and merging files for analysis. Chapter 4 of this guide provides in-depth information about the IDB Analyzer, and includes examples illustrating its use.

Occasional users of the database may not want to use one of the commercial statistical software packages due to their associated costs. In addition to the IDB Analyzer, there are a growing number of alternative packages suitable for analyzing complex sample data, able to handle the jackknifing replication method implemented in ICILS 2018.

The WesVar (Westat Inc. 2008) software for complex sample analysis is available free of charge. The software is accompanied by a user guide and technical appendices.

Commercial packages that include support for the weights and the replication method used in ICILS 2018 are SAS 9.4 and later editions (SAS Institute Inc. 2013), and Stata 16 and later editions (StataCorp 2019). While these packages support the complex samples in ICILS 2018, they do not generally support these in orchestration with the multiple imputation methodology that ICILS 2018 used to describe and represent the data on students' CIL and CT. Third-party scripts and macros may exist to provide this support, for example as packages for R (R Core Team 2014), a free software environment for statistical computing and graphics. There is also a package called

3 More details on plausible values can be found in Chapters 11 and 13 of the ICILS 2018 technical report (Fraillon et al. 2020b).

ACER Replicates Module for SPSS that can be used to estimate sampling variance using replication methods and measurement variance estimation with plausible values, developed by the Australian Council for Educational Research (ACER).[4]

1.3.3 Levels and units of analysis

ICILS 2018 defined two target populations, each of which was sampled using a multistage stratified cluster design. Each school was regarded as a "cluster," with all students and teachers nested within these clusters. Schools can therefore be referred to as the primary sampling units (level 2 in multilevel models), and teachers and students as the secondary sampling units (level 1 in multilevel models).[5] ICILS defined populations to be as inclusive as possible, and designed samples that would yield unbiased estimates for both student and teacher populations. While schools can be considered as units of analysis in their own right, the school information in ICILS 2018 was of secondary interest. Samples were optimized to enrich and contribute to the information of central interest, that is, the student and the teacher data.

Most of the tables in the ICILS 2018 international report (Fraillon et al. 2020a) use the student as the unit of analysis, either on their own or by combining them with school-level variables. In the latter case, school information becomes an attribute of the student, and the information from both files can be used to answer such research questions as: "What percentage of students are studying in schools with a particular (school) attribute?" In other words, the publication generally reports data and findings from the perspective of students. Note, however, that in this case the appropriate weight to use is the final student weight, TOTWGTS (see also section 3.2.1).

Another possibility for analysts working with the data is to "aggregate" student-level information to the school level and to use this information in school-level or teacher-level analyses. Be aware, though, of the implicit shift of focus within this "aggregation" scenario to the school level: inferences and interpretations can no longer refer to the level 1 units (in this case, the students). Ignoring this issue may result in an "ecological fallacy" (Robinson 1950) that may occur when aggregated information is being analyzed. This fallacy assumes that each individual member of a group has the average characteristics of the group at large. ICILS 2018 derived and reported a few such variables. (Appendix C of this guide lists all of these derived variables.)

In chapter 3 of their book, Snijders and Bosker (1999) summarized the pros and cons of both "disaggregating" and "aggregating" information, while section 3.2.1 of this user guide describes the weights that have to be used during merging of files. However, it is important to note that for certain research questions, neither of these two methods may fully account for the hierarchical nature of the data. The potential effects arising from the fact that students are nested within schools also need to be considered. In the worst-case scenario, the two methods may provide an incomplete or misleading representation of respective education systems and processes. Those interested in answering research questions that refer to or try to explain the degree of variability of a characteristic located within schools and between schools may find multilevel models (e.g., a two-level hierarchical linear model) a more appropriate choice.

Although ICILS 2018 was designed with multilevel modelling in mind, we do not discuss such models in either theoretical or practical terms in this guide because more factors and considerations than can be addressed here determine their specification within the purview of specific research questions. However, because users of the ICILS 2018 database need to fully understand the

4 The module is an add-in component running under SPSS and offers a number of features for applying different replication methods when estimating sampling and imputation variance. The application can be downloaded at https://icils.acer.org/icils-2018-reports

5 As elaborated in chapter 3 of this guide, the teacher data collected for ICILS 2018 were deemed insufficient to meet the preconditions for multilevel analysis.

theoretical and mathematical bases for multilevel analysis, readers should consult the existing literature on multilevel modeling. Section 3.2.1 of this user guide describes the use of weights in such models. Chapter 13 in the technical report (Fraillon et al. 2020b) includes a description of how hierarchical linear modelling has been applied to results included in the international report (Fraillon et al. 2020a).

When undertaking multilevel analysis of the ICILS 2018 data, users will need to take into account the structure of each participating education system. Although there are no major differences across the ICILS 2018 countries in how they defined a student for the purposes of the study, their definitions of what a school is (e.g., with respect to administrative units, multi-campus schools, buildings, tracks, and shifts) did vary across countries. The results of multilevel and variance decomposition analyses that investigate the across-school variability of a characteristic therefore need to be interpreted in terms of the structure of the education systems, the definitions underlying the school sample frame, and the specific schools that ICILS 2018 asked teachers and principals to refer to when completing their questionnaires.

Snijders and Bosker's (1999) introduction to multilevel analysis is highly readable and provides a straightforward description of this method. Those interested in the actual estimation of such models should refer to the popular multilevel software packages, which include Stata (StataCorp LLC 2019), HLM 6 (Raudenbusch et al. 2004), Mplus (Muthén & Muthén 2012), MLwiN (Rasbash et al. 2014), and SAS (SAS Institute 2013).

1.3.4 Limitations of the international database

When analyzing ICILS 2018 data, researchers need to keep the following constraints in mind:

- Participation rates in the student survey were below ICILS 2018 standards in the United States; the results for the United States are thus presented separately in the ICILS international report (Fraillon et al. 2020a). Student data from this country may be affected by non-response bias and results should therefore be interpreted with caution; the results from the United States should not be compared directly with those from other countries.
- Participation rates in the teacher questionnaire were below ICILS standards in France, Germany, Luxembourg, the United States, and Uruguay. These results are therefore presented separately in the ICILS 2018 international report (Fraillon et al. 2020a). Teacher data from these countries are at greater risk of non-response bias; these results should be interpreted with caution and cannot be compared directly with those from other countries.
- Exclusion rates pertaining to the student population were above five percent in Denmark, Kazakhstan and Portugal. The ICILS 2018 research team deemed this level of exclusion a significant reduction of target population coverage; researchers need to keep this feature in mind when interpreting results.
- Italy assessed its grade 8 students at the beginning of the school year and therefore the average age of sampled students was lower than 13.5 years at the time of assessment, which is below target group population age defined for the survey. As a consequence, CIL results from Italy are reported separately in the ICILS 2018 international report (Fraillon et al. 2020a).
- In Luxembourg, due to the relatively small number of schools and size of the target population, all eligible schools and students were included in the ICILS 2018 survey (census).

Chapters 6 and 7 of the ICILS 2018 technical report (Fraillon et al. 2020b) provide further details on participation and exclusion rates.

1.4 Contents of the user guide

This user guide for the ICILS 2018 international database describes the content and format of the data contained in the database. In addition to this introduction, the guide includes the following chapters:

- Chapter 2 describes the structure and content of the ICILS 2018 international database.
- Chapter 3 introduces the use of weighting and variance estimation variables for analyzing the ICILS 2018 data. It also provides guidelines on comparing estimates.
- Chapter 4 introduces the IEA IDB Analyzer software (IEA 2020) and, using this software in conjunction with SPSS (IBM Corporation 2016) and SAS (SAS Institute 2013), presents example analyses of the ICILS 2018 data.

Three appendices also accompany this user guide.

- Appendix A includes the international version of all international questionnaires administered in ICILS 2018. These serve as a reference guide to the questions asked and the variable names used to record the responses in the international database.
- Appendix B provides details on all national adaptations applied to the national versions of all ICILS 2018 international questionnaires. When using the database, please refer to this supplement and check for any special adaptations to the background and perceptions variables that could potentially affect the results of analyses.
- Appendix C describes the derived questionnaire variables, many of which were presented in tables in the ICILS 2018 international report (Fraillon et al. 2020a).

CHAPTER 2:

The ICILS 2018 international database files

Ekaterina Mikheeva and Sebastian Meyer

2.1 Overview

The ICILS 2018 international database (IDB) contains student, teacher, and school data collected in the 12 countries and two benchmarking participants that participated in the study. The database also includes data from the ICILS 2018 national contexts survey, providing information on the national contexts of computer and information literacy education for all participating countries.

An operational code was assigned to each ICILS 2018 country in the international database (Table 2.1). Only eight countries and one benchmarking participant took the optional CT modules; four of the ICILS 2018 countries also participated in ICILS 2013 (Table 2.1).

For details on population coverage and exclusion rates for countries that participated in ICILS 2018, please refer to chapter 6 of the ICILS 2018 technical report; for details on participation rates, please refer to chapter 7 of the ICILS 2018 technical report (Fraillon et al. 2020b).

The database contains materials that provide additional information on its structure and content. This chapter describes the content of the database, and is divided into five major sections each covering the different file types and materials included in the database.

Table 2.1: Countries participating in ICILS 2018

Country	Operational codes		ICILS 2018 modules taken		Participated in ICILS 2013
	Alpha-3	Numeric	CIL	CT	
Chile	CHL	152	•		•
Denmark[1, 2]	DNK	208	•	•	•
Finland	FIN	246	•	•	
France[3]	FRA	250	•	•	
Germany[3]	DEU	276	•	•	•
Italy[4]	ITA	380	•		
Kazakhstan	KAZ	398	•		
Korea, Republic of	KOR	410	•	•	•
Luxembourg[3]	LUX	442	•	•	
Portugal[5]	PRT	620	•	•	
Uruguay[3]	URY	858	•		
United States[3, 6]	USA	840	•	•	
Benchmarking participants					
North Rhine-Westphalia (Germany)[3, 5]	DNW	276001	•	•	
Moscow (Russian Federation)	RMO	6431	•		

Notes:
1 Country met guidelines for sampling participation rates only after replacement schools were included.
2 Country did not meet sample participation requirements for the student survey in ICILS 2013.
3 Country did not meet sample participation requirements for the teacher survey.
4 Country surveyed target grade in the first half of the school year.
5 Country nearly met guidelines for sampling participation rates after replacement schools were included.
6 Country did not meet sample participation requirements for the student survey.

2.2 ICILS 2018 database

The ICILS 2018 database comprises data from all instruments administered to the students, the teachers teaching in the target grade, the school principals, and the ICT coordinators at the students' respective schools. The data files include the student responses to the CIL and CT achievement items and the responses to the student, teacher, school, and ICT coordinator questionnaires. The files also contain the achievement scores estimated for participating students, as well as the background variables derived for reporting study findings in the ICILS 2018 international report (Fraillon et al. 2020a). National research coordinators' responses to the national contexts survey are also contained in the international database.

This chapter also describes the contents and format of the ICILS 2018 data files. These are provided in SPSS format (.sav) and SAS format (.sas7bdat), except for the national contexts survey data, which are only available in SPSS format (.sav). The files can be downloaded from the IEA Data Repository (at http://www.iea.nl/data-tools/repository). Data files are provided for each country that participated in ICILS 2018 where internationally comparable data are available.[6]

The three types of ICILS 2018 data files in the database correspond to the three data levels established in ICILS 2018: school level, student level, and teacher level. Files of the same type include the same uniformly defined set of variables across countries. The file name identifies the type of data file and the country (Table 2.2). For example, BSGLUX2I2.sav is an SPSS file that contains Luxembourg's ICILS 2018 target grade student data. Each file type contains a separate data file for each participating country.

Table 2.2: ICILS 2018 data file names

File names	Descriptions
BSG•••I2	Student achievement and questionnaire file
BTG•••I2	Teacher questionnaire file
BCG•••I2	School and ICT coordinator questionnaire file
NCSICSI2	National contexts survey file

Note: ••• = three-character alphanumeric country code based on the ISO 3166 coding scheme (see Table 2.1)

The SPSS files include full dictionary/meta information, that is, variable name, format (type, width, and decimals), label, value labels, missing values, and appropriately set measurement levels (nominal, ordinal, or scale). The dictionary information can be accessed through the SPSS "View → Variables" menu, or in output form through the "File → Display Data File Information" menu. SAS files include appropriate display formats and variable labels but do not permanently store value labels in data files.

All information related to the structure of the ICILS 2018 data files, as well as the source, format, descriptive labels, and response option codes for all variables, are contained in codebook files. Each type of data file in the database is accompanied by a codebook file in Excel format. The naming convention for codebook files follows the convention for the data files (see Table 2.2) except that the file extension is ".xlsx".

Please note the SPSS data files are created in Unicode mode. However, when saving SPSS data files in Unicode encoding in code page mode, defined string widths are automatically tripled. These format changes will then cause problems when merging data with the IDB Analyzer (i.e., when merging the data in SPSS). Users should take this into account when saving data files in SPSS.

6 Please refer to section 1.3.4 in chapter 1 for information about the constraints on data comparability.

2.2.1 Student data files (BSG)

Students who participated in ICILS 2018 were administered two of five CIL test modules, each of which contained a series of tasks. Some of these tasks were multiple-choice items, some were constructed-response items, some were automatically scored computer-skills tasks, and others were large tasks that were scored using analytic criteria. The student data files contain the actual responses to the multiple-choice questions and the scores assigned to the constructed-response items, the automatically scored skills items, and the large-task criteria.

Students who participated in ICILS 2018 were also administered a questionnaire that asked them to answer questions related to their home background and their value beliefs, attitudes, and behaviors relevant to CIL (and CT).

The CT test modules followed the student questionnaire session (in countries participating in CT). The CT test consisted of two test modules, which were both administered to all students participating in the CT assessment. The modules were rotated. This means that some student started with CT module 1 and then worked on CT module 2, while others began with CT module 2 and then undertook CT module 1. In addition to the task types used in the CIL test modules, CT tasks included unique tasks that were assessed using multiple criteria with multiple score categories.

The student data files contain students' responses to these questions. They also contain students' CIL and CT (where applicable) proficiency scores (plausible values). In addition, the student data files feature a number of identification variables, tracking and timing variables, sampling and weighting variables, and derived variables that were used for the analyses described in the international report (see section 2.4). In the student data files, each student was assigned a unique identification number (IDSTUD). The IDSTUD can be used to identify individual students within a country.

Item response code values

A series of conventions also were adopted to code the data included in the CIL and CT test data files.

The values assigned to each of the test item variables depend on the item format. For multiple-choice items, numerical values from 1 through 2, 1 through 3, 1 through 4, 0 through 11, or 0 through 22 correspond to the response options in individual items. For these items, the correct response(s) is (are) included in the value label.

The scoring, whether automatic or human, of constructed-response items and large-task criteria used a one-digit scheme. Large tasks in the ICILS 2018 test modules were all scored using task-specific criteria. The manifestation of the assessment criteria across the different tasks depended on the nature of each task. In CIL test modules, some criteria allowed for dichotomous scoring as either 0 (no credit) or 1 (full credit) score points; others allowed for partial credit scoring as 0 (no credit), 1 (partial credit), or 2 (full credit) score points. In CT test modules, students could receive a score of zero, one, or two points on one of the two tasks, and a score of zero, one, two, or three points on the other task.

The "missing" code ("9" in SPSS; "." in SAS) was used when a student made no attempt to answer a task. This code was only allocated when the entire stimulus, question stem, and question response area were left blank by the student. The scoring system automatically allocated the "missing" code and checked whether the response showed any deviation from its initial state.

2.2.2 School data files (BCG)

The school data files contain responses from school principals and ICT coordinators to the questions in the ICILS 2018 principal and ICT coordinator questionnaires. Although analysis with schools as investigative units can be performed, it is preferable to analyze school-level variables as attributes of students or teachers. If users want to perform student- or teacher-level analyses with the ICILS 2018 school data, they will need to merge the school data files with the student or teacher data

files and to use the country and school identification variables to do so. Section 4.2 of this user guide details the IEA IDB Analyzer's merging procedure.

2.2.3 Teacher data files (BTG)

The teachers sampled for participation in ICILS 2018 were asked to complete a questionnaire containing questions pertaining to their background and the organization and culture of the schools where they were teaching. Remaining questions focused on general aspects of teaching with respect to CIL. Each teacher in the teacher data files has his or her own identification number (IDTEACH). This number uniquely identifies each teacher within a country.

It is important to note that, in contrast to other IEA surveys, the teachers in the ICILS 2018 teacher data files constitute a representative sample of target-grade teachers in a country. However, student and teacher data must not (and cannot) be merged at the level of individuals because these two groups constitute separate, albeit related, target populations. Chapter 4 of this user guide describes how the IEA IDB Analyzer software can be used to conduct student-level analyses with teacher data.

Questionnaire response code values

A series of conventions were adopted to code the data included in the ICILS 2018 questionnaire data files.

The values assigned to each of the questionnaire variables depend on the item format and the number of options available. For categorical questions, sequential numerical values were used to correspond to the response options available. The numbers correspond to the sequence of appearance of the response options. For example, the first response option is represented with a 1, the second response option with a 2, and so on. Check-all-that-apply questions were coded as "checked" if the corresponding option was chosen, otherwise it was coded as "not checked". Open-ended questions, such as "the number of female students in a school", were coded with the actual number given as a response.

2.2.4 National contexts survey data file

This data file contains the responses provided by national research coordinators of the participating countries to the ICILS 2018 national contexts survey. The national contexts survey was designed to systematically collect relevant data on the structure of the education system, education policy, and computer and information literacy education, teacher qualifications for CIL education, and information about national debates and reforms. The survey also collected data on processes at the national level related to assessment of and quality assurance in CIL education and school curriculum approaches. The national contexts survey was administered online using the IEA Online Survey System (OSS) developed by IEA.

The national contexts survey data file (NCSICSI2.sav) is available in SPSS format and contains data for all 14 countries participating in ICILS 2018.

2.3 Records included

The international database includes all records that satisfied the international sampling standards. Data from those respondents who either did not participate or did not pass adjudication because, for example, within-school participation was insufficient, were removed from the final database.

More specifically, the database contains records for the following:

- All participating schools: any school where the school principal responded to the principal questionnaire and/or the ICT coordinator responded to the ICT coordinator questionnaire has a record in the school-level files. Participation in ICILS 2018 at school level is independent of participation at the student and/or teacher levels for the same school.
- All participating teachers: any teacher who responded to the teacher questionnaire has a record in the teacher-level files, provided that at least 50 percent of the sampled teachers of that school participated in the study.
- All participating students: any student who responded to at least one item of the student test has a record in the student-level files, but only if at least 50 percent of the sampled students of that school took part in ICILS 2018.

Consequently, the following records were excluded from the database:

- Schools where both the principal and the ICT coordinator did not respond to the questionnaire;
- Students who could not or refused to participate or did not respond to a single item of the student test;
- Students who experienced a technical failure of the electronic assessment system during test administration and were consequently unable to complete the assessment;
- Students from those schools where less than 50 percent of the sampled students participated;
- Teachers who did not respond to the questionnaire;
- Teachers from those schools where less than 50 percent of the sampled teachers participated;
- Students and/or teachers who were afterwards reported as not in scope, not eligible, or excluded;
- Students or teachers who participated but were not part of the sample; and
- Any other records that were considered unreliable, of undocumented origin, or otherwise in violation of accepted sampling and adjudication standards.

Any additional data collected by countries to meet national requirements were also excluded from the international database.

For further information on the ICILS 2018 participation and sampling adjudication requirements, refer to Chapter 5 of the ICILS 2018 technical report (Fraillon et al. 2020b).

2.4 Survey variables

The database contains the following information for each school that participated in the survey:

- The identification variables for the country and school;
- Additional administrative variables;
- Additional structure and design variables;
- The school principal's responses to the principal questionnaire;
- The ICT coordinator's responses to the ICT coordinator questionnaire;
- The school indices derived from the original questions in the principal and ICT coordinator questionnaires;
- Weights and variance estimation variables pertaining to schools; and
- The database version and the date of its creation by IEA along with the scope of the database.

The information in the database for each teacher who participated in the survey is as follows:

- The identification variables for the country, school, and teacher;
- Additional administrative variables;
- Additional structure and design variables;
- The teacher's responses to the teacher questionnaire;
- The teacher indices derived from the original questions in the teacher questionnaire;
- The weights and variance estimation variables pertaining to teachers; and
- The database version and the date of its creation by IEA along with the scope of the database.

For each student who participated in the survey, the following information is available:

- The identification variables for the country, school, and student;
- The student's responses to the student questionnaire;
- The student's responses to the student CIL test;
- The student's responses to the student CT test, if applicable;
- Additional structure and design variables;
- The student CIL test scores;
- The student CT test scores, if applicable;
- Timing information, i.e., the time students spent on each task and module;
- The student indices derived from the original questions in the student questionnaire;
- The weights and variance estimation variables pertaining to students; and
- The database version and the date of its creation by IEA along with the scope of the database.

Sections 2.4.1 to 2.4.3 offer more detailed explanations of these variables.

2.4.1 Identification variables

All ICILS 2018 data files contain several identification variables that provide information to identify countries and entries of students, teachers, or schools (Table 2.3). These variables are used to link variables of one case, clusters of cases (students and teachers pertaining to specific schools), and cases across the different types of data file. However, the variables do not allow identification of individual schools, students, or teachers in a country.

IDCNTRY indicates the country or participating education system that the data refers to as an up to six-digit numeric code based on the ISO 3166-1 classification (Table 2.1), with adaptations

reflecting the education systems participating. This variable should always be used as the first linking variable whenever files are linked within and across countries.

CNTRY indicates the participant's three-digit alphanumeric code, based on the ISO 3166-1 coding, with adaptations reflecting the education systems participating.

IDSCHOOL is a four-digit identification code that uniquely identifies the participating schools within each country. The school codes are not unique across countries, but schools across countries can be uniquely identified by the combination of IDCNTRY and IDSCHOOL.

IDSTUD is an eight-digit identification code that uniquely identifies each sampled student within a country. Students can be uniquely identified across countries using the combination of IDCNTRY and IDSTUD. The first four digits of IDSTUD contain the IDSCHOOL code for the student's school, thus identifying a student within a school.

IDTEACH is a six-digit identification code that uniquely identifies the sampled teacher within a country. Teachers can be uniquely identified across countries using the combination of IDCNTRY and IDTEACH. The first four digits of IDTEACH contain the IDSCHOOL code for the teacher's sampled school.

As for reasons of confidentiality, the identification variables for the student (IDSTUD), teacher (IDTEACH), and school (IDSCHOOL) were scrambled, they did not match the identifiers used during data collection. However, the structural link between the school and student/teacher level (the variable IDSCHOOL in the student and teacher files and the first four digits of any IDSTUD/IDTEACH variable) was maintained for all countries. For each country, unique matching tables were created and made available to authorized individuals.

Table 2.3: Location of identification variables in the ICILS 2018 international database

Weight variables	Data file		
	BCG	BSG	BTG
IDCNTRY	•	•	•
CNTRY	•	•	•
IDSCHOOL	•	•	•
IDSTUD		•	
IDTEACH			•

Notes: BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

2.4.2 Administration variables

The international database includes several variables that provide additional information about survey administration, participation in the study, and other basic characteristics of respondents (Table 2.4).

ITLANGP indicates the language used in the principal questionnaire. The two-digit alphanumeric language codes are based on the ISO 639-1 standard (ISO [International Organization for Standardization] 2020).

MODEA_PrQ indicates the principal's questionnaire mode. The variable is set to "1" if the questionnaire was completed online. It is set to "2" if it was completed on paper.

ITLANGC indicates the language used in the ICT coordinator questionnaire. The two-digit alphanumeric language codes are based on the ISO 639-1 standard.

MODEA_CoQ indicates the ICT coordinator's questionnaire mode. The variable is set to "1" if the questionnaire was completed online. It is set to "2" if it was completed on paper.

IDBOOK identifies the specific instrument version that was administered to each student via the electronic ICILS 2018 assessment software. The instrument versions are given a numerical value that ranges from 11 through 30 for CIL test modules and from 31 through 70 for CT test modules.

ITLANGS indicates the language(s) in which the student test was written in a country and which each student was actually required to use when working through the assessment. The two-digit alphanumeric language codes are based on the ISO 639-1 standard.

TADATE indicates the date (month/year) when the test was administered to the student.

ITLANGT represents the language used in the teacher questionnaire. The two-digit alphanumeric language codes are based on the ISO 639-1 standard.

MODEA_TcQ indicates the teacher's questionnaire mode. The variable is set to "1" if the teacher completed the questionnaire online and "2" if he or she completed it on paper.

Table 2.4: Location of administration variables in the ICILS 2018 international database

Administration variables	Data file		
	BCG	BSG	BTG
ITLANGP	•		
MODEA_PrQ	•		
ITLANGC	•		
MODEA_CoQ	•		
IDBOOK		•	
ITLANGS		•	
TADATE		•	
ITLANGT			•
MODEA_TcQ			•

Notes: BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

2.4.3 Achievement item variables

The names of the achievement item variables pertaining to the international test are based on an alphanumeric code (e.g., C1H04AC). These codes consist of up to eight characters and adhere to the following rules:

- The first character indicates the general study context. "C" stands for computer and information literacy and "T" for computational thinking.
- The second character indicates the assessment cycle when the item was first used in ICILS. It is therefore "1" for all items introduced as part of the ICILS 2013 assessment and "2" for items developed for ICILS 2018.
- The third character represents the test module the item belongs to. The following letters are used to indicate the test modules:
  - "B" indicates the "Band Competition"module
  - "G" indicates the "Board Games" module

  - "H" indicates the "Breathing" module
  - "R" indicates the "Recycling" module
  - "S" indicates the "School Trip" module
  - "A" indicates the "Automated Bus" module
  - "F" indicates the "Farm Drone" module.
- The fourth and fifth characters indicate the item number of the test module.
- The sixth character is used for multipart items. "Z" is used for items not split into multiple parts.
- The seventh digit represents the original item type. "M" represents multiple-choice items; "O" stands for open-ended items. "A" represents items that were automatically scored, and "C" stands for items that were manually scored. "L" is the indicator for items belonging to a large task.

For example, C2R03ZM is the third item from the student CIL test module "Recycling". It is a multiple-choice item and was first developed for use in ICILS 2018.

2.4.4 Achievement test scores

The ICILS 2018 research team produced the student CIL and CT achievement scales. Chapter 11 of the ICILS 2018 technical report (Fraillon et al. 2020b) provides detailed descriptions of the ICILS 2018 scaling and the CIL and CT achievement scales, including their construction. The international database provides five separate estimates of each student's score on that scale. These are contained in the student file. The variability between the five estimated scores, known as "plausible values," encapsulates the uncertainty inherent in the scale estimation process.

The plausible values for the CIL and CT scales are the best available measures of student achievement on these scales in the international database and should therefore be used as the outcome measure in any study of student achievement. Plausible values can be readily analyzed using the IEA IDB Analyzer, described in detail in chapter 4 of this user guide.

The five achievement score variable, i.e. plausible value, names are PV1CIL to PV5VIL for the CIL and PV1CT to PV5CT for the CT scale.

2.4.5 Questionnaire variables

The questionnaire variable names consist of a 6- to 8-character string (e.g., IS2G04A). The following rules are applied in naming the variables of the international and national instruments:

- The first character indicates the reference level. The letter "I" is used for variables that are administered on an international level.
- The second character indicates the type of respondent. The letter "C" is used to identify data from school principals, while the letter "I" is used for ICT-coordinator data. The letter "T" is used for teacher data. The letter "S" is used for student data.
- The third character indicates the study cycle. Number "2" identifies ICILS 2018 as the second cycle of the IEA study.
- The fourth character is used to indicate the context of the variable. The letter "G" is used for general contexts.
- The fifth and sixth characters indicate the question number.
- The seventh and eighth characters represent optional digits for multipart items, and optional digits for multipart subitems, respectively.

The values assigned to each of the questionnaire variables depend on the questionnaire item format and the number of options available. For categorical questions, sequential numerical values are used that correspond to the response options available. The numbers correspond to the sequence of appearance of the response options. For example, the first response option is represented with a 1, the second response option with a 2, and so on. Open-ended questions, such as "number of students in a school," are coded with the actual number given as a response.

The raw information collected by the questionnaires underwent extensive processing, inspection, cleaning, and editing. Out-of-range values, questions determining the flow of the questionnaire, and inconsistent or implausible combinations of responses were inspected and cleaned where necessary. To address residual inconsistencies, ICILS 2018 imposed certain automatic edits, for example, the removal of implausible responses, for all countries. For further information on data collection, capturing, processing, editing, weighting, and adjudication of the international database, please consult chapters 7 and 10 of the ICILS 2018 technical report (Fraillon et al. 2020b).

With respect to the international database, the data-cleaning process at IEA ensured that information coded in each variable would be internationally comparable. National adaptations were reflected appropriately in all concerned variables, and questions that were not internationally comparable were removed from the database. For more information on national adaptations and their eventual handling, consult Appendix B of this user guide.

2.4.6 Indices, ratios, and indicators derived from the questionnaire data

Several questions asking about various aspects of a single construct appear frequently in the ICILS 2018 questionnaires. In these cases, the ICILS research team combined responses to the individual items in order to create a derived variable that provided a more comprehensive picture of the construct of interest than the individual variables could on their own.

The international database contains scale indices derived from scaling of items, a process typically achieved by using item response modeling of dichotomous or Likert-type items. Questionnaire scales derived from weighted likelihood estimates (logits) present values on a continuum with an ICILS average of 50 and a standard deviation of 10 (for equally weighted national samples). The database also contains other indices that were derived by simple recoding or arithmetical transformation of original questionnaire variables.

Appendix C of this user guide provides a description of all derived variables included in the international database. For further information about the scaling procedure for questionnaire items, please refer to Chapter 12 of the ICILS 2018 technical report (Fraillon et al. 2020b).

2.4.7 Summary scales and derived variables from the questionnaires

In the ICILS 2018 questionnaires, typically sets of items reflecting a number of different aspects were used to measure a single construct. In these cases, responses to the individual items were combined to create a derived variable which provided a more comprehensive picture of the construct of interest than relying on individual item responses.

In the ICILS 2018 reports, a scale is a special type of derived variable that assigns a score value to students on the basis of their responses to the component variables. In ICILS 2018 new scales were typically calculated as IRT weighted likelihood estimation (WLE) scores with mean of 50 and standard deviation of 10 for equally weighted countries. Scales based on (unmodified) item sets already included in the ICILS 2013 questionnaire were equated and their scale scores are comparable with the scales established in the previous survey; in these cases, the metric reflects a mean of 50 and a standard deviation in the pooled ICILS 2013 sample giving equal weights to each participating country. For student, teacher, and school questionnaire scaling, we only included records in the scale calculation if there were data for at least two of the corresponding indicator variables.

In addition to the scale indices, the ICILS 2018 international database also contains other (simple) indices that were derived by simple recoding or arithmetical transformation of original questionnaire variables.

Appendix C to this user guide provides a description of all derived variables (scale scores and indices) included in the international database. For further information about the scaling procedure for questionnaire items refer to Chapter 11 of the ICILS 2018 technical report (Fraillon et al. 2020b).

2.4.8 Weighting and variance estimation variables

To allow for calculation of the population estimates and correct jackknife variance estimates, the data files provide sampling and weighting variables. Further details about weighting and variance estimation are provided in Chapter 3 of this user guide.

Each record in the ICILS 2018 international database contains one or more variables that reflect the record's selection probabilities (or base weights) and nonresponse adjustment(s). The last character of the variable name indicates the data type (student = S, teacher = T, school = C). The weights and weighting factors differ depending on the data type. The only value identical in all three types of datasets is the value for the school base weight (variable WGTFAC1). This is because the school sampling comprised universally the first sampling stage and is therefore independent of data type. Each data file contains an estimation or final weight variable. Each such variable starts with the letters "TOT" (i.e., the product of all other weight variables) and must be used for single-level analyses.

The ICILS 2018 international database contains 12 weight variables (Table 2.5).

WGTFAC1 is the school base weight. It corresponds to the inverse of the selection probability of the school.

TOTWGTC is the final school weight for schools. It is computed as the product of WGTFAC1 and WGTADJ1C. The final school weight for schools must be applied when analyzing the data coming from the school questionnaire.

WGTADJ1C is the school weight adjustment for schools. It accounts for the non-returned school questionnaires.

TOTWGTS is the final student weight. It is computed as the product of WGTFAC1, WGTADJ1S, WGTFAC3S, and WGTADJ3S. The final student weight must be applied when analyzing the students' data.

WGTADJ1S is the school weight adjustment for students. It accounts for the sampled schools that did not participate in the student survey. The adjustment is done within explicit strata.

WGTFAC3S is the student base weight. It corresponds to the inverse of the selection probability of the student.

WGTADJ3S is the student weight adjustment. It accounts for the sampled students that did not participate in the student survey. The adjustment is done within schools.

TOTWGTT is the final teacher weight. It is computed as the product of the WGTFAC1, WGTADJ1T, WGTFAC2T, WGTADJ2T, and WGTADJ3T. The final teacher weight must be applied when analyzing the teacher's data.

WGTADJ1T is the school weight adjustment for teachers. It accounts for the sampled schools that did not participate in the teacher survey. The adjustment is done within explicit strata.

WGTFAC2T is the teacher weight factor. It corresponds to the inverse of the selection probability of the teacher within the school.

WGTADJ2T is the teacher weight adjustment. It accounts for sampled teachers that did not participate in the teacher questionnaire. The adjustment is done within schools.

WGTFAC3T is the teacher multiplicity adjustment. It accounts for teachers teaching in more than one school.

Table 2.5: Location of weighting variables in the ICILS 2018 international database

Weighting variables	Data file		
	BCG	BSG	BTG
WGTFAC1	•	•	•
TOTWGTC	•		
WGTADJ1C	•		
TOTWGTS		•	
WGTADJ1S		•	
WGTFAC3S		•	
WGTADJ3S		•	
TOTWGTT			•
WGTADJ1T			•
WGTFAC2T			•
WGTADJ2T			•
WGTFAC3T			•

Notes: BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

A variance estimation method that considers the structure of the data is the jackknife repeated replication (JRR) method. The ICILS 2018 international database contains variables that support the implementation of this method (i.e., "jackknife zone," "jackknife replicate," "replicate weights"); we strongly encourage database users to use them. As the IEA IDB Analyzer automatically recognizes the data structure of ICILS 2018, it reports correct standard errors for all estimates using JRR with the respective variables.

Several variance estimation variables (or "jackknife variables") are included in the ICILS 2018 international database (Table 2.6). The actual replicate weights are computed "on-the-fly" within the IDB Analyzer, but, as researchers may wish to conduct analyses without using the IDB Analyzer, these variables are also presented within the data.

JKZONES indicates to which sampling zone the student belongs. The values of JKZONES can vary between 1 and 75. This variable is used to estimate sampling errors when analyzing student data.

JKREPS can take the values 0 or 1. This variable indicates whether the student should be deleted or its weight doubled when estimating sampling errors.

The variables SRWGT1 to SRWGT75 indicate the jackknife replicate weights variables (1–75) for the student survey.

JKZONET indicates to which sampling zone the teacher belongs. The values of JKZONET can vary between 1 and 75. This variable is used to estimate sampling errors when analyzing teacher data.

JKREPT can take the values 0 or 1. This variable indicates whether the teacher should be deleted or its weight doubled when estimating sampling errors.

The variables TRWGT1 to TRWGT75 indicate the jackknife replicate weights variables (1–75) for the teacher questionnaire.

JKZONEC indicates to which sampling zone the school belongs. The values of JKZONEC can vary between 1 and 75. This variable is used to estimate sampling errors when analyzing school data.

JKREPC can take the values 0 or 1. It indicates if the school should be deleted or its weight doubled when estimating sampling errors.

The variables CRWGT1 to CRWGT75 indicate the jackknife replicate weights variables (1–75) for the school survey.

Table 2.6: Location of variance estimation variables in the ICILS 2018 international database

Variance estimation variables	Data file		
	BCG	BSG	BTG
JKZONEC	•		
JKREPC	•		
CRWGT1 to CRWGT75	•		
JKZONES		•	
JKREPS		•	
SRWGT1 to SRWGT75		•	
JKZONET			•
JKREPT			•
TRWGT1 to TRWGT75			•

Notes: BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

2.4.9 Database creation variables

Information about the version number of the ICILS 2018 international database and the date of its creation by IEA is contained in the database creation variables. They are included in all data files.

VERSION indicates the system of database version numbers was used throughout the data processing process. The version number of the ICILS 2018 final database is "5.0" or higher.

IEADATE specifies the date when IEA produced the data file.

SCOPE identifies the scope of the data files. Code "2" indicates the files are restricted use files and code "3" indicates that they are public use files.

2.5 Coding of missing data

A subset of the values for each variable type was reserved for specific codes related to different categories of missing data. We recommend that the user reads the following section with particular care since the way in which these missing codes are used may have major consequences for analyses.

2.5.1 Omitted response codes (SPSS: 9, 99, 999, ...; SAS: .)

"Omitted" response codes are used for questions or items that a student, teacher, or school principal should have answered but did not, i.e. an omitted response code is given when an item is left blank. The length of the omitted response code given to a variable in the SPSS data files depends on the number of characters needed to represent the variable. For example, the omitted code for a one-digit variable is "9," whereas the omitted code for three-digit variables would be "999".

2.5.2 Not administered response codes (SPSS: 8, 98, 998, …; SAS: .A)

Specific codes were given to items that were "not administered" to distinguish these from data that were missing due to non-response. The not administered code was used in the following cases:

- *CIL test item was not assigned to the student*: All students participating in ICILS 2018 CIL test received only two of the five CIL test modules. All variables corresponding to items that were not part of the modules assigned to a student were coded as "not administered".
- *CT test item was not assigned to the student*: The ICILS 2018 IDB includes CT-related variables even for countries that did not participate in the CT module. All variables corresponding to items that were not part of the assigned CT test module were coded as "not administered".
- *Student was absent from test session*: When a student did not attend a particular testing session, for example because of sickness, all variables relevant to that session were coded as "not administered".
- *The achievement item was not displayed to the student due to a technical failure of the electronic assessment system*: If the assessment system failed during the assessment, all variables following the last item presented to a student when the failure occurred (i.e., assuming there was still time left to complete the corresponding test module) were coded as "not administered" (see chapter 11 in the ICILS 2018 technical report; Fraillon et al. 2020b).
- *Question or item deleted or mistranslated*: A question or item identified during translation verification or item review as having a translation error, such that the nature of the question was altered, or as having poor psychometric properties, was coded as "not administered" if it could not be recoded to match as closely as possible the international version.
- *A questionnaire was returned empty, was not returned, or was lost*: All variables referring to that instrument and any derived variables were coded as "not administered."
- *A country chose, for cultural reasons, not to administer (include) a certain question in its national questionnaire*: The variables corresponding to the removed question were coded as "not administered." Appendix B of this user guide provides details on the national adaptations.

The length of the not administered response code in the SPSS data files depends on the number of characters needed to represent the variable. For example, the not administered code for a one-digit variable is "8," whereas the not administered code for three-digit variables would be "998".

2.5.3 Not reached response codes (SPSS: 7; SAS: .R)

An item was considered "not reached" in the achievement data files when the item itself and the item preceding it were not answered and when (1) no other items were completed in the remainder of the test module, and (2) no technical failure of the electronic student assessment system occurred.

2.5.4 Logically not applicable response codes (SPSS: 6, 96, 996, …., SAS: .B)

"Logically not applicable" response codes were used for the questionnaire items for which responses were dependent on a filter question. If the filter question was answered such that the following questions would not apply any follow-up question has been coded as "logically not applicable".

The length of the logically not applicable response code in the SPSS data files depends on the number of characters needed to represent the variable. For example, the logically not applicable code for a one-digit variable is "6," whereas the logically not applicable code for three-digit variables would be "996".

2.6 Codebook files

All information related to the structure of the ICILS 2018 data files, as well as the source, format, descriptive labels, and response option codes for all variables, is contained in a codebook file in Excel format.

In the codebook file, there is a tab for each appropriate data file type in the ICILS 2018 international database. These tabs describe the contents and structure of the respective data file. Important codebook fields include "Label," which contains extended textual information for all variables, "Value Scheme Detailed," which lists the acceptable responses allowed for each variable, and "Missing Scheme Detailed," which lists all applicable missing codes in SPSS and SAS.

2.7 Two versions of the ICILS 2018 international database

To protect the confidentiality of the study respondents, ICILS 2018 applied certain disclosure-avoidance measures at the international level. These measures were consistent across all countries. These measures were implemented for all data versions and exports of the database that participating countries and public users can access. Indirect identification of individuals was prevented by applying international disclosure risk edits, such as scrambling of identification variables and jackknife zone information. Furthermore some of the personal data variables that were needed only during field operations and data processing were removed, and variables that were identified as highly identifying were suppressed or categorized.

The ICILS 2018 international database is available in two versions: a public use file (PUF) and a restricted use file (RUF). The public use version is available for immediate access from the IEA Data Repository (https://www.iea.nl/data-tools/repository). A number of variables have been removed or categorized from the public use version in order to minimize the risk of disclosing confidential information or allow re-identification. Users will be able to replicate all published ICILS 2018 results with this version of the ICILS 2018 international database. The restricted use file is an extended version for scientific use. Users who require any of the removed variables to conduct their analyses should contact the IEA through its Data Repository to obtain permission and access to the restricted use version of the ICILS 2018 international database.

Some variables in the restricted and the public use versions of the ICILS 2018 international database have been scrambled, categorized, or removed for differing reasons (see Tables 2.7, 2.8 and 2.9). More details for all of these variables are available in the codebook files (see section 2.6).

Table 2.7: Disclosure risk edits for sampling, identification, and tracking variables

Variables	Description	Location of data files	RUF	PUF
IDSCHOOL / IDSTUD / IDTEACH	ID variables	All files	Scrambled	Scrambled
JKZONEC/T/S	Jackknife zone	BCG, BTG, BSG	Scrambled	Scrambled
IDSTRATE	Explicit stratum code	BCG, BTG, BSG	Suppressed	Suppressed
IDSTRATI	Implicit stratum code	BCG, BTG, BSG	Suppressed	Suppressed
MODEA_CoQ / MODEA_PrQ	Administration mode school	BCG	Included	Suppressed
MODEA_TcQ	Administration mode teacher	BTG	Included	Suppressed
NTEACHERS	Number of teachers in target grade	BCG	Suppressed	Suppressed
ITBIRTHY_T	Teachers' year of birth from tracking forms	BTG	Suppressed	Suppressed
ITBIRTHY_S, ITBIRTHM_S	Students' year/month of birth from tracking forms	BSG	Suppressed	Suppressed
TADATE	Date of testing	BSG	Included	Suppressed

Notes: RUF = restricted use file; PUF = public use file; BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

Table 2.8: Disclosure risk edits for school questionnaire variables

Variables	Description	Location of data files	RUF	PUF
IP2G08A	Public or private school	BCG	Included	Suppressed
P_PRIV	Public or private school – derived	BCG	Included	Suppressed
IP2G03A/IP2G03B	Total enrollment	BCG	Included	Suppressed
P_NUMSTD	Total enrollment - derived	BCG	Included	Categorized
IP2G04A/IP2G04B	Enrollment <target grade>	BCG	Included	Suppressed
P_NUMTAR	Enrollment <target grade> – derived	BCG	Included	Categorized
IP2G06A/IP2G06B	Total number of full-time and part-time teachers	BCG	Included	Suppressed
P_NUMTCH	Total number of full-time and part-time teachers – derived	BCG	Included	Categorized

Notes: RUF = restricted use file; PUF = public use file; BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

Table 2.9: Disclosure risk edits for student questionnaire variables

Variables	Description	Location of data files	RUF	PUF
IS2G01A, IS2G01B	Students' date of birth (month, year)	BSG	Suppressed	Suppressed
IS2G07A, IS2G07B, IS2G08A, IS2G08B	Parent / guardian 1's job (open-ended)	BSG	Suppressed	Suppressed
IS2G11A, IS2G11B, IS2G12A, IS2G12B	Parent / guardian 2's job (open-ended)	BSG	Suppressed	Suppressed

Notes: RUF = restricted use file; PUF = public use file; BCG = school and ICT coordinator questionnaire file; BSG = student achievement and questionnaire file, BTG = teacher questionnaire file.

CHAPTER 3:

Weights and variance estimation for ICILS 2018

Sabine Tieck and Sabine Meinck

3.1 Overview

This chapter provides an introduction to the use of weight and variance estimation variables in the ICILS 2018 student, teacher, and school data analyses, and its content is largely based on chapter 3 of the ICILS 2013 User Guide (Jung & Carstens 2015). The examples outlined here demonstrate the importance of using appropriate weight variables and variance estimation techniques in order to achieve a correct estimation of population parameters and calculate standard errors that correctly reflect the uncertainty of these parameters. It is important to account for the ICILS survey design if researchers are to draw correct conclusions about the population under study. This chapter also includes a discussion of constraints for specific analysis types (e.g., when simultaneously using data from different sources).

3.2 Sampling weights

All data in the ICILS 2018 international database were derived from randomly drawn samples of schools, students, and teachers. In order to arrive to unbiased estimates of the target population under study, database users, and analysts must take into account the complex nature of the sampling design implemented in each ICILS education system. Chapter 6 of the ICILS 2018 technical report (Fraillon et al. 2020b) provides details about ICILS 2018 sampling design.

This complex design resulted in varying selection probabilities for sampled schools, students, and teachers. Another consideration arising out of this design is that the varying nonparticipation patterns of schools among strata and of students/teachers within participating schools can lead to biased estimates. All units participating in ICILS 2018 have sampling weights that consider these two design features, permitting an unbiased estimation of population parameters. Chapter 7 of the ICILS 2018 technical report (Fraillon et al. 2020b) elucidates on the weighting and nonparticipation adjustments.

Sampling weights were calculated for the ICILS 2018 student, teacher, and school populations to enable correct analyses of the data.

3.2.1 Student weight variables

Five student weight variables are included in the ICILS 2018 international database (Table 3.1).

Table 3.1: Weight variables in student achievement and questionnaire file (BSG)

Variable	Description
TOTWGTS	Final student weight
WGTFAC1	School base weight
WGTADJ1S	School weight adjustment - student study
WGTFAC3S	Student base weight
WGTADJ3S	Student weight adjustment

Note: For a full description of the weight variables, see section 2.4.8.

3.2.2 Teacher weight variables

Six teacher weight variables are included in the ICILS 2018 international database (Table 3.2).

Table 3.2: Weight variables in teacher questionnaire file (BTG)

Variable	Description
TOTWGTT	Final teacher weight
WGTFAC1	School base weight
WGTADJ1T	School weight adjustment - teacher study
WGTFAC2T	Teacher base weight
WGTADJ2T	Teacher weight adjustment
WGTFAC3T	Teacher multiplicity adjustment

Note: For a full description of the weight variables, see section 2.4.8.

3.2.3 School weight variables

Three school weight variables are included the ICILS 2018 international database (Table 3.3).

Table 3.3: Weight variables in school and ICT coordinator questionnaire file (BCG)

Variable	Description
TOTWGTC	Final school weight
WAGFAC1	School base weight
WGTADJ1C	School weight adjustment - school study

Note: For a full description of the weight variables, see section 2.4.8.

3.2.4 Selecting the appropriate weight variable

Researchers analyzing ICILS 2018 data must use sampling weights that consider the study's complex sample design in order to obtain unbiased population estimates. The choice of correct sampling weights will depend on the type of data used and the level of analysis. Section 2.4.8 of this user guide lists and describes all weight variables in the international database. It also provides the variable labels and source files.

3.2.5 Single level analysis

The following weights have to be applied when analyzing data from a single level:

- TOTWGTS should be used for student-level analyses (BSG files);
- TOTWGTT should be used for teacher-level analyses (BTG files); and
- TOTWGTC should be used for school-level analyses (BCG files).

We recommend that the IEA IDB Analyzer is used to analyze ICILS 2018 data because this software automatically selects the correct weight variable, depending on the level of the requested analysis.

Please note that ICILS 2018 is conceptually a survey of students and teachers and was not designed as a survey of schools. Although it is possible to undertake school-level analyses that generate unbiased results, the sampling precision of the estimates tends to be lower (with larger standard errors and confidence intervals) than it is for analyses at the student or teacher level. Therefore, results concerning school-level data tend to be associated with a high degree of uncertainty. For example, when considering the ICILS school data file for Germany, German schools offering grade 8 education have an estimated average school size (in terms of student numbers) of 480.7 students, with a standard error of 41.3. Hence, it is possible to conclude (with a 95% probability) that the true average school size of these German schools lies somewhere between 398.1 and 563.4 students, which is clearly not a very precise estimate.

3.2.6 Merging files from different levels

Researchers who analyze data simultaneously from different levels need to do so with caution because the process means that different types of data have to be merged. The way different file types need to be combined will depend on the particular research question underlying each analysis. Furthermore, the appropriate choice of weights (see section 2.4.8) will depend on the level at which inferences should be made.

- The variable TOTWGTS (the final school weight for schools) has to be used when analyzing student data together with school data. The IEA IDB Analyzer makes this type of disaggregated analysis straightforward (see section 4.2). The software merges school-level data with the student data and automatically selects the correct sampling weight variable for the estimation. School information then becomes an attribute of the student, and the user can analyze information based on both data files. An example would be an analysis of the percentage of students attending a school with a female principal. Chapter 6 of the ICILS 2018 international report (Fraillon et al. 2020a) contains many tables that are a product of this type of analysis.
- In the same way, combined teacher and school data can be analyzed; here TOTWGTT (the final teacher weight) has to be used as a weighting factor. When performing this kind of analysis, the IEA IDB Analyzer again selects the correct estimation weight variable. For this type of analysis, an example of which would be the percentage of grade 8 teachers working at a school with a female principal, school information becomes an attribute of the teachers.
- It is also possible to use weighted aggregates of student or teacher data at the school level during analyses. However, because the IEA IDB Analyzer does not include features to assist this kind of analysis, two additional steps are required prior to undertaking school-level analyses:

  (1) Aggregate student or teacher data by school (using other statistical software tools).

  Note that, in contrast to ICILS 2013, when aggregating within-school student data, not all the weighting factors can be disregarded because all students might not share the same within-school weight. Aggregation of within-school student data requires the aggregate to be computed using WGTADJ3S (a student weight adjustment). Aggregation of within-school teacher data requires the aggregate to be computed using WGTFAC3T (a teacher multiplicity adjustment), as this is the only weighting factor that differs between teachers within a given school (see section 1.3.4 for a discussion of the potential problems).

  (2) Merge the aggregated data to the school file.

Please note that it is neither possible nor meaningful to directly combine individual student and teacher data files because they constitute two different target populations and are not directly linked to each other. This means that a teacher in a sampled school in the dataset may never have taught a particular student in the same school and, conversely, that surveyed students may never have been exposed to the participating teacher, even though both belong to the same school.

Nevertheless, it is possible to aggregate teacher data at the school level and to operationalize this as an attribute of the students, or to use aggregated student data for an analysis of teacher data. The ICILS 2018 international report (Fraillon et al. 2020a, table 6.13, p. 196) presented one example of such an analysis. For this, teacher responses to questions on professional development participation were aggregated at school level, and these data were then merged to the student data file. Analysis of the generated dataset produced the percentages of students at schools where teachers were participating in professional development focused on using ICT in teaching and learning.

Finally, users should be aware that the proportion of missing values tends to increase when data from different datasets are combined. Because missing data can bias the analysis results, it is important to review possible reductions in the sample size due to missing data before conducting the analysis and when interpreting the results. As an example of bias related to missing data,

consider a case where all or most ICILS students from disadvantaged backgrounds did not respond to questions about their respective backgrounds. Any estimation of CIL average scores controlling for these variables would inevitably lead to biased results, because CIL is interrelated with social background (Fraillon et al. 2019). Multiple imputation methods offer a possible solution for dealing with missing data issues.

Problems with missing data can become particularly problematic for countries with low within-school individual response rates. For example, a national dataset may include some schools that count as participants in the student survey but cannot be considered to have participated in the teacher survey because less than 50 percent of the teachers returned their questionnaire. In such cases, the corresponding schools would be present in the student data file but absent from the teacher data file.

3.2.7 Multi-level analysis

Working with data at different levels poses some methodological considerations (for details, see Snijders & Bosker 1999). A common approach used for analyzing clustered data is hierarchical (or multilevel) linear modeling (HLM). Specialized software packages, such as HLM (Raudenbusch et al. 2004), Mplus (Muthén & Muthén 2012), and MLwiN (Rasbash et al. 2014), provide tools for undertaking this type of analysis. If using multilevel modeling, it is important that users choose a correct set of weights for each different level of analysis. The use of weights in multilevel analysis is still under debate in the research community; however, in line with the recommendations of Rutkowski et al. (2010), the ICILS 2018 research team applied and supports the following approach:

- At level 1 (student level), a "within-school student weight" should be computed as the product of the student-level weighting factors (WGTFAC3S × WGTADJ3S).[7] In cases where teachers constitute level 1, a "within-school teacher weight" should be computed as the product of the teacher-level weighting factors (WGTFAC2T × WGTADJ2T × WGTADJ3T).

  The resulting level 1 weights reflect the selection probabilities, adjusted for nonresponse, of individuals within their primary sampling unit (here, schools).
- At level 2 (school level), a "school weight" should be used for analysis. During analysis of student data, this weight should be computed as the product of the variables WGTFAC1 and WGTADJ1S; during analysis of teacher data, this weight variable can be derived as the product of WGTFAC1 and WGTADJ1T. In both cases, the resulting level 2 weights reflect the selection probabilities of the schools adjusted for nonresponse. Note that it is not appropriate to use the variable TOTWGTC from the school files, as nonresponse adjustments made to school questionnaire data may differ from school-level nonresponse adjustments for the student and teacher surveys.

It is important to ensure that the software used for multilevel analysis normalizes the weights, which means that the sum of weights must be set so that it is equal to the sample size (students or teachers within schools, schools within a country). If users do not follow this procedure, the standard errors of parameter estimates may be underestimated.

One important prerequisite for multilevel analysis is that sufficiently large sample sizes at both levels are needed to assure acceptable precision of the estimated model parameters. According to Meinck and Vandenplas (2012), the precision varies considerably for different kinds of model parameters (namely fixed-model parameters versus variances). As a rule of thumb, sample sizes of, at the very least, 10 units at level 1 and 30 units at level 2 can be viewed as the absolute minimum

7 In ICILS 2018, the student weights do not differ within a given school, which means this step can also be skipped, leaving the level 1 data unweighted.

number of units required for multilevel analysis.[8] These sample sizes are important not only for achieving precise parameter estimates but also for obtaining unbiased estimates of the parameters' standard errors.[9] Because the sampling precision differs considerably for different parameters of a multilevel model, analysts must take into account the respective standard errors of coefficients when interpreting the results.

For analysis pertaining to students at level 1, the requirement for sufficiently large samples was met in the majority of schools in most ICILS 2018 countries (Table 3.4). However, users should thoroughly review the number of schools with smaller student samples before conducting such analyses and interpret the results with caution if there are many schools with small student samples.

Table 3.4: Number of participating students per participating school (student cluster size)

Country	Student cluster size			
	Minimum	Maximum	Mean	Standard error
Chile	3	24	17.4	4.0
Denmark	5	24	16.8	3.0
Finland	1	21	17.7	3.0
France	11	20	18.9	1.2
Germany	5	20	17.5	2.8
Italy	8	22	18.7	1.7
Kazakhstan	4	24	18.4	3.9
Korea	7	20	19.2	1.8
Luxembourg	23	333	142.1	67.6
Moscow, Russian Federation	7	20	19.0	1.5
North Rhine-Westphalia, Germany	10	20	18.3	1.8
Portugal	7	24	16.1	3.1
United States	4	36	25.8	3.9
Uruguay	5	22	15.7	3.1

If multilevel analyses are done using the entire national sample, the sample size should generally be sufficiently large for conducting this type of analysis. However, if the analysis is undertaken only for subgroups of schools, researchers should ensure that there are no fewer than 30 schools within each subgroup.

For the majority of participating countries, conducting multilevel analysis with teacher data is unlikely to result in precise level 1 estimates. The average number of responding teachers per school is close to 10 (Table 3.5); hence, a significant number of schools have smaller cluster sizes. In this instance, single-level analysis may be preferable in order to obtain more reliable results.

8 Given that the school sample size of 38 cases at level 2 for Luxembourg provided only limited statistical power, data from this country were not included in the multilevel analysis reported for ICILS 2018 (Fraillon et al. 2020a).

9 See Meinck and Vandenplas (2012) for details and an extensive literature review on the topic.

Table 3.5: Number of participating teachers per participating school (teacher cluster size)

Country	Teacher cluster size			
	Minimum	Maximum	Mean	Standard error
Chile	3	19	9.7	3.6
Denmark	2	18	8.1	3.5
Finland	3	18	13.0	2.7
France	6	19	12.0	2.5
Germany	2	19	12.8	2.6
Italy	3	19	12.0	3.6
Kazakhstan	7	19	14.3	2.0
Korea	5	19	14.4	2.9
Luxembourg	11	25	17.6	4.3
Moscow, Russian Federation	7	18	14.9	0.9
North Rhine-Westphalia, Germany	5	18	13.7	1.9
Portugal	5	19	13.5	2.3
United States	2	20	12.4	5.6
Uruguay	6	17	10.9	2.5

3.2.8 Importance of using weights for data analysis

Although the sampling design used for ICILS generally leads to self-weighted samples[10], certain circumstances, briefly described below, explain a high variation between the estimation weights of sampled units.

- The sampling design was optimized for the student population: This means the base weights for schools depend on their size (i.e., number of grade 8 students), with larger schools having higher selection probabilities than smaller schools. If weights are ignored during school-level analysis, large schools will be overrepresented. The following example illustrates this. In an estimate of the average number of fulltime teachers per school in Korea (variable IP2G06A in file BCGKORC2), the unweighted (hence incorrect) estimate is 37.5, while the (correctly) weighted estimate is considerably smaller (30.3). This difference is due to the sampling design, which leads to a sample that contains more large schools than are actually present in the population, and of course, large schools also have more teachers on staff than small schools.
- The correlation between the numbers of grade 8 students in schools (used as the measure of size for determining school selection probabilities) and grade 8 teachers is only moderate. The teacher selection probabilities accordingly vary by design.
- Explicit stratification and disproportional sample allocation was commonly used. This practice would lead to further variation in school selection probabilities.
- Nonresponse patterns vary in accordance with nonresponse adjustment cells (i.e., strata or schools). For instance, individual student weights in schools with a response rate of just over 50 percent[11] would be almost twice as large as those from schools where all sampled students participated.

10 All sampling units have similar estimation weights. This is achieved by assigning low selection probabilities to small schools but high selection probabilities to students within small schools and, vice versa, high selection probabilities to large schools but low selection probabilities to students within large schools. The product of the two base weights is then similar for all students. See Meinck (2015) for further reading on this matter.

11 Note that ICILS 2018 considered schools with response rates below 50 percent as refusals and hence assigned them a weight of zero.

Circumstances such as these make using weights in all ICILS 2018 data analysis essential if biased results are to be avoided. In other words, not using weights in data analysis can lead to severely biased results.

Our next example illustrates this importance. Imagine a researcher is interested in ascertaining the CIL average in France (variables PV1CIL–PV5CIL in the BSG file) and is using (e.g., in SPSS) unweighted data. The mean of each plausible value is calculated first, followed by the average of the five values. The average score would turn out to be 496.36 (Figure 3.1).

Figure 3.1: Example of unweighted analysis in SPSS

	N	Minimum	Maximum	Mean	Std. error	Std. deviation
Computer and information literacy – 1st PV	2940	93.50	742.16	496.8793	1.46355	79.35634
Computer and information literacy – 2nd PV	2940	162.73	719.86	495.5944	1.47520	79.98770
Computer and information literacy - 3rd PV	2940	14.72	736.11	496.3210	1.48353	80.43958
Computer and information literacy – 4th PV	2940	161.27	727.93	496.4655	1.48351	80.43830
Computer and information literacy – 5th PV	2940	104.41	716.13	496.5576	1.46659	79.52127
Valid N (listwise)	2940					

Notes: N = number of cases; PV = plausible value; Std. deviation = standard deviation..

However, if weighted data are used with the IEA IDB Analyzer, the correct average of the CIL score in France is actually 498.71 (Figure 3.2).

Figure 3.2: Example of weighted analysis using the IEA IDB Analyzer

Average for PVCIL by IDCNTRY

Country ID - Numeric Code	N of cases	Sum of TOTWGTS	Sum of TOTWGTS (s.e.)	Percent	Percent (s.e.)	PVCIL (mean)	PVCIL (s.e.)	Std.Dev
France	2940	801969	12327.38	100.00	.00	498.71	2.35	80.45
Table average	.	.	.	100.00	.00	498.71	2.35	80.45

Notes: N = number of cases; PVCIL = plausible value computer and information literacy; s.e. = standard error; Std Dev. = standard deviation..

In this example, the difference between the unweighted and weighted results can be explained by the specific sampling design for France: the sample is selected disproportionally (i.e., schools from one stratum have a higher selection probability and therefore a smaller weight than schools from other strata). The proportion of students from schools in the stratum characterized as schools with a large amount of digital equipment in the sample is considerably higher than their proportion in the population. The sample was intentionally designed so that French researchers could not only obtain more precise estimates for this group of students but also detect statistically significant differences between students from schools with a large amount of digital equipment and those from schools with a normal amount of digital equipment. In order to balance out the disproportionate sample allocation, the weights assigned to students from schools that were supplied with a large amount of digital equipment were smaller than the weights assigned to students from the other school types. Because, on average, students attending schools with a normal amount of digital equipment perform better than their peers from other school types, omitting weights would lead to an underestimation of student achievement for France. The sampling weights compensate for the disproportionate school sample allocation.

Analyses of groups of countries

Thus far, the discussion has focused on analysis of data from one country at a time. However, all the above statements also hold when more than one country is analyzed and researchers should exercise caution when calculating the international averages. If an international average is computed using TOTWGTS, TOTWGTT, or TOTWGTC, larger countries will contribute more to this average than smaller countries, which may not be the intention of the researcher.

Instead of performing weighted analyses across groups of countries, users must conduct weighted analyses separately for each country and calculate an average of these results afterwards. This is true regardless of whether single-level data, aggregated or disaggregated data, or multi-level data files are used for analysis.

Users of the IEA IDB Analyzer do not need to worry about the issue of international averages (called "table averages" there), since the software performs the correct calculations automatically. When calculating an international mean, the IEA IDB Analyzer first calculates national means using the TOTWGT variables and then averages the results over the countries that contribute to the international mean.

3.3 Variance estimation

Because all statements about any ICILS 2018 population are based upon sample data, they can only be made with a limited degree of certainty. Standard errors reflect the precision of the estimates and should always be reported when analyzing ICILS 2018 data. Also, because the samples were drawn using a stratified complex design, the calculation of standard errors of parameter estimates is not as straightforward as in the case of simple random samples, and standard software packages do not always support this design feature.

A variance estimation method that considers the structure of the data is jackknife repeated replication (JRR). The ICILS 2018 international database contains variables that support the implementation of this method. They include the "jackknife zone," the "jackknife replicate," and "replicate weights." For details on the JRR technique used in ICILS 2018, please refer to Chapter 13 of the ICILS 2018 technical report (Fraillon et al. 2020b).

The IEA IDB Analyzer recognizes the data structure of ICILS 2018 automatically and reports correct standard errors for all estimates.

3.3.1 Variance estimation variables in the ICILS 2018 international database

Student-level, teacher-level and school-level variance estimation variables (or "jackknife variables") are included in the ICILS 2018 international database (Tables 3.6, 3.7, and 3.8).

Table 3.6: Student-level variance estimation variables in the student achievement and questionnaire file (BSG)

Variable	Description
JKZONES	Jackknife zone - student study
JKREPS	Jackknife replicate code - student study
SRWGT1, SRWGT2, ..., SRWGT75	Student jackknife replicate weight 1, Student jackknife replicate weight 2, ... Student jackknife replicate weight 75

Note: For a full description of the variance estimation variables, see section 2.4.8

Table 3.7: Teacher-level variance estimation variables in the teacher questionnaire file (BTG)

Variable	Description
JKZONET	Jackknife zone - teacher study
JKRPET	Jackknife replicate code - teacher study
TRWGT1, ... TRWGT75	Teacher jackknife replicate weight 1, ... Teacher jackknife replicate weight 75

Note: For a full description of the variance estimation variables, see section 2.4.8

Table 3.8: School-level variance estimation variables in the school and ICT coordinator questionnaire file (BCG)

Variable	Description
JKZONEC	Jackknife zone - school study
JKREPC	Jackknife replicate code - school study
CRWGT1, ... CRWGT75	School jackknife replicate weight 1, ... School jackknife replicate weight 75

Note: For a full description of the variance estimation variables, see section 2.4.8

3.3.2 Selecting the appropriate variance estimation variables

Different variance estimation variables must be applied depending on the type of data:

- For all student level analyses, JKZONES and JKREPS should be used;
- For all teacher level analyses, JKZONET and JKREPT should be used; and
- For all school level analyses, JKZONEC and JKREPC should be used.

Even for the same school, the variables at different levels of analysis can differ from each other and thus are not interchangeable. As is the case with weights, researchers should ensure to choose the correct jackknife variables when working with aggregated datasets. The level of analysis (student, teacher, or school) determines which variable to choose.

When calculations are performed with the IEA IDB Analyzer, the correct variables will be selected automatically. However, users may want to use specialized software for those types of analysis that go beyond the range of the IDB Analyzer's capabilities. In this case, the jackknife variables must be specified according to the requirements of the software. Usually, "zone" variables have to be specified as "stratum" or "strata" variables, while the "replicate" variables are commonly referred to as "cluster" variables. Frequently, software accepts direct use of the replicate weights. In such cases, the JKZONE and JKREP variables can be ignored. We strongly recommend that data users employ the replicate weights provided for all single-level analysis of ICILS 2018 data.

3.3.3 Example for variance estimation

Not using the jackknife variables in data analysis will lead to standard errors that do not reflect correctly the uncertainty of point estimates. The following example illustrates the importance of using the JRR technique for research and analysis with ICILS 2018 data.

A researcher may be interested in the average teacher age (variable T_AGE) in Chile. Using SPSS, they find that the (weighted) average teacher age is about 40 years and the standard error seems to be close to 0.05 years (see Figure 3.3).

But using the JRR technique with the IEA IDB Analyzer, the correct estimate for the standard error is found to be more than nine times larger than indicated by the SPSS analysis (see Figure 3.4).

Figure 3.3: Example of incorrect variance estimation in SPSS

	N	Mean	Std. error
Teacher age	49720	39.65	.052
Valid N (listwise)	49720		

Notes: N = number of cases; Std. error = standard error.

Figure 3.4: Example of weighted analysis using the IEA IDB Analyzer

N of cases	Sum of TOTWGTT	Sum of TOTWGTT (s.e.)	Percent	Percent (s.e.)	T_AGE (Mean)	T_AGE (s.e.)
1683	49837.87	1151.36	100.00	.00	40.02	.49

Notes: N = number of cases, T_AGE = teacher's age, s.e. = standard error.

The standard methods of the SPSS base version can neither handle weights correctly for sampling variance estimation, nor can it take the clustered data structure into account. This means that not only standard errors but also all analyses that contain significance tests will be incorrect unless specialized software is used.

3.3.4 Estimating sampling variance with jackknife repeated replication

When population parameter μ is estimated, then μ_s is its estimate, assuming all weighted sampled measurements have been used (i.e., applying TOTWGTS for the student population or TOTWGTT for the teacher population). Because all samples in ICILS 2018 are probabilistic, μ_s itself is a random variable, and μ is therefore estimated with a certain degree of precision. To account for this, we use JRR methodology to estimate the sampling variance of μ

$$SV_\mu = \sum_{i=1}^{75} [\mu_i - \mu_s]^2$$

where 75 refers to the number of jackknife zones, and μ_i is the estimate of μ using the ith set of jackknife replicate weights. The standard error of μ is given by:

$$SE_\mu = \sqrt{SV_\mu}.$$

A particular parameter of interest in ICILS 2018 is the CIL scale. For this particular case, to account for the variability introduced by all plausible values reflecting the construct, the JRR formula to estimate the variance of the construct is given by:

$$SE_{\mu} = \left(\frac{1}{P} \sum_{j=1}^{P} \left[\sum_{i=1}^{75} (\mu_{ij} - \mu_j)^2 \right] \right) + \left(\frac{P+1}{P} * \frac{\sum_{j=1}^{P} (\mu_j - \mu)^2}{P-1} \right)$$

where P is the number of plausible values (i.e., five in the case of CIL), μ_{ij} is the estimate of μ using the j[th] plausible value with the i[th] set of jackknife replicate weights, and μ_j is the estimate of μ using the j[th] plausible value with full-sample weights (i.e., TOTWGTS).

Finally, note that in this case, SE_{μ} is the sum of two independent sources of variation. The first term reflects variation on μ due to sampling, while the second reflects variation due to measurement.

Once more, please note that the IEA IDB Analyzer applies the above formulas for computing standard error estimates automatically.

3.3.5 Comparing groups and statistical significance testing

Analyzing data by subgroups is common practice in research. However, if the aim is to review statistical differences among subgroups, users will need to proceed cautiously. This is because the sampling design has a direct impact on the standard error of any estimate, as we pointed out in section 3.2.8. Even in the case of larger effect sizes, statistically significant differences among subgroups are unlikely if the number of sampled students or teachers within grouping cells is small or if all members of a subgroup belong to only a very small number of schools. Furthermore, the standard error estimate itself is not accurate in these cases. As a rule of thumb, an analysis group should have no fewer than 50 individuals (students or teachers) coming from at least 25 different schools.[12] In developing research questions and designs, we recommend that users evaluate whether the survey and sampling design support the respective research goals.

In this section of this chapter, we consider comparisons of means, percentages, and percentiles. Because comparison of other estimators such as correlation or regression coefficients or standard deviations is not as straightforward, this is not covered in this guide.

Testing for significant differences between group estimates involves the following steps:

(1) Estimating the difference between two groups by simply subtracting the two group estimates from each other;

(2) Estimating the standard error of the difference and then dividing the difference by its standard error (the result of this division is called the "*t*-value"); and

(3) Comparing the *t*-value to the *t*-distribution.

Absolute *t*-values larger than 1.96 point to significant differences on the 95-percent certainty level ($p < 0.05$). In other words, if the absolute *t*-value is larger than 1.96, we can, with a probability of 95 percent, predict that the difference is not only present in the sample but also in the population. Note, however, that *t*-values are no proof of the absence of a difference between two compared subgroups (a mistake commonly made in statistical analysis); instead, the probability of whether or not there is a difference is less than 95 percent.

The second step above (computing the standard error of the difference) deserves special attention. The method used to compute this standard error will depend on the composition of the groups to be compared. We can distinguish between three cases.

12 The JRR method measures sampling variance by comparing the variation between paired schools, which makes it important to have enough schools contributing to the computations.

Differences between independent samples

Independent samples consist of sample subgroups that were not part of the same sampling frame. This axiom holds for comparisons across countries or among different explicit strata.

The standard error of the difference SE_{dif_ab} and the *t*-value for two independent groups *a* and *b* is computed by the IDB Analyzer as:

$SE_{dif\_ab} = \sqrt{SE_a^2 + SE_b^2}$, and

$t = \frac{(a-b)}{SE_{dif\_ab}}$

Differences between dependent samples

Dependent samples consist of sample subgroups that were part of the same sampling frame. One example is gender groups. Assume that female and male students are sampled as part of the same explicit strata. For example, they attend the same school type (a feature that is relevant if used for explicit stratification), or they share the same teacher and school environment because they attend the same school. The sampling covariance between these subgroups will need to be considered during estimation of the standard errors.

Using jackknife replication to estimate the standard error of the difference involves the following formula:

$$SE_{dif\_ab} = \sqrt{\left[\sum_{i=1}^{75}((a^i - b^i) - (a-b))^2\right]}.$$

Here, *a* and *b* represent the weighted averages (or percentages) in each of the two subgroups for the fully weighted sample, and a^i and b^i are the weighted averages for the replicate samples.

Where, with respect to ICILS 2018, there are differences in CIL scores, the measurement error also needs to be taken into account using the following formula:

$$SE_{dif\_ab} = \sqrt{\frac{\sum_{p=1}^{P}\left(\sum_{i=1}^{75}((a_p^i - b_p^i) - (a_p - b_p))^2\right)}{P} + \left(\left(1+\frac{1}{P}\right)\frac{\sum_{p=1}^{P}(a_p - b_p) - (\bar{a}_p - \bar{b}_p)^2}{P-1}\right)}$$

Here, a_p and b_p represent the weighted subgroup averages in groups *a* and *b* for each of the *P* plausible values ($P = 5$), a_p^i and b_p^i are the subgroup averages within replicate samples for each of the *P* plausible values, and $\bar{a}_p$ and $\bar{b}_p$ are the means of the two weighted subgroup averages across the *P* plausible values.

Obviously, manually computing the standard error estimates of these differences would be tedious. A simpler solution is to model group differences with a regression, an approach which also builds in the covariance term. The IEA IDB Analyzer makes it easy to implement this approach for both variable types; t-values of group differences are part of the output. Section 4.4.2 of this guide gives a detailed explanation of the implementation of this method.

Estimating standard errors of dependent samples by using the method for independent samples risks overestimating the standard error, thereby detecting fewer significant differences than are actually present.

Differences between group and combined-group estimates

Researchers sometimes want to compare a group estimate with a combined estimate where the group of interest also contributes to the combined estimate (of independent groups). A typical example is that of comparing national average scores with the "country average" (an estimate based on data from all participating countries).[13] In this case, the samples to be compared are not independent because the national mean contributes to the estimation of the international mean. The (adjusted) standard error estimate of this difference SE_{dif_ic} can be computed as

$$SE_{dif\_ic} = \frac{\sqrt{((N-1)^2-1)-SE_c^2+\sum_{k=1}^{N} SE_k^2}}{N}$$

where SE_c is the standard error for country c and SE_k is the standard error for the k^{th} of the N participating countries (or groups contributing to the combined estimate).

Again, because the IEA IDB Analyzer does not offer this operation, it needs to be performed manually.

3.3.6 Importance of using the correct variance estimation method

The data structure must be taken into account when performing analyses, otherwise the analyses are likely to produce incorrect standard errors. Standard errors will be considerably underestimated in most cases, and group differences will become significant even though they are not. The following example illustrates the importance of using the JRR technique when analyzing ICILS data.

The ICILS 2018 international report presented country average CIL achievement scores for both females and males (Fraillon et al. 2020a, figure 3.7, p. 70). The difference between average scores for boys in Germany (511) and boys in Finland (516) was five CIL score points. The standard error has to be computed to verify whether the difference is statistically significant. Because the samples compared are independent, the following formula applies:

$$SE_{dif} = \sqrt{SE^2_{German\_boys} + SE^2_{Finland\_boys}}$$

Inserting the standard errors of the CIL scores of both countries ($SE_{German\_boys} = 3.6$; $SE_{Finland\_boys} = 3.6$) into the formula, results in a standard error of the difference of 5.1. The next step is to divide the difference by its standard error to compute the t-value; here $t = 0.98$. Accordingly, the CIL average score difference between boys in Germany and boys in Finland might just be due to chance.

However, estimating the standard errors of the same CIL scores on the assumption of simple random sampling (by, e.g., using SPSS) reveals that the standard errors are largely underestimated. When the total weights in the analysis are applied, the standard error estimations are 7 to 24 times smaller than the correct estimates ($SE_{SRS\_German\_boys} = 0.15$; $SE_{SRS\_Finland\_boys} = 0.5$). If these incorrect standard errors are used for hypothesis testing, the country difference becomes significant (the t-value would be 9.6). Failing to apply the weights while still treating samples as simple random samples would lead to underestimation of the standard errors (2.0 for Germany and 2.4 for Finland), and the difference would appear insignificant (the t-value would be 1.6).

The effect of underestimating standard errors generally holds for all variables or types of analysis.

13 Please see information about comparing North Rhine-Westphalia to the ICILS 2018 average in chapter 13 of the ICILS 2018 technical report (Fraillon et al. 2020b).

CHAPTER 4:

Analyzing the ICILS 2018 data using the IEA IDB Analyzer

Ekaterina Mikheeva and Sebastian Meyer

4.1 Overview

The IEA IDB Analyzer software (IEA 2020) can be used to analyze the ICILS 2018 international data files. Used in conjunction with either SPSS (IBM Corporation 2016) or SAS (SAS Institute 2013), the IEA IDB Analyzer provides a user-friendly interface to easily merge the various data file types of the ICILS 2018 international database and seamlessly takes into account the sampling information and the multiple imputed CIL and CT scores to produce accurate statistical results.

Here we provide examples of analyses to illustrate the capabilities of the IEA IDB Analyzer. The IDB Analyzer can be used to compute a variety of statistics, including percentages of students in specified subgroups, average scores in those subgroups, correlations, regression coefficients, and percentages of students reaching certain proficiency levels. The examples we provide use student, teacher, and school level data to replicate some of the ICILS 2018 results included in the ICILS 2018 international report (Fraillon et al. 2020a), as well as other useful analyses for investigating policy-relevant research questions.

Users should be able to perform statistical analyses with the IEA IDB Analyzer with a basic knowledge of the ICILS 2018 international database. Chapter 2 gives a more detailed description of the data files contained in the international database, including their structure and contents, along with a description of all the supporting documentation provided with the international database.

Developed by IEA, the IEA IDB Analyzer is an interface for SPSS and SAS, which are both well-known statistical analysis software packages. The IEA IDB Analyzer enables users to combine either SPSS or SAS data files from IEA's large-scale assessments, and, without actually writing programming code, conduct analyses using either SPSS or SAS. The IEA IDB Analyzer generates SPSS and SAS syntax that incorporates information from the sampling design in the computation of statistics and their standard errors. In addition, the generated syntax makes appropriate use of plausible values for calculating estimates of CIL and CT scores and their standard errors, combining both sampling variance and imputation variance. (Chapter 3 of this user guide provides a more in-depth description of and rationale for requirements pertaining to complex sample analysis.)

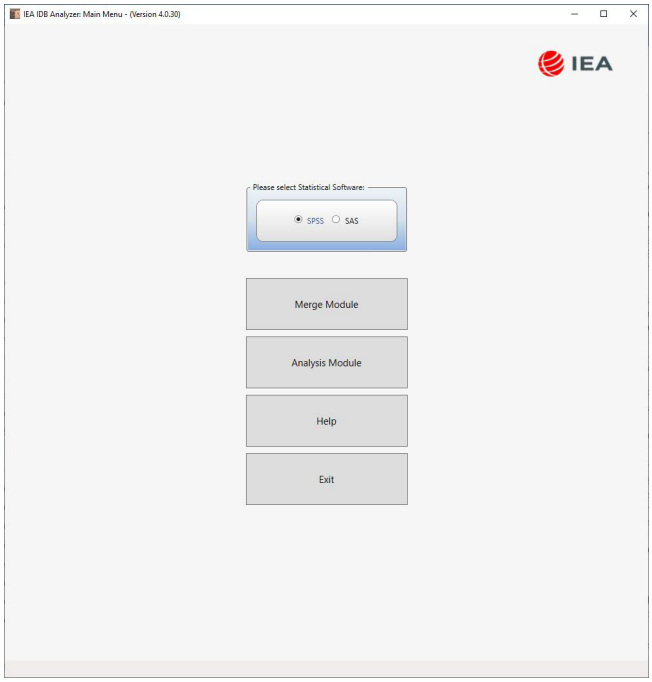
The IEA IDB Analyzer consists of two modules, the merge module and the analysis module, which are integrated and executed in one common application. The merge module is used to create analysis datasets by combining data files of different types and from different countries, and selecting subsets of variables for analysis. The analysis module provides procedures for computing various statistics and their standard errors. The latest version of the IEA IDB Analyzer (version 4) is available for download from the IEA website (https://www.iea.nl/data-tools/tools). Once installed, the IEA IDB Analyzer can be accessed by using the START menu in Windows:

Start ⇨ All Programs ⇨ IEA ⇨ IDB AnalyzerV4 ⇨ IEA IDB Analyzer

When the IEA IDB Analyzer application is launched, the main window appears (Figure 4.1). Users first need to select either SPSS or SAS as their statistical software of choice. For all the examples in this chapter, we use SPSS software and hence the SPSS data files from the ICILS 2018 international database.

The main window will direct users to the **Merge Module**, the **Analysis Module**, the **Help** manual, or to simply Exit the application. The IEA IDB Analyzer has an extensive manual, accessible through the **Help** button, which users are encouraged to consult for full details on all the functionalities and features of the IEA IDB Analyzer.

Figure 4.1: IEA IDB Analyzer main window



4.2 Merging files with the IEA IDB Analyzer

The ICILS 2018 data files are disseminated separately for each country and by file type. In addition to allowing users to combine data from the same file type from more than one country for cross-country analyses, the merge module allows for the combination of data from different levels, e.g. merging student and school data into single SPSS dataset. This enables users to analyze the student data in combination with certain characteristics of the school that students attend using the IEA IDB Analyzer Analysis Module.

The ICILS 2018 design allows several possible combinations of data file types to be merged at different levels (see Table 4.1; gray-shaded cells on the diagonal represent merges for the same file type).

- The school questionnaire file can be merged with every other file type.
- Teacher files can be merged only with themselves (i.e., teacher files from different countries) and with school files. Merging teacher files with student files is not possible. This is due to the study's sample design; the ICILS 2018 teacher sample was drawn by taking all teachers from the students' target grade into account (see chapter 6 of the ICILS 2018 technical report; Fraillon et al. 2020b). Because these teachers are usually not just the teachers who teach the sampled students, it is not possible to link the teacher data to student data at the level of individuals. Instead, linking can only be done at the level of the school.
- Student files can be merged only with themselves (i.e., student files from different countries) and with school files, but not with teacher files for the same reasons.

Merging files from different levels has implications for analysis of the data: when data files from different levels are merged, the weights (see section 2.4.8 and chapter 3 for an overview of the study weights) retained in the merged file will depend on the particular levels that were merged. This situation also has implications for interpretation of the results. As an example, when school and teacher files are merged, the teacher becomes the reference (unit of analysis), and the computed statistics are interpreted as applying to "teachers who teach in schools with characteristic X" (see Table 4.1).

Table 4.1: Possible merging of data between different file types in ICILS 2018

File type	Weight in merged file	Interpretation
Student files of different countries	TOTWGTS	Student characteristics
Teacher files of different countries	TOTWGTT	Teacher characteristics
School files of different countries	TOTWGTC	School characteristics
Student file and school file of a country	TOTWGTS	Student characteristics; school characteristics as properties of students
Teacher file and school file of a country	TOTWGTT	Teacher characteristics; school characteristics as properties of teachers

Please note that merging data from different levels may result in larger amounts of missing data if more than one variable is involved in the analysis. For example, suppose teacher files and school files are merged. If the analysis variables from both teachers and school principals (or school ICT-coordinators) are used, the number of missing responses are likely to increase because the missing data from teachers and from school principals have been combined.

4.2.1 Merging data from different countries

Merging the files from different countries on a single level is simple. The same steps apply for merging student, school questionnaire, or teacher questionnaire. The following example will create an SPSS or SAS[15] data file with student questionnaire data from all ICILS 2018 countries (Figure 4.2 shows the screen view after the correct steps are entered):

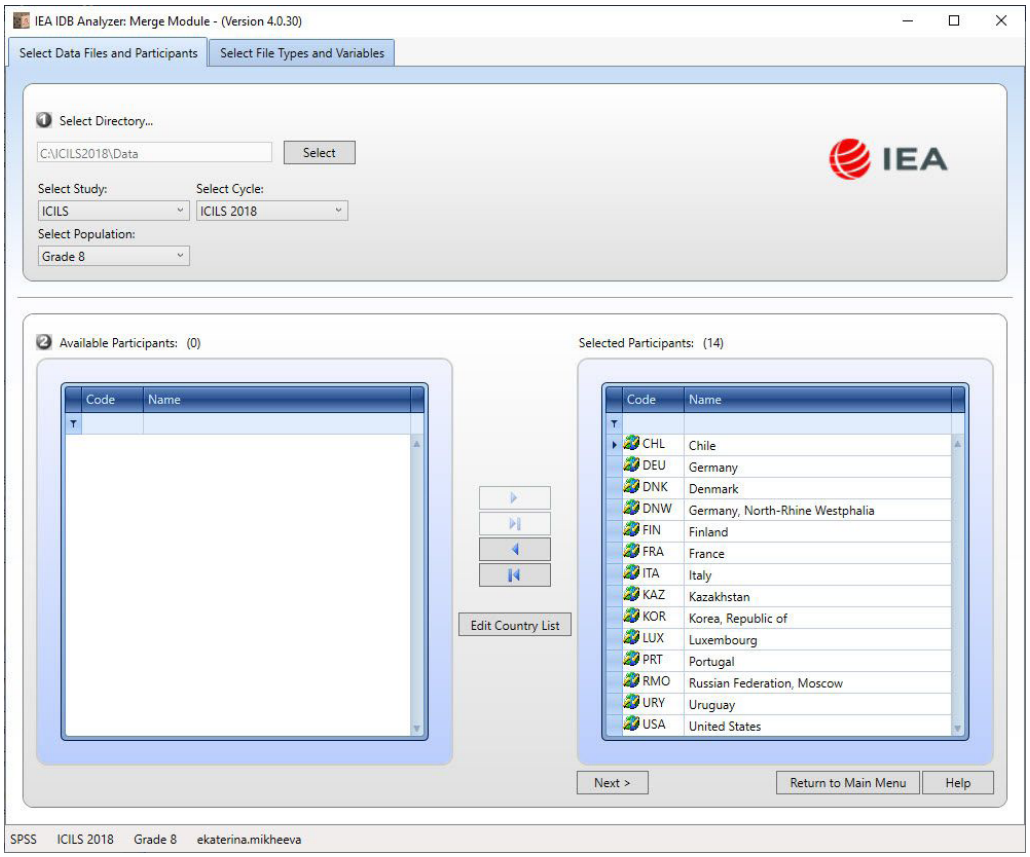
(1) Start the IEA IDB Analyzer from the START menu and click the **Merge Module** button.

(2) In the ***Select Data Files and Participants*** tab and in the ***Select Directory*** field, click **Select** and browse to the folder where all data files are located. For example, all SPSS data files are located in the folder titled "C:\ICILS2018\Data". The program will automatically recognize and complete the ***Select Study***, ***Select Year***, and ***Select Population*** fields and list all countries available in this folder as possible candidates for merging. If the folder contains data from more than one IEA study, study cycle, or from more than one population, the IEA IDB Analyzer will prompt users to select files from the desired combination of study, cycle, and population for analyses. Here, ICILS 2018 grade 8 is selected.

(3) Click a country of interest from the ***Available Participants*** list and click the **right arrow** button (▶) to move it to the ***Selected Participants*** panel. Individual countries can be moved directly to the Selected Participants panel by double-clicking on them. To select multiple countries, hold the **CTRL** key of the keyboard when clicking countries. Click the **tab-right arrow** button (▶I) to move all countries to the ***Selected Participants*** panel. In this example, all available ICILS 2018 countries were selected.

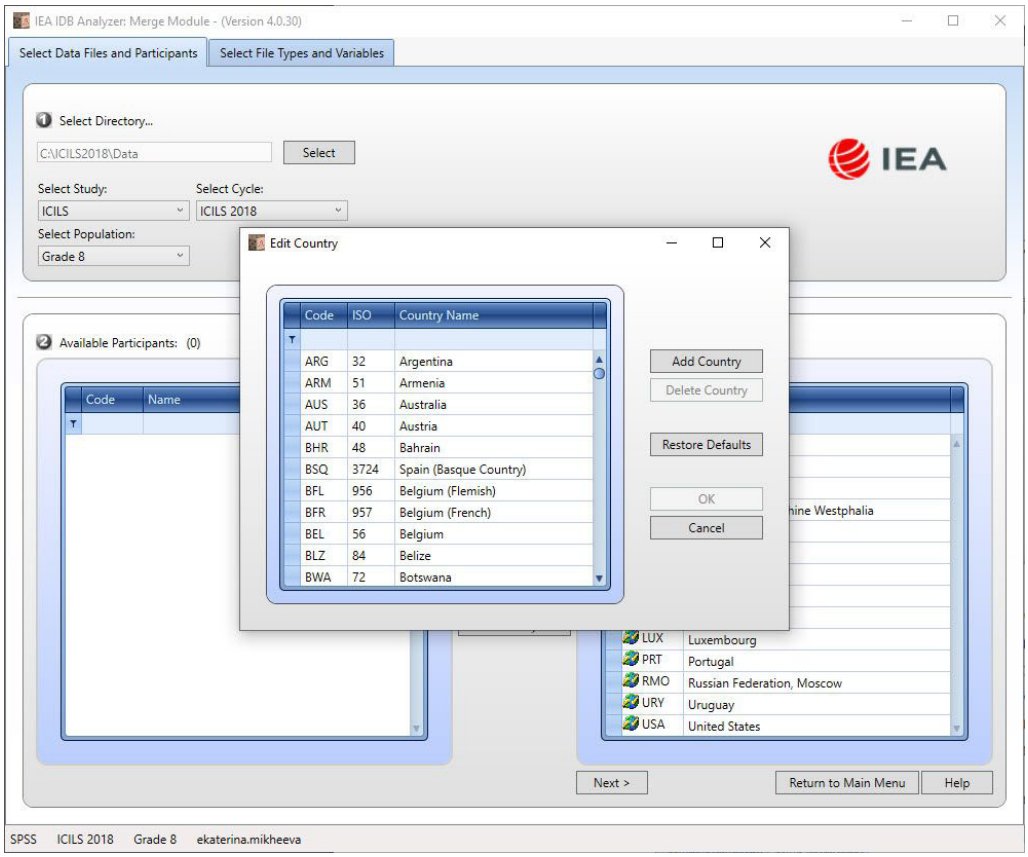
15 Depending on the software selected in the main menu of the IEA IDB Analyzer.

Figure 4.2: IEA IDB Analyzer Merge Module: selecting countries



(4) To change how the country names appear in the outputs from the IDB Analyzer when analyzing data, users can select the ***Edit Country List*** button. Three columns are displayed: ***Code*** (numeric codes of the countries), ***ISO*** (the three-letter character codes for the countries), and ***Country Name***. The values in the first two columns cannot be changed. Scroll down to the country that needs to be edited, click in the cell in the ***Country Name*** column and change the entry. Click **OK** to confirm the change (see Figure 4.3). To restore the default values, click the **Restore Defaults** button. Click **OK** to close the ***Edit County List*** window.

Figure 4.3: IEA IDB Analyzer Merge Module: editing country list



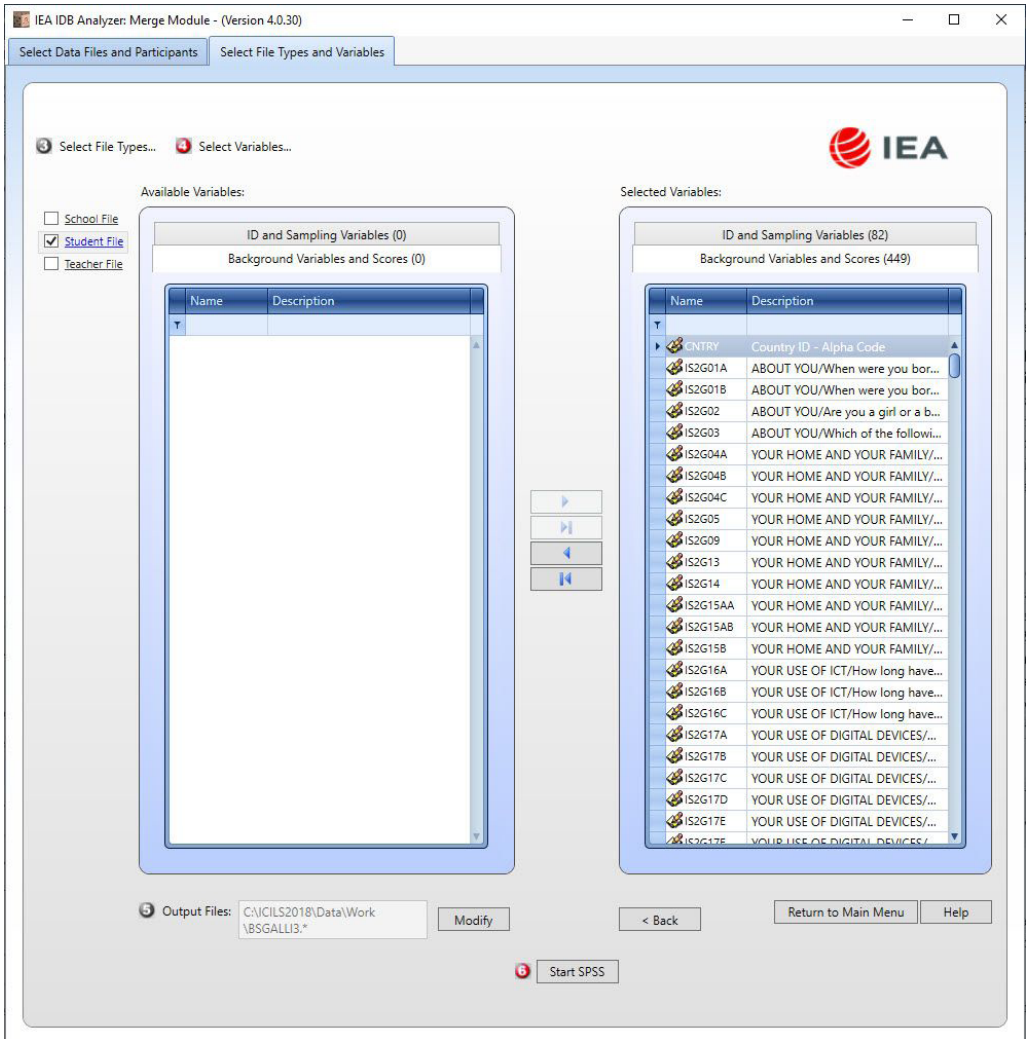
(5) Click the **Next** > button to proceed to the next step. The software will open the ***Select File Types and Variables*** tab of the merge module (Figure 4.4) to select the file types and the variables to be included in the merged data file.

(6) Select the file types for merging by checking the appropriate boxes to the left of the window. In the example, only the international student questionnaire file is selected (see Figure 4.4).

(7) Select the variables of interest from the ***Available Variables*** list in the left panel. Variables are selected by clicking on them and then clicking the **right arrow** (▶) button. Clicking the **tab-right arrow** (▶I) button selects all variables. Note that there are two tabs: ***Background Variables and Scores*** and ***ID and Sampling Variables***. All CIL and CT scores and all identification and sampling variables are selected automatically by the IEA IDB Analyzer. Appendix A of this user guide provides the variable names for all questions in the questionnaires. In the example, all student variables are selected for merging.

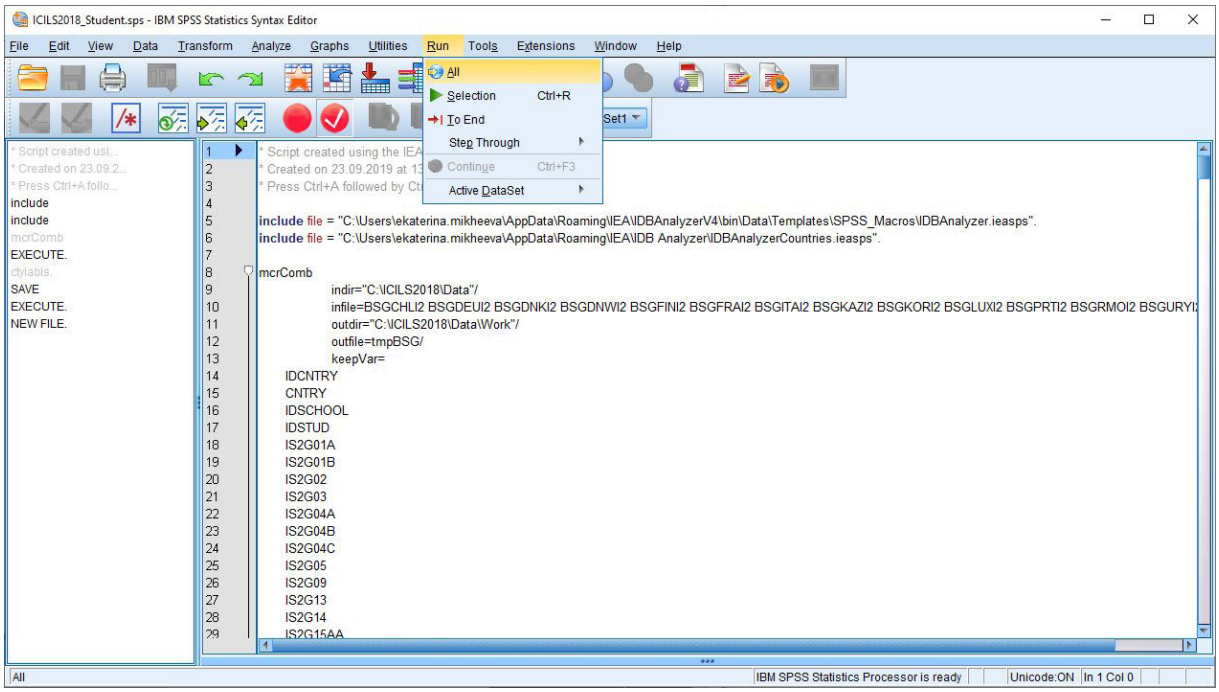
(8) Specify the desired name for the merged data file and the folder where it will be stored in the ***Output Files*** field by clicking the **Define/Modify** button. The IEA IDB Analyzer also will create a SPSS or SAS syntax file (*.SPS or *.SAS) of the same name and in the same folder as the SPSS or SAS code used to perform the merge. In the example (Figure 4.4), the SPSS data file BSGALLI2.SAV and the syntax file BSGALLI2.SPS are stored in the "C:\ICILS2018\Data\Work" folder. When using SAS, the resulting files would be BSGALLI2.sas7bdat (data) and BSGALLI2.sas (syntax). The merged data file will contain student questionnaire data with the variables shown in the ***Selected Variables*** panel.

Figure 4.4: IEA IDB Analyzer Merge Module: selecting file types and variables



(9) Click the **Start SPSS** button to create the SPSS syntax file with the specified name. The IEA IDB Analyzer stores the SPSS syntax file in the specified folder and opens it in a SPSS Syntax Editor window (Figure 4.5) ready for execution. The syntax file can be executed by opening the **Run** menu of SPSS and selecting the **All** menu option. In SAS, hitting the **Submit** option from the Run menu will execute the syntax. The IEA IDB Analyzer will display a warning if it is about to overwrite an existing file in the specified folder.

Figure 4.5: SPSS Syntax Editor with merge syntax produced by the IEA IDB Analyzer Merge Module



Once SPSS or SAS has completed its execution, it is important to check the SPSS output window or SAS log for possible warnings. If warnings appear, they should be examined carefully because they might indicate that the merge process was not performed properly and that the resulting merged data file might not be as expected.

4.2.2 Merging school and student data files

The ICILS 2018 school samples were designed to optimize the student samples and the student-level estimates. Therefore, it is preferable to analyze school variables as attributes of students, rather than as elements in their own right. However, the school samples are representative probability samples of schools within each participating country and so it is possible to compute weighted numbers of schools with particular characteristics for providing reasonable estimates of percentages and means across the populations of schools in each country.

When merging school and student questionnaire data files, the school data will be disaggregated to student level, so that the school data become an attribute of the students in that school.

To merge the school and student questionnaire data files, select both the **school file** and **student file** types. The variables of interest to be included in the merged data file need to be selected separately by file type using the same set of instructions as described in section 4.2.1. The ID and sampling variables will be selected automatically. Please note that when merging student and school data, only the total student weight (TOTWGTS) variable will be included in the merged file, but not the total school weight (TOTWGTC). An analysis using school variables on student level together with student-level variables will use the total student weight and will not allow the researcher to make inferences for the school themselves. The interpretation of the results will be about students who study in schools with certain characteristics. For example, if merged student and school data uses the principals' gender as the grouping variable, the total student weight would be selected as weighting variable. The results then would be interpreted as percentages of students who study in schools where the school principal is male or female: e.g., In Chile, 47% of grade 8 students study in schools with male principals, and 52% study in schools with female principals (the reason the numbers do not add up to exactly 100% is because of rounding).

4.2.3 Merging school and teacher data files

Merging the school and teacher data files follows the same procedure as merging the school and student data files. School data will be disaggregated to the teacher level by adding the respective school level variables to each teacher record. To merge teacher questionnaire and school questionnaire data files, perform steps 1 to 4 as described in section 4.2.1. Then, simply select both file types in the second window of the IEA IDB Analyzer Merge Module. The variables of interest need to be selected separately for both file types, as follows:

(1) **Check the checkbox** next to the **teacher file** type so that it appears checked. The ID and sampling variables are selected automatically and already listed in the right panel.

(2) elect the variables of interest from the left panel and click the **right arrow** (▶) button to move these variables to the ***Selected Variables*** panel on the right. Click the **tab-right arrow** (▶I) button to select all available variables.

(3) Next, **check the checkbox** next to the **school file** type. Based on the country selection, the IEA IDB Analyzer might display a warning that certain countries do not have data for the selected regional questionnaire. Close the warning message and select the variables of interest from the ***Background Variables and Scores*** panel in the same manner as described in step 1 and 2.

(4) **Define/Modify** the desired name of the merged data file and the folder where it will be stored in the ***Output Files*** field. The IEA IDB Analyzer will create an SPSS syntax file (*.SPS) of the same name and in the same folder with the code necessary to perform the merge.

(5) Click on the **Start SPSS** button to create the SPSS syntax file that will produce the required merged data file, which can then be run by opening the **Run** menu of SPSS and selecting the **All** option.

4.2.4 Merged data files for the example analyses

To carry out the sample analyses described in this chapter, users should expect to find the following merged data files, including all available context and background variables and scores:

(1) BSGALLI2.SAV Merged student (BSG) data files for all countries;

(2) BTGALLI2.SAV Merged teacher (BTG) data files for all countries; and

(3) BSG_BCGALLI2.SAV Merged school (BCG) and student (BSG) data files for all countries.

4.3 Performing analyses with the IEA IDB Analyzer

The IEA IDB Analyzer can perform statistical analyses on any files created using the Merge Module or on any original IEA study data file. There are several statistical procedures available in the Analysis Module of the IEA IDB Analyzer (Table 4.2).

Table 4.2: Statistical procedures available in the Analysis Module of the IEA IDB Analyzer

Statistic type	Description
Percentages and Means	Computes percentages, means, and standard deviations for selected analysis variables by subgroups defined by grouping variable(s). Plausible values can be included as analysis variables.
Percentages only	Computes percentages by subgroups defined by grouping variable(s).
Linear regression	Computes linear regression coefficients for selected independent variables to predict a dependent variable by subgroups defined by grouping variable(s). Plausible values can be included as dependent or independent variables.
Logistic regression*	Computes logistic regression coefficients for selected independent variables to predict a dependent variable by subgroups defined by grouping variable(s). Plausible values can be included as dependent or independent variables. When used as a dependent variable, plausible values will be dichotomized using a specified cut-point, such as one of the ICILS 2018 international benchmarks.
Benchmarks	Computes percentages of students meeting a set of user-specified Achievement proficiency levels by subgroups defined by grouping variable(s).
Correlations	Computes means, standard deviations, and correlation coefficients for selected variables by subgroups defined by grouping variable(s). Plausible values can be included as analysis variables.
Percentiles	Computes the score points that separate a given proportion of the distribution of scores, by subgroups defined by the grouping variable(s). Plausible values can be included as analysis variables.
Group Differences by Performance*	Computes differences in an analysis variable, between groups, conditional on the Achievement or performance levels.

Note: * The statistics types *Logistic Regression* and *Group Differences by Performance* will not be covered in this chapter. Refer to the IEA IDB Analyzer Help manual for information about these types of analysis.

The IEA IDB Analyzer has a Help Manual that provides extensive descriptions of all features. All statistical procedures offered in the analysis module of the IEA IDB Analyzer make appropriate use of sampling weights and standard errors are computed using the jackknife repeated replication (JRR) method. Percentages, means, linear regressions, correlations, and percentiles may be specified with or without achievement scores. When CIL or CT scores are selected the analyses are performed five times (once for each plausible value) and the results are aggregated to produce accurate estimates of CIL or CT with standard errors that incorporate both sampling and imputation errors. To conduct analyses using achievement scores, select the **Use PVs** option from the **Plausible Value Option** drop-down menu. The diverse variables required to perform an analysis need to be selected from specific variable fields according to their purpose (see Table 4.3).

Table 4.3: Fields for variable selection in the Analysis Module of the IEA IDB Analyzer

Field	Description
Grouping Variables	This is a list of variables to define subgroups of interest. The list must consist of at least one grouping variable. By default, the IEA IDB Analyzer includes the variable IDCNTRY used to distinguish the participating countries. Additional variables may be selected from the available list. If the **Exclude Missing from Analysis** option is checked, only cases that have non-missing values in the grouping variables will be used in the analysis. If it is not checked, missing values become reporting categories.
Analysis Variables	This is a list of variables for which means, percentages, correlations, or percentiles are to be computed. Usually, more than one analysis variable can be selected. To compute statistics based on achievement scores, it is necessary to select the **Use PVs** option in the **Plausible Value** option drop-down menu, and select the **Achievement Scores** of interest in the **Plausible Values** field.
Plausible Values	This section is used to identify the set of plausible values to be used when **Achievement Scores** are the analysis variable for computing statistics. Select the **Use PVs** option in the **Plausible Value** option drop-down menu before specifying the **Achievement Scores** in the **Plausible Values** field.
Independent Variables	This is a list of variables to be treated as independent variables for a linear or logistic regression analysis. More than one independent variable can be selected. Categorical variables and continuous variables can be specified as independent variables. When specifying categorical variables as independent variables, they can be treated either by "effect coding" or "dummy coding" using the **Contrast** drop-down menu. **Achievement Scores** also can be included as an independent variable. To specify **Achievement Scores** as an independent variable, it is necessary to select the **Use PVs** option in the **Plausible Value** option drop-down menu and select the CIL / CT achievement scores of interest in the **Plausible Values** field.
Dependent Variable	This is the variable to be used as the dependent variable when a linear or logistic regression analysis is specified. Only one dependent variable can be listed and can be either a context or background variable or CIL/CT achievement scores. To use **Achievement Scores** as the dependent variable, select the **Use PVs** option in the **Plausible Value** option drop-down menu, click on the Plausible Values radio button in the **Dependent Variable** section, and select the **Achievement Scores** of interest in the **Plausible Values** field.
Achievement Benchmarks	These are the values that will be used as cut points on the **Achievement Scale**, selected in the **Plausible Values** section, for computing the percentages of students meeting the specified benchmarks. Multiple cut points can be specified, each separated by a blank space. A drop-down menu is available to select the ICILS 2018 international benchmarks.
Percentiles	These are the percentiles that will be calculated from the distribution of a continuous analysis variable selected in the **Analysis Variables** section. **Achievement Scores** can also be selected as an analysis variable. Select the **Use PVs** option in the **Plausible Value** option drop-down menu and select the **Achievement Scores** of interest in the **Plausible Values** field. Multiple percentiles can be specified, each separated by a blank space.
Weight Variable	This is the sampling weight variable that will be used in the analysis. The IEA IDB Analyzer automatically selects the appropriate weight variable for analysis based on the file types included in the merged data file. Generally, this will be TOTWGTS for analysis on student level. When analyzing teacher data TOTWGTT will be used. Chapter 3 of this user guide provides more information on the ICILS 2018 sampling weights.

4.4 Performing analyses with student-level variables

Many analyses of the ICILS 2018 data can be undertaken using student-level data only. This section presents examples of analyses used to produce tables for the ICILS 2018 international report (Fraillon et al. 2020a); these include examples of computing percentages only, and percentages and means, undertaking linear regression analyses, and computing percentages of students reaching proficiency levels. We also describe how to conduct correlation analyses.

4.4.1 Student-level analysis without achievement scores

As an example of how to undertake a student-level analysis without achievement scores, we here replicate the analysis of the students' reported age at the time of testing that was presented in the ICILS 2018 international report (Table 4.4; see Fraillon et al. 2020a, table 3.4, p. 75). This example focuses on the average age at the time of testing (with appropriate standard errors) and, therefore, we compute means without achievement scores.

Table 4.4 : Example of student-level analysis without CIL achievement scores originally published in the ICILS 2018 international report

Country	Average age of students in years	CIL achievement distribution	Average CIL score score (and country rank)	ICT development index (IDI)
		100 200 300 400 500 600 700		
Denmark† [1]	14.9		553 (2.0) ▲	8.71 (4)
Korea, Republic of	14.2		542 (3.1) ▲	8.85 (2)
Finland	14.8		531 (3.0) ▲	7.88 (22)
Germany	14.5		518 (2.9) ▲	8.39 (12)
Portugal†† [1]	14.1		516 (2.6) ▲	7.13 (44)
France	13.8		499 (2.3)	8.24 (15)
Luxembourg	14.5		482 (0.8) ▼	8.47 (9)
Chile	14.1		476 (3.7) ▼	6.57 (56)
Uruguay	14.3		450 (4.3) ▼	7.16 (42)
Kazakhstan[1]	14.3		395 (5.4) ▼	6.79 (52)
ICILS 2018 average	14.4	Below L1 L1 L2 L3 L4	496 (1.0)	
Testing at the beginning of the school year				
Italy	13.3		461 (2.8) ▼	7.04 (47)
Not meeting sample participation requirements				
United States	14.2		519 (1.9)	8.18 (16)
Benchmarking participants meeting sample participation requirements				
Moscow (Russian Federation)[2]	14.8		549 (2.2) ▲	7.07 (45)[2]
North Rhine-Westphalia (Germany)[3]	14.4		515 (2.6) ▲	8.39 (12)[3]

Notes: ICT development index (IDI) score and country rank data relate to 2017 (source: ITU 2019).
Standard errors appear in parentheses. Dotted vertical lines indicate the cut-points between proficiency levels.
† Met guidelines for sampling participation rates only after replacement schools were included.
†† Nearly met guidelines for sampling participation rates after replacement schools were included.
[1] National defined population covers 90% to 95% of the national target population.
[2] Data relate to all of Russian Federation.
[3] Data relate to all of Germany.

Percentiles of performance
5th 25th 75th 95th
Mean and confidence interval (±2SE)

▲ Achievement significantly higher than ICILS 2018 average
▼ Achievement significantly lower than ICILS 2018 average

Source: Fraillon et al. (2020a, table 3.4, p. 75).

Replicating the results in this table involves several steps. The student questionnaire data codebook reveals that the student questionnaire data derived variable S_AGE is the numeric variable reporting the age of students at the time of testing.

After creating the merged data file for the analysis, the Analysis Module of the IEA IDB Analyzer enables the user to perform the analysis using the following steps (see Figure 4.6):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Select the merged data file BSGALLI2.SAV as the **Analysis File** by clicking the **Select** button.

(3) Select **ICILS (Using Student Weights)** as the **Analysis Type**.

(4) Select **Percentages and Means** as the **Statistic Type**.

(5) Select **None Used** as the **Plausible Value Option**.

(6) Set **1** as the **Number of Decimals** (as in the report).

(7) The variable IDCNTRY is selected automatically as **Grouping Variables**. No additional grouping variables are needed for this analysis. Leave the default option **Exclude Missing From Analysis** selected.

(8) Click the **Analysis Variables** field to activate it. Select S_AGE from the list of available variables and move it to the **Analysis Variables** field by clicking the **right arrow** (▶) button in this section.

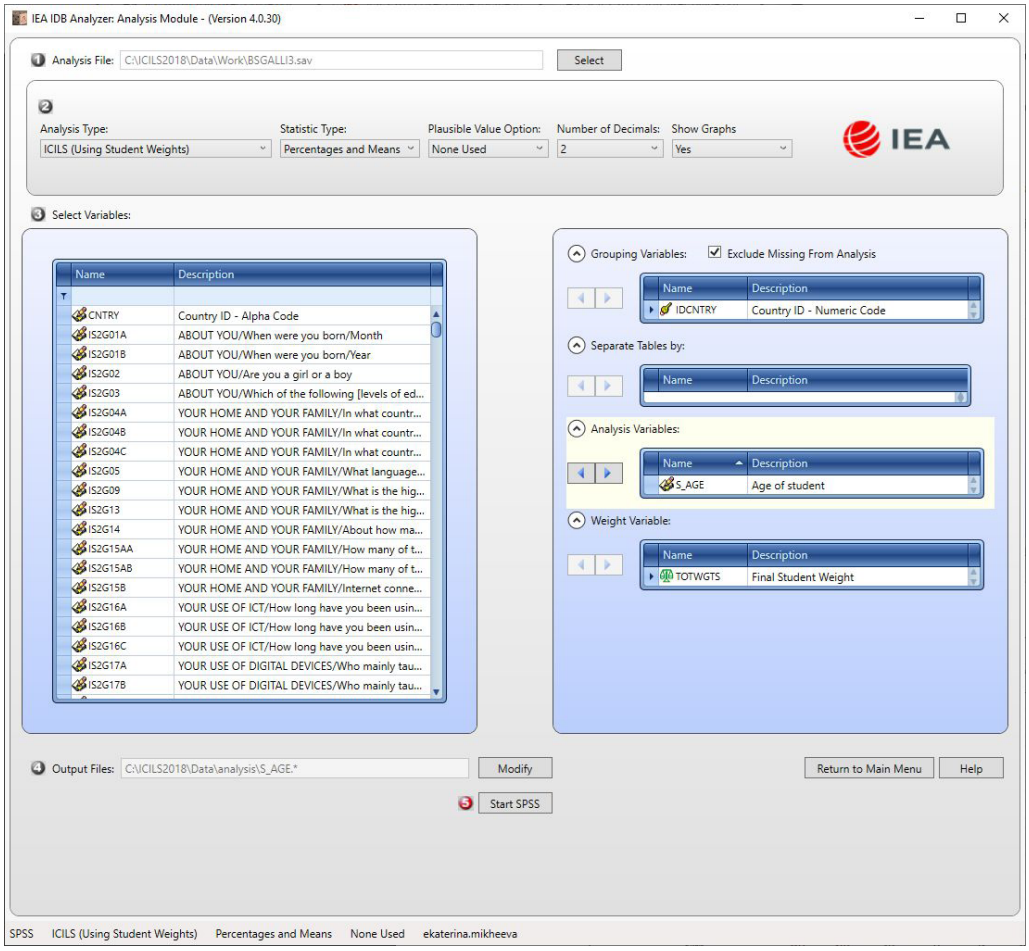
(9) The **Weight Variable** is automatically defined by the software. As this example analysis uses student questionnaire data, TOTWGTS is selected by default. The 75 replicate weights will also be involved in the analysis for computing the correct estimates of the standard errors, although the IEA IDB Analyzer interface does not indicate or list them individually.

(10) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button. The IEA IDB Analyzer will use this name and folder to create six output files. (i) An SPSS syntax file that contains the code for performing the analysis, and, after running the syntax file, (ii) an SPSS data file with the results, (iii) an SPSS output file, and (iv) an Excel file with these same results. Another two files contain significant test results: (v) an SPSS data file, and (vi) an Excel file.

(11) Press the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** option. If necessary, the IEA IDB Analyzer will prompt the user to confirm overwriting already existing files.

Note that IEA IDB Analyzer also displays an average statistics for all countries included in the analysis at the end of the results tables ("Table Average").

Figure 4.6: IEA IDB Analyzer setup for example student-level analysis without plausible values



In this example, each country's average for the S_AGE variable is reported for all sampled students. The IDB Analyzer outputs the number of valid cases, sum of weights of the sampled students, and their percentage, mean, and standard deviation, as well as the respective jackknife standard errors (Figure 4.7). In this case, Chile has valid data for 3092 students and these sampled students represent a population of 225,453 students. Chilean students were, on average, 14.4 years old at the time they took the ICILS 2018 assessment, with a standard error of less than 0.01. Less than 0.01% of Chilean students did not report their age at the time of testing.

Figure 4.7: IEA IDB Analyzer output for example student-level analysis without achievement scores

Average for S_AGE by (IDCNTRY)

Country ID - Numeric Code	N of cases	Sum of TOTWGTS (s.e.)	Sum of TOTWGTS	Percent	Percent (s.e.)	S_AGE (mean)	S_AGE (s.e.)	Std.Dev	Std.Dev. (s.e.)	Percent Missing
Chile	3092	225452.9	4588.6	3.1	.1	14.1	.0	.7	.0	.0
Denmark	2402	65634.2	1788.4	.9	.0	14.9	.0	.4	.0	.1
Finland	2546	58252.0	1408.7	.8	.0	14.8	.0	.4	.0	.0
France	2940	801969.1	12327.4	10.9	.2	13.8	.0	.4	.0	.0
Germany	3655	730824.7	11322.1	10.0	.2	14.5	.0	.6	.0	.0
Italy	2810	541124.2	8390.4	7.4	.1	13.3	.0	.4	.0	.0
Kazakhstan	3371	224452.4	5415.1	3.1	.1	14.3	.0	.5	.0	.0
Korea, Republic of	2875	439683.1	9039.0	6.0	.1	14.2	.0	.3	.0	.0
Luxembourg	5297	6093.6	7.3	.1	.0	14.5	.0	.7	.0	2.0
Portugal	3219	99076.0	2147.3	1.4	.0	14.1	.0	.8	.0	.0
United States	6767	3841158.4	47478.3	52.4	.4	14.2	.0	.4	.0	.4
Uruguay	2604	46213.7	958.1	.6	.0	14.3	.0	.8	.0	.2
Russian Federation (Moscow)	2852	90583.6	2594.1	1.2	.0	14.8	.0	.4	.0	.0
Table Average	.	.	.	7.1	.0	14.3	.0	.5	.0	.
Germany, North Rhine-Westphalia	1991	164197.2	3002.3	2.2	.0	14.4	.0	.6	.0	.0

Notes: N = number, s.e. = standard error, Std. Dev. = standard deviation.

4.4.2 Student-level analysis with achievement scores

In our second example, we replicate another set of results presented in the ICILS 2018 international report (Table 4.5; see Fraillon et al 2020a, table 3.7, p. 80). In this case, the example investigates the relationship between students' gender and CIL, the latter being represented by a set of five plausible values. Since the results are based on plausible values, these must be included when a user creates the file using the merge module, to indicate that the analysis will make use of CIL achievement scores when the user specifies the analysis type.

Table 4.5: Example of student-level analysis with CIL achievement scores originally published in the ICILS 2018 international report

Country	Mean scale score females	Mean scale score males	Difference (females – males)	Gender difference
Chile	480 (4.1)	472 (4.7)	8 (4.8)	
Denmark† [1]	561 (2.2)	545 (2.8)	**16** (3.0)	
Finland	545 (3.2)	516 (3.6)	**29** (3.6)	
France	511 (2.9)	487 (2.8)	**24** (3.3)	
Germany	526 (3.1)	511 (3.6)	**16** (3.3)	
Kazakhstan[1]	399 (5.6)	391 (5.9)	**8** (4.1)	
Korea, Republic of	563 (3.4)	524 (3.9)	**39** (4.3)	
Luxembourg	494 (1.5)	471 (1.3)	**23** (2.3)	
Portugal†† [1]	522 (2.6)	511 (3.2)	**11** (3.0)	
Uruguay	453 (4.9)	448 (4.9)	5 (4.5)	
ICILS 2018 average	505 (1.1)	488 (1.2)	**18** (1.2)	
Testing at the beginning of the school year				
Italy	469 (3.6)	454 (3.1)	**16** (3.7)	
Not meeting sample participation requirements				
United States	531 (2.0)	508 (2.3)	**23** (2.1)	
Benchmarking participants meeting sample participation requirements				
Moscow (Russian Federation)	552 (2.5)	546 (2.7)	**6** (2.7)	
North Rhine-Westphalia (Germany)	517 (3.3)	513 (3.2)	4 (3.8)	

Notes: Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent. Statistically significant differences ($p < 0.05$) between subgroups are shown in **bold**.
† Met guidelines for sampling participation rates only after replacement schools were included.
†† Nearly met guidelines for sampling participation rates after replacement schools were included.
[1] National defined population covers 90% to 95% of the national target population.

Source: Fraillon et al (2020a, table 3.7, p. 80).

The codebooks reveal that the variable S_SEX in the student questionnaire data files contains categorical information on the gender of the student.

The **Percentages and Means** analysis type with the **Use PVs** option activated computes percentages and mean CIL scores based on plausible values and their respective standard errors. The IEA IDB Analyzer enables the user to replicate the analysis of gender differences in CIL scores. After opening the analysis module and selecting the BSGALLI2.SAV data file, the steps in the IEA IDB Analyzer are as follows (Figure 4.8 shows how the analysis module looks when the settings for this example analysis are entered correctly):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Select the merged data file BSGALLI2.SAV as the **Analysis File** by clicking the **Select button**.

(3) Select **ICILS (Using Student Weights)** as the **Analysis Type**.

(4) Select **Percentages and Means** as the **Statistic Type**. By default, the program will exclude records with missing grouping variables from the analysis.

(5) Select **Use PVs** as the **Plausible Value Option**.

(6) Add the variable S_SEX as a second **Grouping Variable**. The variable IDCNTRY is always selected automatically as a grouping variable.

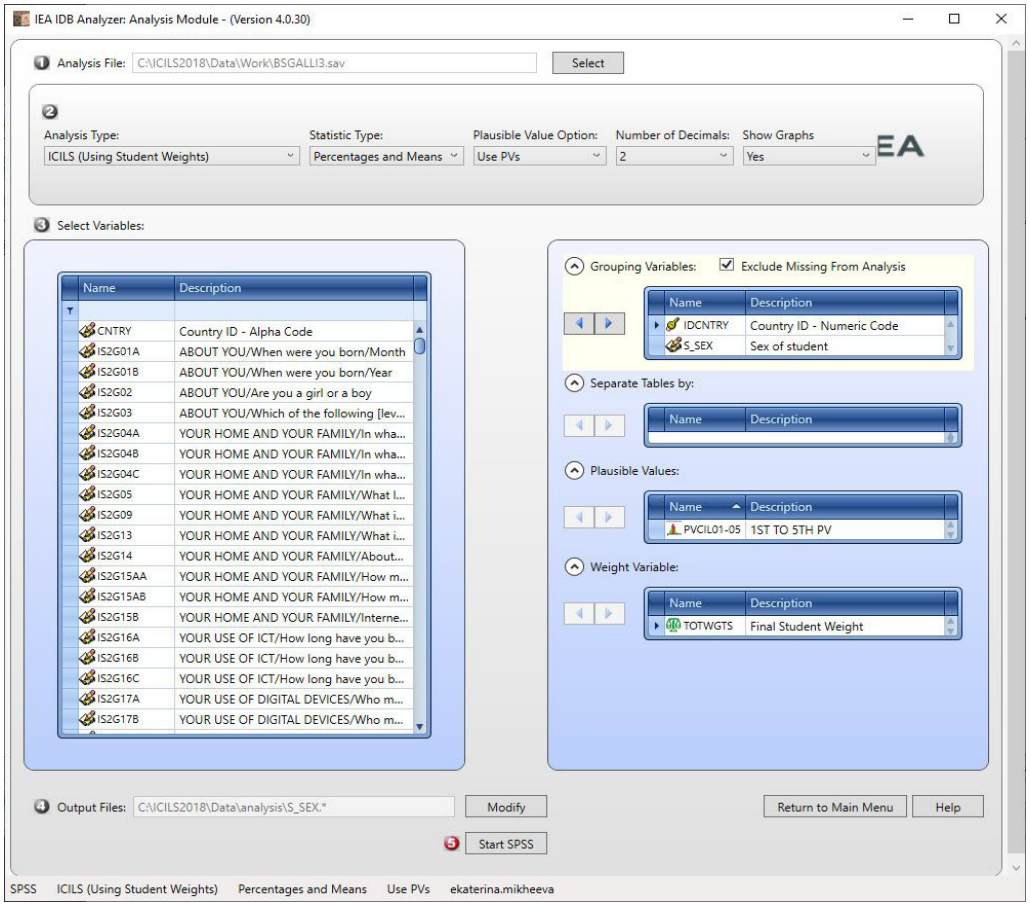
(7) Specify the achievement scale to be used (in this example CIL) for the analysis by clicking the **Plausible Values** field to activate it. Select PVCIL01-05 from the list of available variables and move it to the **Plausible Values** field by clicking the **right arrow** (▶) button in this section.

(8) The **Weight Variable** is automatically selected by the software. As this example analysis uses student questionnaire data, TOTWGTS is included in the analysis by default.

(9) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button.

(10) Click the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** menu option. If necessary, the IEA IDB Analyzer will prompt the user to confirm or cancel overwriting already existing files.

Figure 4.8: IEA IDB Analyzer setup for example student-level analysis with achievement scores



The IEA IDB Analyzer outputs each country's results split by gender, i.e. the values of the S_SEX variable (Figure 4.9). The countries are identified in the first column and the second column describes the category of S_SEX being reported. The third column reports the number of valid cases and the fourth and fifth the sum of weights of the sampled students and the standard error of that sum. Two columns report the percentage of students in each category and the associated standard error, followed by the estimated mean CIL score and associated standard error. The standard deviation of the CIL achievement scores and standard error are reported in the last two columns.

For example. In Denmark, 49.46% of the target population students are girls and 50.54% are boys; the mean CIL achievement score is 560.84 (standard error of 2.24) for girls and 544.62 (standard error of 2.81) for boys (Figure 4.9).

Figure 4.9: IEA IDB Analyzer output for example student-level analysis with CIL achievement scores

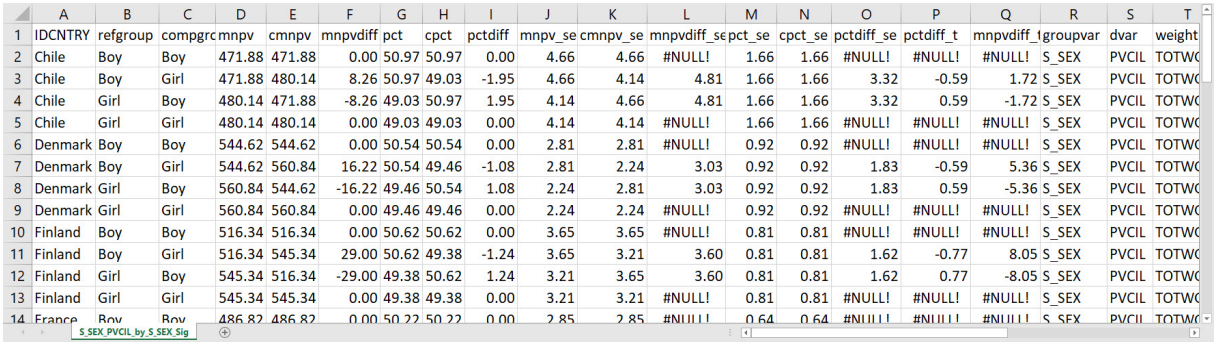
Average for S_SEX by (IDCNTRY)

Country ID - Numeric Code	Sex of student	N of cases	Sum of TOTWGTS	Sum of TOTWGTS (s.e.)	Percent	Percent (s.e.)	PVCIL (mean)	PVCIL (s.e.)	Std.Dev.	Std.Dev. (s.e.)
Chile	Boy	1519	114920	4574.06	50.97	1.66	471.88	4.66	84.71	3.57
	Girl	1573	110533	4213.98	49.03	1.66	480.14	4.14	81.54	2.51
Denmark	Boy	1217	33210	1082.43	50.54	.92	544.62	2.81	70.40	1.67
	Girl	1187	32498	1081.07	49.46	.92	560.84	2.24	59.97	1.83
Finland	Boy	1296	29488	902.59	50.62	.81	516.34	3.65	85.36	3.14
	Girl	1250	28764	789.73	49.38	.81	545.34	3.21	72.78	2.31
France	Boy	1475	402771	8509.20	50.22	.64	486.82	2.85	83.07	2.58
	Girl	1465	399198	7460.57	49.78	.64	510.71	2.86	75.84	2.43
Germany	Boy	1862	376388	8361.73	51.50	.92	510.57	3.64	84.07	3.67
	Girl	1793	354436	9134.09	48.50	.92	526.44	3.13	74.67	2.50
Italy	Boy	1471	283507	5570.47	52.39	.64	453.51	3.11	82.47	2.32
	Girl	1339	257618	5278.92	47.61	.64	469.29	3.58	80.05	2.21
Kazakhstan	Boy	1738	116016	2995.69	51.69	.68	391.17	5.85	107.42	3.38
	Girl	1633	108437	3203.77	48.31	.68	399.43	5.61	104.29	3.99
Korea, Republic of	Boy	1497	233084	6159.47	53.01	.89	523.89	3.92	96.60	2.39
	Girl	1378	206599	5786.55	46.99	.89	562.61	3.44	88.41	2.24
Luxembourg	Boy	2850	3276	40.40	52.71	.65	470.88	1.29	86.39	1.09
	Girl	2551	2939	40.65	47.29	.65	493.90	1.49	78.87	.99
Portugal	Boy	1654	50935	1522.78	51.40	1.04	510.94	3.25	73.78	2.78
	Girl	1567	48152	1454.69	48.60	1.04	522.32	2.61	67.68	1.62
United States	Boy	3437	1950048	26877.02	50.64	.41	507.97	2.33	83.15	1.44
	Girl	3346	1900960	30070.08	49.36	.41	530.52	1.96	76.21	1.35
Uruguay	Boy	1313	22834	725.53	49.29	1.03	448.10	4.86	103.83	2.80
	Girl	1300	23490	623.69	50.71	1.03	452.73	4.86	97.08	2.72
Russian Federation (Moscow)	Boy	1452	46405	1431.55	51.23	.75	546.14	2.68	68.08	1.86
	Girl	1400	44178	1493.87	48.77	.75	552.30	2.54	67.65	2.06
Table Average	Boy	.	.	.	51.29	.24	492.54	.96	84.77	.70
	Girl	.	.	.	48.71	.24	508.81	.90	78.32	.63
Germany, North Rhine-Westphalia	Boy	1008	85152	2393.53	51.86	1.10	512.66	3.20	77.40	2.47
	Girl	983	79045	2296.01	48.14	1.10	516.84	3.28	72.45	2.72

Notes: N = number, s.e. = standard error, Std. Dev. = standard deviation.

The IEA IDB Analyzer also provides output files for all analysis types in Excel format. These files are located in the folder specified in the Output Files field. For the Percentages and Means analysis type (and as well for the Benchmark analysis type) the program generates an Excel file with significance test results for differences of percentages as well as differences in means (for an example, see Figure 4.10).

Figure 4.10: IEA IDB Analyzer Excel output including significance test results for example student-level analysis with CIL achievement scores



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	IDCNTRY	refgroup	compgrc	mnpv	cmnpv	mnpvdiff	pct	cpct	pctdiff	mnpv_se	cmnpv_se	mnpvdiff_se	pct_se	cpct_se	pctdiff_se	pctdiff_t	mnpvdiff_t	groupvar	dvar	weight
2	Chile	Boy	Boy	471.88	471.88	0.00	50.97	50.97	0.00	4.66	4.66	#NULL!	1.66	1.66	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC
3	Chile	Boy	Girl	471.88	480.14	8.26	50.97	49.03	-1.95	4.66	4.14	4.81	1.66	1.66	3.32	-0.59	1.72	S_SEX	PVCIL	TOTWC
4	Chile	Girl	Boy	480.14	471.88	-8.26	49.03	50.97	1.95	4.14	4.66	4.81	1.66	1.66	3.32	0.59	-1.72	S_SEX	PVCIL	TOTWC
5	Chile	Girl	Girl	480.14	480.14	0.00	49.03	49.03	0.00	4.14	4.14	#NULL!	1.66	1.66	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC
6	Denmark	Boy	Boy	544.62	544.62	0.00	50.54	50.54	0.00	2.81	2.81	#NULL!	0.92	0.92	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC
7	Denmark	Boy	Girl	544.62	560.84	16.22	50.54	49.46	-1.08	2.81	2.24	3.03	0.92	0.92	1.83	-0.59	5.36	S_SEX	PVCIL	TOTWC
8	Denmark	Girl	Boy	560.84	544.62	-16.22	49.46	50.54	1.08	2.24	2.81	3.03	0.92	0.92	1.83	0.59	-5.36	S_SEX	PVCIL	TOTWC
9	Denmark	Girl	Girl	560.84	560.84	0.00	49.46	49.46	0.00	2.24	2.24	#NULL!	0.92	0.92	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC
10	Finland	Boy	Boy	516.34	516.34	0.00	50.62	50.62	0.00	3.65	3.65	#NULL!	0.81	0.81	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC
11	Finland	Boy	Girl	516.34	545.34	29.00	50.62	49.38	-1.24	3.65	3.21	3.60	0.81	0.81	1.62	-0.77	8.05	S_SEX	PVCIL	TOTWC
12	Finland	Girl	Boy	545.34	516.34	-29.00	49.38	50.62	1.24	3.21	3.65	3.60	0.81	0.81	1.62	0.77	-8.05	S_SEX	PVCIL	TOTWC
13	Finland	Girl	Girl	545.34	545.34	0.00	49.38	49.38	0.00	3.21	3.21	#NULL!	0.81	0.81	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC
14	France	Boy	Boy	486.82	486.82	0.00	50.22	50.22	0.00	2.85	2.85	#NULL!	0.64	0.64	#NULL!	#NULL!	#NULL!	S_SEX	PVCIL	TOTWC

S_SEX_PVCIL_by_S_SEX_Sig

Notes: The output shows only a few countries, and is for illustrative purposes. refgroup = the label of the reference group; compgroup = the label of the comparison group; mnpv and cmnpv = the mean plausible value of the reference and the comparison group; pct and cpct = percent of people in the reference and the comparison group; mnpv_se and cmnpv_se = standard errors for mnpv and cmnpv; pct_se and cpct_se = standard errors for pct and cpct; mnpvdiff = difference between the comparison group and the reference group on the analysis variable; mnpvdiff_se = standard error of mnpvdiff; mnpvdiff_t = *t*-statistics for the mean difference between the reference and comparison group; pctddiff = difference between the percent of people in the comparison group and the reference group; pctddiff_se = standard error of pctddiff; pctddiff = *t*-statistics for the percent difference between the reference and comparison group; groupvar = name of the variable that defines the groups that are being compared; dvar = name of the dependent variable.

The Excel file provides significance test results for all combinations of grouping variables that were specified in the analysis module. In this example, this comprises all combinations of students' gender: boys with boys, boys with girls, girls with boys, and girls with girls. The interesting comparison is girls with boys (or vice versa). In Denmark, the difference in CIL achievement between girls and boys was already established from the SPSS output (see Figure 4.9; girls score 560.84, boys score 544.62). In our example, row 6 of the Excel file (Figure 4.10) shows that, in Denmark, boys score 16.22 score points lower than girls on the CIL achievement scale (with a standard error of 2.24). Column Q provides the *t*-value, which in this case is −5.36. Opting for a 95% confidence level, this difference is statistically significant, as the absolute value of that *t*-value (5.36) is ≥1.96.

4.4.3 Student-level linear regression analysis

The IEA IDB Analyzer is able to calculate multiple linear regressions between dependent variables and a set of independent variables. This section demonstrates an example for a regression analysis with achievement scores using student-level variables selected in the example merged data file BSGALLI2.SAV.

The IEA IDB Analyzer can also be used to compute regression analysis without achievement scores, but no example will be described here, as the steps are similar to those described for a regression analysis with achievement scores. The only difference between the two analyses is that, if conducting the "without achievement scores" analysis, the user needs to select **None Used** instead of **Use PVs** from the **Plausible Value Option** drop-down menu.

Linear regression with continuous independent variables

In our third example, we do not replicate any results presented in the ICILS 2018 international report; instead we examine the language spoken at home as a predictor of CT achievement. The linear regression analysis uses the variable S_TLANG, which indicates whether or not the student took the ICILS 2018 assessment in the language spoken at home, as the predictor of the five plausible values for CT achievement (PVCT01 through PVCT05), using the weighting variable TOTWGTS. The data are read from the merged data file BSGALLI2.SAV and the standard errors are computed based on 75 sets of replicate weights.

The example regression analysis is performed using the analysis module of the IEA IDB Analyzer as follows (Figure 4.11 shows how the analysis module should look when the proper settings for this example analysis are entered):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Specify the data file BSGALLI2.SAV as the **Analysis File** by clicking the **Select** button and selecting the file from the location it has been saved.

(3) Select **ICILS (Using Student Weights)** as the **Analysis Type**.

(4) Select **Linear Regression** as the **Statistic Type**.

(5) Select **Use PVs** as the **Plausible Value Option**.

(6) The variable IDCNTRY is selected automatically as **Grouping Variables**. No additional grouping variables are needed for this analysis.

(7) Click the **Categorical Variables** field in the **Independent Variables** section to activate it and select the variable S_TLANG as the independent variable. This is done by selecting S_TLANG from the list of available variables and moving it to the **Categorical Variables** field by clicking the **right arrow** (▶) button in this section. By clicking the **Contrast** field of S_TLANG, a drop-down menu will appear, from which **Dummy Coding** should be selected. By default, the IEA IDB Analyzer will assume that S_TLANG has two categories and it will select the first category (code 0) according to the coding of the variable as the reference category. With these settings, the intercept or constant will be the estimated average CT achievement score for students with "other language[s]" spoken at home rather than the language of test, whereas the regression coefficient (S_TLANG (estimate)) shows the estimated difference in CT achievement score points between students speaking the language of test at home and those students who speak another language at home. These settings also allow the user to perform a *t*-test to determine if the average CT achievement for students who speak the language of the test at home differs significantly from that of students who do not speak the language of the test at home.

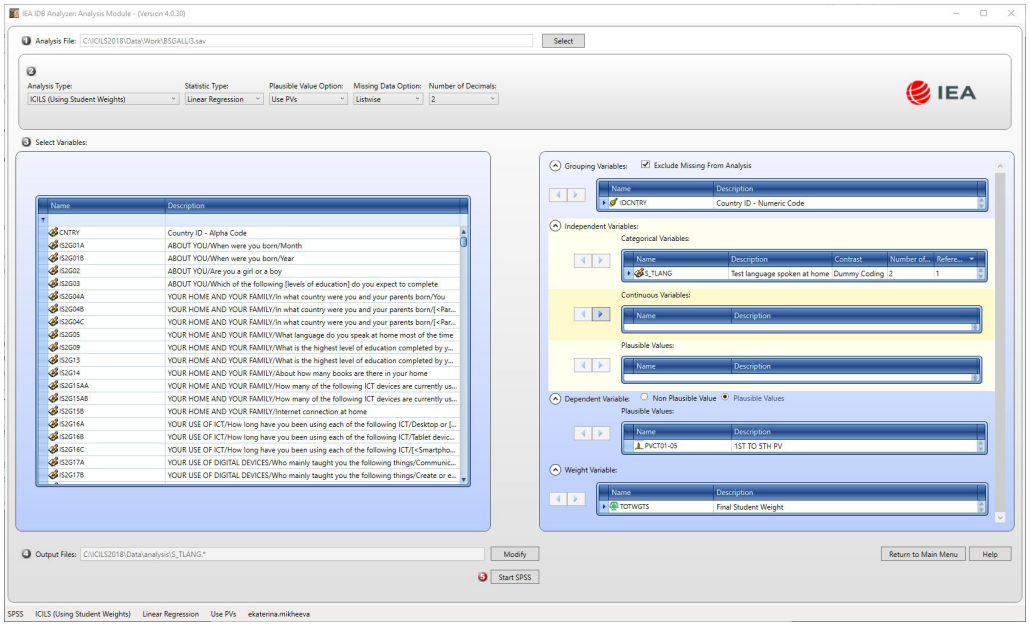
(8) Click the **Plausible Values** radio button in the **Dependent Variable** section and select PVCT01-05 as the Plausible Values. This is done by selecting PVCT01-05 from the list of available variables and moving it to the Plausible Values field by clicking the **right arrow** (▶) button in this section.

(9) The **Weight Variable** is automatically selected by the software. As this example analysis uses student questionnaire data, TOTWGTS is selected by default.

(10) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button.

(11) Click the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** option. If applicable, the IEA IDB Analyzer will prompt the user to confirm that they want to overwrite any existing files.

Figure 4.11: IEA IDB Analyzer setup for example student-level regression analysis with achievement scores



The IEA IDB Analyzer outputs the mean CT achievement scores for each country for students who did (marked "Constant") and students who did not (flagged by the variable S_TLANG_D2) speak the language of the test at home (Figure 4.12). As an example, these results show that, in France, the estimated mean CT achievement of target-grade students speaking the language of test at home (Constant) was 445.64, with a standard error of 9.24. The French target-grade students speaking the language of test at home had an estimated mean CT achievement score 64.07 points (S_TLANG_D2) higher than French students who did not speak the language of test at home, with standard error of 9.46. The estimated *t*-test value is 6.93, which in absolute value is greater than 1.96, indicating that this difference is statistically significant at a 95% confidence level. In the model statistics section of the results, the output (Figure 4.12) shows that about 5% of the variance in student CT achievement in France can be attributed to whether the language the student took the ICILS 2018 test in was the language spoken at home.

4.12: IEA IDB Analyzer output for example student-level regression analysis with CT achievement scores

Regression Coefficients

IDCNTRY	Variable	Regression Coefficient (s.e.)	Regression Coefficient (t-value)	Regression Coefficient	Stndrdzd. Coefficient (s.e.)	Stndrdzd. Coefficient (t-value)	Stndrdzd. Coefficient
Denmark	(CONSTANT)	480.98	8.78	54.75	.	.	.
	S_TLANG_D2	50.13	8.96	5.59	.15	.03	5.28
Finland	(CONSTANT)	474.10	10.01	47.38	.	.	.
	S_TLANG_D2	38.11	9.95	3.83	.10	.03	3.80
France	(CONSTANT)	445.64	9.24	48.21	.	.	.
	S_TLANG_D2	64.07	9.46	6.77	.23	.03	6.93
Germany	(CONSTANT)	438.86	6.89	63.70	.	.	.
	S_TLANG_D2	63.37	6.93	9.14	.25	.03	9.77
Germany, North Rhine-Westphalia	(CONSTANT)	439.44	5.88	74.69	.	.	.
	S_TLANG_D2	64.25	6.68	9.61	.28	.03	10.32
Korea, Republic of	(CONSTANT)	480.48	34.01	14.13	.	.	.
	S_TLANG_D2	56.27	32.37	1.74	.04	.03	1.69
Luxembourg	(CONSTANT)	451.60	1.12	403.24	.	.	.
	S_TLANG_D2	44.88	4.19	10.71	.17	.02	10.70
Portugal	(CONSTANT)	489.06	10.52	46.49	.	.	.
	S_TLANG_D2	-7.44	10.13	-.73	-.02	.03	-.73
United States	(CONSTANT)	468.15	5.12	91.46	.	.	.
	S_TLANG_D2	34.10	4.76	7.17	.12	.02	6.55
Table Average	(CONSTANT)	463.15	4.50	102.94	.	.	.
	S_TLANG_D2	45.30	4.38	10.35	15	.01	17.17

Model Statistics

IDCNTRY	R-Square	R-Square (s.e.)	Adjusted R-Square	Adjusted R-Square (s.e.)
Denmark	.02	.01	.02	.01
Finland	.01	.01	.01	.01
France	.05	.02	.05	.02
Germany	.06	.01	.06	.01
Germany, North Rhine-Westphalia	.08	.02	.08	.02
Korea, Republic of	.00	.00	.00	.00
Luxembourg	.03	.01	.03	.01
Portugal	.00	.00	.00	.00
United States	.01	.00	.01	.00
Table Average	.03	.00	.03	.00

Note: s.e. = standard error.

4.4.4 Calculating percentages of students reaching proficiency levels

This section describes the IEA IDB Analyzer can be used to perform benchmark analyses, which compute the percentages of students reaching specified proficiency levels on the CIL achievement scale and within specified subgroups, along with appropriate standard errors.

As an example, we now describe how the IDB Analyzer can be used to compute the percentages of students (not) reaching the four ICILS 2018 international proficiency levels of CIL achievement (level 1 = 407 to 491 scale points; level 2 = 492 to 576 score points; level 3 = 577 to 661 score points; and level 4 = above 661 scale points) using the merged BSGALLI2.SAV data file. This analysis replicates results from the ICILS 2018 international report (Table 4.6; see Fraillon et al. 2020a, table 3.5, p. 76).

Table 4.6 : Percentages of students at each proficiency level of CIL achievement, originally published in the ICILS 2018 international report

Country	Below Level 1 (less than 407 scale points)	Level 1 (from 407 to 491 scale points)	Level 2 (from 492 to 576 scale points)	Level 3 (from 577 to 661 scale points)	Level 4 (above 661 scale points)	Students achieving at each level (%) 0 10 20 30 40 50 60 70 80 90 100
Chile	20 (1.7)	34 (1.3)	36 (1.6)	10 (1.0)	0 (0.1)	
Denmark† ¹	3 (0.4)	14 (0.9)	45 (1.3)	36 (1.5)	3 (0.5)	
Finland	8 (0.9)	20 (1.1)	43 (1.3)	27 (1.4)	3 (0.4)	
France	13 (1.0)	30 (1.2)	40 (1.2)	15 (1.0)	1 (0.2)	
Germany	10 (1.1)	23 (1.3)	43 (1.2)	22 (1.1)	2 (0.5)	
Kazakhstan¹	54 (2.1)	27 (1.4)	15 (1.1)	4 (0.8)	0 (0.2)	
Korea, Republic of	9 (0.7)	19 (1.2)	32 (1.4)	32 (1.6)	9 (0.8)	
Luxembourg	19 (0.5)	32 (0.7)	38 (0.7)	11 (0.4)	0 (0.2)	
Portugal†† ¹	7 (0.9)	27 (1.2)	46 (1.1)	19 (1.2)	1 (0.4)	
Uruguay	33 (1.6)	29 (1.3)	27 (1.5)	9 (1.0)	1 (0.2)	
ICILS 2018 average	18 (0.4)	25 (0.4)	36 (0.4)	19 (0.4)	2 (0.1)	
Testing at the beginning of the school year						
Italy	24 (1.3)	39 (1.2)	30 (1.2)	7 (0.7)	0 (0.1)	
Not meeting sample participation requirements						
United States	10 (0.6)	24 (0.8)	41 (0.7)	23 (0.8)	2 (0.3)	
Benchmarking participants meeting sample participation requirements						
Moscow (Russian Federation)	3 (0.6)	15 (1.2)	44 (1.4)	34 (1.3)	3 (0.4)	
North Rhine-Westphalia (Germany)	8 (1.2)	28 (1.4)	44 (1.5)	19 (1.1)	2 (0.4)	

Notes: Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
† Met guidelines for sampling participation rates only after replacement schools were included.
†† Nearly met guidelines for sampling participation rates after replacement schools were included.
¹ National defined population covers 90% to 95% of the national target population.

Source: Fraillon et al. (2020a, table 3.5, p. 76).

This example is performed by the analysis module of the IEA IDB Analyzer as follows (Figure 4.13 shows how the analysis module should look when the correct settings for this example analysis are entered):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Specify the data file BSGALLI2.SAV as the **Analysis File** by clicking the **Select** button.

(3) Select **ICILS (Using Student Weights)** as the **Analysis Type**.

(4) Select Benchmarks as the **Statistic Type**.

(5) Select the **Discrete** option under the **Benchmark Option** drop-down menu to get discrete percentages of students reaching the ICILS 2018 international benchmarks.

(6) The variable IDCNTRY is selected automatically as **Grouping Variables**. No additional grouping variables are needed for this analysis.

(7) Specify the achievement scores to be used for the analysis by clicking the **Plausible Values** (8) field. Select PVCIL01-05 from the list of available variables and move it to the **Plausible Values** field by clicking the **right arrow** (▶) button in this section.

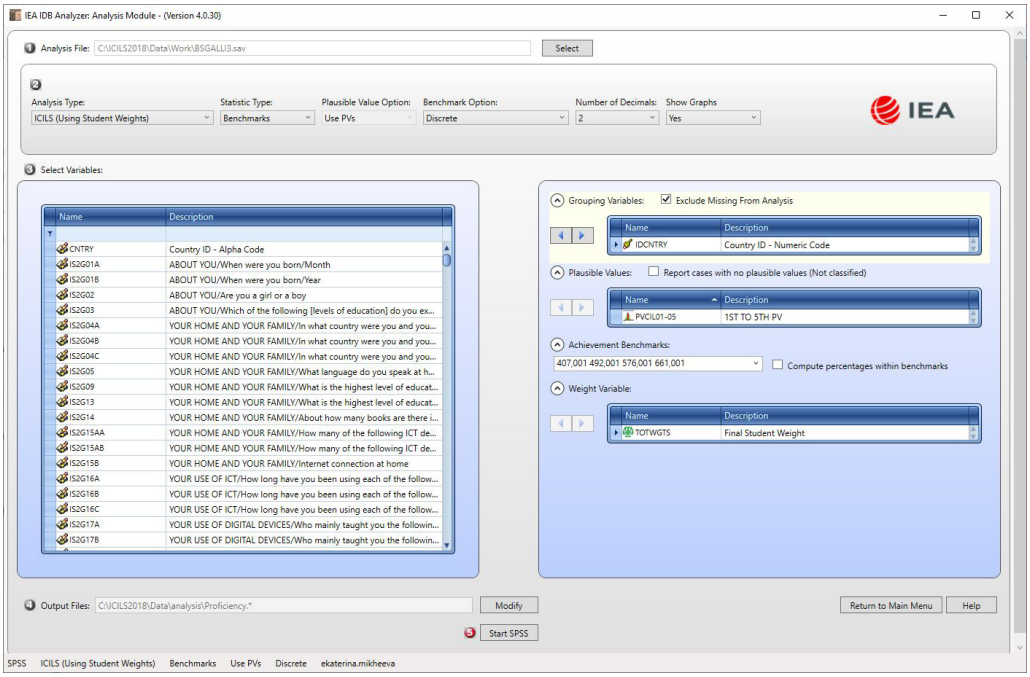
(8) Specify the ICILS 2018 International Benchmarks, namely 407, 492, 576, and 661 (level 1, level 2, level 3 and level 4, respectively). These values can be entered manually in the **Achievement Benchmarks** field, each separated by a blank space, or they can be selected by clicking on the drop-down menu available for this field.

(9) The **Weight Variable** is automatically defined by the software. As this example analysis uses student questionnaire data, TOTWGTS is selected by default.

(10) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button.

(11) Click the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** option. If necessary, the IEA IDB Analyzer will prompt the user to confirm that they want to overwrite existing files.

Figure 4.13: IDB Analyzer setup for example benchmark analysis



The IEA IDB Analyzer outputs the percentages of students reaching the specified benchmarks (Figure 4.14). In Germany, 9.69 percent of the target-grade students are below the proficiency level 1 score of 407 points (with a standard error of 1.12%), 23.47 percent of students reached proficiency level 1 (with a standard error of 1.27%), 42.93 percent of the students reached proficiency level 2 (with a standard error of 1.18%), 22.02 percent of students reached proficiency level 3 (with a standard error of 1.14%), and 1.89 percent of the students did score at proficiency level 4 (with standard error of 0.45%).

Figure 4.14: IEA IDB Analyzer output for example benchmark analysis of levels of CIL achievement

Percents by Performance Groups of PVCIV

Country ID - Numeric Code	Performance Group	N of Cases	Sum of TOTWGTS	Sum of TOTWGTS (s.e.)	Percent	Percent (s.e.)
Chile	1.Below 407.001	604	44393	4157.15	19.69	1.72
	2.From 407.001 to Below 492.001	954	76793	3153.78	34.06	1.31
	3.From 492.001 to Below 576.001	1109	81610	3723.01	36.20	1.61
	4.From 576.001 to Below 661.001	403	21855	2230.08	9.69	.96
	5.At or Above 661.001	21	803	316.16	.36	.14
Denmark	1.Below 407.001	64	1686	254.89	2.57	.39
	2.From 407.001 to Below 492.001	324	8957	620.17	13.63	.89
	3.From 492.001 to Below 576.001	1065	29286	1256.67	44.57	1.30
	4.From 576.001 to Below 661.001	879	23746	1137.81	36.14	1.50
	5.At or Above 661.001	72	2032	331.38	3.09	.49
Finland	1.Below 407.001	218	4522	545.13	7.76	.91
	2.From 407.001 to Below 492.001	511	11380	752.14	19.54	1.15
	3.From 492.001 to Below 576.001	1092	24821	922.35	42.61	1.35
	4.From 576.001 to Below 661.001	663	15970	908.16	27.42	1.42
	5.At or Above 661.001	62	1559	229.21	2.68	.39
France	1.Below 407.001	394	104849	8562.32	13.07	1.03
	2.From 407.001 to Below 492.001	923	244141	10180.30	30.44	1.18
	3.From 492.001 to Below 576.001	1166	320956	11452.18	40.02	1.24
	4.From 576.001 to Below 661.001	432	124027	7803.68	15.47	.98
	5.At or Above 661.001	25	7996	1968.28	1.00	.25
Germany	1.Below 407.001	301	70813	8114.79	9.69	1.12
	2.From 407.001 to Below 492.001	911	171554	9497.04	23.47	1.27
	3.From 492.001 to Below 576.001	1592	313722	9692.66	42.93	1.18
	4.From 576.001 to Below 661.001	787	160915	9192.14	22.02	1.14
	5.At or Above 661.001	65	13821	3335.22	1.89	.45
…						
Table average	1.Below 407.001	.	.	.	15.73	.31
	2.From 407.001 to Below 492.001	.	.	.	25.76	.31
	3.From 492.001 to Below 576.001	.	.	.	37.41	.34
	4.From 576.001 to Below 661.001	.	.	.	19.09	.30
	5.At or Above 661.001	.	.	.	2.00	.10

Notes: N = number, s.e. = standard error. The output shows the first five countries, and is for illustrative purposes only.

4.4.5 Computing correlations with context or background variables and achievement scores

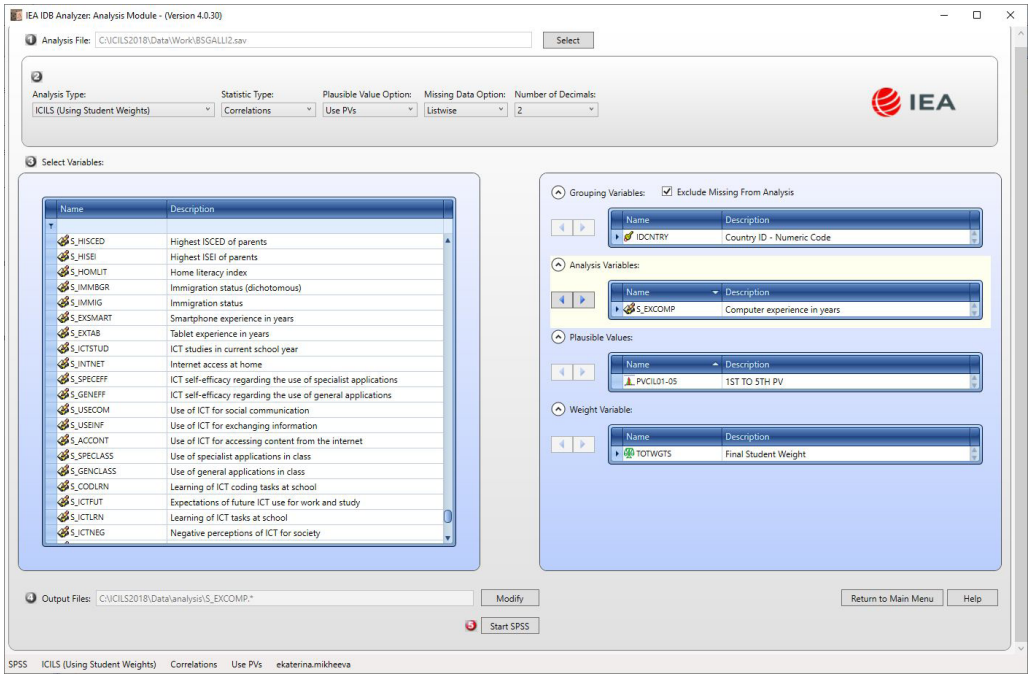
In addition to the analyses described above, the IEA IDB Analyzer also is able to compute correlations between context or background variables, and between context or background variables and achievement scores. The next example is a correlation analysis with achievement scores. Correlation analysis between two context or background variables follows the same steps. The only difference is that the correlation between two context or background variables will require adding two variables in the Analysis Variables field instead of one.

The examples of correlation between a context or background variable and CIL scores presented here cannot be found in the ICILS 2018 international report. This example calculates the correlation between students' computer experience in years (S_EXCOMP and the computer and information literacy (CIL) score (represented by the five plausible values (PVCIL01-05). The steps required to perform this correlation analysis are as follows (Figure 4.15 shows how the analysis module window should look when the correct settings for the analysis are entered):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Specify the data file BSGALLI2.SAV as the **Analysis File.**

Figure 4.15: IEA IDB analyzer setup for example correlation analysis



(3) Select **ICILS (Using Student Weights)** as the **Analysis Type**.

(4) Select **Correlations** as the **Statistic Type**. The IDCNTRY (country ID) is selected by default. No other variable needs to be selected for this analysis.

(5) Specify the achievement scores to be used for the analysis by clicking the **Plausible Values** field to activate it.

(6) Specify the variable S_EXCOMP as the analysis variable by clicking the **Analysis Variables** field to activate it. Select S_EXCOMP from the list of available variables and move it to the **Analysis Variables** field by clicking the **right arrow** (▶) button in this section.

(7) Select PVCIL01-05 from the list of available variables and move it to the **Plausible Values** field by clicking the **right arrow** (▶) button in this section.

(8) The **Weight Variable** is automatically defined by the software. As this example analysis uses student questionnaire data, TOTWGTS is selected by default.

(9) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button.

(10) Click the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** option. If necessary, the IEA IDB Analyzer will prompt the user to confirm that they want to overwrite existing files.

The IEA IDB Analyzer outputs the correlation analysis in SPSS format (Figure 4.16) revealing the correlation between students' computer experience in years and the CIL achievement score in Uruguay is 0.36 with a standard error of 0.02. To verify whether this correlation is statistically significant, the *t*-value is computed by dividing the correlation coefficient by its standard error. Using the exact numbers from the Excel output gives a *t*-value of 18, which indicates that, on a 95% confidence level, there is a statistically significant correlation in Uruguay between students' computer experience in years and students' CIL achievement.

Figure 4.16 : IEA IDB Analyzer output for example correlation analysis

Correlation Coefficients

IDCNTRY	Variable	Correlation with S_EXCOMP (s.e.)	Correlation with S_EXCOMP (s.e.)	Correlation with PV_CIL	Correlation with PV_CIL (s.e.)
Chile	S_EXCOMP	1.00	.00	.29	.02
	PV_CIL	.29	.02	1.00	.00
Denmark	S_EXCOMP	1.00	.00	.19	.02
	PV_CIL	.19	.02	1.00	.00
Finland	S_EXCOMP	1.00	.00	.22	.02
	PV_CIL	.22	.02	1.00	.00
France	S_EXCOMP	1.00	.00	.11	.02
	PV_CIL	.11	.02	1.00	.00
Germany	S_EXCOMP	1.00	.00	.12	.03
	PV_CIL	.12	.03	1.00	.00
Germany, North Rhine-Westphalia	S_EXCOMP	1.00	.00	.12	.03
	PV_CIL	.12	.03	1.00	.00
Italy	S_EXCOMP	1.00	.00	.21	.02
	PV_CIL	.21	.02	1.00	.00
Kazakhstan	S_EXCOMP	1.00	.00	.34	.02
	PV_CIL	.34	.02	1.00	.00
Korea, Republic of	S_EXCOMP	1.00	.00	.29	.02
	PV_CIL	.29	.02	1.00	.00
Luxembourg	S_EXCOMP	1.00	.00	.10	.01
	PV_CIL	.10	.01	1.00	.00
Portugal	S_EXCOMP	1.00	.00	.16	.02
	PV_CIL	.16	.02	1.00	.00
Russian Federation (Moscow)	S_EXCOMP	1.00	.00	.14	.02
	PV_CIL	.14	.02	1.00	.00
United States	S_EXCOMP	1.00	.00	.27	.02
	PV_CIL	.27	.02	1.00	.00
Uruguay	S_EXCOMP	1.00	.00	.36	.02
	PV_CIL	.36	.02	1.00	.00
Table Average	S_EXCOMP	1.00	.00	.21	.01
	PV_CIL	.21	.01	1.00	.00

Note: s.e. = standard error.

4.4.6 Calculating percentiles of students' achievement

The IEA IDB Analyzer can also be used to calculate percentiles of CIL (or CT) scores by selecting the Percentiles analysis option. This computes the percentiles within the distribution of student achievement scores within specified subgroups of students. This analysis type also computes the appropriate standard errors for those percentiles.

In the next example, we compute the 5th, 25th, 75th, and 95th percentiles of student CIL scores and their standard errors within each country, using the weighting variable TOTWGTS, replicating values that were previously reported in the ICILS 2018 international report (Table 4.4; see Fraillon et al. 2020a, table 3.4, p. 75). The data are derived from the data file BSGALLI2.sav and the standard error calculations are based on replicate weights.

To perform a percentile analysis, we again use the Analysis Module of the IEA IDB Analyzer as follows (Figure 4.17 shows how the analysis module should look when the correct settings for the example analysis are entered):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Specify the data file BSGALLI2.SAV as the **Analysis File**.

(3) Select **ICILS (Using Student Weights)** as the **Analysis Type**.

(4) Select Percentiles as the **Statistic Type**.

(5) The IDCNTRY (country ID) is selected by default as a grouping variable. No other grouping variable needs to be selected for this analysis.

(6) Specify the CIL achievement scores to be used for the analysis by clicking the **Plausible Values** field to activate it. Select PVCIL01-05 from the list of available variables and move it to the **Plausible Values** field by clicking the **right arrow** (▶) button in this section.

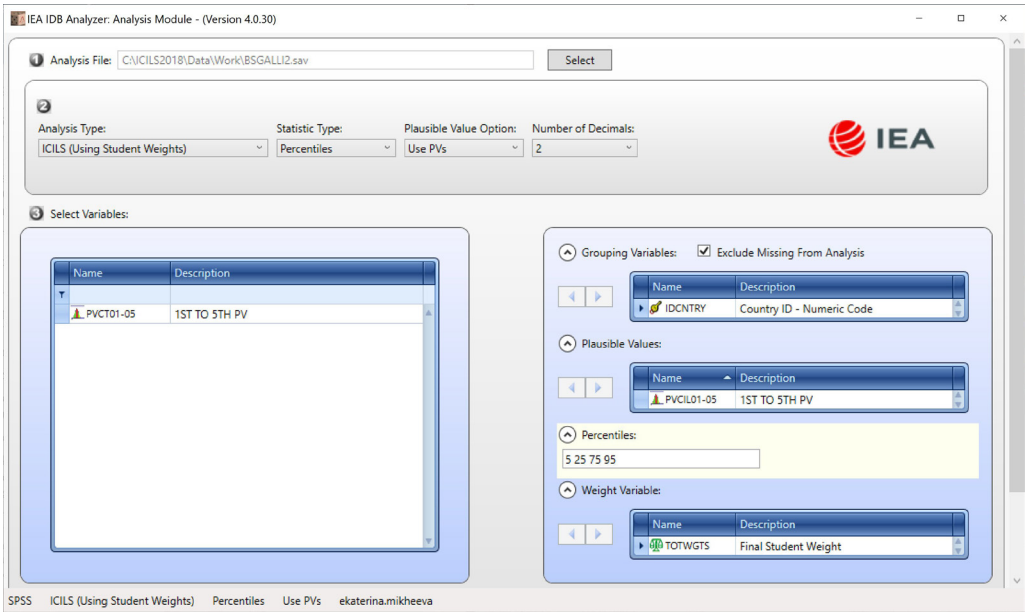
(7) The **Weight Variable** is automatically defined by the software. As this example analysis uses student questionnaire data, TOTWGTS is selected by default.

(8) Click on the **Percentiles** radio button and specify the percentile points in the distribution. For this example we use the 5th, 25th, 75th and 95th percentiles. These need to be typed in increasing order separated by spaces.

(9) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button.

(10) Click the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** option. If necessary, the IEA IDB Analyzer will prompt the user to confirm that they want to overwrite existing files.

Figure 4.17: IEA IDB Analyzer Analysis Module setup screen for computing percentiles



The IEA IDB Analyzer outputs the percentile analysis in SPSS format (Figure 4.18). The example reveals that, in Portugal the score of the 5th percentile of the score distribution is 392.33 points (standard error 8.32), for the 25th percentile it is 472.04 points (standard error 4.00), for the 75th percentile it is 564.75 points (standard error 3.73), and for the 95th percentile it is 622.81 points (standard error 3.30).

Figure 4.18: IEA IDB Analyzer SPSS output for percentiles

Percentiles for PVCIV by IDCNTRY

Country ID - Numeric Code	N of Cases	Sum of TOTWGTS	p5	p5_se	p25	p25_se	p75	p75_se	p95	p95_se
Chile	3092	225453	325.19	11.36	425.23	6.22	534.12	3.46	599.98	5.65
Denmark	2404	65708	434.56	5.95	514.60	3.02	598.05	2.38	650.07	3.97
Finland	2546	58252	381.40	7.61	486.00	4.19	586.67	3.62	645.27	4.03
France	2940	801969	357.38	9.64	448.25	4.04	554.75	2.76	618.20	3.78
Germany	3655	730825	371.73	8.95	469.77	4.69	573.99	2.50	633.82	4.28
Italy	2810	541124	315.40	6.82	410.06	5.59	517.68	2.70	586.84	3.85
Kazakhstan	3371	224452	216.80	9.77	322.47	7.67	470.78	6.84	564.11	8.91
Korea, Republic of	2875	439683	369.52	7.10	481.36	4.90	610.01	2.82	681.52	4.83
Luxembourg	5401	6216	329.38	3.99	428.21	1.92	542.02	1.21	606.06	2.19
Portugal	3221	99087	392.33	8.32	472.04	4.00	564.75	3.73	622.81	3.30
United States	6790	3856661	373.43	4.89	468.67	3.09	576.11	2.22	638.43	3.12
Uruguay	2613	46323	279.62	6.82	379.53	5.52	526.72	5.28	605.33	7.08
Russian Federation (Moscow)	2852	90584	425.23	7.25	509.15	2.80	595.22	2.46	650.85	3.74
Table Average	.	.	354.04	2.08	448.71	1.24	558.29	.93	623.73	1.27
Germany, North Rhine-Westphalia	1991	164197	384.55	7.45	466.63	3.95	565.13	3.24	628.95	3.78

Notes: N = number, s.e. = standard error, p5 = 5th percentile, p25 = 25th percentile, p75 = 75th percentile, p95 = 95th percentile.

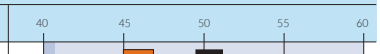
4.5 Performing analyses with teacher-level data

As already noted, student and teacher data cannot be merged and analyzed together due to the sampling design of ICILS 2018. The example of an analysis using teacher questionnaire data presented here determines teachers' average confidence in doing ICT tasks for teachers under and over 40 years of age. The analysis can, of course, be conducted only at the level of teachers.

The analysis replicates results reported in the ICILS 2018 international report (Table 4.7; see also Fraillon et al. 2020a, table 6.3, p. 182). Note that this example simply computes the means of teachers under 40 and teachers over 40 years of age.

Table 4.7: Example of teacher-level analysis, originally published in the ICILS 2018 international report

Country	National average scores of teacher confidence in doing ICT tasks									
	All teachers			40 years and over		Under 40 years		Differences (older – younger)		
Chile	49	(0.3)	▽	46	(0.4)	50	(0.4)	**–4.0**	(0.7)	
Denmark[†,1]	53	(0.3)	▲	53	(0.4)	55	(0.4)	**–1.9**	(0.6)	
Finland	51	(0.2)	△	49	(0.3)	55	(0.3)	**–6.0**	(0.4)	
Italy[2]	47	(0.3)	▼	46	(0.3)	51	(0.6)	**–4.7**	(0.6)	
Kazakhstan[1]	47	(0.4)	▽	46	(0.5)	49	(0.5)	**–3.1**	(0.6)	
Korea, Republic of	50	(0.3)		49	(0.5)	53	(0.4)	**–3.8**	(0.6)	
Portugal	53	(0.3)	△	52	(0.3)	57	(0.4)	**–5.1**	(0.5)	
ICILS 2018 average	50	(0.1)		49	(0.2)	53	(0.2)	**–4.1**	(0.2)	
Not meeting teacher sample participation requirements										
France[1]	45	(0.3)		43	(0.3)	47	(0.4)	**–4.3**	(0.5)	
Germany	45	(0.3)		44	(0.4)	48	(0.4)	**–4.4**	(0.6)	
Luxembourg	47	(0.4)		45	(0.6)	49	(0.5)	**–4.1**	(0.8)	
United States[1]	54	(0.3)		53	(0.5)	56	(0.4)	**–3.7**	(0.7)	
Uruguay	50	(0.3)		48	(0.5)	52	(0.4)	**–3.2**	(0.6)	
Benchmarking participants meeting sample participation requirements										
Moscow (Russian Federation)	50	(0.3)	△	50	(0.3)	52	(0.4)	**–2.5**	(0.5)	
North Rhine-Westphalia (Germany)	45	(0.3)	▼	43	(0.3)	48	(0.4)	**–5.1**	(0.4)	



National ICILS 2018 results are:
▲ More than three score points above average
△ Significantly above average
▽ Significantly below average
▼ More than three score points below average

Average score +/– confidence interval for teachers ≥40 years old
Average score +/– confidence interval for teachers <40 years old

On average across items, students with a score in the range with this colour have more than 50% probablity to indicate:
Never done this
Know how to do this

Notes: Standard errors appear in parentheses. Comparisons with ICILS 2018 only reported for countries or benchmarking participants meeting sample participation requirements.
Statistically significant differences ($p < 0.05$) between subgroups are shown in **bold**.
† Met guidelines for sampling participation rates only after replacement schools were included.
1 National defined population covers 90% to 95% of national target population.
2 Country surveyed target grade in the first half of the school year.

Source: Fraillon et al. (2020a, table 6.3, p.182).

As with previous examples, the first step is to identify the variables relevant to the analysis in the appropriate files, and review the documentation for any specific national adaptations to the questions of interest (see Appendix B of this user guide). The teacher questionnaire data files provide variable IT2G02, which contains the age ranges for teachers: (i) under 25 years of age; (ii) 25 to 29 years; (iii) 30 to 39 years; (iv) 40 to 49 years; (v) 50 to 59 years; and (vi) 60 years of age and over. Because these age-range categories are more detailed than required for this example, here they are collapsed into two categories (namely, under 40 years old and 40 years old and over). The SPSS syntax (see Figure 4.19) then loads the data file BTGALLI2.SAV into SPSS (see section 4.2.4 for details) and completes all necessary recoding, thus creating a new variable. It then assigns labels to the new categories and saves the file.

Figure 4.19: Example SPSS program to recode variable IT2G02 for the teacher-level analysis

```
GET FILE = 'C:\ICILS2018\Data\Work\BTGALLI2.sav'.

RECODE IT2G02 (LOWEST THRU 3 = 0) (4 THRU 6 = 1)
(ELSE = COPY) INTO IT2G02col.

VARIABLE LABELS IT2G02col 'Collapsed IT2G02: About You/How old are you'.

VALUE LABELS IT2G02col
0 'Under 40'
1 '40 and over'
8 'Not administered/missing by design'
9 'Presented but not answered'.

MISSING VALUES IT2G02col (8, 9).
FORMATS IT2G02col (F1.0).

EXECUTE.

SAVE OUTFILE = 'C:\ICILS2018\Data\Work\BTGALLI2.sav'.
```

Once this operation is complete, the next step is to reload the file into the IEA IDB Analyzer; the file can now be used for the analysis, and software set to recognize the newly-created variables. The Analyzer analysis module automatically selects the country variable (IDCNTRY) and the variables containing the sampling information used to compute the error estimates.

The analysis module of the IEA IDB Analyzer is used to perform the example teacher-level analysis as follows (Figure 4.20 shows how the analysis module should look when the correct settings are entered):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Select the data file BTGALLI2.SAV as the **Analysis File**.

(3) Select **ICILS (Using Teacher Weights)** as the **Analysis Type** to analyze the responses of the teachers.

(4) Select **Percentages and Means** as the **Statistic Type**.

(5) Specify the variable IT2G02col (collapsed teacher age ranges) as a second grouping variable by clicking the **Grouping Variables** field to activate it. Select IT2G02col from the list of available variables and move it to the **Grouping Variables** field by clicking the **right arrow** (▶) button in this section.

(6) Locate and add the variable for the scale T_ICTEFF ("Teachers ICT self-efficacy") as an **Analysis Variable**. (The ICILS 2018 technical report and Appendix C of this user guide provide more details on the scales and their construction.)

(7) The **Weight Variable** is automatically defined by the software. As this example analysis uses only teacher questionnaire data, TOTWGTT is selected by default.

(8) Specify the name and the folder of the output files in the **Output Files** field by clicking the **Define/Modify** button.

(9) Click the **Start SPSS** button to create the SPSS syntax file. The file will open in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **All** option. If necessary, the IEA IDB Analyzer will prompt the user to confirm that they want to overwrite existing files.

The IDB Analyzer outputs each country's results on two lines, one for each value of the IT2G02col variable (Figure 4.21). In this case, the selected variable has two categories (Under 40/40 and over). For categorical variables with more than two categories, the output will show one line per category for each country. The results are presented in the same manner as in the previous examples, revealing that, in Finland for example, the average of the scale "Teachers ICT self-efficacy" (T_ICTEFF) is 55.06 for teachers under 40 years of age and 49.09 for teachers of 40 years of age and more (standard errors are 0.33 and 0.29, respectively).

Figure 4.20: IEA IDB Analyzer setup for example teacher-level analysis

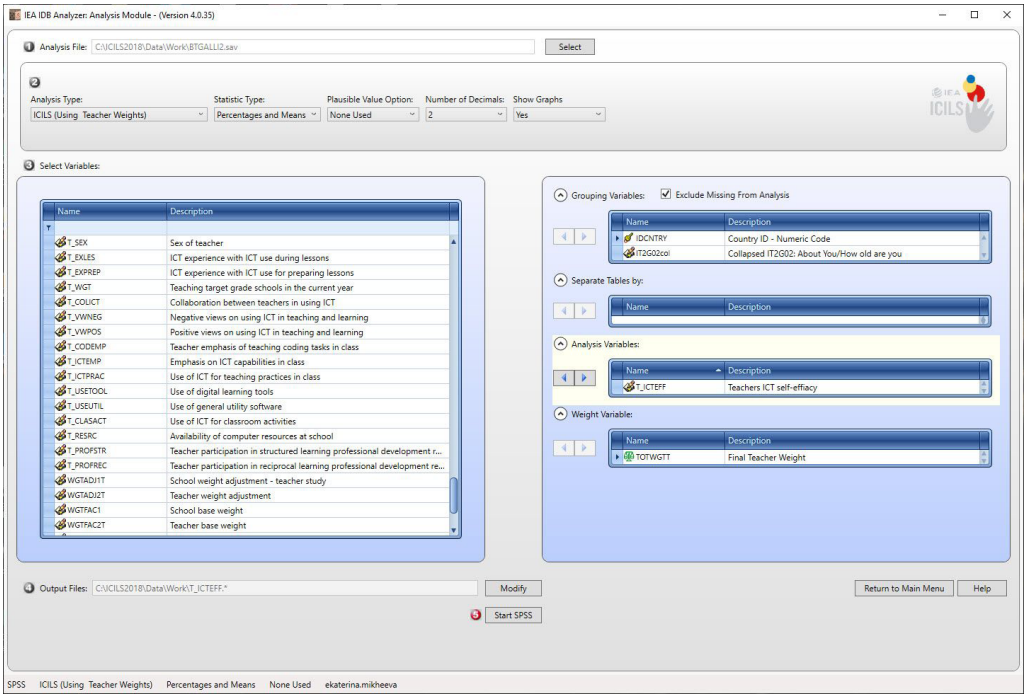


Figure 4.21: IEA IDB Analyzer output for example teacher-level analysis

Average for T_ICTEFF by (IDCNTRY IT2G02COL)

Country ID - Numeric Code	Collapsed IT2G02: How old are you	N of cases	Sum of TOTWGTS	Sum of TOTWGTS (s.e.)	Percent	Percent (s.e.)	T_ICTEFF (mean)	T_ICTEFF (s.e.)	Std.Dev	Std.Dev. (s.e.)	Percent Missing
Chile	Under 40	948	30428.48	1197.66	61.26	2.41	50.10	.40	7.20	.20	.02
	40 and over	730	19245.39	1394.85	38.74	2.41	46.10	.44	7.51	.23	.82
Denmark	Under 40	390	3813.00	215.49	33.09	1.65	54.50	.42	7.68	.51	.59
	40 and over	718	7710.51	338.55	66.91	1.65	52.58	.42	8.46	.35	.85
Finland	Under 40	592	5215.43	230.90	32.18	1.19	55.06	.33	7.65	.17	.00
	40 and over	1257	10990.43	329.95	67.82	1.19	49.09	.29	9.39	.18	.11
France	Under 40	552	59229.00	3125.15	38.61	1.93	47.27	.38	8.09	.28	.09
	40 and over	901	94176.83	3223.09	61.39	1.93	42.97	.35	9.35	.27	.51
Germany	Under 40	883	80238.41	4368.65	36.65	1.68	47.90	.44	7.22	.26	.10
	40 and over	1422	138690.61	5996.23	63.35	1.68	43.51	.42	8.73	.29	1.53
Italy	Under 40	168	9084.74	961.80	9.56	1.00	51.09	.59	7.66	.32	.00
	40 and over	1586	85990.61	2393.00	90.44	1.00	46.42	.28	9.39	.23	.91
Kazakhstan	Under 40	1158	43104.47	1384.47	46.16	1.56	49.13	.48	13.67	.49	.83
	40 and over	1430	50266.40	2042.54	53.84	1.56	46.02	.54	12.61	.49	.74
Korea, Republic of	Under 40	802	15496.48	714.34	38.30	2.25	52.65	.37	9.73	.31	.08
	40 and over	1314	24968.11	1469.22	61.70	2.25	48.88	.46	10.29	.26	.33
Luxembourg	Under 40	253	1078.74	42.09	53.78	2.24	48.63	.51	8.20	.30	.25
	40 and over	233	927.18	50.25	46.22	2.24	44.57	.64	9.44	.39	.52
Portugal	Under 40	420	4274.66	244.41	15.65	.88	56.91	.44	6.69	.28	.45
	40 and over	2389	23040.31	475.67	84.35	.88	51.76	.30	9.46	.23	.40
United States	Under 40	1421	148581.15	6952.82	43.93	1.68	56.27	.36	9.14	.21	1.42
	40 and over	1755	189614.07	10045.85	56.07	1.68	52.59	.51	10.25	.26	1.03
Uruguay	Under 40	653	4422.64	194.27	51.95	1.73	51.70	.40	9.17	.20	1.71
	40 and over	625	4090.34	166.94	48.05	1.73	48.46	.55	10.53	.37	2.93
Russian Federation (Moscow)	Under 40	718	8021.07	464.92	33.63	1.27	52.11	.38	7.61	.26	.16
	40 and over	1506	15832.33	479.32	66.37	1.27	49.58	.33	8.49	.22	.27
Table average	Under 40	.	.	.	38.22	.45	51.51	.11	8.35	.08	.
	40 and over	.	.	.	61.78	.45	47.52	.12	9.46	.08	.
Germany, North Rhine-Westphalia	Under 40	573	18576.77	820.11	40.36	1.50	47.78	.39	7.25	.27	.43
	40 and over	887	27456.38	1039.18	59.64	1.50	42.70	.33	8.53	.35	.21

Notes: N = number, s.e. = standard error, Std. Dev. = standard deviation.

4.6 Performing analyses with school-level data augmented with school-level data

When performing analyses with the merged school-level data, the data are analyzed to make statements about the number or percentages of students attending schools with a given characteristic, rather than about the number or percentages of schools with a given characteristic. This example of school level analysis focuses on the percentage of students enrolled at schools where ICT coordinators reported that the use of ICT for teaching and learning was hindered a lot or to some extent by insufficient pedagogical resources, replicating values that were previously reported in the ICILS 2018 international report (Table 4.8; see Fraillon et al. 2020a, table 6.9, p. 191).

Table 4.8: Example of school-level analysis, originally published in the ICILS 2018 international report

Country	Percentage of students enrolled at school with:					
	Insufficient ICT skills among teachers	Insufficient time for teachers to prepare lessons	Lack of effective professional learning resources for teachers	Lack of an effective online learning support platform	Lack of incentives for teachers to integrate ICT use in their	Insufficient pedagogical support for the use of ICT teaching
Chile	68 (5.7)	52 (5.2) ▼	59 (5.3)	58 (5.0) ▲	57 (5.0)	49 (3.8)
Denmark† [1]	53 (4.9) ▼	81 (3.6) ▲	34 (4.3) ▼	24 (4.2) ▼	32 (4.2) ▼	34 (4.5) ▼
Finland	84 (3.9) ▲	76 (3.7) ▲	75 (4.5) ▲	39 (4.7)	78 (4.3) ▲	59 (5.2)
France	67 (4.3)	55 (4.6) ▽	62 (4.0)	35 (4.6) ▽	42 (4.3) ▼	42 (4.6)
Germany	84 (3.4) ▲	85 (2.8) ▲	74 (3.8) ▲	65 (4.4) ▲	77 (4.3) ▲	68 (4.2) ▲
Italy[2]	81 (3.1) ▲	66 (4.1)	66 (4.4)	54 (4.2) △	83 (3.3) ▲	54 (4.3)
Kazakhstan[1]	43 (4.0) ▼	50 (4.0) ▼	47 (4.1) ▼	51 (4.4)	38 (4.0) ▼	41 (3.6) ▽
Korea, Republic of	25 (3.4) ▼	55 (4.7)	45 (4.1) ▼	45 (4.6)	46 (4.4) ▼	45 (4.5)
Luxembourg	72 (0.0) △	40 (0.1) ▼	51 (0.0) ▽	30 (0.0) ▼	59 (0.1)	51 (0.1)
Portugal†† [1]	72 (3.7) △	75 (3.5) ▲	72 (4.2) ▲	37 (3.6) ▽	57 (4.3)	57 (4.2)
Uruguay	67 (5.1)	68 (4.5)	63 (4.6)	49 (5.4)	57 (5.1)	51 (5.2)
ICILS 2018 average	65 (1.2)	64 (1.2)	59 (1.2)	44 (1.3)	57 (1.2)	50 (1.3)
Not meeting student sample participation requirements						
United States	47 (3.6)	43 (3.7)	43 (3.4)	29 (2.9)	38 (3.5)	29 (3.3)
Benchmarking participants meeting sample participation requirements						
Moscow (Russian Federation)	37 (4.3) ▼	22 (3.3) ▼	19 (3.1) ▼	20 (3.4) ▼	27 (4.5) ▼	10 (2.3) ▼
North Rhine-Westphalia (Germany)	92 (2.4) ▲	87 (2.5) ▲	76 (4.5) ▲	62 (4.2) ▲	80 (4.2) ▲	82 (3.9) ▲

Notes: Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.
Comparisons with ICILS 2018 only reported for countries or benchmarking participants meeting sample participation requirements.
† Met guidelines for sampling participation rates only after replacement schools were included.
†† Nearly met guidelines for sampling participation rates after replacement schools were included.
[1] National defined population covers 90% to 95% of national target population.
[2] Country surveyed target grade in the first half of the school year.

National ICILS 2018 results are:
▲ More than 10 percentage points above average
△ Significantly above average
▽ Significantly below average
▼ More than 10 percentage points below average

Source: Fraillon et al. (2020a, table 6.9, p.191).

The variable of interest here is II2G13G ("Insufficient ICT skills among teachers"), namely question 13G in the ICT coordinator questionnaire (see Appendix A). Note that this example simply computes the percentages of students where ICT coordinators reported the use of ICT for teaching and learning was hindered either "a lot" or "to some extent" by insufficient pedagogical resources. Thus, as in the previous example, the first and second categories of variable II2G13G need first to be collapsed into one using an SPSS syntax file (Figure 4.22).

Figure 4.22: Example SPSS program to recode variable II2G13G for school-level analysis

```
GET FILE = 'C:\ICILS2018\Data\Work\BSG_BCGALLI2.sav'.
RECODE II2G13G (LOWEST THRU 2 = 0) (3 THRU 4 = 1)
(ELSE = COPY) INTO II2G13Gcol.
VARIABLE LABELS II2G13Gcol 'Collapsed II2G13G: ICT Support/Use of ICT hindered/Insufficient
of ICT skills among teachers'.
VALUE LABELS II2G13Gcol
0 'A lot or to some extent'
1 'Very little or not at all'
8 'Not administered/missing by design'
9 'Presented but not answered'.
MISSING VALUES II2G13Gcol (8, 9).
FORMATS II2G13Gcol (F1.0).
EXECUTE.
SAVE OUTFILE = 'C:\ICILS2018\Data\Work\BSG_BCGALLI2.sav'.
```

Once this operation is complete, the next step is to reload the file into the IEA IDB Analyzer; the file can now be used for the analysis and software set to recognize the newly created variables. The Analyzer analysis module automatically selects the country variable (IDCNTRY) and the variables containing the sampling information used to compute the error estimates.

Note that merging the school- and student-level data means that only the total student weight (TOTWGTS) and its replicate weights are included in the merged file. The school weights are excluded because they are no longer meaningful or interpretable.

The analysis module of the IEA IDB Analyzer is used to perform the example school-level analysis as follows (Figure 4.23 shows how the analysis module should look when the correct settings are entered):

(1) Open the **Analysis Module** of the IEA IDB Analyzer.

(2) Select the merged data file BSG_BCGALLI2.SAV as the **Analysis File**.

(3) Select **ICILS (Using Student Weights)** as the Analysis Type to analyze school questionnaire data as student attributes.

(4) Select **Percentages Only** as the **Statistic Type**.

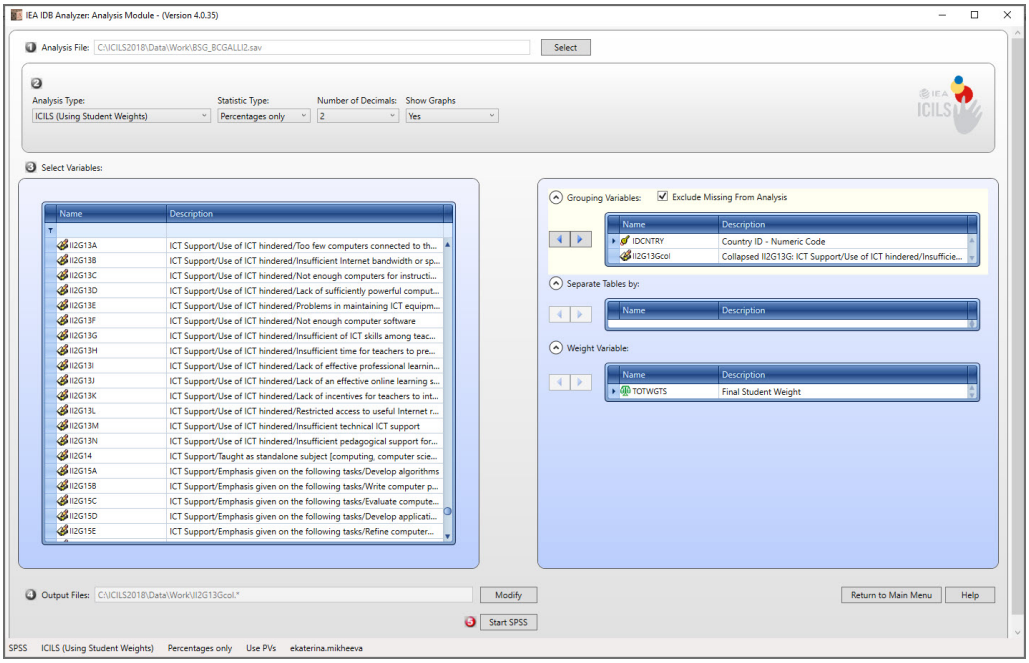
(5) Specify the variable II2G13Gcol as a second grouping variable by clicking the **Grouping Variables** field to activate it. Select II2G13Gcol from the list of available variables and move it to the **Grouping Variables** field by clicking the **right arrow** (▶) button in this section.

(6) The **Weight Variable** is automatically selected by the software; As this example analysis uses student questionnaire data as well as school questionnaire data disaggregated to student level, TOTWGTS is selected by default.

(7) Specify the name and the folder of the output files in the Output Files field by clicking the **Define/Modify** button.

(8) Click the **Start SPSS** button to create the SPSS syntax file and open it in a SPSS syntax window. The syntax file can be executed by opening the **Run** menu of SPSS and selecting the **All** option. If necessary, the IEA IDB Analyzer will prompt the user to confirm that they want to overwrite existing files.

Figure 4.23: IDB Analyzer setup for example analysis with school-level data



The IDB Analyzer outputs each country's results on two lines, one for each value of the II2G13Gcol variable (Figure 4.24). In this case, the selected variable has two categories (a lot or to some extent/very little or not at all and over). For categorical variables with more than two categories, the output will show one line per category for each country. The results are presented in the same manner as in the previous examples, revealing that, for example, 68.05 percent of target-grade students in Chile were enrolled in schools where the ICT coordinator reported that the use of ICT in teaching and learning was hindered a lot or to some extent by insufficient ICT skills among teachers (standard error of this estimate 5.73).

Figure 4.24: IDB Analyzer output for example analysis with school-level data

Percentages by (IDCNTRY II2G13GCOL)

Country ID - Numeric Code	Collapsed II2G13G: ICT Support/Use of ICT hindered/Insufficient of ICT skills among teachers	N of Cases	Sum of TOTWGTS	Sum of TOTWGTS (s.e.)	Percent	Percent (s.e.)
Chile	A lot or to some extent	1883	144889	12759.35	68.05	5.73
	Very little or not at all	1005	68028	12611.18	31.95	5.73
Denmark	A lot or to some extent	1107	29645	2984.73	52.57	4.92
	Very little or not at all	990	26747	3006.40	47.43	4.92
Finland	A lot or to some extent	2115	47779	2427.18	84.35	3.91
	Very little or not at all	355	8866	2231.84	15.65	3.91
France	A lot or to some extent	1558	425690	34236.08	66.75	4.25
	Very little or not at all	838	212021	27469.47	33.25	4.25
Germany	A lot or to some extent	2804	516805	31300.91	83.74	3.41
	Very little or not at all	429	100348	21036.26	16.26	3.41
Italy	A lot or to some extent	2109	402311	17753.48	80.83	3.06
	Very little or not at all	495	95408	15791.42	19.17	3.06
Kazakhstan	A lot or to some extent	1529	93219	8641.12	42.84	3.99
	Very little or not at all	1712	124399	9981.95	57.16	3.99
Korea, Republic of	A lot or to some extent	714	107821	15152.20	24.76	3.40
	Very little or not at all	2141	327589	16393.51	75.24	3.40
Luxembourg	A lot or to some extent	2865	3338	4.34	71.81	.04
	Very little or not at all	1120	1310	1.68	28.19	.04
Portugal	A lot or to some extent	1979	67080	4158.04	71.92	3.67
	Very little or not at all	1010	26192	3438.18	28.08	3.67
United States	A lot or to some extent	2606	1547649	136657.3	46.74	3.63
	Very little or not at all	3236	1763686	129981.2	53.26	3.63
Uruguay	A lot or to some extent	1193	22310	2429.14	66.59	5.06
	Very little or not at all	663	11196	1652.86	33.41	5.06
Russian Federation (Moscow)	A lot or to some extent	1148	32966	3660.20	36.62	4.26
	Very little or not at all	1687	57051	4649.82	63.38	4.26
Table average	A lot or to some extent	.	.	.	63.53	1.05
	Very little or not at all	.	.	.	36.47	1.05
Germany, North Rhine-Westphalia	A lot or to some extent	1706	141957	5580.74	91.86	2.38
	Very little or not at all	165	12586	3717051	8.14	2.38

Note: s.e. = standard error.

4.7 Trend analyses

Four of the countries that participated in ICILS 2013 also participated in ICILS 2018. Three of these countries met the necessary sample participation requirements within each cycle to allow valid comparisons of students' CIL achievement across the two cycles. When performing trend analyses, users should note that the process of equating the tests across the two cycles of ICILS introduces some additional error into the calculation of any test statistic. Therefore, this additional error, termed the equating error, needs to be recognized and incorporated when calculating the standard error of any differences between results from different cycles.

In order to estimate the standard error (SE) of a trend statistic, the mean and its standard error needs to be estimated for each cycle. The trend is the difference between the means. To estimate the standard error of the difference, the two standard errors of the means need to be combined with the equating error:

$$SE(\mu_{(ICILS18)} - \mu_{(ICILS13)}) = \sqrt{SE^2_{\mu ICILS18} + SE^{\,2}_{SE^2 \mu ICILS13} + EqErr^2}$$

where $SE(\mu_{(ICILS18)} - \mu_{(ICILS13)})$ is the the standard error of the trend analysis, μ can be any statistic in units on the equated ICILS scale (mean, percentile, gender difference, but not percentages) and $SE_{\mu ICILS18}$ and $SE_{\mu ICILS13}$ are the respective standard errors of this statistic from the two surveys. *EqErr* denotes the equating error that reflects the uncertainty in the link between both assessments, which was equal to 3.9 score points for the CIL scale. Please see also chapter 13 of the ICILS 2018 technical report (Fraillon et al. 2020b), which includes a section on reporting of differences.

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APPENDIX A:

International version of the ICILS 2018 questionnaires

Overview

The ICILS 2018 international database includes data for all questionnaires administered as part of the ICILS 2018 assessment. This appendix contains the international version of the ICILS 2018 questionnaires in the following five sections:

- Section 1: Principal questionnaire
- Section 2: ICT coordinator questionnaire
- Section 3: Teacher questionnaire
- Section 4: Student questionnaire
- Section 5: National contexts survey

Each section contains the international version of the questionnaire with variable names labeled next to the corresponding question. Questionnaires are presented as administered. The ICILS 2018 questionnaires were designed to provide an opportunity for individual countries to modify some questions or response options. This feature allowed countries to include the appropriate wording or options most consistent with their own national systems, languages, and cultures. In the international version of the questionnaires, such questions contain instructions to the national research coordinators (NRCs) to substitute the appropriate wording for their country and/or to modify or delete any inappropriate questions or options. These instructions were indicated in the questionnaires by text inserted within angle brackets (<country-specific>). NRCs were asked to substitute, if necessary, an appropriate national adaptation that would retain the same basic interpretation as the text within brackets. Appendix B of this user guide documents these national adaptations.

Section 1: Principal questionnaire

IEA International Computer and Information Literacy Study

Principal Questionnaire for the Main Survey

November 2017

Confidential to ICILS 2018
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IEA

ACER
The Australian Council *for* Educational Research

[INTRODUCTION TO THE SCHOOL PRINCIPAL QUESTIONNAIRE]

Thank you for taking part in the 2018 International Computer and Information Literacy Study. The purpose of this study is to examine across different countries the extent to which young people in [target grade] have developed computer and information literacy, which is defined as the ability to use Information and Communications Technology (ICT) to investigate, create, and communicate with others at home, school, the workplace and in society.

In this questionnaire ICT can refer to:

- desktop computers
- notebook or laptop computers
- netbook computers
- tablet devices
- [smartphones], except when being used for talk and text.

In this questionnaire you will find questions about:

- You and your use of ICT
- Characteristics of your school
- The application of ICT in teaching and learning at your school
- Aspects of the management of ICT in your school.

Please answer the questions with reference to [the school of the sampled students] as a whole.

In answering the questions please refer to the following definition of 'school': A school is [to be country adapted].

For some of the questions you are asked to answer referring only to [target grade] students. Please look at the instructions given in each of the questions.

We thank you for your effort and cooperation!

ABOUT YOU AND YOUR USE OF ICT

Q1 Are you female or male?

Female ☐ Male ☐ IP2G01

Q2 How often do you use ICT for the following activities?

(Please mark one choice in each row)

		Never	Less than once a month but not every week	At least once a month but not every day	At least once a week	Every day	
a)	Search for information on the Internet or a network maintained by education authorities for its schools	☐	☐	☐	☐	☐	IP2G02A
b)	Provide information about an educational issue through a website	☐	☐	☐	☐	☐	IP2G02B
c)	Look up records in a database (e.g. in a student information system)	☐	☐	☐	☐	☐	IP2G02C
d)	Maintain, organize and analyze data (e.g. with a spreadsheet or database)	☐	☐	☐	☐	☐	IP2G02D
e)	Prepare presentations	☐	☐	☐	☐	☐	IP2G02E
f)	Communicate with teachers in your school	☐	☐	☐	☐	☐	IP2G02F
g)	Communicate with education authorities	☐	☐	☐	☐	☐	IP2G02G
h)	Communicate with principals and senior staff in other schools	☐	☐	☐	☐	☐	IP2G02H
i)	Communicate with parents	☐	☐	☐	☐	☐	IP2G02I
j)	Work with a learning management system (e.g. [Moodle])	☐	☐	☐	☐	☐	IP2G02J
k)	Use social media to communicate with the wider community about school-related activities	☐	☐	☐	☐	☐	IP2G02K
l)	Management of staff (e.g. scheduling, professional development)	☐	☐	☐	☐	☐	IP2G02L
m)	Preparing the curriculum	☐	☐	☐	☐	☐	IP2G02M
n)	School financial management	☐	☐	☐	☐	☐	IP2G02N

YOUR SCHOOL

When answering the questions in this section, please refer to the definition of 'school' given in the note at the beginning of this questionnaire.

Q3 What is the total number of boys and girls in the school?

Record 0 (zero), if none.

☐☐☐☐ Total number of girls IP2G03A

☐☐☐☐ Total number of boys IP2G03B

Q4 What is the total number of boys and girls in the school?

Record 0 (zero), if none.

☐☐☐☐ Total number of girls IP2G04A

☐☐☐☐ Total number of boys IP2G04B

Q5 (a) What is the lowest (youngest) grade that is taught at your school?

(Please mark only one choice) IP2G05A

- [National Adaptation 1] ☐
- [National Adaptation 2] ☐
- [National Adaptation 3] ☐
- [National Adaptation 4] ☐
- [National Adaptation 5] ☐
- [National Adaptation 6] ☐
- [National Adaptation 7] ☐
- [National Adaptation 8] ☐

b) What is the highest (oldest) grade that is taught at your school?

(Please mark only one choice) IP2G05B

- [National Adaptation 9] ☐
- [National Adaptation 10] ☐
- [National Adaptation 11] ☐
- [National Adaptation 12] ☐
- [National Adaptation 13] ☐
- [National Adaptation 15] ☐

Q6 What are the total numbers of full-time and part-time teachers in your school?

A full-time teacher is employed on a regular basis as a teacher for at least 90% of full-time hours for the full school year. All other teachers should be considered part-time.

Record 0 (zero), if none.

a) ☐☐☐☐ Total number of full-time teachers IP2G06A

b) ☐☐☐☐ Total number of part-time teachers IP2G06B

Q7 Which of the following best describes where your school is located?

(Please mark only one choice) IP2G07

- In a community with fewer than 3,000 people ☐
- In a town with at least 3,000 but less than 15,000 people ☐
- In a town with at least 15,000 but less than 100,000 people ☐
- In a city with at least 100,000 but less than 1,000,000 people ☐
- In a city with 1,000,000 or more people ☐

Q8a Is this school a public or a private school?

(Please mark only one choice) IP2G08A

A public school

(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.)

A private school

(This is a school managed directly or indirectly by a non-government organization; for example, a church, trade union, business, or other private institution.)

Q8b Approximately what percentage of students in your school have the following backgrounds?

(Please mark one choice in each row)

		0 to 10%	11 to 25%	26 to 50%	More than 50%	
a)	Come from economically affluent homes or a network maintained by education authorities for its schools	☐	☐	☐	☐	IP2G08BA
b)	Come from economically disadvantaged homes	☐	☐	☐	☐	IP2G08BB

ICT AND TEACHING IN YOUR SCHOOL

Q9 How important is each of the following outcomes of education in your school?

(Please mark one choice in each row)

		Very important	Quite important	Somewhat important	Not important	
a)	The development of students' basic computer skills (e.g. internet use, email, word processing, presentation software)	☐	☐	☐	☐	IP2G09A
b)	The development of students' skills in using ICT for collaboration with others	☐	☐	☐	☐	IP2G09B
c)	The use of ICT for facilitating students' responsibility for their own learning	☐	☐	☐	☐	IP2G09C
d)	The use of ICT to augment and improve students' learning	☐	☐	☐	☐	IP2G09D
e)	The development of students' understanding and skills relating to safe and appropriate use of ICT	☐	☐	☐	☐	IP2G09E
f)	The development of students' proficiency in accessing and using information with ICT	☐	☐	☐	☐	IP2G09F
g)	The development of students' ability to write [apps] or programs	☐	☐	☐	☐	IP2G09G

Q10 Are there procedures in place to monitor whether teachers at this school use ICT to achieve the following learning outcomes?

*(Please select **all** that apply for **each** row)*

		Yes, by reviewing lesson plans	Yes, through teacher self-evaluation	Yes, through observing classrooms	Yes, by other means	No, this is not monitored
a)	The development of students' basic computer skills (e.g. internet use, email, word processing, presentation software)	IP2G10AA	IP2G10AB	IP2G10AC	IP2G10AD	IP2G10AE
b)	The development of students' skills in using ICT for collaboration with others	IP2G10BA	IP2G10BB	IP2G10BC	IP2G10BD	IP2G10BE
c)	The use of ICT for facilitating students' responsibility for their own learning	IP2G10CA	IP2G10CB	IP2G10CC	IP2G10CD	IP2G10CE
d)	The use of ICT to augment and improve students' learning	IP2G10DA	IP2G10DB	IP2G10DC	IP2G10DD	IP2G10DE
e)	The development of students' understanding and skills relating to safe and appropriate use of ICT	IP2G10EA	IP2G10EB	IP2G10EC	IP2G10ED	IP2G10EE
f)	The development of students' proficiency in accessing and using information with ICT	IP2G10FA	IP2G10FB	IP2G10FC	IP2G10FD	IP2G10FE
g)	The development of students' ability to write [apps] or programs	IP2G10GA	IP2G10GB	IP2G10GC	IP2G10GD	IP2G10GE

Q11 Are teachers in your school expected to acquire knowledge and skills in each of the following activities?

(Please mark one choice in each row)

		Expected and required	Expected but not required	Not expected	
a)	Integrate Web-based learning in their instructional practice	☐	☐	☐	IP2G11A
b)	Use ICT-based forms of student assessment	☐	☐	☐	IP2G11B
c)	Use ICT for monitoring student progress	☐	☐	☐	IP2G11C
d)	Collaborate with other teachers via ICT	☐	☐	☐	IP2G11D
e)	Communicate with parents via ICT	☐	☐	☐	IP2G11E
f)	Communicate with students via ICT	☐	☐	☐	IP2G11F
g)	Integrate ICT into teaching and learning	☐	☐	☐	IP2G11G
h)	Use subject-specific digital learning resources (e.g. tutorials, simulation)	☐	☐	☐	IP2G11H
i)	Use e-portfolios for assessment	☐	☐	☐	IP2G11I
j)	Use ICT to develop authentic (real-life) assignments for students	☐	☐	☐	IP2G11J
k)	Assess students' [computer and information literacy]	☐	☐	☐	IP2G11K

MANAGEMENT OF ICT IN YOUR SCHOOL

Q12 Who has the main responsibility for making decisions about each of the following aspects of ICT in this school?

(Please mark one choice in each row)

		[Ministry, department or local/ district authority]	School boards/ councils	School principal or deputy	[Heads of department]	ICT coordinator	Information specialist or librarian	Individual teachers	No one	
a)	The procurement of ICT equipment	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12A
b)	The choice of non-digital learning materials	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12B
c)	The choice of digital learning materials	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12C
d)	The selection of a learning management system	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12D
e)	The maintenance of ICT equipment	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12E
f)	Decisions about whether ICT is used in teaching	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12F
g)	The implementation of ICT-based approaches in teaching	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12G
h)	The implementation of ICT-based approaches in administration	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12H
i)	The use of ICT-based approaches to assessment	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12I
j)	The assessment of students' [computer and information literacy]	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12J
k)	The implementation of a [computer and information literacy] curriculum at the school	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12K
l)	The development of ICT-related teacher competencies	☐	☐	☐	☐	☐	☐	☐	☐	IP2G12L

Q13 Does your school or school system have policies with regard to the following aspects of ICT use?

(Please mark one choice in each row)

		Yes	No	
a)	The provision of security measures to prevent unauthorized system access or entry	☐	☐	IP2G13A
b)	Restrictions on the number of hours students are allowed to sit at a computer	☐	☐	IP2G13B
c)	Student access to school computers outside class hours (but during school hours)	☐	☐	IP2G13C
d)	Student access to school computers outside school hours	☐	☐	IP2G13D
e)	The fulfillment of intellectual property rights (e.g. software copyrights)	☐	☐	IP2G13E
f)	Prohibitions of access to inappropriate material (e.g. pornography, violence)	☐	☐	IP2G13F
g)	Student use of non-school related games on school computers	☐	☐	IP2G13G
h)	The provision of access to school computers and/or the Internet for the local community (parents and/or others)	☐	☐	IP2G13H
i)	Support for [students with special needs or specific learning difficulties]	☐	☐	IP2G13I
j)	Unacceptable behaviours towards other students (e.g. [Cyberbullying])	☐	☐	IP2G13J
k)	The provision of laptop computers and/or other mobile learning devices for student use at school and at home	☐	☐	IP2G13K
l)	Student use of their own ICT at school	☐	☐	IP2G13L

Q14 Throughout the current school year, how many teachers in this school participate in the following forms of professional development about ICT for teaching and learning?

(Please mark one choice in each row)

		None or hardly any	Some of them	Most of them	All or nearly all	
a)	Courses on the use of ICT in teaching provided by the school or the school system	☐	☐	☐	☐	IP2G14A
b)	Training by another teacher who has attended a course on ICT	☐	☐	☐	☐	IP2G14B
c)	Discussions about the use of ICT in education as a regular item during meetings of the teaching staff	☐	☐	☐	☐	IP2G14C
d)	Observations of colleagues using ICT in their teaching	☐	☐	☐	☐	IP2G14D
e)	Group discussions of teachers about their use of ICT in teaching	☐	☐	☐	☐	IP2G14E
f)	Participation in professional learning programs delivered online	☐	☐	☐	☐	IP2G14F
g)	Participation in courses on ICT conducted by an external agency or expert	☐	☐	☐	☐	IP2G14G
h)	Participation in a [community of practice] concerned with ICT in teaching	☐	☐	☐	☐	IP2G14H

Q15 At your school, what priority is given to the following ways of facilitating the use of ICT in teaching and learning?

(Please mark one choice in each row)

		High priority	Medium priority	Low priority	Not a priority	
a)	Increasing the numbers of computers per student in the school	☐	☐	☐	☐	IP2G15A
b)	Increasing the number of computers connected to the Internet	☐	☐	☐	☐	IP2G15B
c)	Increasing the bandwidth of Internet access for the computers connected to the Internet	☐	☐	☐	☐	IP2G15C
d)	Increasing the range of digital learning resources available for teaching and learning	☐	☐	☐	☐	IP2G15D
e)	Establishing or enhancing an online learning support platform	☐	☐	☐	☐	IP2G15E
f)	Supporting participation in professional development on pedagogical use of ICT	☐	☐	☐	☐	IP2G15F
g)	Increasing the availability of qualified technical personnel to support the use of ICT	☐	☐	☐	☐	IP2G15G
h)	Providing teachers with incentives to integrate ICT use in their teaching	☐	☐	☐	☐	IP2G15H
i)	Providing more time for teachers to prepare lessons in which ICT is used	☐	☐	☐	☐	IP2G15I
j)	Increasing the professional learning resources for teachers in the use of ICT	☐	☐	☐	☐	IP2G15J

Section 2: ICT coordinator questionnaire

IEA International Computer and Information Literacy Study

ICT-Coordinator Questionnaire for the Main Survey

November 2017

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IEA

ACER
The Australian Council *for* Educational Research

[INTRODUCTION FOR ICT-COORDINATORS TO THE QUESTIONNAIRE]

This questionnaire is concerned with Information and Communication Technology (ICT) in schools and in particular the resources and support available for its use.

In this questionnaire ICT can be:

- desktop computers
- notebook or laptop computers
- netbook computers
- tablet devices
- [smartphones], except when being used for talk and text.

In this questionnaire you will find questions about:

- Your position as ICT coordinator
- ICT resources in your school
- Support for ICT use in your school.

Please answer as accurately as you can.

We have estimated that it will take less than 15 minutes of your time to complete the questionnaire.

Thank you for making that time available.

ABOUT YOUR POSITION

This questionnaire asks for information about ICT resources (including computers) in your school as well as pedagogical practices that use ICT. It is important that the person responding knows about the ICT facilities in your school and about practices regarding their use.

The questionnaire should be completed by the person with designated responsibility for ICT in the school. If there is no person with designated responsibility for ICT in the school, the questionnaire should be completed by the principal or [deputy-principal].

If you do not have the information to answer particular questions, then please consult other persons in your school

Q1 Do you, at your school, hold the position of technology or computer coordinator?

(Please mark only one choice) II2G01

- ☐ Yes, I formally serve as coordinator.
- ☐ Yes, I informally serve as coordinator.
- ☐ I am not the ICT-coordinator, but I am answering as the school principal or his/her designate.

Q2 Which of the following teaching duties do you have?

(Please mark one choice in each row)

		Yes	No	
a)	I teach ICT courses to students.	☐	☐	II2G02A
b)	I teach other subjects (not related to learning about ICT) to students.	☐	☐	II2G02B
c)	I do not have any teaching duties for students.	☐	☐	II2G02C
d)	I teach ICT courses to, or conduct workshops for, teachers and other school staff.	☐	☐	II2G02D

Q3 How many years has your school been using ICT for teaching and/or learning purposes for students in [target grade]?

(Please mark only one choice) II2G03

- ☐ Never, we do not use ICT
- ☐ Fewer than 5 years
- ☐ At least 5 but fewer than 10 years
- ☐ 10 years or more

ICT RESOURCES

Q4 Please indicate the availability of the following technology resources in your school.
(Please mark one choice in each row)

		Available to teachers and students	Available only to teachers	Available only to students	Not available	
a)	Digital learning resources that can be accessed offline	☐	☐	☐	☐	II2G04A
b)	Digital learning resources that can only be used online	☐	☐	☐	☐	II2G04B
c)	Access to the Internet through the school network	☐	☐	☐	☐	II2G04C
d)	Access to an education site or network maintained by education authorities	☐	☐	☐	☐	II2G04D
e)	Email accounts for school-related use	☐	☐	☐	☐	II2G04E

Q5 Please indicate the availability of each of the following software resources at your school.

(Please mark one choice in each row)

		Available to teachers and students	Available only to teachers	Available only to students	Not available	
a)	Practice programs or [apps] where teachers decide which questions are asked of students (e.g. [Quizlet, Kahoot], [mathfessor])	☐	☐	☐	☐	II2G05A
b)	Single user digital learning games (e.g. [languages online])	☐	☐	☐	☐	II2G05B
c)	Multi-user digital learning games with graphics and inquiry tasks (e.g. [Quest Atlantis])	☐	☐	☐	☐	II2G05C
d)	Word-processor software (e.g. [Microsoft Word®])	☐	☐	☐	☐	II2G05D
e)	Presentation software (e.g. [Microsoft PowerPoint®])	☐	☐	☐	☐	II2G05E
f)	Video and photo software for capture and editing (e.g. [Windows Movie Maker, iMovie, Adobe Photoshop])	☐	☐	☐	☐	II2G05F
g)	Concept mapping software (e.g. [Inspiration®], [Webspiration®])	☐	☐	☐	☐	II2G05G
h)	Data logging and monitoring tools (e.g. [Logger Pro]) that capture real-world data digitally for analysis (e.g. speed, temperature)	☐	☐	☐	☐	II2G05H
i)	Simulations and modelling software (e.g. [NetLogo])	☐	☐	☐	☐	II2G05I
j)	A learning management system (e.g. [Edmodo], [Blackboard])	☐	☐	☐	☐	II2G05J
k)	Graphing or drawing software	☐	☐	☐	☐	II2G05K
l)	e-portfolios (e.g. [VoiceThread])	☐	☐	☐	☐	II2G05L
m)	Digital contents linked with textbooks	☐	☐	☐	☐	II2G05M
n)	Social media (e.g. [Facebook, Twitter])	☐	☐	☐	☐	II2G05N

Q6 Please indicate the availability of the following technology facilities at [target grade].

(Please mark one choice in each row)

		Available to teachers and students	Available only to teachers	Available only to students	Not available	
a)	Remote access to a school network	☐	☐	☐	☐	II2G06A
b)	Space on a school network to store files	☐	☐	☐	☐	II2G06B
c)	A school intranet with applications and workspaces	☐	☐	☐	☐	II2G06C
d)	Internet-based applications for collaborative work (e.g. [Google Docs®])	☐	☐	☐	☐	II2G06D
e)	A 3D printer	☐	☐	☐	☐	II2G06E
f)	Robots or robotic devices	☐	☐	☐	☐	II2G06F
g)	Access to a wireless LAN (Wi-fi)	☐	☐	☐	☐	II2G06G
h)	A learning management system (e.g. [WebCT®], [Moodle])	☐	☐	☐	☐	II2G06H

Q7a In your school, approximately how many of the following types of (school-provided) ICT devices are available?

For this question please:

- *Count terminals (if they have a keyboard and a screen) as computers*
- *Exclude computers that are not in use (e.g. in storage)*
- *Exclude computers that are only used as servers*
- *Record 0 (zero), if none.*

	All devices in the school	Devices available for student use
Desktop computers	☐☐☐☐	☐☐☐☐
	II2G07AA1	II2G07AA2
Laptops/notebooks	☐☐☐☐	☐☐☐☐
	II2G07AB1	II2G07AB2
Tablet devices	☐☐☐☐	☐☐☐☐
	II2G07AC1	II2G07AC2

Q7b Approximately, what percentage of all ICT devices in the school (include all types) are connected to the Internet?

☐☐☐☐ %

II2G07B

Q7c In your school, about how many (school-provided) smart boards or interactive whiteboards are available?

Record 0 (zero), if none.

☐☐☐☐ %

II2G07C

Q8 Does your school or [educational authority] provide teachers with their own portable digital device?

(Please mark only one choice)

II2G08

- ☐ Yes, for every teacher
- ☐ Yes, but not for all teachers
- ☐ No

Q9 Approximately what percentage of students at the [target grade] have access to portable computers (laptops, netbooks or tablet devices) at school?

(Please mark one choice in each row)

		0 to 25%	26 to 50%	51 to 75%	76 to 100%	
a)	Students provided with portable computers by their [school] for use at school only	☐	☐	☐	☐	II2G09A
b)	Students provided with portable computers by their [school] for use at home and at school	☐	☐	☐	☐	II2G09B
c)	Students bring portable computers which they own to use at school	☐	☐	☐	☐	II2G09C

Q10 Where are school ICT devices for teaching and learning in [target grade] located?

(Please mark one choice in each row)

		Yes	No	
a)	In most (80% or more) classrooms	☐	☐	II2G10A
b)	In computer laboratories	☐	☐	II2G10B
c)	As class sets of computers that can be moved between classrooms	☐	☐	II2G10C
d)	In the library	☐	☐	II2G10D
e)	In other places accessible to students (e.g. cafeteria, auditorium, study area)	☐	☐	II2G10E
f)	Students bring the devices to class	☐	☐	II2G10F

ICT SUPPORT

Q11 At your school, who provides [routine/day-to-day] technical ICT support?
(Please mark one choice in each row)

		Yes	No	
a)	Yourself	☐	☐	II2G11A
b)	A network administrator in the school (other than yourself)	☐	☐	II2G11B
c)	ICT technical staff (other than yourself) at the school	☐	☐	II2G11C
d)	Administrators or school staff (other than yourself)	☐	☐	II2G11D
e)	Teachers (other than yourself)	☐	☐	II2G11E
f)	Staff from the relevant education authority responsible for the school	☐	☐	II2G11F
g)	Personnel from external companies contracted to provide maintenance	☐	☐	II2G11G
h)	Students from this school	☐	☐	II2G11H

Q12 At your school, who provides [routine/day-to-day] pedagogical ICT support for teachers?
(Please mark one choice in each row)

		Yes	No	
a)	Yourself	☐	☐	II2G12A
b)	ICT technical staff (other than yourself) at the school	☐	☐	II2G12B
c)	Administrators or school staff (other than yourself)	☐	☐	II2G12C
d)	Librarians, library staff or information specialists (other than yourself)	☐	☐	II2G12D
e)	Teachers (other than yourself	☐	☐	II2G12E
f)	Staff from the relevant education authority responsible for the school	☐	☐	II2G12F

Q13 To what extent is the use of ICT in teaching and learning at your school hindered by each of the following obstacles?

(Please mark one choice in each row)

		A lot	To some extent	Very little	Not at all	
a)	Too few computers with an Internet connection	☐	☐	☐	☐	II2G13A
b)	Insufficient Internet bandwidth or speed	☐	☐	☐	☐	II2G13B
c)	Not enough computers for instruction	☐	☐	☐	☐	II2G13C
d)	Lack of sufficiently powerful computers	☐	☐	☐	☐	II2G13D
e)	Problems in maintaining ICT equipment	☐	☐	☐	☐	II2G13E
f)	Not enough computer software	☐	☐	☐	☐	II2G13F
g)	Insufficient ICT skills among teachers	☐	☐	☐	☐	II2G13G
h)	Insufficient time for teachers to prepare lessons	☐	☐	☐	☐	II2G13H
i)	Insufficient effective professional learning resources for teachers	☐	☐	☐	☐	II2G13I
j)	Lack of an effective online learning support platform	☐	☐	☐	☐	II2G13J
k)	Insufficient incentives for teachers to integrate ICT use in their teaching	☐	☐	☐	☐	II2G13K
l)	Restricted access to useful Internet resources	☐	☐	☐	☐	II2G13L
m)	Insufficient technical ICT support	☐	☐	☐	☐	II2G13M
n)	Insufficient pedagogical support for the use of ICT	☐	☐	☐	☐	II2G13N

Q14 Is [computing, computer science, information technology, informatics or similar] taught as a standalone subject at the [target grade] in your school? II2G14

Yes ☐ Please continue with question 15

No ☐ Please go to the end of the questionnaire

Q15 In the teaching of [computing, computer science, information technology, informatics or similar] at the [target grade] in your school, how much emphasis is given to the following tasks?

(Please mark one choice in each row)

		Strong emphasis	Some emphasis	Little emphasis	No emphasis	
a)	Develop algorithms (e.g. instructions for a program like [Scratch])	☐	☐	☐	☐	II2G15A
b)	Write computer programs	☐	☐	☐	☐	II2G15B
c)	Evaluate computer programs	☐	☐	☐	☐	II2G15C
d)	Develop applications	☐	☐	☐	☐	II2G15D
e)	Refine computer code to improve efficiency	☐	☐	☐	☐	II2G15E
f)	Debug computer code	☐	☐	☐	☐	II2G15F
g)	Develop simulations	☐	☐	☐	☐	II2G15G
h)	Test solutions to problems using simulations	☐	☐	☐	☐	II2G15H
i)	Create visual displays of processes (e.g. flow charts, decision trees)	☐	☐	☐	☐	II2G15I

Section 3: Teacher questionnaire

IEA International Computer and Information Literacy Study

Teacher Questionnaire for the Main Survey

November 2017

Confidential to ICILS 2018
Do not cite or quote

IEA

ACER
The Australian Council *for* Educational Research

[INTRODUCTION FOR TEACHERS TO THE QUESTIONNAIRE]

This questionnaire is concerned with Information and Communication Technology (ICT) in schools, its use in teaching and learning, and students' development of Computer and Information Literacy (CIL).

In this questionnaire ICT can refer to:

- desktop computers
- notebook or laptop computers
- netbook computers
- tablet devices
- [smartphones], except when being used for talk and text.

In this questionnaire you will find questions about:

- Your background and familiarity with ICT
- Your use of ICT in teaching a reference [target grade] class
- The use of ICT in the school
- Learning to use ICT in teaching.

Some questions focus on a nominated 'reference' class. This is the first [target grade] class that you teach for a regular subject (i.e. other than home room, assembly) on or after the Tuesday following the last weekend before you first accessed this questionnaire. You may, of course, teach the class at other times during the week as well.

If you did not teach a [target grade] class on that Tuesday, please use the [target grade] class that you taught on the first day after that Tuesday.

Please answer as accurately as you can. You will mostly answer by clicking on a button. You can change your responses at any time until you have clicked on 'I've finished' at the end of the questionnaire.

We have estimated that it will take less than 30 minutes of your time to complete the questionnaire.

Thank you for making that time available.

ABOUT YOU

Q1 Are you female or male?

Female ☐ Male ☐ IT2G01

Q2 How old are you?

Less than 25 ☐ IT2G02

25–29 ☐

30–39 ☐

40–49 ☐

50–59 ☐

60 or over ☐

Q3 What are the main subjects that you teach in this school in the current school year?

(Please indicate the subjects that you teach in this school, indicating only those that individually account for at least [four lessons] each week in this school. The exact name of one or more of your subjects may not appear in the list for each category. If it does not, please mark the category you think best fits the subject.)

a)	[Language arts: test language]	☐	IT2G03A
b)	[Language arts: foreign or other national languages]	☐	IT2G03B
c)	Mathematics [Add any appropriate national examples]	☐	IT2G03C
d)	Sciences (general science and/or physics, chemistry, biology, geology, earth sciences, technical science)	☐	IT2G03D
e)	Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.)	☐	IT2G03E
f)	Creative arts (visual arts, music, dance, drama, etc.)	☐	IT2G03F
g)	[Information technology, computer studies or similar]	☐	IT2G03G
h)	Practical and vocational subjects [Add any appropriate national examples]	☐	IT2G03H
i)	Other (e.g. [moral/ethics, physical education, personal and social development])	☐	IT2G03I

Q4 In the current school year, at how many schools do you teach [target grade] students?

(Please mark only one choice)

IT2G04

- ☐ Only in this school
- ☐ In this and another school
- ☐ In this and in two other schools
- ☐ In this and in three or more other schools

ABOUT YOUR POSITION

Q5 Approximately how long have you been using ICT for teaching purposes?

(Please mark one choice in each row)

		Never	Less than two years	Between two and five years	More than five years	
a)	During lessons	☐	☐	☐	☐	IT2G05A
b)	Preparing lessons	☐	☐	☐	☐	IT2G05B

Q6 How often do you use ICT in these settings?

(Please mark one choice in each row)

		Never	Less than once a month	At least once a a month but not every week	At least once a a week but not every day	Every day	
a)	At school when teaching	☐	☐	☐	☐	☐	IT2G06A
b)	At school for other work-related purposes	☐	☐	☐	☐	☐	IT2G06B
c)	Outside school for work-related purposes	☐	☐	☐	☐	☐	IT2G06C
d)	Outside school for non-work-related purposes	☐	☐	☐	☐	☐	IT2G06D

Q7 How well can you do these tasks using ICT?

(Please mark one choice in each row)

		I know how to do this	I haven't done this but I could find out how	I do not I think I could do this	
a)	Find useful teaching resources on the Internet	☐	☐	☐	IT2G07A
b)	Contribute to a discussion forum / user group on the Internet (e.g. a wiki or blog)	☐	☐	☐	IT2G07B
c)	Produce presentations (e.g. [Microsoft PowerPoint®] or a similar program) with simple animation functions	☐	☐	☐	IT2G07C
d)	Use the Internet for online purchases and payments	☐	☐	☐	IT2G07D
e)	Prepare lessons that involve the use of ICT by students	☐	☐	☐	IT2G07E
f)	Use a spreadsheet program (e.g. [Microsoft Excel®]) for keeping records or analyzing data	☐	☐	☐	IT2G07F
g)	Assess student learning	☐	☐	☐	IT2G07G
h)	Collaborate with others using shared resources such as [Google Docs®], [Padlet]	☐	☐	☐	IT2G07H
i)	Use a learning management system (e.g. [Moodle], [Blackboard], [Edmodo])	☐	☐	☐	IT2G07I

YOUR USE OF ICT IN TEACHING

In this section of the questionnaire please focus your responses on your teaching practices in a 'reference' class.

This is the first [target grade] class that you teach for a regular subject (i.e. other than home room, assembly) on or after Tuesday following the last weekend before you first accessed this questionnaire. You may, of course, teach the class at other times during the week as well. If you did not teach a [target grade] class on that Tuesday, please use the [target grade] class that you taught on the first day after that Tuesday.

Q8 In the current school year, at how many schools do you teach [target grade] students?

(Please mark only one choice)

IT2G08

[Language arts: test language]l	☐
[Language arts: foreign or other national languages]	☐
Mathematics [Add any appropriate national examples]	
Sciences (general science and/or physics, chemistry, biology, ge-ology, earth sciences, technical sciences)	☐
Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.)	☐
Creative arts (visual arts, music, dance, drama, etc.)	☐
[Information technology, computer studies or similar]	☐
Practical and vocational subjects [Add any appropriate national examples]	☐
Other (e.g. [moral/ethics, physical education, personal and social development])	☐

Q9 In your teaching of the reference class in this school year, how much emphasis have you given to developing the following ICT-based capabilities in your students?

(Please mark one choice in each row)

		Strong emphasis	Some emphasis	Little emphasis	No emphasis	
a)	To access information efficiently	☐	☐	☐	☐	IT2G09A
b)	To display information for a given audience/ purpose	☐	☐	☐	☐	IT2G09B
c)	To evaluate the credibility of digital information	☐	☐	☐	☐	IT2G09C
d)	To share digital information with others	☐	☐	☐	☐	IT2G09D
e)	To use computer software to construct digital work products (e.g. presentations, documents, images and diagrams)	☐	☐	☐	☐	IT2G09E
f)	To provide digital feedback on the work of others (such as classmates)	☐	☐	☐	☐	IT2G09F
g)	To explore a range of digital resources when searching for information	☐	☐	☐	☐	IT2G09G
h)	To provide references for digital information sources	☐	☐	☐	☐	IT2G09H
i)	To understand the consequences of making information publically available online	☐	☐	☐	☐	IT2G09I

Q10 How often do <u>students</u> in your reference class use ICT for the following activities?

(Please mark one choice in each row)

		They do not engage in this activity	They never use ICT in this activity	They sometimes use ICT in this activity	They often use ICT in this activity	They always use ICT in this activity	
a)	Work on extended projects (i.e. lasting over a week)	☐	☐	☐	☐	☐	IT2G10A
b)	Work on short assignments (i.e. within one week)	☐	☐	☐	☐	☐	IT2G10B
c)	Explain and discuss ideas with other students	☐	☐	☐	☐	☐	IT2G10C
d)	Submit completed work for assessment	☐	☐	☐	☐	☐	IT2G10D
e)	Work individually on learning materials at their own pace	☐	☐	☐	☐	☐	IT2G10E
f)	Undertake open-ended investigations or field work	☐	☐	☐	☐	☐	IT2G10F
g)	Reflect on their learning experiences (e.g. by using a learning log)	☐	☐	☐	☐	☐	IT2G10G
h)	Communicate with other students on projects	☐	☐	☐	☐	☐	IT2G10H
i)	Plan a sequence of learning activities for themselves	☐	☐	☐	☐	☐	IT2G10I
j)	Analyze data	☐	☐	☐	☐	☐	IT2G10J
k)	Evaluate information resulting from a search	☐	☐	☐	☐	☐	IT2G10K
l)	Collect data for a project	☐	☐	☐	☐	☐	IT2G10L
m)	Create visual products or videos	☐	☐	☐	☐	☐	IT2G10M
n)	Share products with other students	☐	☐	☐	☐	☐	IT2G10N

Q11 How often do you use ICT with the following practices when teaching your reference class?

(Please mark one choice in each row)

		I do **not** use this practice with the reference class	I never use ICT with this practice	They use ICT with this practice	They use ICT with this practice	They use ICT with this practice	
a)	The presentation of information through direct class instruction	☐	☐	☐	☐	☐	IT2G11A
b)	The provision of remedial or enrichment support to individual students or small groups of students	☐	☐	☐	☐	☐	IT2G11B
c)	The support of student-led whole-class discussions and presentations	☐	☐	☐	☐	☐	IT2G11C
d)	The assessment of students' learning through tests	☐	☐	☐	☐	☐	IT2G11D
e)	The provision of feedback to students on their work	☐	☐	☐	☐	☐	IT2G11E
f)	The reinforcement of learning of skills through repetition of examples	☐	☐	☐	☐	☐	IT2G11F
g)	The support of collaboration among students	☐	☐	☐	☐	☐	IT2G11G
h)	The mediation of communication between students and experts or external mentors	☐	☐	☐	☐	☐	IT2G11H
i)	The communication with parents or [guardians] about students' learning	☐	☐	☐	☐	☐	IT2G11H
j)	The support of inquiry learning	☐	☐	☐	☐	☐	IT2G11J

Q12 How often did <u>you</u> use the following tools in <u>your</u> teaching of the ref-erence class this school year?

(Please mark one choice in each row)

		Never	In some lessons	In most lessons	In every or almost every lesson	
a)	Practice programs or apps where you ask students questions (e.g. [Quizlet, Kahoot], [mathfessor])	☐	☐	☐	☐	IT2G12A
b)	Digital learning games	☐	☐	☐	☐	IT2G12B
c)	Word-processor software (e.g. [Microsoft Word®])	☐	☐	☐	☐	IT2G12C
d)	Presentation software (e.g. [Microsoft PowerPoint®])	☐	☐	☐	☐	IT2G12D
e)	Spreadsheets (e.g. [Microsoft Ex-cel®])	☐	☐	☐	☐	IT2G12E
f)	Video and photo software for capture and editing (e.g. [Windows Movie Maker, iMovie, Adobe Photoshop])	☐	☐	☐	☐	IT2G12F
g)	Concept mapping software (e.g. [Inspiration®], [Webspiration®])	☐	☐	☐	☐	IT2G12G
h)	Simulations and modelling software (e.g. [NetLogo])	☐	☐	☐	☐	IT2G12H
i)	A learning management system (e.g. [Edmodo], [Blackboard])	☐	☐	☐	☐	IT2G12I
j)	Communication software (e.g. email, direct messaging, Skype)	☐	☐	☐	☐	IT2G12J
k)	Collaborative software (e.g. [Google Docs®], [Onenote], [Padlet])	☐	☐	☐	☐	IT2G12K
l)	Computer-based information resources (e.g. topic-related websites, wikis, encyclopaedia)	☐	☐	☐	☐	IT2G12L
m)	Interactive digital learning resources (e.g. learning objects)	☐	☐	☐	☐	IT2G12M
n)	Graphing or drawing software	☐	☐	☐	☐	IT2G12N
o)	e-portfolios (e.g. [VoiceThread])	☐	☐	☐	☐	IT2G12O
p)	Digital contents linked with textbooks	☐	☐	☐	☐	IT2G12P
q)	Social media (e.g. [Facebook, Twitter])	☐	☐	☐	☐	IT2G12Q

Q13 In your teaching of the reference class this school year, how much emphasis have you given to teaching the following skills?

(Please mark one choice in each row)

		Strong emphasis	Some emphasis	Little emphasis	No emphasis	
a)	To display information in different ways	☐	☐	☐	☐	IT2G13A
b)	To break a complex process into smaller parts	☐	☐	☐	☐	IT2G13B
c)	To understand diagrams that describe or show real-world problems	☐	☐	☐	☐	IT2G13C
d)	To plan tasks by setting out the steps needed to complete them	☐	☐	☐	☐	IT2G13D
e)	To use tools to make diagrams that help solve problems	☐	☐	☐	☐	IT2G13E
f)	To use simulations to help understand or solve real-world problems	☐	☐	☐	☐	IT2G13F
g)	To make flow diagrams to show the different parts of a process	☐	☐	☐	☐	IT2G13G
h)	To record and evaluate data to understand and solve a problem	☐	☐	☐	☐	IT2G13H
i)	To use real-world data to review and revise solutions to problems	☐	☐	☐	☐	IT2G13I

IN YOUR SCHOOL

Q14 To what extent do you agree or disagree with the following statements about the use of ICT in teaching at your school?

(Please mark one choice in each row)

		Strongly agree	Agree	Disagree	Strongly disagree	
a)	ICT is considered a priority for use in teaching.	☐	☐	☐	☐	IT2G14A
b)	My school has sufficient ICT equipment (e.g. computers).	☐	☐	☐	☐	IT2G14B
c)	The computer equipment in my school is up-to-date.	☐	☐	☐	☐	IT2G14C
d)	My school has access to sufficient digital learning resources (e.g. learning software or [apps]).	☐	☐	☐	☐	IT2G14D
e	My school has good connectivity (e.g. fast speed and stable) to the Internet.	☐	☐	☐	☐	IT2G14E
f)	There is enough time to prepare lessons that incorporate ICT.	☐	☐	☐	☐	IT2G14F
g)	There is sufficient opportunity for me to develop expertise in ICT.	☐	☐	☐	☐	IT2G14G
h)	There is sufficient technical support to maintain ICT resources.	☐	☐	☐	☐	IT2G14H

Q15 To what extent do you agree or disagree with the following statements about your use of ICT in teaching and learning at your school?

(Please mark one choice in each row)

		Strongly agree	Agree	Disagree	Strongly disagree	
a)	I work together with other teachers on improving the use of ICT in classroom teaching.	☐	☐	☐	☐	IT2G15A
b)	I collaborate with colleagues to develop ICT-based lessons.	☐	☐	☐	☐	IT2G15B
c)	I observe how other teachers use ICT in teaching.	☐	☐	☐	☐	IT2G15C
d)	I discuss with other teachers how to use ICT in teaching topics.	☐	☐	☐	☐	IT2G15D
e)	I share ICT-based resources with other teachers in my school.	☐	☐	☐	☐	IT2G15E

LEARNING TO USE ICT IN TEACHING

Q16 Did your [initial teacher education] include the following elements?

(Please mark one choice in each row)

		Yes	No	
a)	Learning how to use ICT	☐	☐	IT2G16A
b)	Learning how to use ICT in teaching	☐	☐	IT2G16B

Q17 How often have you participated in any of the following professional learning activities in the past two years?

(Please mark one choice in each row)

		Not at all	Once only	More than once	
a)	A course on ICT applications (e.g. word processing, presentations, internet use, spreadsheets, databases)	☐	☐	☐	IT2G17A
b)	A course or webinar on integrating ICT into teaching and learning	☐	☐	☐	IT2G17B
c)	Training on subject-specific digital teaching and learning resources	☐	☐	☐	IT2G17C
d)	Observations of other teachers using ICT in teaching	☐	☐	☐	IT2G17D
e)	An ICT-mediated discussion or forum on teaching and learning	☐	☐	☐	IT2G17E
f)	The sharing of digital teaching and learning resources with others through a collaborative workspace	☐	☐	☐	IT2G17F
g)	Use of a collaborative workspace to jointly evaluate student work	☐	☐	☐	IT2G17G
h)	A course on use of ICT for [students with special needs or specific learning difficulties]	☐	☐	☐	IT2G17H
i)	A course on how to use ICT to support personalized learning by students	☐	☐	☐	IT2G17I

APPROACHES TO TEACHING

Q18 To what extent do you agree or disagree with the following statements about using ICT in teaching and learning at school?

(Please mark one choice in each row)

	Using ICT at school ...	Strongly agree	Agree	Disagree	Strongly disagree	
a)	Impedes concept formation by students.	☐	☐	☐	☐	IT2G18A
b)	Helps students develop greater interest in learning.	☐	☐	☐	☐	IT2G18B
c)	Helps students to work at a level appropriate to their learning needs.	☐	☐	☐	☐	IT2G18C
d)	Results in students copying material from Internet sources.	☐	☐	☐	☐	IT2G18D
e)	Helps students develop problem solving skills.	☐	☐	☐	☐	IT2G18E
f)	Distracts students from learning.	☐	☐	☐	☐	IT2G18F
g)	Results in poorer written expression among students.	☐	☐	☐	☐	IT2G18G
h)	Results in poorer calculation and estimation skills among students.	☐	☐	☐	☐	IT2G18H
i)	Limits the amount of personal communication among students.	☐	☐	☐	☐	IT2G18I
j)	Enables students to collaborate more effectively.	☐	☐	☐	☐	IT2G18J
k)	Helps students develop skills in planning and self-regulation of their work.	☐	☐	☐	☐	IT2G18K
l)	Improves academic performance of students.	☐	☐	☐	☐	IT2G18L
m)	Enables students to access better sources of information.	☐	☐	☐	☐	IT2G18M

Section 4: Student questionnaire

IEA International Computer and Information Literacy Study

Student Questionnaire for the Main Survey

November 2017

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In this questionnaire you will find questions about:

- You, your home and your family
- Where and hor often you use of ICT
- What you use ICT for
- Your views about the use of ICT.

Please read each question carefully and answer as accurately as you can. In this questionnaire, you will mostly answer by clicking on a button. You can change your responses at any time until you have clicked on 'I've finished' at the end of the questionnaire.

There are also a few questions where you will need to write a short response.

In this questionnaire, there are no right or wrong answers. Your answers should be the ones that apply to you.

You may ask for help if you do not understand something or if you are not sure how to answer a question.

All your answers will be kept confidential.

ABOUT YOU

Q1 When were you born?

January – December (Month) IS2G01A

1997 – 2008 (Year) IS2G01B

Q2 Are you a girl or a boy?

Girl	Boy	IS2G02
☐	☐	

Q3 What is the highest level of education you expect to complete?

(Please mark one choice)

	IS2G03
[ISCED level 6, 7 or 8]	☐
[ISCED level 4 or 5]	☐
[ISCED level 3]	☐
[ISCED level 2]	☐
I do not expect to complete [ISCED level 2]	☐

ABOUT YOU

In this section you will be asked some questions about your family and your home.

Some of these questions will be about home and your parents or guardians who look after you — for example, step-parents or foster-parents. Select one parent or guardian as [parent or guardian 1] and the other as [parent or guardian 2].

If you share your time with more than one set of parents or guardians, please answer the following questions for those parents/guardians with whom you spend the most time. If you share your time only with one parent, please answer only the following questions for this parent.

Q4 In what country were you and your parents born?

(Please mark only one choice in each column)

	IS2G04A	IS2G04B	IS2G04C
	You	[Parent or guardian 1]	[Parent or guardian 2]
[Country of test]	☐	☐	☐
[Other country/Group A]	☐	☐	☐
[Other country/Group B]	☐	☐	☐
[Another country]	☐	☐	☐

Q5 What language do you speak at home most of the time?

(Please mark one choice)

	IS2G05
[Language of test]	☐
[Other language 1]	☐
[Other language 2]	☐
[Another language]	☐

Q6 Does your [parent or guardian 1] work in a paid [job]?

(Please mark one choice)

IS2G06

Yes ☐ (**Note**: Student will be directed to Q7a and Q8a)

No ☐ (**Note** Student will be directed to Q7b and Q8b)

Q7a What is your [parent or guardian 1]'s main [job]?

(for example high school teacher, kitchen-hand, sales manager)

(Please write in the [job] title)

IS2G07A

Q8a What does your [parent or guardian 1] do in his/her main [job]?

(for example teaches high school students, helps the cook prepare meals in a restaurant, manages a sales team)

(Please use a sentence to describe the kind of work he/she does in that [job])

IS2G08A

Q7b What was your [parent or guardian 1]'s last main [job]?

(for example high school teacher, kitchen-hand, sales manager)

Please tell us his/her last main [job]. If he/she has never had a paid [job], please write what he/she is currently doing.

(Please write in the [job] title)

IS2G07B

Q8b What did your [parent or guardian 1] do in his/her last main [job]?

(for example taught high school students, helped the cook prepare meals in a restaurant, managed a sales team)

(Please use a sentence to describe the kind of work he/she did in that [job] or what he/she is currently doing if he/she has never had a paid [job])

IS2G08B

Q9 What is the highest level of education completed by your [parent or guardian 1]?

If you are not sure which box to choose, please ask the [test administrator] for help.

(Please mark only one choice)

IS2G09

- [ISCED level 6, 7 or 8] ☐
- [ISCED level 4 or 5] ☐
- [ISCED level 3] ☐
- [ISCED level 2] ☐
- He/she did not complete [ISCED level 2]. ☐

Q10 Does your [parent or guardian 2] work in a paid [job]?

(Please mark one choice)

IS2G10

- Yes ☐ (**Note:** Student will be directed to Q11a and Q12a)
- No ☐ (**Note:** Student will be directed to Q11b and Q12b)

Q11a What is your [parent or guardian 2]'s main [job]?

(for example high school teacher, kitchen-hand, sales manager)

(Please write in the [job] title)

IS2G11A

Q12a What does your [parent or guardian 2] do in his/her main [job]?

(for example teaches high school students, helps the cook prepare meals in a restaurant, manages a sales team)

(Please use a sentence to describe the kind of work he/she does in that [job])

IS2G12A

Q11b What was your [parent or guardian 2]'s last main [job]?

(for example high school teacher, kitchen-hand, sales manager)

Please tell us his/her last main [job]. If he/she has never had a paid [job], please write what he/she is currently doing.

(Please write in the [job] title)

IS2G11B

Q12b What did your [parent or guardian 2] do in his/her last main [job]?

(for example taught high school students, helped the cook prepare meals in a restaurant, managed a sales team)

(Please use a sentence to describe the kind of work he/she did in that [job] or what he/she is currently doing if he/she has never had a paid [job])

IS2G12B

Q13 What is the highest level of education completed by your [parent or guardian 2]?

If you are not sure which box to choose, please ask the [test administrator] for help.

(Please mark only one choice)

IS2G13

- [ISCED level 6, 7 or 8] ☐
- [ISCED level 4 or 5] ☐
- [ISCED level 3] ☐
- [ISCED level 2] ☐
- He/she did not complete [ISCED level 2]. ☐

Q14 About how many books are there in your home?

(Please mark one choice)

IS2G14

- None or very few (0–10 books) ☐
- Enough to fill one shelf (11–25 books) ☐
- Enough to fill one bookcase (26–100 books) ☐
- Enough to fill two bookcases (101–200 books) ☐
- Enough to fill three or more bookcases (more than 200 books) ☐

Q15a How many of the following ICT devices are currently used in your home?

(Please mark one choice in each row)

		None	One	Two	Three or more	
a)	Desktop or [laptop] computers	☐	☐	☐	☐	IS2G15AA
b)	Tablet devices or e-readers (e.g. [iPad, Tablet PC, Kindle])	☐	☐	☐	☐	IS2G15AB

Q15b Do you have an Internet connection at home?

(Please mark one choice)

IS2G15B

Yes ☐

No ☐

YOUR USE OF ICT

Q16 How long have you been using each of the following types of ICT devices?

(Please mark one choice in each row)

		Never or less than one year	At least one year but less than three years	At least three years but less than five years	At least five years but less than seven years	Seven years or more	
a)	Desktop or [laptop] computers	☐	☐	☐	☐	☐	IS2G16A
b)	Tablet devices or e-readers (e.g. [iPad, Tablet PC, Kindle])	☐	☐	☐	☐	☐	IS2G16B
c)	[Smartphones] except for using text and calling	☐	☐	☐	☐	☐	IS2G16C

Q17 Who mainly taught you how to do the following activities?

(Please mark one choice in each row)

		My teachers	My family	My friends	I taught myself	I have never learned this	
a)	Communicate over the Internet	☐	☐	☐	☐	☐	IS2G17A
b)	Create or edit digital documents	☐	☐	☐	☐	☐	IS2G17B
c)	Create or edit digital presentations	☐	☐	☐	☐	☐	IS2G17C
d)	Change settings on an ICT device	☐	☐	☐	☐	☐	IS2G17D
e)	Find information on the Internet	☐	☐	☐	☐	☐	IS2G17E
f)	Use programs and files in a computer network	☐	☐	☐	☐	☐	IS2G17F

Q18 How often do you use ICT in these places?

Please do not count the use of [smartphones] when making phone calls or writing text messages.

(Please mark one choice in each row)

		Never	Less than once a month	At least once a month but not every	At least once a week but not every day	Every day	
a)	At school for school-related purposes	☐	☐	☐	☐	☐	IS2G18A
b)	At school for other purposes	☐	☐	☐	☐	☐	IS2G18B
c)	Outside of school for school-related purposes	☐	☐	☐	☐	☐	IS2G18C
d)	Outside of school for other purposes	☐	☐	☐	☐	☐	IS2G18D

Q19 How often do you use ICT for each of the following activities?

(Please mark one choice in each row)

		Never	Less than once a month	At least once a month but not every	At least once a week but not every day	Every day	
a)	Write or edit documents	☐	☐	☐	☐	☐	IS2G19A
b)	Use a spreadsheet to do calculations, store data or plot graphs (e.g. using [Microsoft Excel®])	☐	☐	☐	☐	☐	IS2G19B
c)	Create a simple "slideshow" presentation (e.g. using [Microsoft PowerPoint®])	☐	☐	☐	☐	☐	IS2G19C
d)	Record or edit videos	☐	☐	☐	☐	☐	IS2G19D
e)	Write computer programs, scripts or apps (e.g. using [Logo, LUA or Scratch])	☐	☐	☐	☐	☐	IS2G19E
f)	Use drawing, painting or graphics software or [apps]	☐	☐	☐	☐	☐	IS2G19F
g)	Produce or edit music	☐	☐	☐	☐	☐	IS2G19G
h)	Build or edit a webpage	☐	☐	☐	☐	☐	IS2G19H

Q20 How often do you use ICT to do each of the following communication activities?

(*Please mark one choice in each row)*

		Never	Less than once a month	At least once a month but not every	At least once a week but not every day	Every day	
a)	Share news about current events on social media	☐	☐	☐	☐	☐	IS2G20A
b)	Communicate with friends, family, or other people using instant messaging, voice or video chat (e.g. [Skype, WhatsApp, Viber])	☐	☐	☐	☐	☐	IS2G20B
c)	Send texts or instant messages to friends, family, or other people	☐	☐	☐	☐	☐	IS2G20C
d)	Write posts and updates about what happens in your life on social media	☐	☐	☐	☐	☐	IS2G20D
e)	Ask questions on forums or [Q&A, question and answer] websites	☐	☐	☐	☐	☐	IS2G20E
f)	Answer other peoples' questions on forums or [Q&A, question and answer] websites	☐	☐	☐	☐	☐	IS2G20F
g)	Write posts for your own blog (e.g. [WordPress, Tumblr, Blogger])	☐	☐	☐	☐	☐	IS2G20G
h)	Post images or video in social networks or online communities (e.g. [Facebook, Instagram or YouTube])	☐	☐	☐	☐	☐	IS2G20H
i)	Watch videos or images that other people have posted online	☐	☐	☐	☐	☐	IS2G20I
j)	Send or forward information about events or activities to other people	☐	☐	☐	☐	☐	IS2G20J

Q21 How often do you use ICT to do each of the following leisure activities?

(*Please mark one choice in each row)*

		Never	Less than once a month	At least once a month but not every	At least once a week but not every day	Every day	
a)	Search the Internet to find information about places to go or activities to do	☐	☐	☐	☐	☐	IS2G21A
b)	Read reviews on the Internet of things you might want to buy	☐	☐	☐	☐	☐	IS2G21B
c)	Read news stories on the Internet	☐	☐	☐	☐	☐	IS2G21C
d)	Search for online information about things you are interested in	☐	☐	☐	☐	☐	IS2G21D
e)	Use websites, forums, or online videos to find out how to do something	☐	☐	☐	☐	☐	IS2G21E
f)	Play games	☐	☐	☐	☐	☐	IS2G21F
g)	Listen to downloaded or streamed music	☐	☐	☐	☐	☐	IS2G21G
h)	Watch downloaded or streamed TV shows or movies	☐	☐	☐	☐	☐	IS2G21H

YOUR USE OF ICT

Q22 How <u>often</u> do you use ICT for the following school-related purposes?
(*Please mark one choice in each row)*

		Never	Less than once a month	At least once a month but not every	At least once a week but not every day	Every day	
a)	Prepare reports or essays	☐	☐	☐	☐	☐	IS2G22A
b)	Prepare presentations	☐	☐	☐	☐	☐	IS2G22B
c)	Work online with other students	☐	☐	☐	☐	☐	IS2G22C
d)	Complete [worksheets] or exercises	☐	☐	☐	☐	☐	IS2G22D
e)	Organize your time and work	☐	☐	☐	☐	☐	IS2G22E
f)	Take tests	☐	☐	☐	☐	☐	IS2G22F
g)	Use software or applications to learn skills or a subject (e.g. mathematics tutoring software, language learning software)	☐	☐	☐	☐	☐	IS2G22G
h)	Use the Internet to do research	☐	☐	☐	☐	☐	IS2G22H
i)	Use coding software to complete assignments (e.g. [Scratch])	☐	☐	☐	☐	☐	IS2G22I
j)	Make video or audio productions	☐	☐	☐	☐	☐	IS2G22J

Q23 At school, how <u>often</u> do you use ICT during lessons in the following subjects or subject areas?
(*Please mark one choice in each row)*

		I don't study this subject/ these subjects	Never	In some lessons	In most lessons	In every or almost every lesson	
a)	[Language arts: test language]	☐	☐	☐	☐	☐	IS2G23A
b)	[Language arts: foreign or other national languages]	☐	☐	☐	☐	☐	IS2G23B
c)	Mathematics [Add any appropriate national examples]	☐	☐	☐	☐	☐	IS2G23C
d)	Sciences (general science and/or physics, chemistry, biology, geology, earth sciences)	☐	☐	☐	☐	☐	IS2G23D
e)	Human sciences /Humanities/Social studies (history, geography, civics, law, economics, etc.)	☐	☐	☐	☐	☐	IS2G23E
f)	Creative arts ([visual] arts, music, dance, drama, etc.)	☐	☐	☐	☐	☐	IS2G23F
g)	[Information technology, computer studies or similar]	☐	☐	☐	☐	☐	IS2G23G
h)	Practical or vocational [Add any appropriate national examples]	☐	☐	☐	☐	☐	IS2G23H
i)	Other (e.g. [moral/ethics, physical education, personal and social development])	☐	☐	☐	☐	☐	IS2G23I

Q24 When studying throughout this school year, how often did you use the following tools during class?

(Please mark one choice in each row)

		Never	In some lessons	In most lessons	In every or almost every lesson	
a)	Tutorial software or [practice programs]	☐	☐	☐	☐	IS2G24A
b)	Word-processing software (e.g. [Microsoft Word®])	☐	☐	☐	☐	IS2G24B
c)	Presentation software (e.g. [Microsoft PowerPoint®])	☐	☐	☐	☐	IS2G24C
d)	Spreadsheets (e.g. [Microsoft Excel®])	☐	☐	☐	☐	IS2G24D
e)	Multimedia production tools (e.g. media capture and editing, web production)	☐	☐	☐	☐	IS2G24E
f)	Concept mapping software (e.g. [Inspiration®], [Webspiration®])	☐	☐	☐	☐	IS2G24F
g)	Tools that capture real-world data (e.g. speed, temperature) digitally for analysis	☐	☐	☐	☐	IS2G24G
h)	Simulations and modelling software	☐	☐	☐	☐	IS2G24H
i)	Computer-based information resources (e.g. websites, wikis, encyclopaedia)	☐	☐	☐	☐	IS2G24I
j)	Interactive digital learning resources (e.g. learning games or applications)	☐	☐	☐	☐	IS2G24J
k)	Graphing or drawing software	☐	☐	☐	☐	IS2G24K

Q25 At school, to what extent have you learned how to do the following tasks?

(Please mark one choice in each row)

		To a large extent	To a moderate extent	To a small extent	Not at all	
a)	Provide references to Internet sources	☐	☐	☐	☐	IS2G25A
b)	Search for information using ICT	☐	☐	☐	☐	IS2G25B
c)	Present information for a given audience or purpose using ICT	☐	☐	☐	☐	IS2G25C
d)	Work out whether to trust information from the Internet	☐	☐	☐	☐	IS2G25D
e)	Decide what information obtained from the Internet is relevant to include in school work	☐	☐	☐	☐	IS2G25E
f)	Organize information obtained from Internet sources	☐	☐	☐	☐	IS2G25F
g)	Decide where to look for information on the Internet about an unfamiliar topic	☐	☐	☐	☐	IS2G25G
h)	Use ICT to collaborate with others	☐	☐	☐	☐	IS2G25H

Q26 At school, have you learned about the importance of the fol-lowing topics?

(Please mark one choice in each row)

		Yes	No	
a)	To change passwords regularly (e.g. network account, email, social media)	☐	☐	IS2G26A
b)	To check the origin of emails before opening attachments	☐	☐	IS2G26B
c)	To log out of a shared computer at the end of a session	☐	☐	IS2G26C
d)	To share information on social media responsibly	☐	☐	IS2G26D

YOUR THOUGHTS ABOUT USING AND LEARNING ABOUT ICT

Q27 How well can you do each of these tasks when using ICT?

(*Please mark one choice in each row)*

		I know how to do do this	I have never done this but I could work out how to do this	I do not think I could do this	
a)	Edit digital photographs or other graphic images	☐	☐	☐	IS2G27A
b)	Create a database (e.g. using [Microsoft Access®])	☐	☐	☐	IS2G27B
c)	Write or edit text for a school assignment	☐	☐	☐	IS2G27C
d)	Search for and find relevant information for a school project on the Internet	☐	☐	☐	IS2G27D
e)	Build or edit a webpage	☐	☐	☐	IS2G27E
f)	Change the settings on your device to im-prove the way it operates	☐	☐	☐	IS2G27F
g)	Create a computer program, macro, or [app] (e.g. in [Basic, Visual Basic])	☐	☐	☐	IS2G27G
h)	Set up a local area network of computers or other ICT	☐	☐	☐	IS2G27H
i)	Create a multi-media presentation (with sound, pictures, or video)	☐	☐	☐	IS2G27I
j)	Upload text, images, or video to an online profile	☐	☐	☐	IS2G27J
k)	Insert an image into a document or message	☐	☐	☐	IS2G27K
l)	Install a program or [app]	☐	☐	☐	IS2G27L
m)	Judge whether you can trust information you find on the Internet	☐	☐	☐	IS2G27M

Q28 How much do you agree or disagree with the following statements about ICT?

(Please mark one choice in each row)

		Strongly agree	Agree	Disagree	Strong disagree	
a)	Advances in ICT usually improve people's living conditions.	☐	☐	☐	☐	IS2G28A
b)	ICT helps us to understand the world better.	☐	☐	☐	☐	IS2G28B
c)	Using ICT makes people more isolated in society.	☐	☐	☐	☐	IS2G28C
d)	With more ICT there will be fewer jobs.	☐	☐	☐	☐	IS2G28D
e	People spend far too much time using ICT.	☐	☐	☐	☐	IS2G28E
f)	ICT is valuable to society.	☐	☐	☐	☐	IS2G28F
g)	Advances in ICT bring many social benefits.	☐	☐	☐	☐	IS2G28G
h)	Using ICT may be dangerous for people's health.	☐	☐	☐	☐	IS2G28H
i)	I would like to study subjects related to ICT after [secondary school].	☐	☐	☐	☐	IS2G28I
j)	I hope to find a job that involves advanced ICT.	☐	☐	☐	☐	IS2G28J
k)	Learning how to use ICT applications will help me to do the work I am interested in.	☐	☐	☐	☐	IS2G28K

Q29 When studying during the current school year, to what extent have you been taught how to do the following tasks?

(Please mark one choice in each row)

		To a large extent	To a moderate extent	To a small extent	Not at all	
a)	To display information in different ways	☐	☐	☐	☐	IS2G29A
b)	To break a complex process into smaller parts	☐	☐	☐	☐	IS2G29B
c)	To understand diagrams that describe or show real-world problems	☐	☐	☐	☐	IS2G29C
d)	To plan tasks by setting out the steps needed to complete them	☐	☐	☐	☐	IS2G29D
e)	To use tools to make diagrams that help solve problems	☐	☐	☐	☐	IS2G29E
f)	To use simulations to help understand or solve real world problems	☐	☐	☐	☐	IS2G29F
g)	To make flow diagrams to show the different parts of a process	☐	☐	☐	☐	IS2G29G
h)	To record and evaluate data to understand and solve a problem	☐	☐	☐	☐	IS2G29H
i)	To use real-world data to review and revise solutions to problems	☐	☐	☐	☐	IS2G29I

Q30 Do you study [computing, computer science, information technology, informatics or similar] in the current school year?

IS2G30

Yes ☐

No ☐

Section 5: National contexts survey

IEA International Computer and Information Literacy Study

National Contexts Survey

May 2018

Confidential to ICILS 2018
Do not cite or quote

Introduction

This survey questionnaire is addressed to National Research Coordinators (NRCs), who are asked to supply information about their country's approach to developing computer information literacy among students. This will help provide important background information for interpretation of the data collected in other parts of the International Computer Information Literacy Study (ICILS). Your responses are vital in helping to provide a context for, and a better understanding of, the study results.

Instructions

We ask that you complete this survey questionnaire, working with others in your country as necessary (e.g., ministries and departments of education, relevant non-government organizations, specialist organizations concerned with supporting the application of educational technologies, and teachers associations).

It is important that you answer each question carefully and concisely and provide additional information where requested so that an accurate picture of your country's approach to computer information literacy is presented, particularly in relation to the target population (typically Grade 8).

In order to help you to complete the survey as accurately and concisely as possible there are accompanying Notes for Guidance. It is recommended that you read these first before beginning to complete the survey and refer to them when answering the questions in the sections of the survey.

Section C contains questions about ICT and learning at the lower secondary level (ISCED 2). In some countries, lower secondary education is taught as the second phase of primary or basic education. In this case, the questions should be answered with respect to the grades pertaining to this second phase of primary/basic education. Please refer to the UNESCO ISCED-11 classification to identify the corresponding study programme in your country or education system:

http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

Please complete this questionnaire at the latest by XXXXXXXX. Once you finished the questionnaire, please inform the ICILS International Study Center at ACER by sending a brief confirmation email to icils@acer.edu.au.

Section A. The education system

1. Who has responsibility for establishing the overarching goals and direction (e.g. global funding systems, curriculum development, establishment of assessment systems) for school education in your country?

(Please mark one choice)

NC2GA01

- Responsibility rests primarily with national ministry or department of education (1) ☐
- Responsibility rests primarily with state/provincial jurisdictions (2) ☐
- Responsibility rests primarily with local/municipal jurisdictions (3) ☐
- Responsibility is shared between/across authorities at different levels – please describe below (4) ☐

Other NC2GA01T1

Comments:

Please elaborate your answer to Question 1 by describing the responsibility at national and state/provincial level for the provision of school education in your country. NC2GA01T2

2. For what ages is school education compulsory in your country?

*(Please write a number in **each** box)*

a) At what age does compulsory education begin? NC2GA02A ☐

b) How many years of compulsory education are there? NC2GA02B ☐

Comments:

Please elaborate your answer to Question 2 if there is more than one possible answer to either part of this question (i.e. if the ages and numbers of years can vary across the country). NC2GA02T

3. Please outline the main characteristics of the institutions in which the following phases/cycles of education are provided in your country

(a) Education at the primary level ISCED 1 NC2GA03AT

You may need to differentiate and explain different types of school that operate. It would also be helpful to indicate the ways in which education for students with special needs is provided (e.g. mainly in special schools, in special classes within comprehensive schools or through an integrated system).If there are institutions that provide both ISCED 1 and ISCED 2 levels of education (as happens in some countries), please report on both levels for this institution under this question.

(b) Education at the lower secondary level <ISCED 2> NC2GA03BT

You may need to differentiate and explain different strands, tracks or programmes that exist at institutional level. This could include strands, tracks or programmes concerning:

- General education
- Pre-vocational/pre-technical education
- Vocational or technical education

(c) Education at the upper secondary level <ISCED 3> NC2GA03CT

You may need to differentiate and explain different strands, tracks or programmes that exist at institutional level. This could include strands, tracks or programmes concerning:

- General education
- Pre-vocational/pre-technical education
- Vocational or technical education

(d) The institutions in which education of the target grade mainly takes place. NC2GA03DT

In this response please indicate whether the target grade is most often located in an institution that provides primary and lower secondary education, lower secondary education only, or lower secondary and upper secondary education. It would be helpful to indicate the lowest grade and the highest grade included in the institutions that most often include the target grade and whether those institutions are comprehensive or specialized.

4. What is the approximate percentage of government (public) and non-government (private) schools that provide education at each ISCED level in your country?

*(Please write a percentage in each box and ensure that the percentages add to 100 in **each** row.)*

	Public/government schools	Private schools	Other schools (please describe):
a. <ISCED 1>	NC2GA04A01	NC2GA04A02	NC2GA04A03
b. <ISCED 2>	NC2GA04B01	NC2GA04B02	NC2GA04B03
c. <ISCED 3>	NC2GA04C01	NC2GA04C02	NC2GA04C03

Please use this space to elaborate your response.

NC2GA04T

5. On the basis of the most recent data, what is the percentage of target grade students in:

*(Please write a percentage in **each** box and ensure that the percentages add to 100.)*

a) Public/government schools NC2GA05A

b) Private schools NC2GA05B

c) Other schools NC2GA05C

Please use this space to elaborate your response and indicate the year in which that most recent data were collected. NC2GA05T

6a. How much autonomy do schools with students in the target grade have regarding the selection and purchase of ICT equipment?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding how they operate in order to meet their statutory obligations. (1)*	Some autonomy *Schools have some autonomy (including autonomy in some areas but not others) regarding how they operate in order to meet their statutory obligations. (2)*	Little or no autonomy *Schools have little or no autonomy regarding how they operate in order to meet their statutory obligations. The authority (or authorities) with responsibility for school education control and specify xhow schools are to be run in order to meet their statutory obligations. (3)*
a. Public/government schools NC2GA06AA	☐	☐	☐
b. Private schools NC2GA06AB	☐	☐	☐
c. Other schools NC2GA06AC	☐	☐	☐

Please provide written comments to support your response, if necessary

NC2GA06AT

6b. How much autonomy do schools with students in the target grade have regarding the selection and purchase of ICT equipment?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding the selection and purchase of ICT equipment. (1)*	Some autonomy *Schools have some autonomy regarding the selection and purchase of ICT equipment (with, for example, the relevant education authority(ies) mandating the provision/purchase of some equipment). (2)*	Little or no autonomy *Schools have little or no autonomy regarding the selection and purchase of ICT equipment. The authority (or authorities) with responsibility for school education control and specify schools' selection and purchase of ICT equipment. (3)*
a. Public/government schools NC2GA06BA	☐	☐	☐
b. Private schools NC2GA06BB	☐	☐	☐
c. Other schools NC2GA06BC	☐	☐	☐

Please provide written comments to support your response, if necessary

NC2GA06BT

6c. How much autonomy do schools with students in the target grade have regarding the selection and purchase software?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding the selection and purchase of software. (1)*	Some autonomy *Schools have some autonomy regarding the selection and purchase of software (with, for example, the relevant education authority(ies) mandating the provision/purchase of some software). (2)*	Little or no autonomy *Schools have little or no autonomy regarding the selection and purchase of software. The authority (or authorities) with responsibility for school education control and specify schools' selection and purchase of software. (3)*
a. Public/government schools NC2GA06CA	☐	☐	☐
b. Private schools NC2GA06CB	☐	☐	☐
c. Other schools NC2GA06CC	☐	☐	☐

Please provide written comments to support your response, if necessary

_____

_____

_____ NC2GA06CT

6d. How much autonomy do schools with students in the target grade have regarding staff participation in professional learning in the use of ICT?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding staff participation in professional learning in the use of ICT. (1)*	Some autonomy *Schools have some autonomy regarding staff participation in professional learning in the use of ICT (with, for example, the relevant education authority(ies) mandating some staff participation in professional learning). (2)*	Little or no autonomy *Schools have little or no autonomy regarding staff participation in professional learning in the use of ICT. The authority (or authorities) with responsibility for school education control and specify all staff participation in professional learning in the use of ICT. (3)*
a. Public/government schools NC2GA06DA	☐	☐	☐
b. Private schools NC2GA06DB	☐	☐	☐
c. Other schools NC2GA06DC	☐	☐	☐

Please provide written comments to support your response, if necessary

_____

_____

_____ NC2GA06DT

6e. How much autonomy do schools with students in the target grade have regarding ICT curriculum delivery?T

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding ICT curriculum delivery. (1)*	Some autonomy *Schools have some autonomy regarding ICT curriculum delivery (with, for example, the relevant education authority(ies) mandating some ICT curriculum delivery). (2)*	Little or no autonomy *Schools have little or no autonomy regarding ICT curriculum delivery. The authority (or authorities) with responsibility for school education control and specify ICT curriculum delivery. (3)*
a. Public/government schools NC2GA06EA	☐	☐	☐
b. Private schools NC2GA06EB	☐	☐	☐
c. Other schools NC2GA06EC	☐	☐	☐

Please provide written comments to support your response, if necessary

_____

_____

_____ NC2GA06ET

6f. How much autonomy do schools with students in the target grade have regarding the selection and appointment of their teachers?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding the selection and appointment of their teachers. (1)*	Some autonomy *Schools have some autonomy regarding the selection and appointment of their teachers but the relevant education authority(ies) also has some control of the selection and appointment of teachers in schools. (2)*	Little or no autonomy *Schools have little or no autonomy in the selection and appointment of their teachers. The authority (or authorities) with responsibility for school education control and specify the selection and appointment of teachers in schools. (3)*
a. Public/government schools NC2GA06FA	☐	☐	☐
b. Private schools NC2GA06FB	☐	☐	☐
c. Other schools NC2GA06FC	☐	☐	☐

Please provide written comments to support your response, if necessary

_____

_____

_____ NC2GA06FT

6g. How much autonomy do schools with students in the target grade have regarding the as-sessment of student achievement in computer and information literacy (or its equivalent)?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools are free or largely free to conduct their own assessments of student CIL (or equivalent). (1)*	Some autonomy *Schools have some autonomy in assessing student CIL, but this is combined with mandatory assessments from relevant school authorities. (2)*	Little or no autonomy *Schools have little or no autonomy in the assessment of CIL. All or almost all student assessment of CIL is developed and initiated by the relevant education authority(ies). (3)*
a. Public/government schools NC2GA06GA	☐	☐	☐
b. Private schools NC2GA06GB	☐	☐	☐
c. Other schools NC2GA06GC	☐	☐	☐

Please provide written comments to support your response, if necessary

NC2GA06GT

6h. How much autonomy do schools with students in the target grade have regarding the provision of technical support for ICT?

(Please mark one choice per school type)

School type	Complete or a high level of autonomy *Schools have full or almost full autonomy regarding the provision of technical support for ICT. (1)*	Some autonomy *Schools have some autonomy in enlisting and utilizing ICT technical support. This is combined with mandatory use of support from the relevant education authority(ies). (2)*	Little or no autonomy *Schools have little or no autonomy regarding the provision of technical support for ICT. Technical support for ICT is controlled and managed by the relevant education authority(ies). (3)*
a. Public/government schools NC2GA06HA	☐	☐	☐
b. Private schools NC2GA06HB	☐	☐	☐
c. Other schools NC2GA06HC	☐	☐	☐

Please provide written comments to support your response, if necessary

_____

_____

_____ NC2GA06HT

Section B. Plans and policies for using ICT in education

The questions in Section B relate to general policies and overall approaches to ICT in school education in your country rather than specifically to the target grade. Questions that address the approaches to the use of ICT in the target grade will be asked later in the questionnaire.

7. Are there plans or policies supporting the use of ICT in school education?

(Please mark one choice)

Yes, at the national level	NC2GB07A	☐	
Yes, at the state/provincial level	NC2GB07B	☐	If yes, please continue with question 8
Yes, at the local/district/municipal level	NC2GB07C	☐	
No, neither at the national state/provincial level or local/district/municipal level	NC2GB07D	☐	If no, please go to question 15

Comments:
Please use this space to elaborate your response. NC2GB07T

8. What are the key documents that outline the plans and policies for supporting the use of ICT for teaching and learning purposes in school education in your country

(Please provide a URL for each document if possible) NC2GB08T

9. Have there been any major changes introduced relevant to the approach and use of ICT in education in your country in the last 7 years?

(Please mark one choice)

NC2GB09

Yes (1) ☐

No (2) ☐

Comments:
If you answered 'yes', please describe, in brief, the nature of the changes and provide links/references to relevant documents: NC2GB09T

10. To what extent do the plans or policies for using ICT in education emphasize improving student learning with specific mention of the following aspects:

(Please mark one choice on each row)

		They explicitly state this aspect as an intended focus or outcome (1)	*They imply that this aspect is important, but it is not explicitly stated as an intended focus or outcome (2)*	*They place no emphasis on this aspect (3)*
a) Subject matter content (Language Arts, Science, etc.)	NC2GB10A	☐	☐	☐
b) Preparing students for using ICT in their future work	NC2GB10B	☐	☐	☐
c) Developing information literacy	NC2GB10C	☐	☐	☐
d) ICT-based skills in critical thinking, collaboration and communication	NC2GB10D	☐	☐	☐
e) Increasing access to online courses of study (e.g. for rural students)	NC2GB10E	☐	☐	☐
f) Computer programming or developing applications for digital devices	NC2GB10F	☐	☐	☐
g) Responsible and ethical use of digital devices including cyber-safety	NC2GB10G	☐	☐	☐

Comments:

Please use this space to elaborate your response. NC2GB10T

11. To what extent do the plans or policies for using ICT in education emphasize the importance of the following resources?

(Please mark one choice on each row)

		They explicitly state the need for the resource (1)	*They imply the need for the resource without explicitly stating that it is required (2)*	*They place no emphasis on this resource (3)*
a) Provision of computer equipment and other ICT resources	NC2GB11A	☐	☐	☐
b) Maintenance of computer equipment and other ICT resources	NC2GB11B	☐	☐	☐
c) Renewal, updating and replacement of computer equipment and other ICT resources	NC2GB11C	☐	☐	☐
d) Support for teachers for using computer equipment and other ICT resources in their work	NC2GB11D	☐	☐	☐
e) Access to digital educational resources	NC2GB11E	☐	☐	☐
f) Internet connectivity	NC2GB11F	☐	☐	☐
g) Home access to school-based digital education resources such as through school-hosted online portals	NC2GB11G	☐	☐	☐

Comments:

Please use this space to elaborate your response. NC2GB11T

12. To what extent do the plans or policies for using ICT in education emphasize the following methods of supporting student learning?

(Please mark one choice on each row)

		They explicitly state the need for this method (1)	*They imply the need for this method without explicitly stating it (2)*	*They place no emphasis on this method (3)*
a) Pre-service teacher education in the use of ICT	NC2GB12A	☐	☐	☐
b) In-service teacher education in the use of ICT	NC2GB12B	☐	☐	☐
c) The use of learning management systems	NC2GB12C	☐	☐	☐
d) Reporting to parents	NC2GB12D	☐	☐	☐
e) Providing feedback to students	NC2GB12E	☐	☐	☐

Comments:
Please use this space to elaborate your response. NC2GB12T

13. To what extent do the plans and policies for the use of ICT in education include the following aspects as priorities?

(Please mark one choice on each row)

		Not indicated as a priority (1)	*The need for this aspect is implicit in the plans and policies without being explicitly stated (2)*	*The aspect is explicitly stated in the plans and policies (3)*
a) Professional development for teachers' pedagogical use of ICT	NC2GB13A	☐	☐	☐
b) Sufficient ICT infrastructure and resources in schools	NC2GB13B	☐	☐	☐
c) Development of ICT-related competencies in students	NC2GB13C	☐	☐	☐
d) Development and provision of digital learning materials	NC2GB13D	☐	☐	☐
e) Reduction of the digital divide between groups of students	NC2GB13E	☐	☐	☐
f) Improvement of administrative and management systems in schools	NC2GB13F	☐	☐	☐
g) Use of ICT to improve communication with parents	NC2GB13G	☐	☐	☐

Please provide any further comments to support your responses above and also detail any other aspects of ICT in education that are indicated as priorities in plans and policies.

NC2GB13T

14. Do the plans and/or policies for using ICT in education refer to providing 1:1 computing in schools?
(Please mark one choice)

NC2GB14

Yes, plans and/or policies for ICT in education refer to providing 1:1 computing in schools (1) ☐

No, plans and/or policies for ICT in education do not refer to providing 1:1 computing in schools (2) ☐

Please indicate the targets for computer provision in schools or indicate that there are no targets. NC2GB14T

15. Is there formal support for the development of digital learning resources (e.g. digital curriculum resources or learning objects) through government agencies, incentives for other agencies, or encouragement to publishers to produce these resources?
(Please mark one choice)

NC2GB15

Yes, there is formal support for the development of digital resources (1) ☐

No, there is no formal support for the development of digital resources (2) ☐

Comments (please use this space to describe any support for the development of digital resources): NC2GB15T

16a. How is CIL education intended to be taught at the level of primary education (ISCED Level 1)

(Please mark one choice on each row)

		Yes, as a compulsory subject (1)	*Yes, as a non-compulsory subject (2)*	*No (3)*
It is taught as a separate subject by specializing in CIL-related education (such as ICT literacy/digital literacy/computing)	NC2GB16AA	☐	☐	☐

If you have selected yes,

a) please list the name of the subject(s) with an English translation (if applicable)

b) indicate whether the subject includes "coding" as well as applications. NC2GB16AAT

It is integrated into Science and Technology studies deemed to be relevant to CIL	NC2GB16AB	☐	☐	☐
It is integrated into a range of other subjects taught at school	NC2GB16AC	☐	☐	☐

Comments:
Please use this space to elaborate your response.

NC2GB16AT

16b. How is CIL education intended to be taught at the level of lower secondary education (ISCED Level 2 – the ICILS target grade)

(Please mark one choice on each row)

		Yes, as a compulsory subject (1)	*Yes, as a non-compulsory subject (2)*	*No (3)*
It is taught as a separate subject by teachers specializing in CIL-related education (such as as ICT literacy/digital literacy/computing)	NC2GB16BA	☐	☐	☐

If you have selected yes,

a) please list the name of the subject(s) with an English translation (if applicable)

b) indicate whether the subject includes "coding" as well as applications.

It is integrated into Science and Technology studies deemed to be relevant to CIL	NC2GB16BB	☐	☐	☐
It is integrated into a range of other subjects taught at school	NC2GB16BC	☐	☐	☐

Comments:
Please use this space to elaborate your response.

NC2GB16BT

16c. How is CIL education intended to be taught at the level of upper secondary education (ISCED Level 3)

(Please mark one choice on each row)

		Yes, as a compulsory subject (1)	*Yes, as a non-compulsory subject (2)*	*No (3)*
It is taught as a separate subject by teachers specializing in CIL-related education (such as ICT literacy/digital literacy/computing)	NC2GB16CA	☐	☐	☐

If you have selected yes,

a) please list the name of the subject(s) with an English translation (if applicable)

b) indicate whether the subject includes “coding” as well as applications. NC2GB16CAT

It is integrated into Science and Technology studies deemed to be relevant to CIL	NC2GB16CB	☐	☐	☐
It is integrated into a range of other subjects taught at school	NC2GB16CC	☐	☐	☐

Comments:
Please use this space to elaborate your response.

NC2GB16CT

17. Is there mandated assessment of ICT and computing related skills of students in the target grade?)
(Please mark one choice) NC2GB17

Yes, using a compulsory assessment for all students at the national and/or state/provincial level (1) ☐
Yes, using a sample-based assessment at the national and/or state/provincial level (2) ☐
Yes, using a non-compulsory common assessment (3) ☐
Yes, but assessment is controlled at the school level (4) ☐
There is no mandated requirement for assessing students in this area (5) ☐

Comments:
Please use this space to elaborate your response.

NC2GB17T

Section C. ICT and student learning at lower secondary level (ISCED 2)

In responding to the questions in this section please use the response categories to indicate your general answer for lower secondary education (ISCED 2). In addition please use the comment boxes to indicate:

- whether the national and/or state/provincial education authorities regard the issue as a priority;
- whether there are any projects/programs that promote these practices (and, if possible, briefly describe these projects or programs); and
- whether national and/or state or provincial education authorities collect data on the extent of the practice.

18. In the past seven years have education authorities (at any of the national, state/provincial or local/municipal level) used, or supported the use of, ICT for the provision of the following types of student assessment?

(Please mark one choice on each row)

		Yes (1)	*No (2)*
a) Diagnostic assessments	NC2GC18A	☐	☐
a) Formative assessments	NC2GC18B	☐	☐
b) Summative assessments	NC2GC18C	☐	☐
c) National or state/provincial monitoring programs	NC2GC18D	☐	☐

Please give examples for each assessment type for which you have selected 'Yes':

NC2GC18T

19. To what extent does the national curriculum emphasize the following aspects of CIL?
(Please mark one choice on each row)

		This aspect is explicitly stated in the curriculum (1)	*The value of this aspect is implied without being explicitly stated (2)*	*The curriculum places no emphasis on this aspect (3)*
a) Searching for information using ICT	NC2GC19A	☐	☐	☐
b) Evaluating the reliability of information sources accessed using the Internet	NC2GC19B	☐	☐	☐
c) Presenting information for a given audience or purpose using ICT	NC2GC19C	☐	☐	☐
d) Organizing information obtained from Internet sources	NC2GC19D	☐	☐	☐
e) Issues relating to intellectual property such as copyright and attribution sources	NC2GC19E	☐	☐	☐
f) Responsible and respectful publication of information	NC2GC19F	☐	☐	☐
g) Use of productivity tools (such as word processing, spreadsheet and presentation software)	NC2GC19G	☐	☐	☐
h) IT security issues (e.g. passwords, malware, phishing)	NC2GC19H	☐	☐	☐
i) Data security (such as the collection of Internet use data by search engines and social media sites)	NC2GC19I	☐	☐	☐

Please use this space to elaborate your response. NC2GB19T

20. To what extent does the national curriculum emphasize the following aspects of CIL?
(Please mark one choice on each row)

		This aspect is explicitly stated in the curriculum (1)	*The value of this aspect is implied without being explicitly stated (2)*	*The curriculum places no emphasis on this aspect (3)*
a) Planning technology-based products or solutions	NC2GC20A	☐	☐	☐
b) Developing technology-based products or solutions to meet user requirements	NC2GC20B	☐	☐	☐
c) Evaluating and refining technology-based products or solutions	NC2GC20C	☐	☐	☐
d) Creating visual representations (e.g. flow charts and decision trees) of processes	NC2GC20D	☐	☐	☐
e) Creating visual representations (e.g. tables, graphs or charts) of information/data	NC2GC20E	☐	☐	☐
f) Designing user interfaces for technology-based products or solutions	NC2GC20F	☐	☐	☐
g) Revising technology-based products or solutions on the basis of user feedback or other data	NC2GC20G	☐	☐	☐
h) Creating algorithms	NC2GC20H	☐	☐	☐
i) Writing code, programs or macros	NC2GC20I	☐	☐	☐
j) Evaluating code, programs or macros	NC2GC20J	☐	☐	☐
k) Developing digital applications (e.g. programs/apps)	NC2GC20K	☐	☐	☐
l) Identifying and describing the properties of digital systems	NC2GC20L	☐	☐	☐

Please use this space to elaborate your response. NC2GB20T

Section D. ICT and teacher development

Please indicate the extent to which there is provision for teacher development related to the use of ICT.

In responding to the questions in this section please use the response categories to indicate your general answer. In addition please use the comment boxes to indicate:

- whether national and/or state/provincial education authorities regard the issue as a priority; and
- whether there are any initiatives, projects, or programs in which ICT is used to support teacher development (and, if possible, briefly describe these initiatives, projects or programs).

21. How do education authorities (at the national, state/provincial or local/municipal level) require the development of teacher capacity to use ICT with regard to the following areas?

(Please mark as many choices as apply in each row)

	This is a mandatory component of pre-service teacher education	*Eligibility for registration as a teacher requires evidence of this capacity*	*Participation in some form of professional learning program in this area is required of teachers*	*This is not required*
a) Technical capacity in using ICT	☐ NC2GC21AA	☐ NC2GC21AB	☐ NC2GC21AC	☐ NC2GC21AD
b) Using ICT in pedagogy	☐ NC2GC21BA	☐ NC2GC21BB	☐ NC2GC21BC	☐ NC2GC21BD
c) Collaboration and communication using ICT	☐ NC2GC21CA	☐ NC2GC21CB	☐ NC2GC21CC	☐ NC2GC21CD
d) Using ICT for student assessment	☐ NC2GC21DA	☐ NC2GC21DB	☐ NC2GC21DC	☐ NC2GC21DD

Please describe the ways in which teacher development in these areas is provided or required. NC2GD21T

22. How do education authorities (at the national, state/provincial or local level) support teacher access to, and participation in, ICT-focused professional learning programs for the following purposes?

(Please mark as many choices as apply in each row)

	By funding teacher participation in programs	*By providing resources for teachers to access*	*By providing relieving teachers to allow regular teachers to attend programs*	*Not at all*
a) To improve ICT/technical skills	☐ NC2GC22AA	☐ NC2GC22AB	☐ NC2GC22AC	☐ NC2GC22AD
b) To improve content knowledge with respect to CIL	☐ NC2GC22BA	☐ NC2GC22BB	☐ NC2GC22BC	☐ NC2GC22BD
c) To improve teaching skills with respect to CIL-related content	☐ NC2GC22CA	☐ NC2GC22CB	☐ NC2GC22CC	☐ NC2GC22CD
d) To develop digital teaching and learning resources	☐ NC2GC22DA	☐ NC2GC22DB	☐ NC2GC22DC	☐ NC2GC22DD
e) To integrate ICT in teaching and learning activities	☐ NC2GC22EA	☐ NC2GC22EB	☐ NC2GC22EC	☐ NC2GC22ED
f) To improve skills in computer programming or developing applications for digital devices	☐ NC2GC22FA	☐ NC2GC22FB	☐ NC2GC22FC	☐ NC2GC22FD

Please comment with examples of programs: NC2GD22T

Section F. ICT-based learning and administrative management systems

Please indicate the extent to which ICT is used to support learning and administrative management systems with respect to any learning area (i.e. not limited to ICT literacy, computing or related areas).

In responding to the questions in this section please use the response categories to indicate your general answer. In addition, please use the comment boxes to indicate:

- whether the national and/or state/provincial education authorities regard the issue as a priority; and
- whether there are any projects or programs that promote these practices (and, if possible, briefly describe these projects or programs).

23. Do ministries or departments of education at national and/or state/provincial level use ICT-based data systems for the following purposes?

(Please mark one choice on each row)

		Yes (1)	*No (2)*
a) Collecting, analyzing and reporting student achievement data at various levels of aggregation	NC2GC23A	☐	☐
b) Providing links to examples of student work and teaching resources that are related to achievement data	NC2GC23B	☐	☐
c) Providing tools to schools for analysis of data about the school and its environment	NC2GC23C	☐	☐
d) Providing tools to schools for analysis of data about the school and its environment	NC2GC23D	☐	☐

Please give examples:

NC2GC23T

24. Do ministries or departments of education at national and/or state/provincial level pro-vide training for teachers in the use of ICT for the following activities?

(Please mark one choice on each row)

		Yes (1)	*No (2)*
a) Interpreting data at school, class and/or student level	NC2GC24A	☐	☐
b) Linking data to instructional decisions	NC2GC24B	☐	☐
c) Using data to monitor student progress over time	NC2GC24C	☐	☐

Please give examples:

NC2GC24T

25. Please list any sources of information that you used in addition to those you have listed in response to question 8 to answer this questionnaire

Sources:

NC2GC25T

THANK YOU

for taking the time to complete this survey.
Your response is very important to us.

APPENDIX B:

National adaptations of international questionnaires

Overview

This appendix describes national adaptations made to the international version of the ICILS 2018 questionnaires. This information provides users with a guide to evaluate the availability of internationally comparable data for use in secondary analyses involving the ICILS 2018 questionnaire variables.

Questionnaire adaptations include questions that countries were required to adapt, questions that were not administered, and questions that countries modified to suit their national context.

The adaptations to questionnaires are presented in five sections:

- General adaptations;
- Adaptations in student questionnaire;
- Adaptations in principal questionnaire;
- Adaptations in ICT coordinator questionnaire; and
- Adaptations in teacher questionnaire.

List of general adaptations across questionnaires

Adaptations of <Target grade>

Country	Adaptation
CHL	Grade 8
DEU	Grade 8
DNK	8th grade
FIN	8th grade
FRA	Fourth
ITA	Grade 8
KAZ	8th grade
KOR	Middle school 2nd grade
LUX	6th/8th
PRT	8th grade
RMO	Grade 8
URY	2nd year
USA	Eighth-grade

Adaptations of <Target grade>

Country	Adaptation
CHL	Job
DEU	Profession
DNK	Job
FIN	Job
FRA	Job
ITA	Job
KAZ	Job
KOR	Job
LUX	Job
PRT	Professional activity
RMO	Job
URY	Job
USA	Job

Adaptations of <Guardian 1>

Country	Adaptation
CHL	Mom or Guardian
DEU	Mother or female guardian (e.g., stepmother or foster mother)
DNK	Parent or carer 1
FIN	Parent or guardian 1
FRA	Parent or person responsible 1
ITA	Parent/Guardian A
KAZ	Mother or a female guardian
KOR	Mother or female guardian
LUX	Parent or guardian 1
PRT	Father or guardian
RMO	Mother or guardian
URY	Mother or guardian 1
USA	Parent or guardian 1

Adaptations of <Guardian 2>

Country	Adaptation
CHL	Dad or Guardian
DEU	Father or male guardian (e.g., stepfather or foster father)
DNK	Parent or carer 2
FIN	Parent or guardian 2
FRA	Parent or person responsible 2
ITA	Parent/Guardian B
KAZ	Father or a male guardian
KOR	Father or male guardian
LUX	Parent or guardian 2
PRT	Mother or guardian
RMO	Father or guardian
URY	Father or guardian 2
USA	Parent or guardian 2

Adaptations of <Smartphones>

Country	Adaptation
CHL	Smartphones
DEU	Smartphones
DNK	Smartphones
FIN	Smartphones
FRA	Smartphones
ITA	Smartphones
KAZ	Smartphones
KOR	Smartphones
LUX	Smartphones
PRT	Smartphones
RMO	Smartphones
URY	Smartphones
USA	Smartphones

Adaptations of <App>

Country	Adaptation
CHL	Application
DEU	App
DNK	App
FIN	Application
FRA	Application
ITA	App
KAZ	Application
KOR	App
LUX	App
PRT	App
RMO	App
URY	App
USA	App

Adaptations of <School definition>

Country	Adaptation
CHL	A school is a unit with a defined number of teachers and students, it can include different programs or specialties, and it corresponds to a single National ID
DEU	Omitted
DNK	A school is one whole unit with a defined number of teachers and students, which can include different programs or tracks. The definition of 'school' should be based on the environment that is shared by students, which is usually a shared faculty, set of buildings, social space and also often includes a shared administration and charter
FIN	The school in this survey is the entity that operates in the same premises, under the leadership of the same principal, and to take advantage of shared resources. The school can therefore be either a mere secondary school or a broader comprehensive school
FRA	Your institution as a whole
ITA	In the questionnaire, the term 'school' refers to the building sampled inside of the 'institute'.
KAZ	The school is an educational institution that implements the general education curricula of primary, basic secondary, and general secondary education
KOR	Omitted
LUX	One whole unit with a defined number of teachers and students, which can include different programs or tracks. The definition of 'school' should be based on the environment that is shared by students, which is usually a shared faculty, set of buildings, social space and also often includes a shared administration and charter
PRT	The school attended by the 8th grade students who were selected to participate in ICILS. That is to say, if the organic unit of school that you manage is a cluster of schools, you must consider the specific characteristics of the specific school that is attended by the selected students, i.e., the number of students, the teachers, the resources, and educational offer of that particular establishment
RMO	An educational organization providing training in general education
URY	The center that you direct
USA	Omitted

Adaptations of <School of the sampled students>

Country	Adaptation
CHL	Your school
DEU	Your school as a whole
DNK	The school which the sampled students are enrolled at
FIN	The school which has been selected for this study as a whole
FRA	All secondary school classes
ITA	Omitted
KAZ	Your school as a whole
KOR	Your school
LUX	The school of the interviewed students
PRT	The school of the sampled students
RMO	The school of the sampled students
URY	The school of the sampled students
USA	Your school as a whole

List of country-specific adaptations to the student questionnaire sorted by question group, country, and location

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-03	Chile	StQ-03	D	Levels of education Nationally defined categories: 1 = Undergraduate studies in a university or postgraduate studies (Master or PhD) 2 = Tertiary studies at a professional institute or technical training center 3 = Secondary education 4 = Primary education 5 = I do not expect to complete secondary education	Levels of education Nationally defined categories: 1 = Undergraduate studies in a university or postgraduate studies (Master or PhD) 2 = Tertiary studies at a professional institute or technical training center 3 = Secondary education 4 = Primary education 5 = I do not expect to complete secondary education
StQ-03	Denmark	StQ-03	D	Levels of education Nationally defined categories: 1 = BA, MA, or Ph.D (e.g., teacher, doctor, lawyer) 2 = Academy of professional higher education or short-cycle higher education (e.g., laboratory technician, datamatician, financial adviser) 3 = Upper secondary education or vocational education and training (e.g., general upper secondary education, VET, higher technical examination, higher commercial examination, care assistant, mason, plumber) 4 = Primary and lower secondary school (e.g., the Folkeskole) 5 = Leaving Examination of the Folkeskole (the primary and lower secondary school)	Levels of education Nationally defined categories: 1 = BA, MA, or Ph.D (e.g., teacher, doctor, lawyer) 2 = Academy of professional higher education or short-cycle higher education (e.g., laboratory technician, datamatician, financial adviser) 3 = Upper secondary education or vocational education and training (e.g., general upper secondary education, VET, higher technical examination, higher commercial examination, care assistant, mason, plumber) 4 = Primary and lower secondary school (e.g., the Folkeskole) 5 = Leaving Examination of the Folkeskole (the primary and lower secondary school)
StQ-03	Finland	StQ-03	D	Degree Nationally defined categories: 1 = Polytechnic or university degree 2 = Specialist vocational qualification after upper secondary school or vocational upper secondary school 3 = Upper secondary school or vocational upper secondary school qualification 4 = Comprehensive school qualification 5 = I do not expect to complete the comprehensive school	Degree Nationally defined categories: 1 = Polytechnic or university degree 2 = Specialist vocational qualification after upper secondary school or vocational upper secondary school 3 = Upper secondary school or vocational upper secondary school qualification 4 = Comprehensive school qualification 5 = I do not expect to complete the comprehensive school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-03	France	StQ-03	D	Degree level Nationally defined categories: 1 = Diploma in higher education long (Bachelor, Master, Ph.D., or equivalent) 2 = Diploma in higher education short (e.g., bts, dut) 3 = Bachelor's degree (general, technological, professional), professional certificate 4 = End of lower secondary school 5 = End of lower secondary school	Degree level Nationally defined categories: 1 = Diploma in higher education long (Bachelor, Master, Ph.D., or equivalent) 2 = Diploma in higher education short (e.g., bts, dut) 3 = Bachelor's degree (general, technological, professional), professional certificate 4 = End of lower secondary school 5 = End of lower secondary school
StQ-03	Germany	StQ-03	D	Nationally defined categories: 1 = Doctoral degree 2 = University diploma / Diploma University of applied science 3 = University entrance qualification / Fachhochschule entrance qualification 4 = University entrance qualification (evening schools) / specialized vocational high school / Berufoberschule / Technische Oberschule 5 = Diploma vocational academy / college of public administration / trade and technical schools 6 = Dual System / specialized vocational schools / basic vocational training year 7 = Lower secondary schools after grade 10 8 = Lower secondary schools after grade 9 9 = Finishing special school / special-needs school 10 = I do not expect to complete ISCED level 2	Nationally defined categories: 1 = Doctoral degree / University diploma / Diploma University of applied science / Diploma vocational academy / college of public administration / trade and technical schools 2 = University entrance qualification (evening schools) / specialized vocational high school / Berufoberschule / Technische Oberschule 3 = University entrance qualification / Fachhochschule entrance qualification / Dual System / specialized vocational schools / basic vocational training year 4 = Lower secondary schools after grade 10 / Lower secondary schools after grade 9 / Finishing special school / special-needs school 5 = I do not expect to complete ISCED level 2
StQ-03	Italy	StQ-03	D	Level of education Nationally defined categories: 1 = Bachelor / Masters degree / Postgraduate specialization (e.g., Master, Ph.D) 2 = Post-secondary, non-tertiary education / Tertiary education professionalizing degree (e.g., nursing degree) 3 = Upper secondary education level 4 = Lower secondary education level	Level of education National categories recoded for international comparability: 1 = Bachelor / Masters degree / Postgraduate specialization (e.g., Master, Ph.D) 2 = Post-secondary, non-tertiary education / Tertiary education professionalizing degree (e.g., nursing degree) 3 = Upper secondary education level 4 = Lower secondary education level 5 = Category not administered or data not available
StQ-03	Kazakhstan	StQ-03	D	Level of education Nationally defined categories: 1 = Higher or postgraduate education (BSc, MSc, PhD) 2 = Post-secondary education (technical and professional education, colleges, institutions) 3 = General secondary education (12 grades of school) 4 = Secondary education (9 grades of school) 5 = I am not planning to obtain secondary education	Level of education Nationally defined categories: 1 = Higher or postgraduate education (BSc, MSc, PhD) 2 = Post-secondary education (technical and professional education, colleges, institutions) 3 = General secondary education (12 grades of school) 4 = Secondary education (9 grades of school) 5 = I am not planning to obtain secondary education

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-03	Korea, Republic of	StQ-03	D	Nationally defined categories: 1 = University or graduate school 2 = College 3 = High school 4 = Middle school 5 = Middle school	Nationally defined categories: 1 = University or graduate school 2 = College 3 = High school 4 = Middle school 5 = Middle school
StQ-03	Luxembourg	StQ-03	D	Nationally defined categories: 1 = University (e.g., Bachelor's degree, Master's degree, Ph.D) 2 = Master craftman's diploma, BTS 3 = Upper secondary education (e.g., Secondary school leaving diploma (1st), technical secondary school leaving diploma (13th) 4 = Upper secondary education (Technician's diploma (DT), vocational aptitude diploma (DAP), vocational capacity certificate (CCP)) 5 = Lower secondary education (certificate of course completion, 5th/9th) 6 = Lower secondary education (certificate of course completion, 5th/9th)	Nationally defined categories: 1 = University (e.g., Bachelor's degree, Master's degree, Ph.D) 2 = Master craftman's diploma, BTS 3 = Upper secondary education (e.g., Secondary school leaving diploma (1st), technical secondary school leaving diploma (13th) /Upper secondary education (Technician's diploma (DT), vocational aptitude diploma (DAP), vocational capacity certificate (CCP)) 4 = Lower secondary education (certificate of course completion, 5th/9th) 5 = Lower secondary education (certificate of course completion, 5th/9th)
StQ-03	Portugal	StQ-03	D	Nationally defined categories: 1 = Bachelor's degree, Master's degree, Doctor's degree 2 = Non-tertiary secondary course or higher technical and professional course 3 = Upper secondary education 4 = Lower secondary education 5 = Lower secondary education	Nationally defined categories: 1 = Bachelor's degree, Master's degree, Doctor's degree 2 = Non-tertiary secondary course or higher technical and professional course 3 = Upper secondary education 4 = Lower secondary education 5 = Lower secondary education
StQ-03	Russia (Moscow)	StQ-03	D	Education Nationally defined categories: 1 = Higher education 2 = Secondary vocational education 3 = Secondary (complete) education (11 form) 4 = General education (9 form) 5 = General education (9 form)	Education Nationally defined categories: 1 = Higher education 2 = Secondary vocational education 3 = Secondary (complete) education (11 form) 4 = General education (9 form) 5 = General education (9 form)
StQ-03	United States	StQ-03	D	Nationally defined categories: 1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) 2 = Associate's degree (2-year college program) 3 = High school graduate 4 = Some high school 5 = Less than high school	Nationally defined categories: 1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) 2 = Associate's degree (2-year college program) 3 = High school graduate 4 = Some high school 5 = Less than high school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-03	Uruguay	StQ-03	D	Nationally defined categories: 1 = University or higher 2 = Tertiary non-university 3 = Complete middle education 4 = Complete basic cycle 5 = I do not plan to complete the basic cycle	Nationally defined categories: 1 = University or higher 2 = Tertiary non-university 3 = Complete middle education 4 = Complete basic cycle 5 = I do not plan to complete the basic cycle
StQ-04A-C	Chile	StQ-04A-C	D	Nationally defined categories: 1 = Chile 2 = Another Latin American country 3 = Another non Latin American country	National categories recoded for international comparability: 0 = Another Latin American country / Another non Latin American country 1 = Chile
StQ-04A-C	Denmark	StQ-04A-C	D	Nationally defined categories: 1 = Denmark 2 = Other Nordic country (Iceland, Norway, Sweden, The Faroe Islands) 3 = Other European country (e.g., Germany, Great Britain, Poland, Rumania, Lithuania, Ukraine, Bosnia-Herzegovina) 4 = The Middle East and Eurasia (e.g., Syria, Turkey, Iraq, Lebanon, Iran, Afghanistan, Morocco) 5 = Africa (e.g., Somalia, Uganda, Ghana, Ethiopia) 6 = Asia (e.g., China, Pakistan, Vietnam, Sri Lanka, Thailand, The Philippines, India) 7 = Other country	National categories recoded for international comparability: 0 = Other Nordic country (Iceland, Norway, Sweden, The Faroe Islands) / Other European country (e.g., Germany, Great Britain, Poland, Rumania, Lithuania, Ukraine, Bosnia-Herzegovina) / The Middle East and Eurasia (e.g., Syria, Turkey, Iraq, Lebanon, Iran, Afghanistan, Morocco) / Africa (e.g., Somalia, Uganda, Ghana, Ethiopia) / Asia (e.g., China, Pakistan, Vietnam, Sri Lanka, Thailand, The Philippines, India) / Other country 1 = Denmark
StQ-04A-C	Finland	StQ-04A-C	D	Nationally defined categories: 1 = Finland 2 = Sweden 3 = Estonia 4 = Russia 5 = Somalia 6 = Iraq	National categories recoded for international comparability: 0 = Sweden / Estonia / Russia / Somalia / Iraq / Another country 1 = Finland
StQ-04A-C	France	StQ-04A-C	D	Nationally defined categories: 1 = France 2 = Another country	National categories recoded for international comparability: 0 = Another country 1 = France
StQ-04A-C	Germany	StQ-04A-C	D	Nationally defined categories: 1 = Germany 2 = Former Soviet Union (e.g., Russia, Ukraine, Belarus) 3 = Turkey 4 = Poland 5 = Syria 6 = Afghanistan 7 = Iraq 8 = In another European country 9 = In another non-European country	National categories recoded for international comparability: 0 = Former Soviet Union (e.g., Russia, Ukraine, Belarus) / Turkey / Poland / Syria / Afghanistan / Iraq / In another European country / In another non-European country 1 = Germany

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-04A-C	Italy	StQ-04A-C	D	Nationally defined categories: 1 = Italy 2 = Other (European) country 3 = Other (not European) country	Nationally defined categories: 0 = Other (European) country / Other (not European) country 1 = Italy
StQ-04A-C	Kazakhstan	StQ-04A-C	D	Nationally defined categories: 1 = Kazakhstan 2 = Other Commonwealth of Independent States member countries (Russia, Uzbekistan, Kyrgyzstan etc.) 3 = Another neighboring country (China, Mongolia) 4 = Other country	National categories recoded for international comparability: 0 = Other Commonwealth of Independent States member countries (Russia, Uzbekistan, Kyrgyzstan etc.) / Another neighboring country (China, Mongolia) / Other country 1 = Kazakhstan
StQ-04A-C	Korea, Republic of	StQ-04A-C	D	Nationally defined categories: 1 = Korea 2 = USA 3 = Vietnam 4 = Japan 5 = China 6 = Philippines 7 = Other countries	National categories recoded for international comparability: 0 = USA / Vietnam / Japan / China / Philippines / Other countries 1 = Korea
StQ-04A-C	Luxembourg	StQ-04A-C	D	Nationally defined categories: 1 = Luxembourg 2 = France 3 = Portugal 4 = Germany 5 = Belgium 6 = Italy 7 = Other EU country / Other country 8 = Serbia / Montenegro / Macedonia / Bosnia-Herzegovina / Kosovo 9 = Cape Verde	National categories recoded for international comparability: 0 = France / Portugal / Germany / Belgium / Italy / Other EU country / Other country / Serbia / Montenegro / Macedonia / Bosnia-Herzegovina / Kosovo / Cape Verde 1 = Luxembourg
StQ-04A-C	Portugal	StQ-04A-C	D	Nationally defined categories: 1 = Portugal 2 = Other European country 3 = African country with Portuguese as official language 4 = Brazil 5 = Another country	National categories recoded for international comparability: 0 = Other European country / African country with Portuguese as official language / Brazil / Another country 1 = Portugal
StQ-04A-C	Russia (Moscow)	StQ-04A-C	D	Nationally defined categories: 1 = Russia 2 = Other CIS countries 3 = Another country	National categories recoded for international comparability: 0 = Other CIS countries / Another country 1 = Russia

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-04A-C	United States	StQ-04A-C	D	Nationally defined categories: 1 = USA 2 = Another country	Nationally defined categories: 0 = Another country 1 = USA
StQ-04A-C	Uruguay	StQ-04A-C	D	Nationally defined categories: 1 = Uruguay 2 = Another country / Mercosur (Argentina, Brazil, Paraguay, Chile) 3 = Another country / Rest of America 4 = Another country	National categories recoded for international comparability: 0 = Another country / Mercosur (Argentina, Brazil, Paraguay, Chile) / Another country / Rest of America / Another country 1 = Uruguay
StQ-05	Chile	StQ-05	D	Nationally defined categories: 1 = Castellano 2 = Language of Native People 3 = Another language	National categories recoded for international comparability: 0 = Language of Native People / Another language 1 = Castellano
StQ-05	Denmark	StQ-05	D	Nationally defined categories: Nationally defined categories: 1 = Danish 2 = Other language	National categories recoded for international comparability: 0 = Other language 1 = Danish
StQ-05	Finland	StQ-05	D	Nationally defined categories: Nationally defined categories: 1 = Finnish 2 = Swedish 3 = Estonian 4 = Russian 5 = Somali 6 = Arabic 7 = Another language	National categories recoded for international comparability: 0 = Swedish / Estonian / Russian / Somali / Arabic / Another language 1 = Finnish
StQ-05	France	StQ-05	D	Nationally defined categories: 1 = French 2 = Arabic portuguese 3 = Another language from Africa 4 = Portuguese 5 = Turkish 6 = Another language	National categories recoded for international comparability: 0 = Arabic portuguese / Another language from Africa / Portuguese / Turkish / Another language 1 = French

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-05	Germany	StQ-05	D	Nationally defined categories: 1 = German 2 = A language from the former Soviet Union (e.g., Russian, Ukrainian, Belorussian) 3 = Turkish 4 = Polish 5 = Arabic 6 = Persian 7 = Another European language 8 = Another non-European language	Nationally defined categories: 0 = A language from the former Soviet Union (e.g., Russian, Ukrainian, Belorussian) / Turkish / Polish / Arabic / Persian / Another European language / Another non-European language 1 = German
StQ-05	Italy	StQ-05	D	Nationally defined categories: 1 = Italian 2 = A dialect 3 = Other language	National categories recoded for international comparability: 0 = A dialect / Other language 1 = Italian
StQ-05	Kazakhstan	StQ-05	D	Nationally defined categories: 1 = Kazakh language 2 = Russian language 3 = Uzbek / Uighur language 4 = Another language *Russian: Nationally defined categories: 1 = Russian language 2 = Kazakh language 3 = Uzbek / Uighur language 4 = Another language	National categories recoded for international comparability: 0 = Russian language / Uzbek / Uighur language / Another language 1 = Kazakh language *Russian: National categories recoded for international comparability: 0 = Kazakh language / Uzbek / Uighur language / Another language 1 = Russian language
StQ-05	Korea, Republic of	StQ-05	D	Nationally defined categories: 1 = Korean 2 = English 3 = Vietnamese 4 = Japanese 5 = Chinese 6 = Tagalog (Filipino official language) 7 = Another language	National categories recoded for international comparability: 0 = English / Vietnamese /Japanese / Chinese / Tagalog (Filipino official language) / Another language 1 = Korean

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-05	Luxembourg	StQ-05	D	Nationally defined categories: 1 = German 2 = French 3 = Luxembourgish 4 = Portuguese 5 = Italian 6 = English 7 = Other *French: National defined categories: 1 = French 2 = German 3 = Luxembourgish 4 = Portuguese 5 = Italian 6 = English 7 = Other *English: National defined categories: 1 = English 2 = French 3 = German 4 = Luxembourgish 5 = Portuguese 6 = Italian 7 = Other	Nationally defined categories: 0 = French / Luxembourgish / Portuguese / Italian / English / Other 1 = German *French: National categories recoded for international comparability: 0 = German / Luxembourgish / Portuguese / Italian / English / Other 1 = French *English: National categories recoded for international comparability: 0 = French / German / Luxembourgish / Portuguese / Italian / Other 1 = English
StQ-05	Portugal	StQ-05	D	Nationally defined categories: 1 = Portuguese 2 = Other language	National categories recoded for international comparability: 0 = Other language 1 = Portuguese
StQ-05	Russia (Moscow)	StQ-05	D	Nationally defined categories: 1 = Russian language 2 = Another language	National categories recoded for international comparability: 0 = Another language 1 = Russia
StQ-05	United States	StQ-05	D	Nationally defined categories: 1 = English 2 = Spanish 3 = Another language	National categories recoded for international comparability: 0 = Spanish / Another language 1 = English

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-05	Uruguay	StQ-05	D	Nationally defined categories: 1 = Spanish 2 = English 3 = Portuguese 4 = Another language	Nationally defined categories: 1 = Spanish 2 = English 3 = Portuguese 4 = Another language
StQ-07A	Chile	StQ-07A	D	Occupation	Occupation
StQ-07A	Denmark	StQ-07A	D	(Name of) position	(Name of) position
StQ-07A	Finland	StQ-07A	D	Main job	Main job
StQ-07A	Portugal	StQ-07A	D	Job	Job
StQ-07A	Russia (Moscow)	StQ-07A	D	Work	Work
StQ-07A	United States	StQ-07A	D	Stem of the question changed: What is your parent or guardian 1's main job? (for example, school teacher, cook, sales manager)	Stem of the question changed: What is your parent or guardian 1's main job? (for example, school teacher, cook, sales manager)
StQ-07B	Chile	StQ-07B	D	Occupation	Occupation
StQ-07B	Denmark	StQ-07B	D	(Name of) position	(Name of) position
StQ-07B	Finland	StQ-07B	D	Paid work Paid work Main job	Paid work Paid work Main job
StQ-07B	Portugal	StQ-07B	D	Job	Job
StQ-08A	Finland	StQ-08A	D	Duties	Duties
StQ-09	Chile	StQ-09	D	Highest level of education Nationally defined categories: 1 = Undergraduate studies in a university or postgraduate studies (Master or PhD) 2 = Tertiary studies at a professional institute or technical training center 3 = Secondary education 4 = Primary education 5 = He/she did not complete primary education	Highest level of education Nationally defined categories: 1 = Undergraduate studies in a university or postgraduate studies (Master or PhD) 2 = Tertiary studies at a professional institute or technical training center 3 = Secondary education 4 = Primary education 5 = He/she did not complete primary education

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-09	Denmark	StQ-09	D	Highest level of education Person responsible for the test Nationally defined categories: 1 = BA, MA, or Ph.D (e.g., teacher, doctor, lawyer) 2 = Academy of professional higher education or short-cycle higher education (e.g., laboratory technician, datamatician, financial adviser) 3 = Upper secondary education or vocational education and training (e.g., general upper secondary education, VET, higher technical examination, higher commercial examination, care assistant, mason, plumber) 4 = Primary and lower secondary school (e.g., the Folkeskole) 5 = Leaving Examination of the Folkeskole (the primary and lower secondary school)	Highest level of education Person responsible for the test Nationally defined categories: 1 = BA, MA, or Ph.D (e.g., teacher, doctor, lawyer) 2 = Academy of professional higher education or short-cycle higher education (e.g., laboratory technician, datamatician, financial adviser) 3 = Upper secondary education or vocational education and training (e.g., general upper secondary education, VET, higher technical examination, higher commercial examination, care assistant, mason, plumber) 4 = Primary and lower secondary school (e.g., the Folkeskole) 5 = Leaving Examination of the Folkeskole (the primary and lower secondary school)
StQ-09	Finland	StQ-09	D	Highest degree An adult who is present Nationally defined categories: 1 = Polytechnic or university degree 2 = Specialist vocational qualification after upper secondary school or vocational upper secondary school 3 = Upper secondary school or vocational upper secondary school qualification 4 = Comprehensive school qualification 5 = He/she did not complete the comprehensive school	Highest degree An adult who is present Nationally defined categories: 1 = Polytechnic or university degree 2 = Specialist vocational qualification after upper secondary school or vocational upper secondary school 3 = Upper secondary school or vocational upper secondary school qualification 4 = Comprehensive school qualification 5 = He/she did not complete the comprehensive school
StQ-09	France	StQ-09	D	Nationally defined categories: 1 = Diploma in higher education long (Bachelor, Master, Ph.D., or equivalent) 2 = Diploma in higher education short (e.g., bts, dut) 3 = Bachelor's degree (general, technological, professional), professional certificate 4 = End of lower secondary school 5 = He/she has not reached the end of lower secondary school	National categories recoded for international comparability: 1 = Diploma in higher education long (Bachelor, Master, Ph.D., or equivalent) 2 = Diploma in higher education short (e.g., bts, dut) 3 = Bachelor's degree (general, technological, professional), professional certificate 4 = End of lower secondary school 5 = He/she has not reached the end of lower secondary school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-09	Germany	StQ-09	D	Nationally defined categories: 1 = Doctoral degree 2 = University diploma / Diploma University of applied science 3 = University entrance qualification / Fachhochschule entrance qualification 4 = University entrance qualification (evening schools) / specialized vocational high school / Berufoberschule / Technische Oberschule 5 = Diploma vocational academy / college of public administration / trade and technical schools 6 = Dual System / specialized vocational schools / basic vocational training year 7 = Lower secondary schools after grade 10 8 = Lower secondary schools after grade 9 9 = Finishing special school / special-needs school 10 = I do not expect to complete ISCED level 2	National categories recoded for international comparability: 1 = Doctoral degree / University diploma / Diploma University of applied science / Diploma vocational academy / college of public administration / trade and technical schools 2 = University entrance qualification (evening schools) / specialized vocational high school / Berufoberschule / Technische Oberschule 3 = University entrance qualification / Fachhochschule entrance qualification / Dual System / specialized vocational schools / basic vocational training year 4 = Lower secondary schools after grade 10 / Lower secondary schools after grade 9 / Finishing special school / special-needs school 5 = I do not expect to complete ISCED level 2
StQ-09	Italy	StQ-09	D	Higher level of education Nationally defined categories: 1 = Bachelor / Masters degree / Postgraduate Specialization (e.g., Master, Ph.D) 2 = Post-secondary, non-tertiary education / Tertiary education professionalizing degree (e.g., nursing degree) 3 = Upper secondary education level 4 = Lower secondary education level 5 = He/she did not complete lower secondary education	Higher level of education Nationally defined categories: 1 = Bachelor / Masters degree / Postgraduate Specialization (e.g., Master, Ph.D) 2 = Post-secondary, non-tertiary education / Tertiary education professionalizing degree (e.g., nursing degree) 3 = Upper secondary education level 4 = Lower secondary education level 5 = He/she did not complete lower secondary education
StQ-09	Kazakhstan	StQ-09	D	Nationally defined categories: 1 = Higher or postgraduate education (BSc, MSc, PhD) 2 = Post-secondary education (technical and professional education, colleges, institutions) 3 = General secondary education (12 grades of school) 4 = Secondary education (9 grades of school) 5 = She did not obtain secondary education	Nationally defined categories: 1 = Higher or postgraduate education (BSc, MSc, PhD) 2 = Post-secondary education (technical and professional education, colleges, institutions) 3 = General secondary education (12 grades of school) 4 = Secondary education (9 grades of school) 5 = She did not obtain secondary education
StQ-09	Korea, Republic of	StQ-09	D	Nationally defined categories: 1 = University or graduate school 2 = College 3 = High school 4 = Middle school 5 = Middle school	Nationally defined categories: 1 = University or graduate school 2 = College 3 = High school 4 = Middle school 5 = Middle school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-09	Luxembourg	StQ-09	D	Nationally defined categories: 1 = University (e.g., Bachelor's degree, Master's degree, Ph.D) 2 = Master craftman's diploma, BTS 3 = Upper secondary education (e.g., Secondary school leaving diploma (1st), technical secondary school leaving diploma (13th) 4 = Upper secondary education (Technician's diploma (DT), vocational aptitude diploma (DAP), vocational capacity certificate (CCP)) 5 = Lower secondary education (certificate of course completion, 5th/9th) 6 = Lower secondary education (certificate of course completion, 5th/9th)	National categories recoded for international comparability: 1 = University (e.g., Bachelor's degree, Master's degree, Ph.D) 2 = Master craftman's diploma, BTS 3 = Upper secondary education (e.g., Secondary school leaving diploma (1st), technical secondary school leaving diploma (13th) / Upper secondary education (Technician's diploma (DT), vocational aptitude diploma (DAP), vocational capacity certificate (CCP)) 4 = Lower secondary education (certificate of course completion, 5th/9th) 5 = Lower secondary education (certificate of course completion, 5th/9th)
StQ-09	Portugal	StQ-09	D	Nationally defined categories: 1 = Bachelor's degree, Master's degree, Doctor's degree 2 = Non-tertiary secondary course or higher technical and professional course 3 = Upper secondary education 4 = Lower secondary education 5 = Lower secondary education	Nationally defined categories: 1 = Bachelor's degree, Master's degree, Doctor's degree 2 = Non-tertiary secondary course or higher technical and professional course 3 = Upper secondary education 4 = Lower secondary education 5 = Lower secondary education
StQ-09	Russia (Moscow)	StQ-09	D	Level of education Nationally defined categories: 1 = Higher education 2 = Secondary vocational education 3 = Secondary (complete) education (11 form) 4 = General education (9 form) 5 = General education (9 form)	Level of education Nationally defined categories: 1 = Higher education 2 = Secondary vocational education 3 = Secondary (complete) education (11 form) 4 = General education (9 form) 5 = General education (9 form)
StQ-09	United States	StQ-09	D	Nationally defined categories: 1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) 2 = Associate's degree (2-year college program) 3 = High school graduate 4 = Some high school 5 = Less than high school	Nationally defined categories: 1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) 2 = Associate's degree (2-year college program) 3 = High school graduate 4 = Some high school 5 = Less than high school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-09	Uruguay	StQ-09	D	Nationally defined categories: 1 = University or higher 2 = Tertiary non-university 3 = Complete middle education 4 = Complete basic cycle 5 = She did not complete basic cycle	National categories recoded for international comparability: 1 = University or higher 2 = Tertiary non-university 3 = Complete middle education 4 = Complete basic cycle 5 = She did not complete basic cycle
StQ-11A	Chile	StQ-11A	D	Occupation	Occupation
StQ-11A	Denmark	StQ-11A	D	(Name of) position	(Name of) position
StQ-11A	Finland	StQ-11A	D	Main job	Main job
StQ-11A	Portugal	StQ-11A	D	Job	Job
StQ-11A	Russia (Moscow)	StQ-11A	D	Work	Work
StQ-11A	United States	StQ-11A	D	Stem of the question changed: What is your parent or guardian 2's main job? (for example, school teacher, cook, sales manager)	Stem of the question changed: What is your parent or guardian 2's main job? (for example, school teacher, cook, sales manager)
StQ-11B	Chile	StQ-11B	D	Occupation	Occupation
StQ-11B	Denmark	StQ-11B	D	(Name of) position	(Name of) position
StQ-11B	Finland	StQ-11B	D	Paid work Paid work Main job	Paid work Paid work Main job
StQ-11B	Portugal	StQ-11B	D	Job	Job
StQ-12A	Finland	StQ-12A	D	Duties	Duties
StQ-13	Chile	StQ-13	D	Highest level of education Nationally defined categories: 1 = Undergraduate studies in a university or postgraduate studies (Master or PhD) 2 = Tertiary studies at a professional institute or technical training center 3 = Secondary education 4 = Primary education 5 = He/she did not complete primary education	Highest level of education Nationally defined categories: 1 = Undergraduate studies in a university or postgraduate studies (Master or PhD) 2 = Tertiary studies at a professional institute or technical training center 3 = Secondary education 4 = Primary education 5 = He/she did not complete primary education

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-13	Denmark	StQ-13	D	Highest level of education Person responsible for the test Nationally defined categories: 1 = BA, MA, or Ph.D (e.g., teacher, doctor, lawyer) 2 = Academy of professional higher education or short-cycle higher education (e.g., laboratory technician, datamatician, financial adviser) 3 = Upper secondary education or vocational education and training (e.g., general upper secondary education, VET, higher technical examination, higher commercial examination, care assistant, mason, plumber) 4 = Primary and lower secondary school (e.g., the Folkeskole) 5 = Leaving Examination of the Folkeskole (the primary and lower secondary school)	Highest level of education Person responsible for the test Nationally defined categories: 1 = BA, MA, or Ph.D (e.g., teacher, doctor, lawyer) 2 = Academy of professional higher education or short-cycle higher education (e.g., laboratory technician, datamatician, financial adviser) 3 = Upper secondary education or vocational education and training (e.g., general upper secondary education, VET, higher technical examination, higher commercial examination, care assistant, mason, plumber) 4 = Primary and lower secondary school (e.g., the Folkeskole) 5 = Leaving Examination of the Folkeskole (the primary and lower secondary school)
StQ-13	Finland	StQ-13	D	Highest degree An adult who is present Nationally defined categories: 1 = Polytechnic or university degree 2 = Specialist vocational qualification after upper secondary school or vocational upper secondary school 3 = Upper secondary school or vocational upper secondary school qualification 4 = Comprehensive school qualification 5 = He/she did not complete the comprehensive school	Highest degree An adult who is present Nationally defined categories: 1 = Polytechnic or university degree 2 = Specialist vocational qualification after upper secondary school or vocational upper secondary school 3 = Upper secondary school or vocational upper secondary school qualification 4 = Comprehensive school qualification 5 = He/she did not complete the comprehensive school
StQ-13	France	StQ-13	D	Nationally defined categories: 1 = Diploma in higher education long (Bachelor, Master, Ph.D., or equivalent) 2 = Diploma in higher education short (e.g., bts, dut) 3 = Bachelor's degree (general, technological, professional), professional certificate 4 = End of lower secondary school 5 = He/she has not reached the end of lower secondary school	Nationally defined categories: 1 = Diploma in higher education long (Bachelor, Master, Ph.D., or equivalent) 2 = Diploma in higher education short (e.g., bts, dut) 3 = Bachelor's degree (general, technological, professional), professional certificate 4 = End of lower secondary school 5 = He/she has not reached the end of lower secondary school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-13	Germany	StQ-13	D	Nationally defined categories: 1 = Doctoral degree 2 = University diploma / Diploma University of applied science 3 = University entrance qualification / Fachhochschule entrance qualification 4 = University entrance qualification (evening schools) / specialized vocational high school / Berufoberschule / Technische Oberschule 5 = Diploma vocational academy / college of public administration / trade and technical schools 6 = Dual System / specialized vocational schools / basic vocational training year 7 = Lower secondary schools after grade 10 8 = Lower secondary schools after grade 9 9 = Finishing special school / special-needs school 10 = I do not expect to complete ISCED level 2	National categories recoded for international comparability: 1 = Doctoral degree / University diploma / Diploma University of applied science / Diploma vocational academy / college of public administration / trade and technical schools 2 = University entrance qualification (evening schools) / specialized vocational high school / Berufoberschule / Technische Oberschule 3 = University entrance qualification / Fachhochschule entrance qualification / Dual System / specialized vocational schools / basic vocational training year 4 = Lower secondary schools after grade 10 / Lower secondary schools after grade 9 / Finishing special school / special-needs school 5 = I do not expect to complete ISCED level 2
StQ-13	Italy	StQ-13	D	Higher level of education Nationally defined categories: 1 = Bachelor / Master's degree / Postgraduate Specialization (e.g., Master, Ph.D) 2 = Post-secondary, non-tertiary education / Tertiary education professionalizing degree (e.g., nursing degree) 3 = Upper secondary education level 4 = Lower secondary education level 5 = He/she did not complete lower secondary education	Higher level of education Nationally defined categories: 1 = Bachelor / Master's degree/ Postgraduate Specialization (e.g., Master, Ph.D) 2 = Post-secondary, non-tertiary education / Tertiary education professionalizing degree (e.g., nursing degree) 3 = Upper secondary education level 4 = Lower secondary education level 5 = He/she did not complete lower secondary education
StQ-13	Kazakhstan	StQ-13	D	Nationally defined categories: 1 = Higher or postgraduate education (BSc, MSc, PhD) 2 = Post-secondary education (technical and professional education, colleges, institutions) 3 = General secondary education (12 grades of school) 4 = Secondary education (9 grades of school) 5 = He did not obtain secondary education	Nationally defined categories: 1 = Higher or postgraduate education (BSc, MSc, PhD) 2 = Post-secondary education (technical and professional education, colleges, institutions) 3 = General secondary education (12 grades of school) 4 = Secondary education (9 grades of school) 5 = He did not obtain secondary education
StQ-13	Korea, Republic of	StQ-13	D	Nationally defined categories: 1 = University or graduate school 2 = College 3 = High school 4 = Middle school 5 = Middle school	Nationally defined categories: 1 = University or graduate school 2 = College 3 = High school 4 = Middle school 5 = Middle school

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-13	Luxembourg	StQ-13	D	Nationally defined categories: 1 = University (e.g., Bachelor's degree, Master's degree, Ph.D) 2 = Master craftman's diploma, BTS 3 = Upper secondary education (e.g., Secondary school leaving diploma (1st), technical secondary school leaving diploma (13th) 4 = Upper secondary education (Technician's diploma (DT), vocational aptitude diploma (DAP), vocational capacity certificate (CCP)) 5 = Lower secondary education (certificate of course completion, 5th/9th) 6 = Lower secondary education (certificate of course completion, 5th/9th)	National categories recoded for international comparability: 1 = University (e.g., Bachelor's degree, Master's degree, Ph.D) 2 = Master craftman's diploma, BTS 3 = Upper secondary education (e.g., Secondary school leaving diploma (1st), technical secondary school leaving diploma (13th) / Upper secondary education (Technician's diploma (DT), vocational aptitude diploma (DAP), vocational capacity certificate (CCP)) 4 = Lower secondary education (certificate of course completion, 5th/9th) 5 = Lower secondary education (certificate of course completion, 5th/9th)
StQ-13	Portugal	StQ-13	D	Who is administrating the test Nationally defined categories: 1 = Bachelor's degree, Master's degree, Doctor's degree 2 = Non-tertiary secondary course or higher technical and professional course 3 = Upper secondary education 4 = Lower secondary education 5 = Lower secondary education	Who is administrating the test Nationally defined categories: 1 = Bachelor's degree, Master's degree, Doctor's degree 2 = Non-tertiary secondary course or higher technical and professional course 3 = Upper secondary education 4 = Lower secondary education 5 = Lower secondary education
StQ-13	Russia (Moscow)	StQ-13	D	Level of education Nationally defined categories: 1 = Higher education 2 = Secondary vocational education 3 = Secondary (complete) education (11 form) 4 = General education (9 form) 5 = General education (9 form)	Level of education Nationally defined categories: 1 = Higher education 2 = Secondary vocational education 3 = Secondary (complete) education (11 form) 4 = General education (9 form) 5 = General education (9 form)
StQ-13	United States	StQ-13	D	Nationally defined categories: 1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) 2 = Associate's degree (2-year college program) 3 = High school graduate 4 = Some high school 5 = Less than high school	Nationally defined categories: 1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) 2 = Associate's degree (2-year college program) 3 = High school graduate 4 = Some high school 5 = Less than high school
StQ-13	Uruguay	StQ-13	D	Nationally defined categories: 1 = University or higher 2 = Tertiary non-university 3 = Complete middle education 4 = Complete basic cycle 5 = He did not complete basic cycle	Nationally defined categories: 1 = University or higher 2 = Tertiary non-university 3 = Complete middle education 4 = Complete basic cycle 5 = He did not complete basic cycle

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-15AA-AB	Chile	StQ-15AA	D	Notebook or netbook	Notebook or netbook
StQ-15AA-AB	Denmark	StQ-15AA	D	Portable	Portable
StQ-15AA-AB	Germany	StQ-15AA	D	Notebooks and laptops respectively	Notebooks and laptops respectively
StQ-15AA-AB	Italy	StQ-15AA	D	Portable computer (e.g., laptop)	Portable computer (e.g., laptop)
StQ-15AA-AB	Korea, Republic of	StQ-15AA	D	Notebook	Notebook
StQ-15AA-AB	Portugal	StQ-15AA	D	Portable	Portable
StQ-15AA-AB	Denmark	StQ-15AB	D	iPad, tablet, Kindle	iPad, tablet, Kindle
StQ-15AA-AB	Finland	StQ-15AB	D	iPad, other tablet device, Kindle	iPad, other tablet device, Kindle
StQ-15AA-AB	Kazakhstan	StQ-15AB	D	Tablet devices or e-readers	Tablet devices or e-readers
StQ-15AA-AB	Korea, Republic of	StQ-15AB	D	iPad, Tablet PC, Kindle, Crema	iPad, Tablet PC, Kindle, Crema
StQ-15AA-AB	Russia (Moscow)	StQ-15AB	D	iPad, Asus ZenPad, Lenovo Tab, PocketBook, Sony Reader	iPad, Asus ZenPad, Lenovo Tab, PocketBook, Sony Reader
StQ-15AA-AB	United States	StQ-15AB	D	iPad, Surface Pro, Kindle	iPad, Surface Pro, Kindle
StQ-15B	Denmark	StQ-15B	X	Question not administered or data not available	Question not administered or data not available
StQ-15B	United States	StQ-15B	X	Question not administered or data not available	Question not administered or data not available
StQ-16A-C	Chile	StQ-16A	D	Notebook or netbook	Notebook or netbook
StQ-16A-C	Denmark	StQ-16A	D	Portable	Portable
StQ-16A-C	Germany	StQ-16A	D	Notebooks and laptops respectively	Notebooks and laptops respectively
StQ-16A-C	Korea, Republic of	StQ-16A	D	Notebook	Notebook
StQ-16A-C	Portugal	StQ-16A	D	Portable	Portable
StQ-16A-C	Denmark	StQ-16B	D	iPad, tablet, Kindle	iPad, tablet, Kindle
StQ-16A-C	Finland	StQ-16B	D	iPad, other tablet device, Kindle	iPad, other tablet device, Kindle
StQ-16A-C	Kazakhstan	StQ-16B	D	Tablet devices or e-readers	Tablet devices or e-readers
StQ-16A-C	Korea, Republic of	StQ-16B	D	iPad, Tablet PC, Kindle, Crema	iPad, Tablet PC, Kindle, Crema
StQ-16A-C	Russia (Moscow)	StQ-16B	D	iPad, Asus ZenPad, Lenovo Tab, PocketBook, Sony Reader	iPad, Asus ZenPad, Lenovo Tab, PocketBook, Sony Reader
StQ-16A-C	United States	StQ-16B	D	iPad, Surface Pro, Kindle	iPad, Surface Pro, Kindle
StQ-19A-H	Denmark	StQ-19B	D	Microsoft Excel®, LibreOffice Calc, Google Sheets	Microsoft Excel®, LibreOffice Calc, Google Sheets
StQ-19A-H	France	StQ-19B	D	Microsoft Excel®, Openoffice Calc	Microsoft Excel®, Openoffice Calc
StQ-19A-H	Uruguay	StQ-19B	D	Microsoft Excel®, Calc	Microsoft Excel®, Calc

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-19A-H	Denmark	StQ-19C	D	Microsoft PowerPoint®, LibreOffice Impress, Google Slides, Prezi	Microsoft PowerPoint®, LibreOffice Impress, Google Slides, Prezi
StQ-19A-H	France	StQ-19C	D	Microsoft Powerpoint®, Openoffice Impress	Microsoft Powerpoint®, Openoffice Impress
StQ-19A-H	Uruguay	StQ-19C	D	Microsoft PowerPoint®, Impress	Microsoft PowerPoint®, Impress
StQ-19A-H	Chile	StQ-19E	D	Logo or Scratch	Logo or Scratch
StQ-19A-H	Denmark	StQ-19E	D	Scratch, Stencyl, Lego Mindstorm	Scratch, Stencyl, Lego Mindstorm
StQ-19A-H	Finland	StQ-19E	D	C++, Logo, LUA or Scratch	C++, Logo, LUA or Scratch
StQ-19A-H	Germany	StQ-19E	D	Logo or Scratch	Logo or Scratch
StQ-19A-H	Korea, Republic of	StQ-19E	D	Scratch, Entry, App inventor	Scratch, Entry, App inventor
StQ-19A-H	Russia (Moscow)	StQ-19E	D	Logo, Basic, HTML	Logo, Basic, HTML
StQ-19A-H	United States	StQ-19E	D	Scratch, Logo, VBA, Java	Scratch, Logo, VBA, Java
StQ-19A-H	Uruguay	StQ-19E	D	Logo, Scratch, Enchanting	Logo, Scratch, Enchanting
StQ-20A-J	Chile	StQ-20B	D	Skype, WhatsApp, Facebook Messenger	Skype, WhatsApp, Facebook Messenger
StQ-20A-J	Denmark	StQ-20B	D	Skype, FaceTime, Facebook Messenger, WhatsApp	Skype, FaceTime, Facebook Messenger, WhatsApp
StQ-20A-J	Korea, Republic of	StQ-20B	D	KakaoTalk, Line, Skype	KakaoTalk, Line, Skype
StQ-20A-J	United States	StQ-20B	D	Skype, FaceTime, WhatsApp, Viber	Skype, FaceTime, WhatsApp, Viber
StQ-20A-J	Chile	StQ-20E	D	Questions and answers websites	Questions and answers websites
StQ-20A-J	Italy	StQ-20E	D	Nationally defined dimension: Ask questions in forums or on websites	Nationally defined dimension: Ask questions in forums or on websites
StQ-20A-J	Denmark	StQ-20B	D	Skype, FaceTime, Facebook Messenger, WhatsApp	Skype, FaceTime, Facebook Messenger, WhatsApp
StQ-20A-J	Korea, Republic of	StQ-20B	D	KakaoTalk, Line, Skype	KakaoTalk, Line, Skype
StQ-20A-J	United States	StQ-20B	D	Skype, FaceTime, WhatsApp, Viber	Skype, FaceTime, WhatsApp, Viber
StQ-20A-J	Denmark	StQ-20E-F	D	Question-answer-(websites)	Question-answer-(websites)
StQ-20A-J	Finland	StQ-20E-F	D	Question & answer websites	Question & answer websites
StQ-20A-J	Korea, Republic of	StQ-20E-F	D	Jisik In	Jisik In
StQ-20A-J	Russia (Moscow)	StQ-20E-F	D	Ask.fm, otvet.mail.ru, Znaikak.ru, genon.ru	Ask.fm, otvet.mail.ru, Znaikak.ru, genon.ru
StQ-20A-J	Chile	StQ-20F	D	Websites of questions and answers	Websites of questions and answers
StQ-20A-J	Italy	StQ-20F	D	Nationally defined dimension: Answer other peoples' questions in forums or websites	Nationally defined dimension: Answer other peoples' questions in forums or websites

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-20A-J	Denmark	StQ-20G	D	WordPress, Blogspot, Blogger	WordPress, Blogspot, Blogger
StQ-20A-J	Korea, Republic of	StQ-20G	D	Naver Blog, Tistory, Tumblr	Naver Blog, Tistory, Tumblr
StQ-20A-J	Uruguay	StQ-20G	D	Crea2, Wordpress, Blogger	Crea2, Wordpress, Blogger
StQ-20A-J	Denmark	StQ-20H	D	Facebook, Instagram, Snapchat, YouTube	Facebook, Instagram, Snapchat, YouTube
StQ-20A-J	Kazakhstan	StQ-20H	D	Facebook, Instagram, Vkontakte or YouTube	Facebook, Instagram, Vkontakte or YouTube
StQ-22A-J	Chile	StQ-22D	D	Assignments booklets	Assignments booklets
StQ-22A-J	France	StQ-22D	D	Activity Sheets	Activity Sheets
StQ-22A-J	Denmark	StQ-22I	D	Scratch, Stencyl, Lego Mindstorm	Scratch, Stencyl, Lego Mindstorm
StQ-22A-J	Korea, Republic of	StQ-22I	D	Scratch, Entry	Scratch, Entry
StQ-22A-J	Luxembourg	StQ-22I	D	Notepad++	Notepad++
StQ-22A-J	United States	StQ-22I	D	Scratch, Logo, VBA, Java	Scratch, Logo, VBA, Java
StQ-23A-I	Chile	StQ-23A	D	Language and communication	Language and communication
StQ-23A-I	Denmark	StQ-23A	D	Danish	Danish
StQ-23A-I	Finland	StQ-23A	D	Native language and literature or Finnish as a second language	Native language and literature or Finnish as a second language
StQ-23A-I	France	StQ-23A	D	French	French
StQ-23A-I	Germany	StQ-23A	D	German	German
StQ-23A-I	Italy	StQ-23A	D	Italian	Italian
StQ-23A-I	Kazakhstan	StQ-23A	D	Kazakh language and literature *Russian: Russian language and literature	Kazakh language and literature *Russian Russian language and literature
StQ-23A-I	Korea, Republic of	StQ-23A	D	Korean	Korean
StQ-23A-I	Luxembourg	StQ-23A	D	German	German
StQ-23A-I	Portugal	StQ-23A	D	Portuguese	Portuguese
StQ-23A-I	Russia (Moscow)	StQ-23A	D	Russian language and literature	Russian language and literature
StQ-23A-I	United States	StQ-23A	D	English Language Arts	English Language Arts
StQ-23A-I	Uruguay	StQ-23A	D	Spanish Language	Spanish Language
StQ-23A-I	Chile	StQ-23B	D	Foreign language or original languages	Foreign language or original languages
StQ-23A-I	Denmark	StQ-23B	D	Foreign languages (e.g., English, German, French)	Foreign languages (e.g., English, German, French)
StQ-23A-I	Finland	StQ-23B	D	Languages: Swedish, English, and other languages	Languages: Swedish, English, and other languages

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-23A-I	France	StQ-23B	D	Nationally defined dimensions: Foreign Languages Regional Languages Greek)	National dimensions recoded for international comparability: Foreign Languages / Regional Languages / Ancient Languages (Latin, Greek)
StQ-23A-I	Germany	StQ-23B	D	Foreign language (English, French, Latin, etc.)	Foreign language (English, French, Latin, etc.)
StQ-23A-I	Italy	StQ-23B	D	English and/or other language	English and/or other language
StQ-23A-I	Kazakhstan	StQ-23B	D	Foreign and other national languages	Foreign and other national languages
StQ-23A-I	Korea, Republic of	StQ-23B	D	Language arts: foreign or other national languages	Language arts: foreign or other national languages
StQ-23A-I	Luxembourg	StQ-23B	D	French, English, Spanish, Italian	French, English, Spanish, Italian
StQ-23A-I	Portugal	StQ-23B	D	Foreign languages	Foreign languages
StQ-23A-I	Russia (Moscow)	StQ-23B	D	Foreign languages	Foreign languages
StQ-23A-I	United States	StQ-23B	D	Spanish, or other foreign language	Spanish, or other foreign language
StQ-23A-I	Uruguay	StQ-23B	D	Languages (e.g., English)	Languages (e.g., English)
StQ-23A-I	Chile	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Denmark	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	France	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Germany	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Italy	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Korea, Republic of	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Luxembourg	StQ-23C	D	Geometry, algebra	Geometry, algebra
StQ-23A-I	Portugal	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Russia (Moscow)	StQ-23C	D	Algebra, geometry	Algebra, geometry
StQ-23A-I	Uruguay	StQ-23C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
StQ-23A-I	Chile	StQ-23D	D	Nationally defined dimension: Natural Sciences (general science and/or physics, chemistry, biology, geology, earth sciences)	Nationally defined dimension: Natural Sciences (general science and/or physics, chemistry, biology, geology, earth sciences)

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-23A-I	France	StQ-23D	D	Nationally defined dimension: Physics-Chemistry Life and Earth Sciences	National dimensions recoded for international comparability: Physics-Chemistry / Life and Earth Sciences
StQ-23A-I	Chile	StQ-23E	D	Nationally defined dimension: History, Geography, or Social sciences	Nationally defined dimension: History, Geography, or Social sciences
StQ-23A-I	France	StQ-23E	D	Nationally defined dimension: History-Geography, Civic Education, Humanities and Social Sciences	Nationally defined dimension: History-Geography, Civic Education, Humanities and Social Sciences
StQ-23A-I	Denmark	StQ-23F	D	Nationally defined dimension: Musical and creative arts (Visual art, music, drama, movie knowledge)	Nationally defined dimension: Musical and creative arts (Visual art, music, drama, movie knowledge)
StQ-23A-I	Finland	StQ-23F	D	Nationally defined dimension: Arts (visual arts, music, dance, drama, etc.)	Nationally defined dimension: Arts (visual arts, music, dance, drama, etc.)
StQ-23A-I	France	StQ-23F	D	Nationally defined dimensions: Music Visual Arts	Nationally defined dimensions: Music / Visual Arts
StQ-23A-I	Uruguay	StQ-23F	D	Nationally defined dimension: Visual and plastic education (drawing), Sound education (music), dance, theater, etc.	Nationally defined dimension: Visual and plastic education (drawing), Sound education (music), dance, theater, etc.
StQ-23A-I	Chile	StQ-23G	D	Nationally defined dimension: Technological Education or Computer Studies	Nationally defined dimension: Technological Education or Computer Studies
StQ-23A-I	Denmark	StQ-23G	D	ICT subjects (technology literacy)	ICT subjects (technology literacy)
StQ-23A-I	Finland	StQ-23G	D	Information technology, programming, etc.	Information technology, programming, etc.
StQ-23A-I	Germany	StQ-23G	D	Informatics, information technology or similar	Informatics, information technology or similar
StQ-23A-I	Italy	StQ-23G	D	Technology	Technology
StQ-23A-I	Korea, Republic of	StQ-23G	D	Nationally defined dimension: Informatics, computer studies, or similar	Nationally defined dimension: Informatics, computer studies, or similar
StQ-23A-I	Luxembourg	StQ-23G	D	Informatics	Informatics
StQ-23A-I	Portugal	StQ-23G	D	Nationally defined dimension: Communication and information technologies, computer applications, or similar	Nationally defined dimension: Communication and information technologies, computer applications, or similar
StQ-23A-I	Russia (Moscow)	StQ-23G	D	Information technology and ICT	Information technology and ICT
StQ-23A-I	United States	StQ-23G	D	Nationally defined dimension: Information technology, computer science, or similar subject	Nationally defined dimension: Information technology, computer science, or similar subject

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-23A-I	Uruguay	StQ-23G	D	Nationally defined dimension: Computing	Nationally defined dimension: Computing
StQ-23A-I	Chile	StQ-23H	X	Dimension not administered or data not available	Dimension not administered or data not available
StQ-23A-I	Denmark	StQ-23H	D	E.g., craft and design, home economics, occupation and labor market guidance	E.g., craft and design, home economics, occupation and labor market guidance
StQ-23A-I	Finland	StQ-23H	D	E.g., Handicrafts	E.g., Handicrafts
StQ-23A-I	France	StQ-23H	D	Nationally defined dimension: Vocational Education	Nationally defined dimension: Vocational Education
StQ-23A-I	Germany	StQ-23H	D	E.g., Business and employment studies/handicrafts	E.g., Business and employment studies/handicrafts
StQ-23A-I	Italy	StQ-23H	D	Nationally defined dimension: Practical or vocational subjects	Nationally defined dimension: Practical or vocational subjects
StQ-23A-I	Kazakhstan	StQ-23H	D	Nationally defined dimension: Practical and professional (elective courses on music, art, programming, etc.)	Nationally defined dimension: Practical and professional (elective courses on music, art, programming, etc.)
StQ-23A-I	Korea, Republic of	StQ-23H	D	Nationally defined dimension: Practical or vocational	Nationally defined dimension: Practical or vocational
StQ-23A-I	Luxembourg	StQ-23H	D	Handcraft (e.g., electronics, mechanics, etc.)	Handcraft (e.g., electronics, mechanics, etc.)
StQ-23A-I	Portugal	StQ-23H	D	Nationally defined dimension: Practical and vocational subjects	Nationally defined dimension: Practical and vocational subjects
StQ-23A-I	Russia (Moscow)	StQ-23H	D	Technology	Technology
StQ-23A-I	United States	StQ-23H	D	E.g., mechanics and repair, healthcare occupations, construction trades	E.g., mechanics and repair, healthcare occupations, construction trades
StQ-23A-I	Uruguay	StQ-23H	D	Nationally defined dimension: Vocational and occupational orientation	Nationally defined dimension: Vocational and occupational orientation
StQ-23A-I	Chile	StQ-23I	D	Nationally defined dimension: Other (e.g., religion, physical education, home economics, orientation)	Nationally defined dimension: Other (e.g., religion, physical education, home economics, orientation)
StQ-23A-I	Denmark	StQ-23I	D	Christian studies, physical education, other electives	Christian studies, physical education, other electives
StQ-23A-I	Finland	StQ-23I	D	Life philosophy, physical education, home economics, health education, student counselling	Life philosophy, physical education, home economics, health education, student counselling
StQ-23A-I	France	StQ-23I	D	Nationally defined dimensions: Physical Education and Sport Other	National dimensions recoded for international comparability: Physical Education and Sport / Other

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-23A-I	Germany	StQ-23I	D	Ethics / Philosophy / physical education, home economics	Ethics / Philosophy / physical education, home economics
StQ-23A-I	Italy	StQ-23I	D	Catholic Religion; Teachings Alternative to Religion, Physical education	Catholic Religion; Teachings Alternative to Religion, Physical education
StQ-23A-I	Kazakhstan	StQ-23I	D	Nationally defined dimension: Other disciplines concerned with personal and social development (personal(self)development, physical culture, technology)	Nationally defined dimension: Other disciplines concerned with personal and social development (personal(self)development, physical culture, technology)
StQ-23A-I	Korea, Republic of	StQ-23I	D	Moral/ethics, physical education, personal and social development	Moral/ethics, physical education, personal and social development
StQ-23A-I	Luxembourg	StQ-23I	D	Life and society, physical education, personal and social development	Life and society, physical education, personal and social development development
StQ-23A-I	Russia (Moscow)	StQ-23I	D	Moral/ethics, physical education, home economics, psychology	Moral/ethics, physical education, home economics, psychology
StQ-23A-I	Uruguay	StQ-23I	D	Moral and civic education, physical education, etc.	Moral and civic education, physical education, etc.
StQ-24A-K	Finland	StQ-24A	D	Nationally defined dimension: Educational or training programs	Nationally defined dimension: Educational or training programs
StQ-24A-K	France	StQ-24A	D	Exercise Programmes	Exercise Programmes
StQ-24A-K	Denmark	StQ-24B	D	Microsoft Word®, LibreOffice Writer, Google Docs®	Microsoft Word®, LibreOffice Writer, Google Docs®
StQ-24A-K	France	StQ-24B	D	Microsoft Word®, Openoffice Writer	Microsoft Word®, Openoffice Writer
StQ-24A-K	Germany	StQ-24B	D	Microsoft Word®, OpenOffice Writer	Microsoft Word®, OpenOffice Writer
StQ-24A-K	Italy	StQ-24B	D	Microsoft Word®, Open Office Writer	Microsoft Word®, Open Office Writer
StQ-24A-K	Korea, Republic of	StQ-24B	D	Microsoft Word®, Hancom office Hanguel®	Microsoft Word®, Hancom office Hanguel®
StQ-24A-K	Uruguay	StQ-24B	D	Microsoft Word®, Writer	Microsoft Word®, Writer
StQ-24A-K	Denmark	StQ-24C	D	Microsoft PowerPoint®, LibreOffice Impress, Google Slides	Microsoft PowerPoint®, LibreOffice Impress, Google Slides
StQ-24A-K	France	StQ-24C	D	Microsoft Powerpoint®, Openoffice Impress	Microsoft Powerpoint®, Openoffice Impress
StQ-24A-K	Germany	StQ-24C	D	Microsoft PowerPoint®, OpenOffice Impress	Microsoft PowerPoint®, OpenOffice Impress
StQ-24A-K	Italy	StQ-24C	D	Microsoft PowerPoint®, Open Office Impress	Microsoft PowerPoint®, Open Office Impress
StQ-24A-K	Korea, Republic of	StQ-24C	D	Microsoft PowerPoint®, Hancom office Hanshow®	Microsoft PowerPoint®, Hancom office Hanshow®
StQ-24A-K	Uruguay	StQ-24C	D	Microsoft PowerPoint®, Impress	Microsoft PowerPoint®, Impress
StQ-24A-K	Denmark	StQ-24D	D	Microsoft Excel®, LibreOffice Calc, Google Sheets	Microsoft Excel®, LibreOffice Calc, Google Sheets
StQ-24A-K	France	StQ-24D	D	Microsoft Excel®, Openoffice Calc	Microsoft Excel®, Openoffice Calc

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-24A-K	Germany	StQ-24D	D	Microsoft Excel®, OpenOffice Calc	Microsoft Excel®, OpenOffice Calc
StQ-24A-K	Italy	StQ-24D	D	Microsoft Excel®, Open Office Calc	Microsoft Excel®, Open Office Calc
StQ-24A-K	Uruguay	StQ-24D	D	Microsoft Excel®, Calc	Microsoft Excel®, Calc
StQ-24A-K	Chile	StQ-24F	D	Inspiration®, Cmaptools®	Inspiration®, Cmaptools®
StQ-24A-K	Denmark	StQ-24F	D	MindMeister, Cmap	MindMeister, Cmap
StQ-24A-K	Finland	StQ-24F	D	MindMeister, CmapTools, Popplet	MindMeister, CmapTools, Popplet
StQ-24A-K	France	StQ-24F	D	Xmind, Freemind	Xmind, Freemind
StQ-24A-K	Kazakhstan	StQ-24F	D	draw.io, Visual Studio	draw.io, Visual Studio
StQ-24A-K	Korea, Republic of	StQ-24F	D	ThinkWise©, Estsoft ALMind® Inspiration®	ThinkWise©, Estsoft ALMind® Inspiration®
StQ-24A-K	Uruguay	StQ-24F	D	Mapas Mentales®	Mapas Mentales®
StQ-27A-M	Denmark	StQ-27B	D	Microsoft Access®, LibreOffice Base	Microsoft Access®, LibreOffice Base
StQ-27A-M	Italy	StQ-27B	D	Microsoft Access®, Open Office Base	Microsoft Access®, Open Office Base
StQ-27A-M	Chile	StQ-27G	D	Nationally defined dimension: Programming or creating a macro (for example in Basic, Visual Basic)	Nationally defined dimension: Programming or creating a macro (for example in Basic, Visual Basic)
StQ-27A-M	Denmark	StQ-27G	D	JavaScript, Visual Basic	JavaScript, Visual Basic
StQ-27A-M	Kazakhstan	StQ-27G	D	Visual Basic, C++ and others	Visual Basic, C++ and others
StQ-27A-M	Korea, Republic of	StQ-27G	D	C/C++, Visual Basic	C/C++, Visual Basic
StQ-27A-M	United States	StQ-27G	D	Scratch, Logo, VBA, Java	Scratch, Logo, VBA, Java
StQ-27A-M	Finland	StQ-27L	D	Mobile app	Mobile app
StQ-28A-K	Chile	StQ-28I	D	Secondary education	Secondary education
StQ-28A-K	Denmark	StQ-28I	D	My youth education / general and vocational upper secondary education	My youth education / general and vocational upper secondary education
StQ-28A-K	Finland	StQ-28I	D	Upper secondary school or vocational upper secondary school qualification	Upper secondary school or vocational upper secondary school qualification
StQ-28A-K	France	StQ-28I	D	Upper secondary school	Upper secondary school
StQ-28A-K	Germany	StQ-28I	D	School	School
StQ-28A-K	Kazakhstan	StQ-28I	D	School	School
StQ-28A-K	Russia (Moscow)	StQ-28I	D	School	School

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
StQ-28A-K	United States	StQ-28I	D	High school	High school
StQ-28A-K	Uruguay	StQ-28I	D	Secondary education	Secondary education
StQ-30	Chile	StQ-30	D	Computing, technology, informatics, or similar subject	Computing, technology, informatics, or similar subject
StQ-30	Denmark	StQ-30	D	Subjects with a focus on computers and ICT	Subjects with a focus on computers and ICT
StQ-30	Finland	StQ-30	D	Information technology, programming, data processing etc. during this academic year	Information technology, programming, data processing etc. during this academic year
StQ-30	France	StQ-30	D	Computing	Computing
StQ-30	Germany	StQ-30	D	Nationally defined dimensions: Informatics, applied informatics Informatic basic education, media education	National dimensions recoded for international comparability: Informatics, applied informatics / Informatic basic education, media education
StQ-30	Italy	StQ-30	D	Computer, elements of computer science or information technology	Computer, elements of computer science or information technology
StQ-30	Korea, Republic of	StQ-30	D	Informatics	Informatics
StQ-30	Portugal	StQ-30	D	Computing, informatics, ICT, or a similar subject	Computing, informatics, ICT, or a similar subject
StQ-30	Russia (Moscow)	StQ-30	D	Information technology and ICT	Information technology and ICT

List of country-specific adaptations to the principal questionnaire sorted by question group, country, and location

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-01	Uruguay	PrQ-01	D	Nationally defined categories: 1 = Female 2 = Male 3 = Other	National categories recoded for international comparability: 1 = Female 2 = Male
PrQ-02A-N	Denmark	PrQ-02J	D	MinUddannelse, MeeBook	MinUddannelse, MeeBook
PrQ-02A-N	Finland	PrQ-02J	D	Moodle, Peda.net	Moodle, Peda.net
PrQ-02A-N	Germany	PrQ-02J	D	Moodle, Logineo, mebis, itslearning	Moodle, Logineo, mebis, itslearning
PrQ-02A-N	Italy	PrQ-02J	D	Moodle, Edmodo	Moodle, Edmodo
PrQ-02A-N	Kazakhstan	PrQ-02J	D	Kundelik.kz	Kundelik.kz
PrQ-02A-N	Korea, Republic of	PrQ-02J	D	NEIS, Cyberlearning, Wedorang, Classting, Moodle, Blackboard	NEIS, Cyberlearning, Wedorang, Classting, Moodle, Blackboard
PrQ-02A-N	Luxembourg	PrQ-02J	D	EduMoodle	EduMoodle
PrQ-02A-N	United States	PrQ-02J	D	Blackboard, Edmodo, Moodle	Blackboard, Edmodo, Moodle
PrQ-02A-N	Uruguay	PrQ-02J	D	Crea2, Moodle	Crea2, Moodle
PrQ-05A-B	Chile	PrQ-05A	D	Nationally defined categories: 1 = Nursery education (including kindergarten) 2 = Grade 1 3 = Grade 2 4 = Grade 3 5 = Grade 4 6 = Grade 5 7 = Grade 6 8 = Grade 7 9 = Grade 8	National categories recoded for international comparability: 0 = Nursery education (including kindergarten) 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-05A-B	Denmark	PrQ-05A	D	Nationally defined categories: 1 = Grade 0 2 = Grade 1 3 = Grade 2 4 = Grade 3 5 = Grade 4 6 = Grade 5 7 = Grade 6 8 = Grade 7 9 = Grade 8	National categories recoded for international comparability: 0 = Grade 0 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8
PrQ-05A-B	Finland	PrQ-05A	D	Nationally defined categories: 1 = 1st class 2 = 2nd class 3 = 3rd class 4 = 4th class 5 = 5th class 6 = 6th class 7 = 7th class 8 = 8th class	Nationally defined categories: 1 = 1st class 2 = 2nd class 3 = 3rd class 4 = 4th class 5 = 5th class 6 = 6th class 7 = 7th class 8 = 8th class
PrQ-05A-B	France	PrQ-05A	D	Nationally defined categories: 1 = Sixth 2 = Fifth 3 = Fourth	National categories recoded for international comparability: 6 = Sixth 7 = Fifth 8 = Fourth
PrQ-05A-B	Germany	PrQ-05A	D	Nationally defined categories: 1 = Preschool activities 2 = Grade 1 3 = Grade 2 4 = Grade 3 5 = Grade 4 6 = Grade 5 7 = Grade 6 8 = Grade 7 9 = Grade 8	National categories recoded for international comparability: 0 = Preschool activities 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8
PrQ-05A-B	Italy	PrQ-05A	D	Nationally defined categories: 1 = Kindergarten from 3 years 2 = Grade 1 3 = Grade 6	National categories recoded for international comparability: 0 = Kindergarten from 3 years 1 = Grade 1 6 = Grade 6

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-05A-B	Kazakhstan	PrQ-05A	D	Nationally defined categories: 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8	Nationally defined categories: 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8
PrQ-05A-B	Korea, Republic of	PrQ-05A	D	Nationally defined categories: 1 = Year 1 2 = Year 2 3 = Year 3	National categories recoded for international comparability: 7 = Year 1
PrQ-05A-B	Luxembourg	PrQ-05A	D	Nationally defined categories: 1 = 7th 2 = 6th/8th 3 = 5th/9th 4 = 4th/10th 5 = 3rd/11th 6 = 2nd/12th 7 = 1st/13th	National categories recoded for international comparability: 7 = 7th
PrQ-05A-B	Portugal	PrQ-05A	D	Nationally defined categories: 1 = 1st Grade 2 = 5th Grade 3 = 7th Grade	National categories recoded for international comparability: 1 = 1st Grade 5 = 5th Grade 7 = 7th Grade
PrQ-05A-B	Russia (Moscow)	PrQ-05A	D	Nationally defined categories: 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8	Nationally defined categories: 1 = Grade 1 2 = Grade 2 3 = Grade 3 4 = Grade 4 5 = Grade 5 6 = Grade 6 7 = Grade 7 8 = Grade 8

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-05A-B	United States	PrQ-05A	D	Nationally defined categories: 1 = Preschool 2 = Kindergarten 3 = First Grade 4 = Second Grade 5 = Third Grade 6 = Fourth Grade 7 = Fifth Grade 8 = Sixth Grade 9 = Seventh Grade 10 = Eighth Grade	National categories recoded for international comparability: 0 = Preschool / Kindergarten 1 = First Grade 2 = Second Grade 3 = Third Grade 4 = Fourth Grade 5 = Fifth Grade 6 = Sixth Grade 7 = Seventh Grade 8 = Eighth Grade
PrQ-05A-B	Uruguay	PrQ-05A	D	Nationally defined categories: 1 = Early childhood (0 to 2 years) 2 = Initial 3 years 3 = Initial 4 years 4 = Initial 5 years 5 = 1st Grade of primary school 6 = 2nd Grade of primary school 7 = 3º of primary school 8 = 4th Grade of primary school 9 = 5th Grade of primary school 10 = 6th Grade of primary school 11 = 1º of basic cycle 12 = 2nd of basic cycle	National categories recoded for international comparability: 0 = Early childhood (0 to 2 years) / Initial 3 years / Initial 4 years / Initial 5 years 1 = 1st Grade of primary school 2 = 2nd Grade of primary school 3 = 3º of primary school 4 = 4th Grade of primary school 5 = 5th Grade of primary school 6 = 6th Grade of primary school 7 = 1º of basic cycle 8 = 2nd of basic cycle
PrQ-05A-B	Chile	PrQ-05B	D	Nationally defined categories: 1 = Grade 8 2 = Grade 9 3 = Grade 10 4 = Grade 11 5 = Grade 12	National categories recoded for international comparability: 8 = Grade 8 9 = Grade 9 10 = Grade 10 11 = Grade 11 12 = Grade 12
PrQ-05A-B	Denmark	PrQ-05B	D	Nationally defined categories: 1 = Grade 8 2 = Grade 9 3 = Grade 10 4 = Upper secondary school, 1st year 5 = Upper secondary school, 2nd year 6 = Upper secondary school, 3rd year	National categories recoded for international comparability: 8 = Grade 8 9 = Grade 9 10 = Grade 10 11 = Upper secondary school, 1st year 12 = Upper secondary school, 2nd year 13 = Upper secondary school, 3rd year

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-05A-B	Finland	PrQ-05B	D	Nationally defined categories: 1 = 9th class 2 = 10th class 3 = 1st year of the upper secondary school 4 = 2nd year of the upper secondary school 5 = 3rd year of the upper secondary school 6 = 4th year of the upper secondary school	National categories recoded for international comparability: 9 = 9th class 10 = 10th class 11 = 1st year of the upper secondary school 12 = 2nd year of the upper secondary school 13 = 3rd year of the upper secondary school 14 = 4th year of the upper secondary school
PrQ-05A-B	France	PrQ-05B	D	Nationally defined categories: 1 = Fourth 2 = Third	National categories recoded for international comparability: 8 = Fourth 9 = Third
PrQ-05A-B	Germany	PrQ-05B	D	Nationally defined categories: 1 = Grade 8 2 = Grade 9 3 = Grade 10 4 = Grade 11 5 = Grade 12 6 = Grade 13	National categories recoded for international comparability: 8 = Grade 8 9 = Grade 9 10 = Grade 10 11 = Grade 11 12 = Grade 12 13 = Grade 13
PrQ-05A-B	Italy	PrQ-05B	D	Nationally defined categories: 1 = Grade 8 2 = Grade 13	National categories recoded for international comparability: 8 = Grade 8 13 = Grade 13
PrQ-05A-B	Kazakhstan	PrQ-05B	D	Nationally defined categories: 1 = Grade 9 2 = Grade 10 3 = Grade 11 4 = Grade 12	National categories recoded for international comparability: 9 = Grade 9 10 = Grade 10 11 = Grade 11 12 = Grade 12
PrQ-05A-B	Korea, Republic of	PrQ-05B	D	Nationally defined categories: 1 = Year 1 2 = Year 2 3 = Year 3	National categories recoded for international comparability: 9 = Year 32
PrQ-05A-B	Luxembourg	PrQ-05B	D	Nationally defined categories: 1 = 7th 2 = 6th/8th 3 = 5th/9th 4 = 4th/10th 5 = 3rd/11th 6 = 2nd/12th 7 = 1st/13th	National categories recoded for international comparability: 8 = 6th/8th 12 = 2nd/12th 13 = 1st/13th

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-05A-B	Portugal	PrQ-05B	D	Nationally defined categories: 1 = 8th Grade 2 = 9th Grade 3 = 12th Grade	National categories recoded for international comparability: 9 = 9th class 8 = 8th Grade 9 = 9th Grade 12 = 12th Grade
PrQ-05A-B	Russia (Moscow)	PrQ-05B	D	Nationally defined categories: 1 = Grade 9 2 = Grade 10 3 = Grade 11	National categories recoded for international comparability: 9 = Grade 9 10 = Grade 10 11 = Grade 11
PrQ-05A-B	United States	PrQ-05B	D	Nationally defined categories: 1 = Eighth grade 2 = Ninth grade 3 = Tenth grade 4 = Eleventh grade 5 = Twelfth grade	National categories recoded for international comparability: 8 = Eighth grade 9 = Ninth grade 10 = Tenth grade 11 = Eleventh grade 12 = Twelfth grade
PrQ-05A-B	Uruguay	PrQ-05B	D	Nationally defined categories: 1 = 2° of basic cycle 2 = 3° of basic cycle 3 = 4° (superior) 4 = 5th (higher) 5 = 6th (higher) 6 = Tertiary	National categories recoded for international comparability: 8 = 2° of basic cycle 9 = 3° of basic cycle 10 = 4° (superior) 11 = 5th (higher) 12 = 6th (higher) 13 = Tertiary
PrQ-06A-B	Chile	PrQ-06A-B	D	Question instruction changed: A full-time teacher is employed as a teacher for the full school year for at least 90% of his total time. All other teachers should be considered part-time.	Question instruction changed: A full-time teacher is employed as a teacher for the full school year for at least 90% of his total time. All other teachers should be considered part-time.
PrQ-07	Denmark	PrQ-07	D	Nationally defined categories: 1 = In a community with fewer than 3,000 people 2 = In a town with at least 3,000 but less than 15,000 people 3 = In a town with at least 15,000 but less than 100,000 people 4 = In a city with 100,000 or more people	National categories recoded for international comparability: 1 = In a community with fewer than 3,000 people 2 = In a town with at least 3,000 but less than 15,000 people 3 = In a town with at least 15,000 but less than 100,000 people 4 = In a city with 100,000 or more people 5 = Category not administered or data not available
PrQ-07	Luxembourg	PrQ-07	D	Nationally defined categories: 1 = In a community with fewer than 3,000 people 2 = In a community with at least 3,000 but less than 5,000 people 3 = In a community with at least 5,000 but less than 10,000 people 4 = In a community with at least 10,000 but less than 30,000 people 5 = In a community with 30,000 or more people	National categories recoded for international comparability: 1 = In a community with fewer than 3,000 people 2 = In a community with at least 3,000 but less than 5,000 people / In a community with at least 5,000 but less than 10,000 people 3 = In a community with at least 10,000 but less than 30,000 people 4 = In a community with at least 10,000 but less than 30,000 people / In a community with 30,000 or more people 5 = Category not administered or data not available

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-07	Russia (Moscow)	PrQ-07	D	Gang punched to 5: 'In a city with 1,000,000 or more people'	Gang punched to 5: 'In a city with 1,000,000 or more people'
PrQ-08A	Chile	PrQ-08A	D	Category instruction changed: 1 = A public school (This is a school managed directly or indirectly by a public education authority, government agency, or governing board, appointed by government)	Category instruction changed: 1 = A public school (This is a school managed directly or indirectly by a public education authority, government agency, or governing board, appointed by government)
PrQ-08A	France	PrQ-08A	X	Question not administered or data not available	Question not administered or data not available
PrQ-05A-B	Italy	PrQ-05B	D	Category instruction changed: 1 = A public school A public school means a school run by educational authorities belonging to the public sector 2 = A private school A private school means an equal school, run by a private body, including religious bodies	Category instruction changed: 1 = A public school A public school means a school run by educational authorities belonging to the public sector 2 = A private school A private school means an equal school, run by a private body, including religious bodies
PrQ-11A-K	Chile	PrQ-11A-K	D	Stem of the question changed: Are teachers in your school expected to acquire knowledge and skills to develop each of the following activities?	Stem of the question changed: Are teachers in your school expected to acquire knowledge and skills to develop each of the following activities?
PrQ-11A-K	Denmark	PrQ-11K	D	Computer and information competencies	Computer and information competencies
PrQ-11A-K	Finland	PrQ-11K	D	Multiliteracy	Multiliteracy
PrQ-11A-K	France	PrQ-11K	D	Digital literacy skills	Digital literacy skills
PrQ-11A-K	Portugal	PrQ-11K	D	Communication and information literacy	Communication and information literacy
PrQ-11A-K	Uruguay	PrQ-11K	D	Computer literacy and information management skills	Computer literacy and information management skills
PrQ-12A-L	Chile	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry of Education, local council, or owner of the school 2 = School boards/councils 3 = School principal 4 = Heads of department from the school 5 = ICT coordinator 6 = Librarian or Learning Resources Center Coordinator 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Ministry of Education, local council, or owner of the school 2 = School boards/councils 3 = School principal 4 = Heads of department from the school 5 = ICT coordinator 6 = Librarian or Learning Resources Center Coordinator 7 = Individual teachers 8 = No one

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-12A-L	Denmark	PrQ-12A-L	D	Nationally defined categories: 1 = The ministry or municipality 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = The ministry or municipality 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Finland	PrQ-12A-L	D	Nationally defined categories: 1 = Municipality or municipal education authorities 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Municipality or municipal education authorities 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	France	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry, rectorate (educational local authority), departmental council, or regional council 2 = School boards/councils 3 = School principal or deputy 4 = Discipline coordinator 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Ministry, rectorate (educational local authority), departmental council, or regional council 2 = School boards/councils 3 = School principal or deputy 4 = Discipline coordinator 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Germany	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry, department or local/district authority 2 = School boards/councils 3 = School principal or deputy 4 = Head of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Ministry, department or local/district authority 2 = School boards/councils 3 = School principal or deputy 4 = Head of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-12A-L	Italy	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry and its local offices, local governments or regional government 2 = School boards/councils 3 = School principal or deputy 4 = Department managers 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Ministry and its local offices, local governments or regional government 2 = School boards/councils 3 = School principal or deputy 4 = Department managers 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Kazakhstan	PrQ-12A-L	D	Nationally defined categories: 1 = Educational management bodies 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Educational management bodies 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Luxembourg	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry of education 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Ministry of education 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Portugal	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry of Education 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Ministry of Education 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-12A-L	Russia (Moscow)	PrQ-12A-L	D	Nationally defined categories: 1 = Moscow Department of Education 2 = School boards/councils 3 = School principal or deputy 4 = Heads of departments 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = Moscow Department of Education 2 = School boards/councils 3 = School principal or deputy 4 = Heads of departments 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	United States	PrQ-12A-L	D	Nationally defined categories: 1 = School district or relevant education authority 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Nationally defined categories: 1 = School district or relevant education authority 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Uruguay	PrQ-12A-L	D	Nationally defined categories: 1 = Ministry, department or local/district authority 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = Plan Ceibal 9 = No one	National categories recoded for international comparability: 1 = Ministry, department or local/district authority 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one
PrQ-12A-L	Denmark	PrQ-12J-K	D	Computer and information competencies	Computer and information competencies
PrQ-12A-L	Finland	PrQ-12J-K	D	Multiliteracy	Multiliteracy
PrQ-12A-L	France	PrQ-12J-K	D	Digital literacy skills	Digital literacy skills
PrQ-12A-L	Portugal	PrQ-12J-K	D	Communication and information literacy	Communication and information literacy
PrQ-13A-L	Denmark	PrQ-13I	D	Students with special needs or learning difficulties	Students with special needs or learning difficulties
PrQ-13A-L	Finland	PrQ-13I	D	Students who need it	Students who need it
PrQ-13A-L	France	PrQ-13I	D	Students with special needs or learning difficulties	Students with special needs or learning difficulties
PrQ-13A-L	France	PrQ-13J	D	Cyber harassment	Cyber harassment

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
PrQ-14A-H	Chile	PrQ-14H	D	Group of learning	Group of learning
PrQ-14A-H	Finland	PrQ-14H	D	Nationally defined dimension: Participation in the activities of a group of people interested in using ICT in teaching (e.g., group in social media or association)	Nationally defined dimension: Participation in the activities of a group of people interested in using ICT in teaching (e.g., group in social media or association)
PrQ-14A-H	France	PrQ-14H	D	Network	Network
PrQ-14A-H	Germany	PrQ-14H	D	Working group	Working group
PrQ-14A-H	Kazakhstan	PrQ-14H	D	Practical courses	Practical courses
PrQ-14A-H	Korea, Republic of	PrQ-14H	D	Teacher community (teacher study group)	Teacher community (teacher study group)
PrQ-14A-H	Russia (Moscow)	PrQ-14H	D	Teacher council/association (school level, regional level, virtual/web) and other professional communities, including web-based)	Teacher council/association (school level, regional level, virtual/web) and other professional communities, including web-based)
PrQ-14A-H	Uruguay	PrQ-14H	D	Forum	Forum

List of country-specific adaptations to the ICT coordinator questionnaire sorted by question group, country, and location

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
CoQ-05A-N	Chile	CoQ-05A	D	Kahoot, Quizziz, Socrative	Kahoot, Quizziz, Socrative
CoQ-05A-N	Denmark	CoQ-05A	D	Quizlet, Kahoot, MatematikFessor.dk, pengeby.dk	Quizlet, Kahoot, MatematikFessor.dk, pengeby.dk
CoQ-05A-N	Finland	CoQ-05A	D	Quizlet, Kahoot, Socrative	Quizlet, Kahoot, Socrative
CoQ-05A-N	Italy	CoQ-05A	D	Kahoot, Quizlet, Google Moduli	Kahoot, Quizlet, Google Moduli
CoQ-05A-N	Korea, Republic of	CoQ-05A	D	Quiz app, Quizlet, Kahoot	Quiz app, Quizlet, Kahoot
CoQ-05A-N	Luxembourg	CoQ-05A	D	Quizlet, Kahoot	Quizlet, Kahoot
CoQ-05A-N	Russia (Moscow)	CoQ-05A	D	Quizlet, Kahoot, Hot Potatoes, mathfessor	Quizlet, Kahoot, Hot Potatoes, mathfessor
CoQ-05A-N	United States	CoQ-05A	D	Quizlet, Kahoot	Quizlet, Kahoot
CoQ-05A-N	Uruguay	CoQ-05A	D	Quizlet, Kahoot, PAM	Quizlet, Kahoot, PAM
CoQ-05A-N	Chile	CoQ-05B	D	Duolingo	Duolingo
CoQ-05A-N	Denmark	CoQ-05B	D	Mingoville.com, matematikhaven.dk, pengeby.dk	Mingoville.com, matematikhaven.dk, pengeby.dk
CoQ-05A-N	Finland	CoQ-05B	D	Duolingo, learning games developed by textbook publishers	Duolingo, learning games developed by textbook publishers
CoQ-05A-N	Korea, Republic of	CoQ-05B	D	Hancom typing training	Hancom typing training
CoQ-05A-N	Luxembourg	CoQ-05B	D	Berlitz e-learning platform - CyberTeachers	Berlitz e-learning platform - CyberTeachers
CoQ-05A-N	Russia (Moscow)	CoQ-05B	D	Lingualeo	Lingualeo
CoQ-05A-N	Uruguay	CoQ-05B	D	Doolingo, Cazaproblemas, Letrapaluza, Dragonbox	Doolingo, Cazaproblemas, Letrapaluza, Dragonbox
CoQ-05A-N	Finland	CoQ-05C	D	Quest Atlantis, Stranded, Minecraft	Quest Atlantis, Stranded, Minecraft
CoQ-05A-N	Denmark	CoQ-05D	D	LibreOffice Writer, Google Docs®, Microsoft Word®	LibreOffice Writer, Google Docs®, Microsoft Word®
CoQ-05A-N	France	CoQ-05D	D	Microsoft Word®, OpenOffice Writer	Microsoft Word®, OpenOffice Writer
CoQ-05A-N	Germany	CoQ-05D	D	Microsoft Word®, OpenOffice Writer	Microsoft Word®, OpenOffice Writer
CoQ-05A-N	Italy	CoQ-05D	D	Microsoft Word®, OpenOffice Writer, etc.	Microsoft Word®, OpenOffice Writer, etc.
CoQ-05A-N	Korea, Republic of	CoQ-05D	D	Microsoft Word®, Hancom office Hangeul®	Microsoft Word®, Hancom office Hangeul®
CoQ-05A-N	Uruguay	CoQ-05D	D	Microsoft Word®, Writer	Microsoft Word®, Writer

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
CoQ-05A-N	Denmark	CoQ-05E	D	LibreOffice impress, Google Slides, Microsoft PowerPoint®, Prezi	LibreOffice impress, Google Slides, Microsoft PowerPoint®, Prezi
CoQ-05A-N	France	CoQ-05E	D	Microsoft Powerpoint®, OpenOffice Impress	Microsoft Powerpoint®, OpenOffice Impress
CoQ-05A-N	Germany	CoQ-05E	D	Microsoft PowerPoint®, OpenOffice Impress	Microsoft PowerPoint®, OpenOffice Impress
CoQ-05A-N	Italy	CoQ-05E	D	Microsoft PowerPoint®, Open Office Impress, etc.	Microsoft PowerPoint®, Open Office Impress, etc.
CoQ-05A-N	Korea, Republic of	CoQ-05E	D	Microsoft PowerPoint®, Hancom office Hanshow®	Microsoft PowerPoint®, Hancom office Hanshow®
CoQ-05A-N	Uruguay	CoQ-05E	D	Microsoft PowerPoint®, Impress	Microsoft PowerPoint®, Impress
CoQ-05A-N	Denmark	CoQ-05F	D	Adobe Photoshop, Windows Movie Maker, iMovie, Splice, Flipagram	Adobe Photoshop, Windows Movie Maker, iMovie, Splice, Flipagram
CoQ-05A-N	Uruguay	CoQ-05F	D	Windows Movie Maker, iMovie, Adobe Photoshop, Gimp, Inkscape	Windows Movie Maker, iMovie, Adobe Photoshop, Gimp, Inkscape
CoQ-05A-N	Chile	CoQ-05G	D	Inspiration®, Cmaptools®	Inspiration®, Cmaptools®
CoQ-05A-N	Denmark	CoQ-05G	D	MindMeister, Cmap	MindMeister, Cmap
CoQ-05A-N	Finland	CoQ-05G	D	MindMeister, CmapTools, Popplet	MindMeister, CmapTools, Popplet
CoQ-05A-N	France	CoQ-05G	D	Concept mapping software or mental map (e.g., Xmind, FreeMind)	Concept mapping software or mental map (e.g., Xmind, FreeMind)
CoQ-05A-N	Germany	CoQ-05G	D	Inspiration®, Webspiration®, FreeMind	Inspiration®, Webspiration®, FreeMind
CoQ-05A-N	Kazakhstan	CoQ-05G	D	Smartdraw	Smartdraw
CoQ-05A-N	Korea, Republic of	CoQ-05G	D	Almind®, ThinkWise®, Inspiration®	Almind®, ThinkWise®, Inspiration®
CoQ-05A-N	Uruguay	CoQ-05G	D	Mapas Mentales	Mapas Mentales
CoQ-05A-N	Denmark	CoQ-05H	D	SPARK datalogger	SPARK datalogger
CoQ-05A-N	Germany	CoQ-05H	D	LoggerPro, phyphox, SensorMax	LoggerPro, phyphox, SensorMax
CoQ-05A-N	Korea, Republic of	CoQ-05H	D	MBL, Logger Pro	MBL, Logger Pro
CoQ-05A-N	Uruguay	CoQ-05H	D	LoggerPro, Globilab, Neulog	LoggerPro, Globilab, Neulog
CoQ-05A-N	Denmark	CoQ-05I	D	NetLogo, elevlab.dk	NetLogo, elevlab.dk
CoQ-05A-N	Finland	CoQ-05I	D	NetLogo, GeoGebra, SketchUp	NetLogo, GeoGebra, SketchUp
CoQ-05A-N	Germany	CoQ-05I	D	NetLogo, GeoGebra, plan game stock market	NetLogo, GeoGebra, plan game stock market
CoQ-05A-N	Korea, Republic of	CoQ-05I	D	NetLogo, 123D, Algodoo, Sketchup	NetLogo, 123D, Algodoo, Sketchup
CoQ-05A-N	Russia (Moscow)	CoQ-05I	D	NetLogo, Qucs, LogoMiry	NetLogo, Qucs, LogoMiry
CoQ-05A-N	Denmark	CoQ-05J	D	Meebook, MinUddannelse	Meebook, MinUddannelse

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
CoQ-05A-N	Finland	CoQ-05J	D	Edmodo, Peda.net, Wilma	Edmodo, Peda.net, Wilma
CoQ-05A-N	Germany	CoQ-05J	D	Moodle, Logineo, mebis, itslearning	Moodle, Logineo, mebis, itslearning
CoQ-05A-N	Italy	CoQ-05J	D	Edmodo, Google Suite for Education, Microsoft Office for Education	Edmodo, Google Suite for Education, Microsoft Office for Education
CoQ-05A-N	Kazakhstan	CoQ-05J	D	Kundelik.kz	Kundelik.kz
CoQ-05A-N	Korea, Republic of	CoQ-05J	D	NEIS, Cyberlearning, Wedorang, Classting, Moodle, Blackboard	NEIS, Cyberlearning, Wedorang, Classting, Moodle, Blackboard
CoQ-05A-N	Luxembourg	CoQ-05J	D	EduMoodle	EduMoodle
CoQ-05A-N	Russia (Moscow)	CoQ-05J	D	Edmodo, Moodle, Blackboard	Edmodo, Moodle, Blackboard
CoQ-05A-N	United States	CoQ-05J	D	Blackboard, Edmodo, Moodle	Blackboard, Edmodo, Moodle
CoQ-05A-N	Chile	CoQ-05L	D	GoogleDocs	GoogleDocs
CoQ-05A-N	Finland	CoQ-05L	D	VoiceThread, Evernote, Peda.net	VoiceThread, Evernote, Peda.net
CoQ-05A-N	Germany	CoQ-05L	D	EverNote, VoiceThread	EverNote, VoiceThread
CoQ-05A-N	Korea, Republic of	CoQ-05L	D	Nationally defined dimension: E-portfolios	Nationally defined dimension: E-portfolios
CoQ-05A-N	Uruguay	CoQ-05L	D	Crea2, Googlesite	Crea2, Googlesite
CoQ-05A-N	Kazakhstan	CoQ-05N	D	Facebook, Vkontakte, Instagram	Facebook, Vkontakte, Instagram
CoQ-05A-N	Korea, Republic of	CoQ-05N	D	Facebook, Twitter, Kakao Story, Naver café, Blog	Facebook, Twitter, Kakao Story, Naver café, Blog
CoQ-06A-H	Denmark	CoQ-06D	D	Google Docs®, Microsoft Office 365	Google Docs®, Microsoft Office 365
CoQ-06A-H	United States	CoQ-06D	D	e.g., Google Docs, Padlet, OneNote	e.g., Google Docs, Padlet, OneNote
CoQ-06A-H	Uruguay	CoQ-06D	D	Google Docs®, WPS	Google Docs®, WPS
CoQ-06A-H	Denmark	CoQ-06E	D	Meebook, MinUddannelse	Meebook, MinUddannelse
CoQ-06A-H	Finland	CoQ-06E	D	Moodle, Peda.net and Wilma	Moodle, Peda.net and Wilma
CoQ-06A-H	Germany	CoQ-06E	D	Moodle, Logineo, mebis, itslearning	Moodle, Logineo, mebis, itslearning
CoQ-06A-H	Italy	CoQ-06E	D	Edmodo, Google Suite for Education, Microsoft Office for Education, Moodle, etc.	Edmodo, Google Suite for Education, Microsoft Office for Education, Moodle, etc.
CoQ-06A-H	Kazakhstan	CoQ-06E	D	Kundelik.kz	Kundelik.kz
CoQ-06A-H	Korea, Republic of	CoQ-06E	D	NEIS, Cyberlearning, Wedorang, Classting, Moodle, Blackboard	NEIS, Cyberlearning, Wedorang, Classting, Moodle, Blackboard
CoQ-06A-H	Luxembourg	CoQ-06E	D	EduMoodle	EduMoodle
CoQ-06A-H	United States	CoQ-06E	D	Blackboard, Edmodo, Moodle	Blackboard, Edmodo, Moodle

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
CoQ-06A-H	Uruguay	CoQ-06E	D	Crea2, Moodle	Crea2, Moodle
CoQ-08	Denmark	CoQ-08	D	The municipality	The municipality
CoQ-08	Finland	CoQ-08	D	Municipality	Municipality
CoQ-08	France	CoQ-08	D	The departmental council or the regional council	The departmental council or the regional council
CoQ-08	Germany	CoQ-08	D	Education authority	Education authority
CoQ-08	Italy	CoQ-08	D	Ministry of education	Ministry of education
CoQ-08	Kazakhstan	CoQ-08	D	Education governing authority	Education governing authority
CoQ-08	Korea, Republic of	CoQ-08	D	Educational authority	Educational authority
CoQ-08	Luxembourg	CoQ-08	D	Governmental department	Governmental department
CoQ-08	Portugal	CoQ-08	D	The Ministry of Education	The Ministry of Education
CoQ-08	Russia (Moscow)	CoQ-08	D	Moscow Department of Education	Moscow Department of Education
CoQ-08	United States	CoQ-08	D	School district	School district
CoQ-09A-C	France	CoQ-09A-B	D	Institution	Institution
CoQ-09A-C	Luxembourg	CoQ-09A-B	D	School *English/French: Institution	School *English/French: Institution
CoQ-11A-H	Italy	CoQ-11A	D	Nationally defined dimension: You, as ICT coordinator (digital facilitator)	Nationally defined dimension: You, as ICT coordinator (digital facilitator)
CoQ-11A-H	Chile	CoQ-11A-H	D	Habitually	Habitually
CoQ-11A-H	Denmark	CoQ-11A-H	D	Regular	Regular
CoQ-11A-H	Finland	CoQ-11A-H	D	During school days	During school days
CoQ-11A-H	France	CoQ-11A-H	D	Daily	Daily
CoQ-11A-H	Germany	CoQ-11A-H	D	On a regular basis	On a regular basis
CoQ-11A-H	Italy	CoQ-11A-H	D	Regular technical ICT support	Regular technical ICT support
CoQ-11A-H	Kazakhstan	CoQ-11A-H	D	Everyday	Everyday
CoQ-11A-H	Luxembourg	CoQ-11A-H	D	Routine	Routine
CoQ-11A-H	Portugal	CoQ-11A-H	D	Routine	Routine
CoQ-11A-H	Russia (Moscow)	CoQ-11A-H	D	Routine	Routine
CoQ-11A-H	United States	CoQ-11A-H	D	Day-to-day	Day-to-day

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
CoQ-11A-H	Uruguay	CoQ-11A-H	D	Daily	Daily
CoQ-11A-H	Italy	CoQ-11D	D	Nationally defined dimension: School staff (ATA staff charged by principal)	Nationally defined dimension: School staff (ATA staff charged by principal)
CoQ-11A-H	Italy	CoQ-11F	X	Dimension not administered or data not available	Dimension not administered or data not available
CoQ-12A-F	Chile	CoQ-12A-F	D	Habitually	Habitually
CoQ-12A-F	Denmark	CoQ-12A-F	D	Regular	Regular
CoQ-12A-F	Finland	CoQ-12A-F	D	During school days	During school days
CoQ-12A-F	France	CoQ-12A-F	D	Daily	Daily
CoQ-12A-F	Germany	CoQ-12A-F	D	On a regular basis	On a regular basis
CoQ-12A-F	Italy	CoQ-12A-F	D	Regular pedagogical ICT support	Regular pedagogical ICT support
CoQ-12A-F	Kazakhstan	CoQ-12A-F	D	Everyday	Everyday
CoQ-12A-F	Luxembourg	CoQ-12A-F	D	Routine	Routine
CoQ-12A-F	Portugal	CoQ-12A-F	D	Routine	Routine
CoQ-12A-F	Russia (Moscow)	CoQ-12A-F	D	Routine	Routine
CoQ-12A-F	United States	CoQ-12A-F	D	Day-to-day	Day-to-day
CoQ-12A-F	Uruguay	CoQ-12A-F	D	Daily	Daily
CoQ-12A-F	Chile	CoQ-12D	D	Nationally defined dimension: Librarians or library staff	Nationally defined dimension: Librarians or library staff
CoQ-12A-F	Chile	CoQ-12F	D	Nationally defined dimension: Authority responsible for the school	Nationally defined dimension: Authority responsible for the school
CoQ-12A-F	Italy	CoQ-12F	X	Dimension not administered or data not available	Dimension not administered or data not available
CoQ-14	Denmark	CoQ-14	D	Programming, computer science or technology	Programming, computer science or technology
CoQ-14	Finland	CoQ-14	D	Information technology, programming, or other similar courses	Information technology, programming, or other similar courses
CoQ-14	France	CoQ-14	D	Computing	Computing
CoQ-14	Germany	CoQ-14	D	Informatics, informatics and media, or another subject of informatoric basic education (e.g., ITG)	Informatics, informatics and media, or another subject of informatoric basic education (e.g., ITG)
CoQ-14	Italy	CoQ-14	X	Question not administered or data not available	Question not administered or data not available
CoQ-14	Kazakhstan	CoQ-14	D	Computer Science, for students of 8th grade	Computer Science, for students of 8th grade
CoQ-14	Korea, Republic of	CoQ-14	D	Informatics	Informatics

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
CoQ-14	Luxembourg	CoQ-14	D	Informatics	Informatics
CoQ-14	Portugal	CoQ-14	D	Computing, informatics, or ICT	Computing, informatics, or ICT
CoQ-14	Russia (Moscow)	CoQ-14	D	Informatics and information technology	Informatics and information technology
CoQ-14	Uruguay	CoQ-14	D	Computing, information technology, or similar	Computing, information technology, or similar
CoQ-15A-I	Denmark	CoQ-15A	D	Scratch, Stencyl, Lego Mindstorm	Scratch, Stencyl, Lego Mindstorm
CoQ-15A-I	Korea, Republic of	CoQ-15A	D	Entry, Scratch	Entry, Scratch
CoQ-15A-I	Denmark	CoQ-15A-I	D	Programming, computer science, or technology	Programming, computer science, or technology
CoQ-15A-I	Finland	CoQ-15A-I	D	Information technology, programming, or other similar courses	Information technology, programming, or other similar courses
CoQ-15A-I	France	CoQ-15A-I	D	Computing	Computing
CoQ-15A-I	Germany	CoQ-15A-I	D	Informatics, informatics and media, or another subject of informatoric basic education (e.g., ITG)	Informatics, informatics and media, or another subject of informatoric basic education (e.g., ITG)
CoQ-15A-I	Italy	CoQ-15A-I	X	Question not administered or data not available	Question not administered or data not available
CoQ-15A-I	Kazakhstan	CoQ-15A-I	D	Computer Science	Computer Science
CoQ-15A-I	Luxembourg	CoQ-15A-I	D	Informatics	Informatics
CoQ-15A-I	Portugal	CoQ-15A-I	D	Computing, informatics, or ICT	Computing, informatics, or ICT
CoQ-15A-I	Russia (Moscow)	CoQ-15A-I	D	Informatics and information technology	Informatics and information technology
CoQ-15A-I	Uruguay	CoQ-15A-I	D	Computing, information technology, or similar	Computing, information technology, or similar

List of country-specific adaptations to the teacher questionnaire sorted by question group, country, and location

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-01	Uruguay	TcQ-01	D	Nationally defined categories: 1 = Female 2 = Male 3 = Other	National categories recoded for international comparability: 1 = Female 2 = Male
TcQ-03A-I	Chile	TcQ-03A	D	Language and communication	Language and communication
TcQ-03A-I	Denmark	TcQ-03A	D	Danish	Danish
TcQ-03A-I	Finland	TcQ-03A	D	Native language and literature or Finnish as a second language	Native language and literature or Finnish as a second language
TcQ-03A-I	France	TcQ-03A	D	French	French
TcQ-03A-I	Germany	TcQ-03A	D	German	German
TcQ-03A-I	Italy	TcQ-03A	D	Italian	Italian
TcQ-03A-I	Kazakhstan	TcQ-03A	D	Kazakh language and literature *Russian: Russian language and literature	Kazakh language and literature *Russian: Russian language and literature
TcQ-03A-I	Korea, Republic of	TcQ-03A	D	Korean	Korean
TcQ-03A-I	Luxembourg	TcQ-03A	D	German	German
TcQ-03A-I	Portugal	TcQ-03A	D	Portuguese	Portuguese
TcQ-03A-I	Russia (Moscow)	TcQ-03A	D	Russian language and literature	Russian language and literature
TcQ-03A-I	United States	TcQ-03A	D	English Language Arts	English Language Arts
TcQ-03A-I	Uruguay	TcQ-03A	D	Spanish Language	Spanish Language
TcQ-03A-I	Chile	TcQ-03A-I	D	4 modules of teaching activity	4 modules of teaching activity
TcQ-03A-I	Finland	TcQ-03A-I	D	Four hours	Four hours
TcQ-03A-I	France	TcQ-03A-I	D	Four courses	Four courses
TcQ-03A-I	Korea, Republic of	TcQ-03A-I	D	Four lessons	Four lessons
TcQ-03A-I	Portugal	TcQ-03A-I	D	Four academic periods	Four academic periods
TcQ-03A-I	United States	TcQ-03A-I	D	Four classes or two classes if block scheduling is used	Four classes or two classes if block scheduling is used
TcQ-03A-I	Uruguay	TcQ-03A-I	D	Four hours	Four hours

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-03A-I	Chile	TcQ-03B	D	Foreign language or original languages	Foreign language or original languages
TcQ-03A-I	Denmark	TcQ-03B	D	Foreign languages (e.g., English, German, French)	Foreign languages (e.g., English, German, French)
TcQ-03A-I	Finland	TcQ-03B	D	Languages: Swedish, English and other foreign languages	Languages: Swedish, English and other foreign languages
TcQ-03A-I	France	TcQ-03B	D	Nationally defined dimensions: Foreign Languages Regional Languages Ancient Languages (Latin, Greek)	National dimensions recoded for international comparability: Foreign Languages / Regional Languages / Ancient Languages (Latin, Greek)
TcQ-03A-I	Germany	TcQ-03B	D	Foreign language (English, French, Latin, etc.)	Foreign language (English, French, Latin, etc.)
TcQ-03A-I	Italy	TcQ-03B	D	English and/or other language	English and/or other language
TcQ-03A-I	Kazakhstan	TcQ-03B	D	Foreign and other national languages	Foreign and other national languages
TcQ-03A-I	Korea, Republic of	TcQ-03B	D	Language arts: foreign and other national languages	Language arts: foreign and other national languages
TcQ-03A-I	Luxembourg	TcQ-03B	D	French, English, Spanish, Italian	French, English, Spanish, Italian
TcQ-03A-I	Portugal	TcQ-03B	D	Foreign languages	Foreign languages
TcQ-03A-I	Russia (Moscow)	TcQ-03B	D	Foreign languages	Foreign languages
TcQ-03A-I	United States	TcQ-03B	D	Spanish, or other foreign language	Spanish, or other foreign language
TcQ-03A-I	Uruguay	TcQ-03B	D	Languages (e.g., English)	Languages (e.g., English)
TcQ-03A-I	Chile	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Denmark	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	France	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Germany	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Italy	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Korea, Republic of	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Luxembourg	TcQ-03C	D	Geometry, algebra	Geometry, algebra
TcQ-03A-I	Portugal	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-03A-I	Russia (Moscow)	TcQ-03C	D	Algebra, geometry	Algebra, geometry
TcQ-03A-I	United States	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Uruguay	TcQ-03C	D	Nationally defined dimension: Mathematics	Nationally defined dimension: Mathematics
TcQ-03A-I	Chile	TcQ-03D	D	Nationally defined dimension: Natural Sciences (general science and/or physics, chemistry, biology, geology, earth sciences)	Nationally defined dimension: Natural Sciences (general science and/or physics, chemistry, biology, geology, earth sciences)
TcQ-03A-I	France	TcQ-03D	D	Nationally defined dimensions: Physics-Chemistry Life and Earth Sciences	National dimensions recoded for international comparability: Physics-Chemistry / Life and Earth Sciences
TcQ-03A-I	Chile	TcQ-03E	D	Nationally defined dimension: History, Geography or Social sciences	Nationally defined dimension: History, Geography or Social sciences
TcQ-03A-I	France	TcQ-03E	D	Nationally defined dimension: History-Geography, Civic Education, Humanities and Social Sciences	Nationally defined dimension: History-Geography, Civic Education, Humanities and Social Sciences
TcQ-03A-I	Denmark	TcQ-03F	D	Nationally defined dimension: Musical and creative arts (Visual art, music, drama, movie knowledge)	Nationally defined dimension: Musical and creative arts (Visual art, music, drama, movie knowledge)
TcQ-03A-I	France	TcQ-03F	D	Nationally defined dimensions: Music Visual Arts	Nationally defined dimension: Music / Visual Arts
TcQ-03A-I	Uruguay	TcQ-03F	D	Nationally defined dimension: Visual and plastic education (drawing), Sound education (music), dance, theater, etc.	Nationally defined dimension: Visual and plastic education (drawing), Sound education (music), dance, theater, etc.
TcQ-03A-I	Chile	TcQ-03G	D	Nationally defined dimension: Technological Education or Computer Studies	Nationally defined dimension: Technological Education or Computer Studies
TcQ-03A-I	Denmark	TcQ-03G	D	ICT subjects (technology literacy)	ICT subjects (technology literacy)
TcQ-03A-I	Finland	TcQ-03G	D	Information technology, programming, etc.	Information technology, programming, etc.
TcQ-03A-I	Germany	TcQ-03G	D	Informatics, information technology or similar	Informatics, information technology or similar
TcQ-03A-I	Italy	TcQ-03G	D	Technology	Technology
TcQ-03A-I	Korea, Republic of	TcQ-03G	D	Informatics	Informatics
TcQ-03A-I	Luxembourg	TcQ-03G	D	Informatics	Informatics

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-03A-I	Portugal	TcQ-03G	D	Nationally defined dimension: Communication and information technologies, computer applications, or similar	Nationally defined dimension: Communication and information technologies, computer applications, or similar
TcQ-03A-I	Russia (Moscow)	TcQ-03G	D	Information technology and ICT	Information technology and ICT
TcQ-03A-I	United States	TcQ-03G	D	Nationally defined dimension: Information technology, computer science, or similar subject	Nationally defined dimension: Information technology, computer science, or similar subject
TcQ-03A-I	Uruguay	TcQ-03G	D	Nationally defined dimension: Computing	Nationally defined dimension: Computing
TcQ-03A-I	Chile	TcQ-03H	X	Dimension not administered or data not available	Dimension not administered or data not available
TcQ-03A-I	Denmark	TcQ-03H	D	E.g., craft and design, home economics, occupation and labor market guidance	E.g., craft and design, home economics, occupation and labor market guidance
TcQ-03A-I	Finland	TcQ-03H	D	E.g., Handicrafts	E.g., Handicrafts
TcQ-03A-I	France	TcQ-03H	D	Nationally defined dimension: Vocational Education	Nationally defined dimension: Vocational Education
TcQ-03A-I	Germany	TcQ-03H	D	E.g., Business and employment studies/handicrafts	E.g., Business and employment studies/handicrafts
TcQ-03A-I	Italy	TcQ-03H	D	Nationally defined dimension: Vocational subjects	Nationally defined dimension: Vocational subjects
TcQ-03A-I	Kazakhstan	TcQ-03H	D	Nationally defined dimension: Practical and professional disciplines (for example, technology)	Nationally defined dimension: Practical and professional disciplines (for example, technology)
TcQ-03A-I	Korea, Republic of	TcQ-03H	D	Nationally defined dimension: Practical or vocational	Nationally defined dimension: Practical or vocational
TcQ-03A-I	Luxembourg	TcQ-03H	D	Handcraft (e.g., electronics, mechanics, etc.)	Handcraft (e.g., electronics, mechanics, etc.)
TcQ-03A-I	Portugal	TcQ-03H	D	Nationally defined dimension: Practical and vocational subjects	Nationally defined dimension: Practical and vocational subjects
TcQ-03A-I	Russia (Moscow)	TcQ-03H	D	Technology	Technology
TcQ-03A-I	United States	TcQ-03H	D	E.g., mechanics and repair, healthcare occupations, construction trades	E.g., mechanics and repair, healthcare occupations, construction trades
TcQ-03A-I	Uruguay	TcQ-03H	D	Nationally defined dimension: Vocational and occupational orientation	Nationally defined dimension: Vocational and occupational orientation
TcQ-03A-I	Chile	TcQ-03I	D	Nationally defined dimension: Other (e.g., religion, physical education, home economics, orientation)	Nationally defined dimension Other (e.g., religion, physical education, home economics, orientation)
TcQ-03A-I	Denmark	TcQ-03I	D	Christian studies, physical education, other electives	Christian studies, physical education, other electives

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-03A-I	Finland	TcQ-03I	D	Life philosophy, physical education, home economics, health education, student counselling	Life philosophy, physical education, home economics, health education, student counselling
TcQ-03A-I	France	TcQ-03I	D	Nationally defined dimensions: Physical Education and Sport Other	National dimensions recoded for international comparability: Physical Education and Sport / Other
TcQ-03A-I	Germany	TcQ-03I	D	Ethics/Philosophy, Religion, physical education, home economics	Ethics/Philosophy, Religion, physical education, home economics
TcQ-03A-I	Italy	TcQ-03I	D	Catholic Religion, Alternative teachings to Catholic religion, physical education	Catholic Religion, Alternative teachings to Catholic religion, physical education
TcQ-03A-I	Kazakhstan	TcQ-03I	D	Nationally defined dimension: Other disciplines concerned with personal and social development (physical culture, self related studies)	Nationally defined dimension: Other disciplines concerned with personal and social development (physical culture, self related studies)
TcQ-03A-I	Korea, Republic of	TcQ-03I	D	Google Docs®, Naver office	Google Docs®, Naver office
TcQ-03A-I	Luxembourg	TcQ-03I	D	Life and society, physical education, personal and social development	Life and society, physical education, personal and social development
TcQ-03A-I	Russia (Moscow)	TcQ-03I	D	Moral/ethics, physical education, home economics, psychology	Moral/ethics, physical education, home economics, psychology
TcQ-03A-I	Uruguay	TcQ-03I	D	Moral and civic education, physical education, etc.	Moral and civic education, physical education, etc.
TcQ-06A-D	Italy	TcQ-06A	D	Nationally defined dimension: At school during the lessons	Nationally defined dimension: At school during the lessons
TcQ-07A-I	Italy	TcQ-07A-I	D	Nationally defined categories: 1 = I know how to do this 2 = I haven't done this but I could learn how to do that 3 = I do not think I could do this	Nationally defined categories: 1 = I know how to do this 2 = I haven't done this but I could learn how to do that 3 = I do not think I could do this
TcQ-07A-I	Denmark	TcQ-07C	D	Microsoft PowerPoint®, LibreOffice Impress, Google Slides	Microsoft PowerPoint®, LibreOffice Impress, Google Slides
TcQ-07A-I	France	TcQ-07C	D	Microsoft Powerpoint®, OpenOffice Impress	Microsoft Powerpoint®, OpenOffice Impress
TcQ-07A-I	Korea, Republic of	TcQ-07C	D	Microsoft PowerPoint®, Hancom office Hanshow®	Microsoft PowerPoint®, Hancom office Hanshow®
TcQ-07A-I	Luxembourg	TcQ-07C	D	PowerPoint®	PowerPoint®
TcQ-07A-I	Denmark	TcQ-07F	D	Microsoft Excel®, LibreOffice Calc, Google Sheets	Microsoft Excel®, LibreOffice Calc, Google Sheets
TcQ-07A-I	France	TcQ-07F	D	Microsoft Excel®, OpenOffice Calc	Microsoft Excel®, OpenOffice Calc
TcQ-07A-I	Germany	TcQ-07F	D	OpenOffice Calc, Microsoft Excel®, iWork Numbers®	OpenOffice Calc, Microsoft Excel®, iWork Numbers®
TcQ-07A-I	Chile	TcQ-07H	D	Google Docs®	Google Docs®
TcQ-07A-I	Germany	TcQ-07H	D	Google Docs®	Google Docs®
TcQ-07A-I	Kazakhstan	TcQ-07H	D	Google Docs®	Google Docs®

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-07A-I	Korea, Republic of	TcQ-07H	D	Google Docs®, Naver office	Google Docs®, Naver office
TcQ-07A-I	Luxembourg	TcQ-07H	D	Google Docs®	Google Docs®
TcQ-07A-I	United States	TcQ-07H	D	Google Docs, Padlet, OneNote	Google Docs, Padlet, OneNote
TcQ-07A-I	Uruguay	TcQ-07H	D	Google Docs®, WPS	Google Docs®, WPS
TcQ-07A-I	Denmark	TcQ-07I	D	MinUddannelse, Meebook	MinUddannelse, Meebook
TcQ-07A-I	Finland	TcQ-07I	D	Moodle, Edmodo, Peda.net	Moodle, Edmodo, Peda.net
TcQ-07A-I	Germany	TcQ-07I	D	Moodle, Logineo, mebis, itslearning	Moodle, Logineo, mebis, itslearning
TcQ-07A-I	Kazakhstan	TcQ-07I	D	kundelik.kz	kundelik.kz
TcQ-07A-I	Korea, Republic of	TcQ-07I	D	Cyberlearning, Wedorang, Classting, Moodle, Blackboard	Cyberlearning, Wedorang, Classting, Moodle, Blackboard
TcQ-07A-I	Luxembourg	TcQ-07I	D	EduMoodle	EduMoodle
TcQ-07A-I	Uruguay	TcQ-07I	D	Moodle, Crea2, Edmodo	Moodle, Crea2, Edmodo
TcQ-08	Chile	TcQ-08	D	Stem of the question changed: Which of the following alternatives best describes the subject you teach to the reference class? Nationally defined categories: 1 = Language and communication 2 = Foreign Language or original languages 3 = Mathematics 4 = Natural Sciences (general science and/or physics, chemistry, biology) 5 = History, Geography, or Social Science 6 = Arts (Visual arts, Music, Dance, Drama, etc.) 7 = Technological Education 8 = Other (moral/ethics, religion, physical education, home economics, orientation)	Stem of the question changed: Which of the following alternatives best describes the subject you teach to the reference class? National categories recoded for international comparability: 1 = Language and communication 2 = Foreign Language or original languages 3 = Mathematics 4 = Natural Sciences (general science and/or physics, chemistry, biology) 5 = History, Geography, or Social Science 6 = Arts (Visual arts, Music, Dance, Drama, etc.) 7 = Technological Education 8 = Category not administered or data not available 9 = Other (moral/ethics, religion, physical education, home economics, orientation)
TcQ-08	Denmark	TcQ-08	D	Nationally defined categories: 1 = Danish 2 = Foreign languages (e.g., English, German, French) 3 = Mathematics 4 = Natural Sciences (Physics / Chemistry, Nature / Technology, Biology, Geography, etc.) 5 = Humanities or Social Sciences (History, Social Studies, etc.) 6 = Musical and creative subjects (music, drama, visual arts, film skills) 7 = IT subjects (e.g., technology understanding) 8 = Practical and business subjects (e.g., crafts and design, food knowledge, work knowledge) 9 = Other (Christianity, Sport, other Electives)	Nationally defined categories: 1 = Danish 2 = Foreign languages (e.g., English, German, French) 3 = Mathematics 4 = Natural Sciences (Physics / Chemistry, Nature / Technology, Biology, Geography, etc.) 5 = Humanities or Social Sciences (History, Social Studies, etc.) 6 = Musical and creative subjects (music, drama, visual arts, film skills) 7 = IT subjects (e.g., technology understanding) 8 = Practical and business subjects (e.g., crafts and design, food knowledge, work knowledge) 9 = Other (Christianity, Sport, other Electives)

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-08	Finland	TcQ-08	D	Nationally defined categories: 1 = Native language and literature or Finnish as a second language 2 = Languages: Swedish, English, and other foreign languages 3 = Mathematics 4 = Natural sciences (physics, chemistry, biology, geography) 5 = Social sciences (history, social studies, law, economics, etc.) 6 = Arts (visual arts, music, dance, drama, etc.) 7 = Information technology, programming, etc. 8 = Practical and vocational subjects (e.g., handicrafts) 9 = Other (e.g., life philosophy, physical education, home economics, health education, student counselling)	Nationally defined categories: 1 = Native language and literature or Finnish as a second language 2 = Languages: Swedish, English, and other foreign languages 3 = Mathematics 4 = Natural sciences (physics, chemistry, biology, geography) 5 = Social sciences (history, social studies, law, economics, etc.) 6 = Arts (visual arts, music, dance, drama, etc.) 7 = Information technology, programming, etc. 8 = Practical and vocational subjects (e.g., handicrafts) 9 = Other (e.g., life philosophy, physical education, home economics, health education, student counselling)
TcQ-08	France	TcQ-08	D	Nationally defined categories: 1 = French 2 = Foreign languages 3 = Regional Languages 4 = Ancient languages (Latin, Greek) 5 = Mathematics 6 = Physics-Chemistry 7 = Life and earth sciences 8 = History-Geography, Civic Education, Humanities and Social Sciences 9 = Music 10 = Visual Arts 11 = Technology 12 = Vocational education 13 = Physical education and sport 14 = Other	Nationally defined categories: 1 = French 2 = Foreign languages / Regional Languages / Ancient languages (Latin, Greek) 3 = Mathematics 4 = Physics-Chemistry / Life and earth sciences 5 = History-Geography, Civic Education, Humanities and Social Sciences 6 = Music / Visual Arts 7 = Technology 8 = Vocational education 9 = Physical education and sport / Other
TcQ-08	Germany	TcQ-08	D	Nationally defined categories: 1 = German 2 = Foreign language (English, French, Latin, etc.) 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Informatics, information technology or similar 8 = (e.g., business and employment studies/handicrafts) 9 = Ethics/Philosophy/physical education, home economics	Nationally defined categories: 1 = German 2 = Foreign language (English, French, Latin, etc.) 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Informatics, information technology or similar 8 = (e.g., business and employment studies/handicrafts) 9 = Ethics/Philosophy/physical education, home economics

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-08	Italy	TcQ-08	D	Nationally defined categories: 1 = Italian 2 = English or other foreign languages 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Technology 8 = Vocational subjects 9 = Other (e.g., Catholic Religion, Alternative teachings to Catholic religion, physical education)	Nationally defined categories: 1 = Italian 2 = English or other foreign languages 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Technology 8 = Vocational subjects 9 = Other (e.g., Catholic Religion, Alternative teachings to Catholic religion, physical education)
TcQ-08	Kazakhstan	TcQ-08	D	Nationally defined categories: 1 = Kazakh language and literature / *Russian: Russian language and literature 2 = Foreign and other national languages 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology, computer studies or similar 8 = Practical and professional disciplines (for example, technology) 9 = Other disciplines concerned with personal and social development (physical culture, self related studies)	Nationally defined categories: 1 = Kazakh language and literature / *Russian: Russian language and literature 2 = Foreign and other national languages 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology, computer studies or similar 8 = Practical and professional disciplines (for example, technology) 9 = Other disciplines concerned with personal and social development (physical culture, self related studies)
TcQ-08	Luxembourg	TcQ-08	D	Nationally defined categories: 1 = German 2 = French, English, Spanish, Italian 3 = Mathematics (geometry, algebra) 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences, technical sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology, informatics, or similar 8 = Handcraft (e.g., electronics, mechanics, etc.) 9 = Other (e.g., life and society, physical education, home economics, personal and social development)	Nationally defined categories: 1 = German 2 = French, English, Spanish, Italian 3 = Mathematics (geometry, algebra) 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences, technical sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology, informatics, or similar 8 = Handcraft (e.g., electronics, mechanics, etc.) 9 = Other (e.g., life and society, physical education, home economics, personal and social development)

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-08	Portugal	TcQ-08	D	Nationally defined categories: 1 = Portuguese 2 = Foreign language 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Communication and information technologies, computer applications, or similar 8 = Practical and vocational subjects 9 = Other (e.g., moral/ethics, physical education, home economics, personal and social development)	Nationally defined categories: 1 = Portuguese 2 = Foreign language 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Communication and information technologies, computer applications, or similar 8 = Practical and vocational subjects 9 = Other (e.g., moral/ethics, physical education, home economics, personal and social development)
TcQ-08	Russia (Moscow)	TcQ-08	D	Nationally defined categories: 1 = Russian language and literature 2 = Foreign languages 3 = Mathematics (Algebra, geometry) 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology and ICT 8 = Practical and vocational subjects (Technology) 9 = Moral/ethics, physical education, home economics, psychology	Nationally defined categories: 1 = Russian language and literature 2 = Foreign languages 3 = Mathematics (Algebra, geometry) 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology and ICT 8 = Practical and vocational subjects (Technology) 9 = Moral/ethics, physical education, home economics, psychology
TcQ-08	United States	TcQ-08	D	Nationally defined categories: 1 = English Language Arts 2 = Spanish, or other foreign language 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology, computer science or similar subject 8 = Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades) 9 = Other (e.g., moral/ethics, physical education, home economics, personal and social development)	Nationally defined categories: 1 = English Language Arts 2 = Spanish, or other foreign language 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts, music, dance, drama, etc.) 7 = Information technology, computer science or similar subject 8 = Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades) 9 = Other (e.g., moral/ethics, physical education, home economics, personal and social development)

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-08	Uruguay	TcQ-08	D	Nationally defined categories / Category instruction changed: 1 = Spanish Language 2 = Languages (e.g., English) 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts), music, dance, drama, etc. 7 = Computing 8 = Practical and vocational subjects 9 = Other (e.g., moral / ethics, physical education, personal and social development)	Nationally defined categories / Category instruction changed: 1 = Spanish Language 2 = Languages (e.g., English) 3 = Mathematics 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences / Humanities / Social Studies (history, geography, civics, law, economics, etc.) 6 = Creative arts (visual arts), music, dance, drama, etc. 7 = Computing 8 = Practical and vocational subjects 9 = Other (e.g., moral / ethics, physical education, personal and social development)
TcQ-11A-J	Denmark	TcQ-11I	D	Caregivers	Caregivers
TcQ-11A-J	France	TcQ-11I	D	Persons responsible	Persons responsible
TcQ-11A-J	Portugal	TcQ-11I	D	Education guardians	Education guardians
TcQ-12A-Q	Chile	TcQ-12A	D	Kahoot, Quizziz, Socrative	Kahoot, Quizziz, Socrative
TcQ-12A-Q	Denmark	TcQ-12A	D	Quizlet, Kahoot, MatematikFessor	Quizlet, Kahoot, MatematikFessor
TcQ-12A-Q	Finland	TcQ-12A	D	Quizlet, Kahoot, Socrative	Quizlet, Kahoot, Socrative
TcQ-12A-Q	Germany	TcQ-12A	D	Quizlet, Kahoot, Mathe Quiz	Quizlet, Kahoot, Mathe Quiz
TcQ-12A-Q	Korea, Republic of	TcQ-12A	D	Quiz app, Quizlet, Kahoot	Quiz app, Quizlet, Kahoot
TcQ-12A-Q	Luxembourg	TcQ-12A	D	Quizlet, Kahoot	Quizlet, Kahoot
TcQ-12A-Q	United States	TcQ-12A	D	Quizlet, Kahoot	Quizlet, Kahoot
TcQ-12A-Q	Uruguay	TcQ-12A	D	Quizlet, Kahoot, PAM	Quizlet, Kahoot, PAM
TcQ-12A-Q	Denmark	TcQ-12C	D	Microsoft Word®, LibreOffice Writer, Google Docs®	Microsoft Word®, LibreOffice Writer, Google Docs®
TcQ-12A-Q	France	TcQ-12C	D	Microsoft Word®, OpenOffice Writer	Microsoft Word®, OpenOffice Writer
TcQ-12A-Q	Germany	TcQ-12C	D	Microsoft Word®, OpenOffice Writer	Microsoft Word®, OpenOffice Writer
TcQ-12A-Q	Italy	TcQ-12C	D	Microsoft Word®, Open Office writer	Microsoft Word®, Open Office writer
TcQ-12A-Q	Korea, Republic of	TcQ-12C	D	Microsoft Word®, Hancom office Hanguel®	Microsoft Word®, Hancom office Hanguel®
TcQ-12A-Q	Uruguay	TcQ-12C	D	Microsoft Word®, Writer	Microsoft Word®, Writer
TcQ-12A-Q	Denmark	TcQ-12D	D	Microsoft PowerPoint®, LibreOffice Impress, Google Slides, Prezi	Microsoft PowerPoint®, LibreOffice Impress, Google Slides, Prezi

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-12A-Q	France	TcQ-12D	D	Microsoft Powerpoint®, OpenOffice Impress	Microsoft Powerpoint®, OpenOffice Impress
TcQ-12A-Q	Germany	TcQ-12D	D	Microsoft PowerPoint®, OpenOffice Impress	Microsoft PowerPoint®, OpenOffice Impress
TcQ-12A-Q	Korea, Republic of	TcQ-12D	D	Microsoft PowerPoint®, Hancom office Hanshow®	Microsoft PowerPoint®, Hancom office Hanshow®
TcQ-12A-Q	Uruguay	TcQ-12D	D	Microsoft PowerPoint®, Impress	Microsoft PowerPoint®, Impress
TcQ-12A-Q	Denmark	TcQ-12E	D	Microsoft Excel®, LibreOffice Calc, Google Sheets	Microsoft Excel®, LibreOffice Calc, Google Sheets
TcQ-12A-Q	France	TcQ-12E	D	Microsoft Excel®, OpenOffice Calc	Microsoft Excel®, OpenOffice Calc
TcQ-12A-Q	Germany	TcQ-12E	D	Microsoft Excel®, OpenOffice Calc	Microsoft Excel®, OpenOffice Calc
TcQ-12A-Q	Uruguay	TcQ-12E	D	Microsoft Excel®, Calc	Microsoft Excel®, Calc
TcQ-12A-Q	Denmark	TcQ-12F	D	Windows Movie Maker, iMovie, Audacity	Windows Movie Maker, iMovie, Audacity
TcQ-12A-Q	Uruguay	TcQ-12F	D	Windows Movie Maker, iMovie, Adobe Photoshop, Paint, Gimp, Inkscape	Windows Movie Maker, iMovie, Adobe Photoshop, Paint, Gimp, Inkscape
TcQ-12A-Q	Chile	TcQ-12G	D	Inspiration®, Cmaptools®	Inspiration®, Cmaptools®
TcQ-12A-Q	Denmark	TcQ-12G	D	Cmap, MindMeister	Cmap, MindMeister
TcQ-12A-Q	Finland	TcQ-12G	D	MindMeister, CmapTools, Popplet	MindMeister, CmapTools, Popplet
TcQ-12A-Q	France	TcQ-12G	D	Concept mapping software or mental map (e.g., Xmind, FreeMind)	Concept mapping software or mental map (e.g., Xmind, FreeMind)
TcQ-12A-Q	Germany	TcQ-12G	D	Inspiration®, Webspiration®, FreeMind	Inspiration®, Webspiration®, FreeMind
TcQ-12A-Q	Korea, Republic of	TcQ-12G	D	ThinkWise©, Estsoft ALMind®, Inspiration®	ThinkWise©, Estsoft ALMind®, Inspiration®
TcQ-12A-Q	Uruguay	TcQ-12G	D	Mapas Mentales®	Mapas Mentales®
TcQ-12A-Q	Germany	TcQ-12H	D	NetLogo, GeoGebra, plan game stock market	NetLogo, GeoGebra, plan game stock market
TcQ-12A-Q	Korea, Republic of	TcQ-12H	D	NetLogo, 123D, Algodoo	NetLogo, 123D, Algodoo
TcQ-12A-Q	Denmark	TcQ-12I	D	Meebook, MinUddannelse	Meebook, MinUddannelse
TcQ-12A-Q	Finland	TcQ-12I	D	Edmodo, Peda.net, Wilma	Edmodo, Peda.net, Wilma
TcQ-12A-Q	Germany	TcQ-12I	D	Moodle, Logineo, mebis, itslearning	Moodle, Logineo, mebis, itslearning
TcQ-12A-Q	Kazakhstan	TcQ-12I	D	kundelik.kz	kundelik.kz
TcQ-12A-Q	Korea, Republic of	TcQ-12I	D	Cyberlearning, Wedorang, Classting, Moodle, Blackboard	Cyberlearning, Wedorang, Classting, Moodle, Blackboard
TcQ-12A-Q	Luxembourg	TcQ-12I	D	EduMoodle	EduMoodle
TcQ-12A-Q	United States	TcQ-12I	D	Edmodo, Blackboard, Moodle	Edmodo, Blackboard, Moodle

Question group	Country	Location	Code	Country adaptation	Adaptation recoded for international comparability
TcQ-12A-Q	Uruguay	TcQ-12I	D	Crea2, Moodle	Crea2, Moodle
TcQ-12A-Q	Denmark	TcQ-12J	D	E-mail, weblog, Skype, WhatsApp	E-mail, weblog, Skype, WhatsApp
TcQ-12A-Q	Denmark	TcQ-12K	D	Google Docs®, Prezi, Padlet	Google Docs®, Prezi, Padlet
TcQ-12A-Q	Kazakhstan	TcQ-12K	D	Google Docs®	Google Docs®
TcQ-12A-Q	Korea, Republic of	TcQ-12K	D	Google Docs®, Naver office	Google Docs®, Naver office
TcQ-12A-Q	Uruguay	TcQ-12K	D	Google Docs, WPS	Google Docs, WPS
TcQ-12A-Q	Chile	TcQ-12O	D	GoogleDocs	GoogleDocs
TcQ-12A-Q	Finland	TcQ-12O	D	VoiceThread, Peda.net, Evernote	VoiceThread, Peda.net, Evernote
TcQ-12A-Q	Germany	TcQ-12O	D	EverNote, VoiceThread	EverNote, VoiceThread
TcQ-12A-Q	Korea, Republic of	TcQ-12O	D	Nationally defined dimension: E-portfolios	Nationally defined dimension: E-portfolios
TcQ-12A-Q	Uruguay	TcQ-12O	D	Crea2	Crea2
TcQ-12A-Q	Kazakhstan	TcQ-12Q	D	Facebook, Twitter, Instagram, Vkontakte	Facebook, Twitter, Instagram, Vkontakte
TcQ-12A-Q	Korea, Republic of	TcQ-12Q	D	Facebook, Twitter, KakaoStory, Naver café, Blog	Facebook, Twitter, KakaoStory, Naver café, Blog
TcQ-14A-H	Finland	TcQ-14D	D	Mobile apps	Mobile apps
TcQ-16A-B	Finland	TcQ-16A-B	D	Teacher training after upper secondary education	Teacher training after upper secondary education
TcQ-16A-B	France	TcQ-16A-B	D	Initial teacher training	Initial teacher training
TcQ-16A-B	Kazakhstan	TcQ-16A-B	D	Initial pedagogical education	Initial pedagogical education
TcQ-16A-B	United States	TcQ-16A-B	D	Bachelor's degree	Bachelor's degree
TcQ-17A-I	Denmark	TcQ-17H	D	Students with special needs or learning difficulties	Students with special needs or learning difficulties
TcQ-17A-I	Finland	TcQ-17H	D	Students with special needs	Students with special needs
TcQ-17A-I	France	TcQ-17H	D	Students with special needs or learning difficulties	Students with special needs or learning difficulties
TcQ-17A-I	Italy	TcQ-17H	D	Students with special educational needs or specific learning difficulties	Students with special educational needs or specific learning difficulties
TcQ-17A-I	Kazakhstan	TcQ-17H	D	Students with special needs	Students with special needs

APPENDIX C:

Variables derived from the questionnaire data

Overview

This appendix contains documentation on all the derived variables contained in the ICILS 2018 data files that are based on questionnaire variables. These variables were used to report data in the ICILS 2018 international reports, and they have been made available as part of the ICILS 2018 international database (IDB) so that researchers can use them in secondary analyses. This appendix has four sections corresponding to each questionnaire from which the reporting variables are derived:

- Section 1: Student questionnaire
- Section 2: Principal questionnaire
- Section 3: ICT coordinator questionnaire
- Section 4: Teacher questionnaire

Each section lists first the simple indices and then the scale indices, as derived from survey variables, in the order of the variables that were used to derive the variable as they appear in the instruments, respectively.

The following information is provided for each derived variable:

- Variable name: The name of the derived variable
- Description: A description of the variable content
- Procedure: A procedural description of how the derived variable was computed
- Source: Source variables used to derive scale or index
- Interpretation: A description how to interpret the scale

Section 1: Student questionnaire

Simple indices

Variable Name:	S_AGE		
Description:	Age of student		
Procedure	$S\_AGE = (T_y - S_y) + \frac{(T_m - S_m)}{12}$ where T_y and S_y are, respectively, the year of the test and the year of birth of the tested student, in four-digit format (e.g., "2018" or "2003"), and where T_m and S_m are, respectively, the month of the test and the month of the student's birth.		
Source:	When were you born?		
	Month	IS2G01A	
	Year	IS2G01B	

Variable Name:	S_SEX		
Description:	Sex of student		
Procedure:	Simple recoding		
Source:	Are you a girl or a boy?	IS2G02	Recoding
	1 = Girl	1	1
	2 = Boy	2	0

Variable Name:	S_ISCED		
Description:	Expected ISCED by student		
Procedure:	Simple recoding		
Source:	What is the highest levels of education you expect to complete?		
	(Please mark only one choice)	IS2G03	Recoding
	1 = [ISCED level 6, 7 or 8]	1	4
	2 = [ISCED level 4 or 5]	2	3
	3 = [ISCED level 3]	3	2
	4 = [ISCED level 2]	4	1
	5 = I do not expect to complete [ISCED level 2]	5	0

Variable Name:	S_IMMIG	
Description:	Immigration status	
Procedure:	Simple recoding	
Source:	In what country were you and your parents born?	
	(Please mark only one choice in each column)	
	You	IS2G04A
	[Parent or guardian 1]	IS2G04B
	[Parent or guardian 2]	IS2G04C
	0 = Students and/or at least one parent born in country of test	
	1 = Student born in country of test but both/only parent(s) born abroad	
	2 = Student and both/only parent(s) born abroad	

Variable Name:	S_IMMBGR		
Description:	Immigration status (dummy coded)		
Procedure:	Simple recoding		
Source:	0 = Students and/or at least one parent born in country of test 1 = Student born in country of test but both/only parent(s) born abroad 2 = Student and both/only parent(s) born abroad	0 1 2	0 1 1

Variable Name:	S_TLANG		
Description:	Test language spoken at home		
Procedure:	Simple recoding		
Source:	What is the highest levels of education you expect to complete? *(Please mark only one choice)* 1 = [Language of test] 2 = [Other language 1] 3 = [Other language 2] 4 = [Another language]	IS2G05 1 2 3 4	Recoding 1 0 0 0

Variable Name:	S_P1WORK		
Description:	Paid work status of parent 1		
Procedure:	Simple recoding		
Source:	Does your [parent or guardian 1] work in a paid [job]? Yes No	IS2G06 1 2	Recoding 1 0

Variable Name:	S_P1ISCO	
Description:	ISCO of parent 1	
Procedure:	The occupation codes are based on the ISCO-08 framework.	
Source:	What is your [parent or guardian 1]'s main [job]? (for example high school teacher, kitchen-hand, sales manager) *(Please write in the [job] title)* What was your [parent or guardian 1]'s last main [job]? (for example high school teacher, kitchen-hand, sales manager) *(Please tell us his/her last main [job]. If he/she has never had a paid [job], please write what he/she is currently doing)*	IS2G07A IS2G07B

Variable Name:	S_P1ISEI		
Description:	ISEI of parent 1		
Procedure:	Simple recoding		
Source:	What does your [parent or guardian 1] do in his/her main [job]? (for example teaches high school students, helps the cook prepare meals in a restaurant, manages a sales team) *(Please use a sentence to describe the kind of work he/she does in that [job])*	IS2G08A	
	What did your [parent or guardian 1] do in his/her last main [job]? (for example taught high school students, helped the cook prepare meals in a restaurant, managed a sales team) *(Please use a sentence to describe the kind of work he/she did in that [job] or what he/she is currently doing if he/she never had a paid [job])*	IS2G08B	

Variable Name:	S_P1ISCED		
Description:	ISCED of parent 1		
Procedure:	Simple recoding		
Source:	What is the highest level of education completed by [parent or guardian 1]? *If you are not sure which box to choose, please ask the [test administrator] for help.* *(Please mark only one choice)*	IS2G09	Recoding
	1 = [ISCED level 6, 7, or 8]	1	4
	2 = [ISCED level 4 or 5]	2	3
	3 = [ISCED level 3]	3	2
	4 = [ISCED level 2]	4	1
	5 = He/she did not complete [ISCED level 2]	5	0

Variable Name:	S_P2WORK		
Description:	Paid work status of parent 2		
Procedure:	Simple recoding		
Source:	Does your [parent or guardian 2] work in a paid [job]?	IS2G10	Recoding
	1 = Yes	1	1
	2 = No	2	0

Variable Name:	S_P2ISCO	
Description:	Occupation of the student's father	
Procedure:	The occupation codes are based on the ISCO-08 framework.	
Source:	What is your [parent or guardian 2]'s main [job]? (for example high school teacher, kitchen-hand, sales manager) *(Please write in the [job] title)*	IS2G11A
	What was your [parent or guardian 2]'s last main [job]? (for example high school teacher, kitchen-hand, sales manager) *(Please tell us his/her last main [job]. If he/she has never had a paid [job], please write what he/she is currently doing)* *(Please write in the [job] title)*	IS2G11B

Variable Name:	S_P2ISEI		
Description:	ISEI of parent 2		
Procedure:	Simple recoding		
Source:	What does your [parent or guardian 2] do in his/her main [job]? (for example teaches high school students, helps the cook prepare meals in a restaurant, manages a sales team) *(Please use a sentence to describe the kind of work he/she does in that [job])*	IS2G12A	
	What did your [parent or guardian 2] do in his/her last main [job]? (for example taught high school students, helped the cook prepare meals in a restaurant, managed a sales team) *(Please use a sentence to describe the kind of work he/she did in that [job] or what he/she is currently doing if he/she never had a paid [job])*	IS2G12B	

Variable Name:	S_P2ISCED		
Description:	ISCED of parent 2		
Procedure:	Simple recoding		
Source:	What is the highest level of education completed by your [parent or guardian 2]? *If you are not sure which box to choose, please ask the [test administrator] for help.* *(Please mark only one choice)*	IS2G13	Recoding
	[ISCED level 6, 7, or 8]	1	4
	[ISCED level 4 or 5]	2	3
	[ISCED level 3]	3	2
	[ISCED level 2]	4	1
	He/she did not complete [ISCED level 2]	5	0

Variable Name:	S_HISEI
Description:	Highest ISEI of parents
Procedure:	S_HISEI=max(S_P1ISEI,S_P2SEI)
Source:	S_P1ISEI, S_P2SEI (see above)

Variable Name:	S_HISCED
Description:	Highest ISCED of parents
Procedure:	S_HISCED=max(S_P1ISCED,S_P2ISCED)
Source:	S_ P1ISCED, S_ P2ISCED (see above)

Variable Name:	S_HOMLIT		
Description:	Home literacy index		
Procedure:	Simple recoding		
Source:	About how many books are there in your home? *(for example high school teacher, kitchen-hand, sales manager)* *your schoolbooks.* *(Please mark only one choice)*	IS2G14	Recoding
	1 = None or very few (0-10 books)	1	0
	2 = Enough to fill one shelf (11–25 books)	2	1
	3 = Enough to fill one bookcase (26–100 books)	3	2
	4 = Enough to fill two bookcases (101–200 books)	4	3
	5 = Enough to fill three or more bookcases (more than 200 books)	5	4

Variable Name:	S_INTNET		
Description:	Internet access at home		
Procedure:	Simple recoding		
Source:	Do you have an Internet connection at home? *(Please mark only one choice)*	IS2G15B	Recoding
	1 = Yes	1	1
	2 = No	2	0

Variable Name:	S_EXCOMP		
Description:	Computer experience in years (S_EXCOMP)		
Procedure:	Simple recoding		
Source:	How long have you been using each of the following types of ICT devices? *(Please mark only one choice)*		
	Desktop or [laptop] computers	IS2G16A	Recoding
	1 = Never or less than one year	1	0
	2 = At least one year but less than three years	2	1
	3 = At least three years but less than five years	3	2
	4 = At least five years but less than seven years	4	3
	5 = Seven years or more	5	4

Variable Name:	S_EXTAB		
Description:	Tablet experience in years (S_EXTAB)		
Procedure:	Simple recoding		
Source:	How long have you been using each of the following types of ICT devices? *(Please mark only one choice)*		
	Tablet devices or e-readers (e.g., [iPad, Tablet PC, Kindle])	IS2G16B	Recoding
	1 = Never or less than one year	1	0
	2 = At least one year but less than three years	2	1
	3 = At least three years but less than five years	3	2
	4 = At least five years but less than seven years	4	3
	5 = Seven years or more	5	4

Variable Name:	S_EXSMART		
Description:	Smartphone experience in years (S_EXSMART)		
Procedure:	Simple recoding		
Source:	How long have you been using each of the following types of ICT devices?		
	(Please mark only one choice)		
	[Smartphones] except for using text and calling	IS2G16C	Recoding
	1 = Never or less than one year	1	0
	2 = At least one year but less than three years	2	1
	3 = At least three years but less than five years	3	2
	4 = At least five years but less than seven years	4	3
	5 = Seven years or more	5	4

Variable Name:	S_ICTSTUD		
Description:	ICT studies in current school year		
Procedure:	Simple recoding		
Source:	Do you study [computing, computer science, information technology, informatics, or similar] in the current school year?	IS2G30	Recoding
	(Please mark only one choice)		
	1 = Yes	1	1
	2 = No	2	0

Scale indices

Variable Name:	S_NISB
Description:	National index of socio-economic background
Procedure:	Scale scores with mean of 0 and standard deviation of 1 for equally weighted countries
Source:	Derived from highest occupational status of parents (S_HISEI), highest educational level of parents (S_HISCED: collapsed the lowest two categories to have an indicator variable with four categories), and the number of books at home (S_HOMLIT: collapsing the two highest categories) (See above)

Variable Name:	S_GENACT	
Description:	Use of general applications for activities	
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries	
Interpretation	Higher values indicating more frequent use	
Source:	How often do you use ICT for each of the following activities? *(Please mark one choice in each row)*	
	Write or edit documents	IS2G19A
	Use a spreadsheet to do calculations, store data, or plot graphs (e.g., using [Microsoft Excel®])	IS2G19B
	Create a simple "slideshow" presentation (e.g., using [Microsoft PowerPoint®])	IS2G19C
		Recoding
	1 = Never	0
	2 = Less than once a month	1
	3 = At least once a month but not every week	2
	4 = At least once a week but not every day	3
	5 = Every day	4

Variable Name:	S_SPECACT	
Description:	Use of specialist applications for activities	
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries	
Interpretation	Higher values indicating more frequent use	
Source:	How often do you use ICT for each of the following activities? *(Please mark one choice in each row)*	
	Record or edit videos	IS2G19D
	Write computer programs, scripts, or apps (e.g., using [Logo, LUA, or Scratch])	IS2G19E
	Use drawing, painting, or graphics software or [apps]	IS2G19F
	Produce or edit music	IS2G19G
	Build or edit a webpage	IS2G19H
		Recoding
	1 = Never	0
	2 = Less than once a month	1
	3 = At least once a month but not every week	2
	4 = At least once a week but not every day	3
	5 = Every day	4

Variable Name:	Variable Name: S_USECOM		
Description:	Use of ICT for social communication		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do you use ICT for each of the following communication activities? *(Please mark one choice in each row)*		
	Share news about current events on social media	IS2G20A	
	Communicate with friends, family, or other people using instant messaging, voice or video chat (e.g. [Skype, WhatsApp, Viber])	IS2G20B	
	Send texts or instant messages to friends, family, or other people	IS2G20C	
	Write posts and updates about what happens in your life on social media	IS2G20D	
	Post images or video in social networks or online communities (e.g., [Facebook, Instagram or YouTube])	IS2G20H	
	Watch videos or images that other people have posted online	IS2G20I	
	Send or forward information about events or activities to other people	IS2G20J	
			Recoding
	1 = Never	1	0
	2 = Less than once a month	2	1
	3 = At least once a month but not every week	3	2
	4 = At least once a week but not every day	4	3
	5 = Every day	5	4

Variable Name:	S_USEINF		
Description:	Use of ICT for exchanging information		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do you use ICT for each of the following communication activities? *(Please mark one choice in each row)*		
	Ask questions on forums or [Q&A, question and answer] websites	IS2G20E	
	Answer other peoples' questions on forums or [Q&A, question and answer] websites	IS2G20F	
	Write posts for your own blog (e.g., [WordPress, Tumblr, Blogger])	IS2G20G	
			Recoding
	1 = Never	1	0
	2 = Less than once a month	2	1
	3 = At least once a month but not every week	3	2
	4 = At least once a week but not every day	4	3
	5 = Every day	5	4

Variable Name:	S_ACCONT		
Description:	Use of ICT for accessing content from the internet		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do you use ICT to do each of the following leisure activities? *(Please mark one choice in each row)*		
	Search the Internet to find information about places to go or activities to do	IS2G21A	
	Read reviews on the Internet of things you might want to buy	IS2G21B	
	Read news stories on the Internet	IS2G21C	
	Search for online information about things you are interested in	IS2G21D	
	Use websites, forums, or online videos to find out how to do something	IS2G21E	
			Recoding
	1 = Never	1	0
	2 = Less than once a month	2	1
	3 = At least once a month but not every week	3	2
	4 = At least once a week but not every day	4	3
	5 = Every day	5	4

Variable Name:	S_USESTD		
Description:	Use of ICT for study purposes		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do you use ICT for the following school-related purposes? *(Please mark one choice in each row)*		
	Prepare reports or essays	IS2G22A	
	Prepare presentations	IS2G22B	
	Work online with other students	IS2G22C	
	Complete [worksheets] or exercises	IS2G22D	
	Organize your time and work	IS2G22E	
	Take tests	IS2G22F	
	Use software or applications to learn skills or a subject (e.g., mathematics tutoring software, language learning software)	IS2G22G	
	Use the Internet to do research	IS2G22H	
	Use coding software to complete assignments (e.g., [Scratch])	IS2G22I	
	Make video or audio productions	IS2G22J	
			Recoding
	1 = Never	1	0
	2 = Less than once a month	2	1
	3 = At least once a month but not every week	3	2
	4 = At least once a week but not every day	4	3
	5 = Every day	5	4

Variable Name:	S_GENCLASS		
Description:	Use of general applications in class		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	When studying throughout this school year, how often did you use the following tools during class? *(Please mark one choice in each row)*		
	Word-processing software (e.g., [Microsoft Word®])	IS2G24B	
	Presentation software (e.g., [Microsoft PowerPoint®])	IS2G24C	
	Computer-based information resources (e.g., websites, wikis, encyclopaedia)	IS2G24I	
			Recoding
	1 = Never	1	0
	2 = In some lessons	2	1
	3 = In most lessons	3	2
	4 = In every or almost every lesson	4	3

Variable Name:	S_SPECLASS		
Description:	Use of specialist applications in class		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	When studying throughout this school year, how often did you use the following tools during class? *(Please mark one choice in each row)*		
	Multimedia production tools (e.g., media capture and editing, web production)	IS2G24E	
	Concept mapping software (e.g., [Inspiration®], [Webspiration®])	IS2G24F	
	Tools that capture real-world data (e.g., speed, temperature) digitally for analysis	IS2G24G	
	Simulations and modelling software	IS2G24H	
	Interactive digital learning resources (e.g., learning games or applications)	IS2G24J	
	Graphing or drawing software	IS2G24K	
			Recoding
	1 = Never	1	0
	2 = In some lessons	2	1
	3 = In most lessons	3	2
	4 = In every or almost every lesson	4	3

Variable Name:	S_ICTLRN		
Description:	Learning of ICT tasks at school		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of knowledge		
Source:	At school, to what extent have you learned how to do the following tasks? *(Please mark one choice in each row)*		
	Provide references to Internet sources	IS2G25A	
	Search for information using ICT	IS2G25B	
	Present information for a given audience or purpose using ICT	IS2G25C	
	Work out whether to trust information from the Internet	IS2G25D	
	Decide what information obtained from the Internet is relevant to include in school work	IS2G25E	
	Organize information obtained from Internet sources	IS2G25F	
	Decide where to look for information on the Internet about an unfamiliar topic	IS2G25G	
	Use ICT to collaborate with others	IS2G25H	
			Recoding
	1 = To a large extent	1	3
	2 = To a moderate extent	2	2
	3 = To a small extent	3	1
	4 = Not at all	4	0

Variable Name:	S_GENEFF		
Description:	ICT self-efficacy regarding the use of general applications		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of self-efficacy		
Source:	How well can you do each of these tasks when using ICT? *(Please mark one choice in each row)*		
	Edit digital photographs or other graphic images	IS2G27A	
	Write or edit text for a school assignment	IS2G27C	
	Search for and find relevant information for a school project on the Internet	IS2G27D	
	Create a multi-media presentation (with sound, pictures, or video)	IS2G27I	
	Upload text, images, or video to an online profile	IS2G27J	
	Insert an image into a document or message	IS2G27K	
	Install a program or [app]	IS2G27L	
	Judge whether you can trust information you find on the Internet	IS2G27M	
			Recoding
	1 = I know how to do this	1	2
	2 = I have never done this but I could work out how to do this	2	1
	3 = I do not think I could do this	3	0

Variable Name:	S_SPECEFF		
Description:	ICT self-efficacy regarding the use of specialist applications		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of self-efficacy		
Source:	How well can you do each of these tasks when using ICT? *(Please mark one choice in each row)*		
	Create a database (e.g., using [Microsoft Access®])	IS2G27B	
	Build or edit a webpage	IS2G27E	
	Create a computer program, macro, or [app] (e.g., in [Basic, Visual Basic])	IS2G27G	
	Set up a local area network of computers or other ICT	IS2G27H	
			Recoding
	1 = I know how to do this	1	2
	2 = I have never done this but I could work out how to do this	2	1
	3 = I do not think I could do this	3	0

Variable Name:	S_ICTPOS		
Description:	Perceptions of positive outcomes of ICT for society		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	How much do you agree or disagree with the following statements about ICT? *(Please mark one choice in each row)*		
	Advances in ICT usually improve people's living conditions	IS2G28A	
	ICT helps us to understand the world better	IS2G28B	
	ICT is valuable to society	IS2G28F	
	Advances in ICT bring many social benefits	IS2G28G	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

Variable Name:	S_ICTNEG		
Description:	Perceptions of negative outcomes of ICT for society		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	How much do you agree or disagree with the following statements about ICT? *(Please mark one choice in each row)*		
	Using ICT makes people more isolated in society	IS2G28C	
	With more ICT there will be fewer jobs	IS2G28D	
	People spend far too much time using ICT	IS2G28E	
	Using ICT may be dangerous for people's health	IS2G28H	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

Variable Name:	S_ICTFUT		
Description:	Expectations of future ICT use for work and study		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	How much do you agree or disagree with the following statements about ICT? *(Please mark one choice in each row)*		
	I would like to study subjects related to ICT after [secondary school]	IS2G28I	
	I hope to find a job that involves advanced ICT	IS2G28J	
	Learning how to use ICT applications will help me to do the work I am interested in	IS2G28K	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

Variable Name:	S_CODLRN		
Description:	Learning of ICT coding tasks at school		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of knowledge		
Source:	When studying during the current school year, to what extent have you been taught how to do the following tasks? *(Please mark one choice in each row)*		
	To display information in different ways	IS2G29A	
	To break a complex process into smaller parts	IS2G29B	
	To understand diagrams that describe or show real-world problems	IS2G29C	
	To plan tasks by setting out the steps needed to complete them	IS2G29D	
	To use tools to make diagrams that help solve problems	IS2G29E	
	To use simulations to help understand or solve real-world problems	IS2G29F	
	To make flow diagrams to show the different parts of a process	IS2G29G	
	To record and evaluate data to understand and solve a problem	IS2G29H	
	To use real-world data to review and revise solutions to problems	IS2G29I	
			Recoding
	1 = To a large extent	1	3
	2 = To a moderate extent	2	2
	3 = To a small extent	3	1
	4 = Not at all	4	0

Section 2: Principal questionnaire

Simple indices

Variable Name:	P_SEX (available in the Restricted Use File)		
Description:	Sex of principal		
Procedure:	Simple recoding		
Source:	Are you female or male?	IP2G01	Recoding
	1 = Female	1	1
	2 = Male	2	0

Variable Name:	P_NUMSTD (available in the Restricted Use File)	
Description:	Number of students in school (School size)	
Procedure:	P_NUMSTD = IP2G03A+IP2G03B	
Source:	What is the total number of boys and girls in the school?	
	(Please record a whole number. Record 0 (zero), if none.)	
	Total number of girls	IP2G03A
	Total number of boys	IP2G03B

Variable Name:	P_NUMSTD_CAT
Description:	Number of students in school (School size)
Procedure:	Categorize P_NUMSTD
Source:	What is the total number of boys and girls in the school?
	(Please record a whole number. Record 0 (zero), if none.)
	1 = 1–300
	2 = 301–600
	3 = 601–900
	4 = more than 900

Variable Name:	P_NUMTAR (available in the Restricted Use File)	
Description:	Number of students in target grade	
Procedure:	P_NUMTAR = IP2G04A +IP2G04B	
Source:	What is the total number of boys and girls in [target grade]?	
	(Please record a whole number. Record 0 (zero), if none.)	
	Total number of girls	IP2G04A
	Total number of boys	IP2G04B

Variable Name:	P_NUMTAR_CAT
Description:	Number of students in target grade
Procedure:	Categorize P_NUMTAR
Source:	What is the total number of boys and girls in [target grade]?
	(Please record a whole number. Record 0 (zero), if none.)
	1 = 1–100
	2 = 101–200
	3 = more than 200

Variable Name:	P_NGRADE	
Description:	Number of grades in school	
Procedure:	P_NGRADE = IP2G05B – IP2G05A	
Source:	What is the lowest (youngest) grade that is taught at your school?	IP2G05A
	(Please mark only once choice)	
	1 = [National Adaptation 1]	
	2 = [National Adaptation 2]	
	3 = [National Adaptation 3]	
	4 = [National Adaptation 4]	
	5 = [National Adaptation 5]	
	6 = [National Adaptation 6]	
	7 = [National Adaptation 7]	
	8 = [National Adaptation 8]	
	What is the highest (oldest) grade that is taught at your school?	IP2G05B
	(Please mark only once choice)	
	1 = [National Adaptation 9]	
	2 = [National Adaptation 10]	
	3 = [National Adaptation 11]	
	4 = [National Adaptation 12]	
	5 = [National Adaptation 13]	
	6 = [National Adaptation 14]	

Variable Name:	P_NUMTCH (available in the Restricted Use File)	
Description:	Number of teachers	
Procedure:	P_NUMTCH=(IP2G06A + 0.5* IP2G06B)	
Source:	What are the total numbers of full-time and part-time teachers in your school?	
	A full-time teacher is employed on a regular basis as a teacher for at least 90% of full-time hours for the full school year. All other teachers should be considered part-time.	
	(Please record a whole number. Record 0 (zero), if none.)	
	Total number of full-time teachers	IP2G06A
	Total number of part-time teachers	IP2G06B

Variable Name:	P_NUMTCH_CAT
Description:	Number of teachers
Procedure:	Categorize P_NUMTCH
Source:	What are the total numbers of full-time and part-time teachers in your school?
	A full-time teacher is employed on a regular basis as a teacher for at least 90% of full-time hours for the full school year. All other teachers should be considered part-time.
	(Please record a whole number. Record 0 (zero), if none.)
	1 = 1–25
	2 = 26–50
	3 = 51–75
	4 = more than 75

Variable Name:	P_RATTCH		
Description:	Ratio of school size and teachers		
Procedure:	P_RATTCH=P_NUMTCH/P_NUMSTD		
Source:	What are the total numbers of full-time and part-time teachers in your school? A full-time teacher is employed on a regular basis as a teacher for at least 90% of full-time hours for the full school year. All other teachers should be considered part-time. *(Please record a whole number. Record 0 (zero), if none.)*		
	Total number of full-time teachers	IP2G06A	
	Total number of part-time teachers	IP2G06B	

Variable Name:	P_PRIV (available in the Restricted Use File)		
Description:	Private school indicator		
Procedure:	Simple recoding		
Source:	Is this school a public or a private school? *(Please mark only one choice)*	IP2G08A	Recoding
	1 = A public school *(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)*	1	0
	2 = A private school *(This is a school managed directly or indirectly by a non-government organization; for example, a church, trade union, business, or other private institution)*	2	1

Scale indices

Variable Name:	P_ICTUSE		
Description:	Principals' use of ICT for general school-related activities		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent ICT use		
Source:	How often do you use ICT for the following activities? *(Please mark one choice in each row)*		
	Provide information about an educational issue through a website	IP2G02B	
	Look up records in a database (e.g., in a student information system)	IP2G02C	
	Maintain, organize, and analyze data (e.g., with a spreadsheet or database)	IP2G02D	
	Prepare presentations	IP2G02E	
	Work with a learning management system (e.g., [Moodle])	IP2G02J	
	Use social media to communicate with the wider community about school-related activities	IP2G02K	
	Management of staff (e.g., scheduling, professional development)	IP2G02L	
	Preparing the curriculum	IP2G02M	
	School financial management	IP2G02N	
			Recoding
	1 = Never	1	0
	2 = Less than once a month	2	0
	3 = At least once a month but not every week	3	1
	4 = At least once a week but not every day	4	2
	5 = Every day	5	3

Variable Name:	P_ICTCOM		
Description:	Principals' use of ICT for school-related communication activities		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do you use ICT for the following activities? *(Please mark one choice in each row)*		
	Communicate with teachers in your school	IP2G02F	
	Communicate with education authorities	IP2G02G	
	Communicate with principals and senior staff in other schools	IP2G02H	
	Communicate with parents	IP2G02I	
			Recoding
	1 = Never	1	0
	2 = Less than once a month	2	0
	3 = At least once a month but not every week	3	1
	4 = At least once a week but not every day	4	2
	5 = Every day	5	3

Variable Name:	P_VWICT		
Description:	View on using ICT for educational outcomes		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher importance		
Source:	How important is each of the following outcomes of education in your school? *(Please mark one choice in each row)*		
	The development of students' basic computer skills (e.g., internet use, email, word processing, presentation software)	IP2G09A	
	The development of students' skills in using ICT for collaboration with others	IP2G09B	
	The use of ICT for facilitating students' responsibility for their own learning	IP2G09C	
	The use of ICT to augment and improve students' learning	IP2G09D	
	The development of students' understanding and skills relating to safe and appropriate use of ICT	IP2G09E	
	The development of students' proficiency in accessing and using information with ICT	IP2G09F	
			Recoding
	1 = Very important	1	3
	2 = Quite important	2	2
	3 = Somewhat important	3	1
	4 = Not important	4	0

Variable Name:	P_EXPLRN		
Description:	ICT use expected of teachers		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of expectation		
Source:	Are teachers in your school expected to acquire knowledge and skills in each of the following activities? *(Please mark one choice in each row)*		
	Integrate Web-based learning in their instructional practice	IP2G11A	
	Use ICT-based forms of student assessment	IP2G11B	
	Use ICT for monitoring student progress	IP2G11C	
	Integrate ICT into teaching and learning	IP2G11G	
	Use subject-specific digital learning resources (e.g., tutorials, simulation)	IP2G11H	
	Use e-portfolios for assessment	IP2G11I	
	Use ICT to develop authentic (real-life) assignments for students	IP2G11J	
	Assess students' [computer and information literacy]	IP2G11K	
			Recoding
	1 = Expected and required	1	2
	2 = Expected but not required	2	1
	3 = Not expected	3	0

Variable Name:	P_EXPTCH		
Description:	Expectations for teacher collaboration using ICT		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of expectation		
Source:	Are teachers in your school expected to acquire knowledge and skills in each of the following activities? *(Please mark one choice in each row)*		
	Collaborate with other teachers via ICT	IP2G11D	
	Communicate with parents via ICT	IP2G11E	
	Communicate with students via ICT	IP2G11F	
			Recoding
	1 = Expected and required	1	2
	2 = Expected but not required	2	1
	3 = Not expected	3	0

Variable Name:	P_PRIORH		
Description:	Priorities of increased ICT resources		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher priority		
Source:	At your school, what priority is given to the following ways of facilitating the use of ICT in teaching and learning? *(Please mark one choice in each row)*		
	Increasing the numbers of computers per student in the school	IP2G15A	
	Increasing the number of computers connected to the Internet	IP2G15B	
	Increasing the bandwidth of Internet access for the computers connected to the Internet	IP2G15C	
			Recoding
	1 = High priority	1	3
	2 = Medium priority	2	2
	3 = Low priority	3	1
	4 = Not a priority	4	0

Variable Name:	P_PRIORS		
Description:	Priorities of increased ICT professional learning resources		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher priority		
Source:	At your school, what priority is given to the following ways of facilitating the use of ICT in teaching and learning? *(Please mark one choice in each row)*		
	Increasing the range of digital learning resources available for teaching and learning	IP2G15D	
	Establishing or enhancing an online learning support platform	IP2G15E	
	Supporting participation in professional development on pedagogical use of ICT	IP2G15F	
	Increasing the availability of qualified technical personnel to support the use of ICT	IP2G15G	
	Providing teachers with incentives to integrate ICT use in their teaching	IP2G15H	
	Providing more time for teachers to prepare lessons in which ICT is used	IP2G15I	
	Increasing the professional learning resources for teachers in the use of ICT	IP2G15J	
			Recoding
	1 = High priority	1	3
	2 = Medium priority	2	2
	3 = Low priority	3	1
	4 = Not a priority	4	0

Section 3: ICT coordinator questionnaire

Simple indices

Variable Name:	C_EXP		
Description:	ICT experience in years in the school		
Procedure:	Simple recoding		
Source:	How many years has your school been using ICT for teaching and/or learning purposes for students in [target grade]?	II2G03	Recoding
	(Please mark one choice)		
	1 = Never, we do not use ICT	1	0
	2 = Fewer than 5 years	2	1
	3 = At least 5 but fewer than 10 years	3	2
	4 = 10 years or more	4	3

Variable Name:	C_ICTDEV	
Description:	Sum of ICT devices	
Procedure:	C_ICTDEV=SUM(AA1,AB1,AC1)	
Source:	In your school, approximately how many of the following types of (school-provided) ICT devices are available?	
	(Please record a whole number. Record 0 (zero), if none.)	
	For this question please: • Count terminals (if they have a keyboard and a screen) as computers • Exclude computers that are not in use (e.g., in storage) • Exclude computers that are only used as servers • Record 0 (zero), if none.	
	Desktop computers - All devices in the school	II2G07AA1
	Laptops/notebooks - All devices in the school	II2G07AB1
	Tablet devices - All devices in the school	II2G07AC1

Variable Name:	C_RATDEV
Description:	Ratio of school size and number of ICT devices
Procedure:	C_ RATDEV=P_NUMSTD/C_ICTDEV
Source:	In your school, approximately how many of the following types of (school-provided) ICT devices are available? *(Please record a whole number. Record 0 (zero), if none.)* For this question please: • Count terminals (if they have a keyboard and a screen) as computers • Exclude computers that are not in use (e.g., in storage) • Exclude computers that are only used as servers • Record 0 (zero), if none.

Variable Name:	C_ICTSTD
Description:	Sum of ICT devices available for student use
Procedure:	C_ICTSTD=SUM(AA2,AB2,AC2)
Source:	In your school, approximately how many of the following types of (school-provided) ICT devices are available? *(Please record a whole number. Record 0 (zero), if none.)* For this question please: • Count terminals (if they have a keyboard and a screen) as computers • Exclude computers that are not in use (e.g., in storage) • Exclude computers that are only used as servers • Record 0 (zero), if none. Desktop computers - Devices available for student use — II2G07AA2 Laptops/notebooks - Devices available for student use — II2G07AB2 Tablet devices - Devices available for student use — II2G07AC2

Variable Name:	C_RATSTD
Description:	Ratio of school size and number of devices available for students
Procedure:	C_RATSTD=P_NUMSTD/C_ICTSTD
Source:	In your school, approximately how many of the following types of (school-provided) ICT devices are available? *(Please record a whole number. Record 0 (zero), if none.)* For this question please: • Count terminals (if they have a keyboard and a screen) as computers • Exclude computers that are not in use (e.g., in storage) • Exclude computers that are only used as servers • Record 0 (zero), if none.

Variable Name:	C_RATSMB
Description:	Ratio of school size and smart boards
Procedure:	C_RATSMB=P_NUMSTD/II2G07C
Source:	In your school, about how many (school-provided) smart boards or interactive whiteboards are available? *(Please record a whole number. Record 0 (zero), if none.)*

Scale indices

Variable Name:	C_ICTRES		
Description:	Availability of ICT resources at school		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher availability		
Source:	Please indicate the availability of each of the following software resources at your school *(Please mark one choice in each row)*		
	Digital learning resources that can only be used online	II2G04B	
	Access to the Internet through the school network II2G04C		
	Access to an education site or network maintained by education authorities	II2G04D	
	Email accounts for school-related use	II2G04E	
	Practice programs or [apps] where teachers decide which questions are asked of students (e.g., [Quizlet, Kahoot], [mathfessor])	II2G05A	
	Single user digital learning games (e.g., [languages online])	II2G05B	
	Multi-user digital learning games with graphics and inquiry tasks (e.g., [Quest Atlantis])	II2G05C	
	Video and photo software for capture and editing (e.g., [Windows Movie Maker, iMovie, Adobe Photoshop])	II2G05F	
	Concept mapping software (e.g., [Inspiration®], [Webspiration®])	II2G05G	
	Data logging and monitoring tools (e.g., [Logger Pro]) that capture real-world data digitally for analysis (e.g., speed, temperature)	II2G05H	
	A learning management system (e.g., [Edmodo], [Blackboard])	II2G05J	
	e-portfolios (e.g., [VoiceThread])	II2G05L	
	Digital contents linked with textbooks	II2G05M	
			Recoding
	1 = Available to teachers and students	1	2
	2 = Available only to teachers	2	1
	3 = Available only to students	3	1
	4 = Not available	4	0

Variable Name:	C_HINRES		
Description:	Computer resource hindrances to the use of ICT in teaching and learning		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating fewer hindrances		
Source:	To what extent is the use of ICT in teaching and learning at your school hindered by each of the following obstacles? *(Please mark one choice in each row)*		
	Too few computers with an Internet connection	II2G13A	
	Insufficient Internet bandwidth or speed	II2G13B	
	Not enough computers for instruction	II2G13C	
	Lack of sufficiently powerful computers	II2G13D	
	Problems in maintaining ICT equipment	II2G13E	
	Not enough computer software	II2G13F	
			Recoding
	1 = A lot	1	3
	2 = To some extent	2	2
	3 = Very little	3	1
	4 = Not at all	4	0

Variable Name:	C_HINPED		
Description:	Pedagogical resource hindrances to the use of ICT in teaching and learning		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating fewer hindrances		
Source:	To what extent is the use of ICT in teaching and learning at your school hindered by each of the following obstacles? *(Please mark one choice in each row)*		
	Insufficient ICT skills among teachers	II2G13G	
	Insufficient time for teachers to prepare lessons	I2G13H	
	Lack of effective professional learning resources for teachers	II2G13I	
	Lack of an effective online learning support platform	II2G13J	
	Lack of incentives for teachers to integrate ICT use in their teaching	II2G13K	
	Insufficient pedagogical support for the use of ICT	II2G13N	
			Recoding
	1 = A lot	1	3
	2 = To some extent	2	2
	3 = Very little	3	1
	4 = Not at all	4	0

Section 4: Teacher questionnaire

Simple indices

Variable Name:	T_SEX		
Description:	Sex of teacher		
Procedure:	Simple recoding		
Source:	Are you female or male?	IT2G01	Recoding
	1 = Female	1	1
	2 = Male	2	0

Variable Name:	T_AGE		
Description:	Approximate age of teacher		
Procedure:	Simple recoding		
Source:	How old are you?	IT1G02	Recoding
	(Please mark only one choice)		
	1 = Less than 25	1	23
	2 = 25-29	2	27
	3 = 30-39	3	35
	4 = 40-49	4	45
	5 = 50-59	5	55
	6 = 60 or over	6	63

Variable Name:	T_WGT		
Description:	Allocation of teacher's staff time to sampled school		
Procedure:	Simple recoding		
Source:	In the current school year, at how many schools do you teach [target grade] students?	IT2G04	Recoding
	(Please mark only one choice)		
	1 = Only in this school	1	1,00
	2 = In this and another school	2	0,50
	3 = In this and in two other schools	3	0,33
	4 = In this and in three or more other schools	4	0,25

Variable Name:	T_EXLES		
Description:	ICT experience with ICT use during lessons		
Procedure:	Simple recoding		
Source:	Approximately how long have you been using ICT for teaching purposes?		Recoding
	(Please mark only one choice in each row)		
	During lessons	IT2G05A	
	1 = Never	1	0
	2 = Less than two years	2	1
	3 = Between two and five years	3	2
	4 = More than five years	4	3

Variable Name:	T_EXPREP		
Description:	ICT experience with ICT use for preparing lessons		
Procedure:	Simple recoding		
Source:	Approximately how long have you been using ICT for teaching purposes?		
	(Please mark only one choice in each row)		
	Preparing lessons	IT2G05B	Recoding
	1 = Never	1	0
	2 = Less than two years	2	1
	3 = Between two and five years	3	2
	4 = More than five years	4	3

Scale indices

Variable Name:	T_ICTEFF		
Description:	Teachers ICT self-efficacy		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher level of self-efficacy		
Source:	How well can you do these tasks using ICT? *(Please mark one choice in each row)*		
	Find useful teaching resources on the Internet	IT2G07A	
	Contribute to a discussion forum/user group on the Internet (e.g., a wiki or blog)	IT2G07B	
	Produce presentations (e.g., [PowerPoint® or a similar program]), with simple animation functions	IT2G07C	
	Use the Internet for online purchases and payments	IT2G07D	
	Prepare lessons that involve the use of ICT by students	IT2G07E	
	Using a spreadsheet program (e.g., [Microsoft Excel®]) for keeping records or analyzing data	IT2G07F	
	Assess student learning	IT2G07G	
	Collaborate with others using shared resources such as [Google Docs®], [Padlet]	IT2G07H	
	Use a learning management system (e.g., [Moodle], [Blackboard], [Edmodo])	IT2G07I	
			Recoding
	1 = I know how to do this	1	2
	2 = I haven't done this but I could find out how	2	1
	3 = I do not think I could do this	3	0

Variable Name:	T_ICTEMP		
Description:	Emphasis on ICT capabilities in class		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger emphasis		
Source:	In your teaching the reference class in this school year, how much emphasis have you given to developing the following ICT-based capabilities in your students?		
	(Please mark one choice in each row)		
	To access information efficiently	IT2G09A	
	To display information for a given audience/purpose	IT2G09B	
	To evaluate the credibility of digital information	IT2G09C	
	To share digital information with others	IT2G09D	
	To use computer software to construct digital work products (e.g., presentations, documents, images and diagrams)	IT2G09E	
	To provide digital feedback on the work of others (such as classmates)	IT2G09F	
	To explore a range of digital resources when searching for information	IT2G09G	
	To provide references for digital information sources	IT2G09H	
	To understand the consequences of making information publically available online	IT2G09I	
			Recoding
	1 = Strong emphasis	1	3
	2 = Some emphasis	2	2
	3 = Little emphasis	3	1
	4 = No emphasis	4	0

Variable Name:	T_CLASACT		
Description:	Use of ICT for classroom activities		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do students in your reference class use ICT for the following activities?		
	(Please mark one choice in each row)		
	Work on extended projects (i.e., lasting over a week)	IT2G10A	
	Work on short assignments (i.e., within one week)	IT2G10B	
	Explain and discuss ideas with other students	IT2G10C	
	Submit completed work for assessment	IT2G10D	
	Work individually on learning materials at their own pace	IT2G10E	
	Undertake open-ended investigations or field work	IT2G10F	
	Reflect on their learning experiences (e.g., by using a learning log)	IT2G10G	
	Communicate with students in other schools on projects	IT2G10H	
	Plan a sequence of learning activities for themselves	IT2G10I	
	Analyze data	IT2G10J	
	Evaluate information resulting from a search	IT2G10K	
	Collect data for a project	IT2G10L	
	Create visual products or videos	IT2G10M	
	Share products with other students	IT2G10N	
			Recoding
	1 = They do not engage in this activity	1	Missing
	2 = They never use ICT in this activity	2	0
	3 = They sometimes use ICT in this activity	3	1
	4 = They often use ICT in this activity	4	2
	5 = They always use ICT in this activity	5	3

Variable Name:	T_ICTPRAC		
Description:	Use of ICT for teaching practices in class		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often do you use ICT in the following practices when teaching your reference class?		
	(Please mark one choice in each row)		
	The provision of remedial or enrichment support to individual students or small groups of students	IT2G11B	
	The support of student-led whole-class discussions and presentations	IT2G11C	
	The assessment of students' learning through tests	IT2G11D	
	The provision of feedback to students on their work	IT2G11E	
	The reinforcement of learning of skills through repetition of examples	IT2G11F	
	The support of collaboration among students	IT2G11G	
	The mediation of communication between students and experts or external mentors	IT2G11H	
	The support of inquiry learning	IT2G11J	
			Recoding
	1 = I do not use this practice with the reference class	1	Missing
	2 = I never use ICT with this practice	2	0
	3 = I sometimes use ICT with this practice	3	1
	4 = I often use ICT with this practice	4	2
	5 = I always use ICT with this practice	5	3

Variable Name:	T_USETOOL		
Description:	Use of digital learning tools		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often did you use the following tools in your teaching of the reference class this school year?		
	(Please mark one choice in each row)		
	Practice programs or apps where you ask students questions (e.g., [Quizlet, Kahoot], [mathfessor])	IT2G12A	
	Digital learning games	IT2G12B	
	Concept mapping software (e.g., [Inspiration®], [Webspiration®])	IT2G12G	
	Simulations and modelling software (e.g., [NetLogo])	IT2G12H	
	A learning management system (e.g., [Edmodo], [Blackboard])	IT2G12I	
	Collaborative software (e.g., [Google Docs®], [Onenote]) [Padlet])	IT2G12K	
	Interactive digital learning resources (e.g., learning objects)	IT2G12M	
	Graphing or drawing software	IT2G12N	
	e-portfolios (e.g., [VoiceThread])	IT2G12O	
	Social media (e.g., [Facebook, Twitter])	IT2G12Q	
			Recoding
	1 = Never	1	0
	2 = In some lessons	2	1
	3 = In most lessons	3	2
	4 = In every or almost every lesson	4	3

Variable Name:	T_USEUTIL		
Description:	Use of general utility software		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent use		
Source:	How often did you use the following tools in your teaching of the reference class this school year?		
	(Please mark one choice in each row)		
	Word-processor software (e.g., [Microsoft Word®])	IT2G12C	
	Presentation software (e.g., [Microsoft PowerPoint®])	IT2G12D	
	Computer-based information resources (e.g., topic-related websites, wikis, encyclopaedia)	IT2G12L	
	Digital contents linked with textbooks	IT2G12P	
			Recoding
	1 = Never	1	0
	2 = In some lessons	2	1
	3 = In most lessons	3	2
	4 = In every or almost every lesson	4	3

Variable Name:	T_CODEMP		
Description:	Teacher emphasis of teaching coding tasks in class		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating higher emphasis		
Source:	In your teaching of the reference class this school year, how much emphasis have you given to teaching the following skills?		
	(Please mark one choice in each row)		
	To display information in different ways	IT2G13A	
	To break a complex process into smaller parts	IT2G13B	
	To understand diagrams that describe or show real-world problems	IT2G13C	
	To plan tasks by setting out the steps needed to complete them	IT2G13D	
	To use tools making diagrams that help solve problems	IT2G13E	
	To use simulations to help understand or solve real-world problems	IT2G13F	
	To make flow diagrams to show the different parts of a process	IT2G13G	
	To record and evaluate data to understand and solve a problem	IT2G13H	
	To use real-world data to review and revise solutions to problems	IT2G13I	
			Recoding
	1 = Strong emphasis	1	3
	2 = Some emphasis	2	2
	3 = Little emphasis	3	1
	4 = No emphasis	4	0

Variable Name:	T_RESRC		
Description:	Availability of computer resources at school		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	To what extent do you agree or disagree with the following statements about using ICT in teaching at your school?		
	(Please mark one choice in each row)		
	My school has sufficient ICT equipment (e.g., computers)	IT2G14B	
	The computer equipment in our school is up-to-date	IT2G14C	
	My school has access to sufficient digital learning resources (e.g., learning software or [apps])	IT2G14D	
	My school has good connectivity (e.g., fast speed - same as in STable) to the Internet	IT2G14E	
	There is enough time to prepare lessons that incorporate ICT	IT2G14F	
	There is sufficient opportunity for me to develop expertise in ICT	IT2G14G	
	There is sufficient technical support to maintain ICT resources	IT2G14H	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

Variable Name:	T_COLICT		
Description:	Collaboration between teachers in using ICT		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	To what extent do you agree or disagree with the following statements about your use of ICT in teaching and learning at your school?		
	(Please mark one choice in each row)		
	I work together with other teachers on improving the use of ICT in classroom teaching	IT2G15A	
	I collaborate with colleagues to develop ICT-based lessons	IT2G15B	
	I observe how other teachers use ICT in teaching	IT2G15C	
	I discuss with other teachers how to use ICT in teaching topics	IT2G15D	
	I share ICT-based resources with other teachers in my school	IT2G15E	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

Variable Name:	T_PROFSTR		
Description:	Teacher participation in structured learning professional development related to ICT		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent participation		
Source:	How often have you participated in any of the following professional learning activities in the past two years?		
	(Please mark one choice in each row)		
	A course on ICT applications (e.g., word processing, presentations, internet use, spreadsheets, databases)	IT2G17A	
	A course or webinar on integrating ICT into teaching and learning	IT2G17B	
	Training on subject-specific digital teaching and learning resources	IT2G17C	
	A course on use of ICT for [students with special needs or specific learning difficulties]	IT2G17H	
	A course on how to use ICT to support personalized learning by students	IT2G17I	
			Recoding
	1 = Not at all	1	0
	2 = Once only	2	1
	3 = More than once	3	2

Variable Name:	T_PROFREC		
Description:	Teacher participation in reciprocal learning professional development related to ICT		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating more frequent participation		
Source:	"How often have you participated in any of the following professional learning activities in the past two years?"		
	(Please mark one choice in each row)		
	Observations of other teachers using ICT in teaching	IT2G17D	
	An ICT-mediated discussion or forum on teaching and learning	IT2G17E	
	The sharing of digital teaching and learning resources with others through a collaborative workspace	IT2G17F	
	Use of a collaborative workspace to jointly evaluate student work	IT2G17G	
			Recoding
	1 = Not at all	1	0
	2 = Once only	2	1
	3 = More than once	3	2

Variable Name:	T_VWNEG		
Description:	Negative views on using ICT in teaching and learning		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	To what extent do you agree or disagree with the following practices and principles in relation to the use of ICT in teaching and learning?		
	(Please mark one choice in each row)		
	Using ICT at school:		
	Impedes concept formation by students	IT2G18A	
	Results in students copying material from Internet sources	IT2G18D	
	Distracts students from learning	IT2G18F	
	Results in poorer written expression among students	IT2G18G	
	Results in poorer calculation and estimation skills among students	IT2G18H	
	Limits the amount of personal communication among students	IT2G18I	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

Variable Name:	T_VWPOS		
Description:	Positive views on using ICT in teaching and learning		
Procedure:	IRT WLE scores with mean of 50 and standard deviation of 10 for equally weighted countries		
Interpretation	Higher values indicating stronger agreement		
Source:	To what extent do you agree or disagree with the following practices and principles in relation to the use of ICT in teaching and learning?		
	(Please mark one choice in each row)		
	Using ICT at school:		
	Helps students develop greater interest in learning	IT2G18B	
	Helps students to work at a level appropriate to their learning needs	IT2G18C	
	Helps students develop problem-solving skills	IT2G18E	
	Enables students to collaborate more effectively	IT2G18J	
	Helps students develop skills in planning and self-regulation of their work	IT2G18K	
	Improves academic performance of students	IT2G18L	
	Enables students to access better sources of information	IT2G18M	
			Recoding
	1 = Strongly agree	1	3
	2 = Agree	2	2
	3 = Disagree	3	1
	4 = Strongly disagree	4	0

IEA's International Computer and Information Literacy Study (ICILS) 2018 is designed to assess how well students are prepared for study, work, and life in a digital world. The study measures international differences in students' computer and information literacy (CIL): their ability to use computers to investigate, create, participate, and communicate at home, at school, in the workplace, and in the community. Participating countries also have an option for their students to complete an assessment of computational thinking (CT).

The ICILS 2018 user guide describes the content and format of the data in the ICILS 2018 international database. It introduces the use of weighting and variance estimation variables for analyzing the ICILS 2018 data, and provides a comprehensive overview of how to work with IEA's International Database (IDB) Analyzer software. The ICILS 2018 user guide is accompanied by three appendices: the international versions of all questionnaires; an overview of national adaptations to the national versions of the ICILS 2018 international questionnaires; and a comprehensive catalogue of the derived variables used in the ICILS 2018 international report.