# Second Information Technology in Education Study

# SITES 2006 User Guide for the International Database


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International Association for the
Evaluation of Educational Achievement

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# Contents

**Appendices**

# List of Tables and Figures

# Overview of the SITES 2006 International Database

1

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## 1.1 Introduction

To support and promote secondary analyses, the International Association for the Evaluation of Educational Achievement (IEA) is making the SITES 2006 international database and accompanying User Guide available to researchers, analysts, and public users. The database comprises national contexts and school- and teacher-level data from 23 education systems, all of which gave IEA permission to release their national data. It includes information from roughly 8,000 schools, including more than 13,000 mathematics and over 16,000 science teachers.

The SITES 2006 User Guide describes the content, format, and usage of the SITES 2006 international database. Chapter 2 describes the structure of the database in detail including information about the response, sampling, and derived variables and their coding. Chapter 3 details the weighting and variance estimation methods used in SITES 2006 and provides information on the use of weights and guidelines for estimating variance when conducting secondary analysis. Chapter 4 provides instructions on analyzing the SITES 2006 international database using IEA's International Database (IDB) Analyzer software to replicate the results presented in the SITES 2006 international report as well as to conduct secondary analysis. The appendices contain the international version of each of the SITES 2006 questionnaires.

Since SITES 2006 was an ambitious and demanding study, involving complex procedures for drawing samples, collecting data, and analyzing and reporting findings, it is necessary to have an understanding of the characteristics of the study in order to work effectively with the data. Although the SITES 2006 design, operations, and data gathering resembled to a large extend the procedures used in IEA's past and current student achievement studies such as TIMSS and PIRLS, SITES' adult target populations, for example, implied certain consequences and necessities for data collection and analysis.

The SITES 2006 User Guide describes the organization, content, and usage of the international database, while the SITES 2006 Technical Report (Carstens & Pelgrum, 2009) provides a comprehensive account of the methodological and analytical implementation of the study. It is imperative, therefore, that this user guide be used in conjunction with the technical report. The international report (Law, Pelgrum, & Plomp, 2008) is another key resource for the analysis itself. Using all these publications will allow analysts to confidently replicate the procedures used, and to accurately undertake new analyses in areas of special interest.[1]



1 Further information about the international report, its supplementary online appendices, as well as order details and links are provided on the study's website at http://www.sites2006.net

## 1.2 An Overview of SITES 2006

For more than 50 years, IEA has been conducting comparative studies in education. IEA's Second Information Technology in Education Study (SITES) produced internationally comparable indicators on information and communication technology (ICT) usage and practices, as well as an in-depth analysis of the way in which ICT impacts teaching and learning processes. SITES 2006 is the fourth in IEA's series of ICT-related surveys, which began in 1987 with the IEA Computers in Education Study (COMPED), followed by SITES Module 1 (1997–2000) and SITES Module 2 (2000–2004). COMPED focused on the use of computers in schools and the effects of this usage within schools. SITES Module 1 looked at the readiness of schools to integrate ICT into teaching and learning. SITES Module 2 concerned 174 case studies of innovative pedagogical practices in different countries, examining and comparing the characteristics of these practices as well as the factors associated with them.

SITES 2006 is the fourth project in this series. It consists of a survey of schools and teachers of mathematics and science. Its aim is to understand what pedagogical practices teachers and schools in different education systems apply and how ICT is used in these practices. The study's initial findings are presented in Law, Pelgrum, & Plomp (2008).

### *1.2.1 Participating Education Systems*

Table 1.1 shows information about the 22 education systems that participated in SITES 2006. In addition to these 22, Australia participated as a benchmarking country and collected data during the following school year.[2] Altogether, SITES 2006 covered education systems from five different continents. Fifteen of these systems had already participated in SITES Module 1.

The ISO 3166-1 definition for country codes was used to identify education systems. For education systems not listed in the ISO 3166-1, the IEA Data Processing and Research Center (DPC) derived new alphanumeric and associated numeric codes. The three letter alphanumeric code is used in filenames and identifies the education systems associated with that file. The numeric code is used within the data files to identify the education system for each record.

The survey was administered towards the end of the school year. In order to conform to this timeline, 18 education systems followed the northern hemisphere (NH) timeline and administered the survey in the first half of calendar year 2006. Four education systems administered the survey towards the end of the calendar year 2006, following the southern hemisphere timeline (SH).[3]

In the Russian Federation, regions were selected as a first sampling stage. A sample of schools from within each region was selected. In the case of the Moscow region, the sample was extended to arrive at optimized estimates for the region. Therefore, data from schools sampled for the Moscow region contributed to both the estimates for the Moscow region and for the Russian Federation. All records from the Moscow region sample were consequently also added to the Russian Federation data.

### *1.2.2 Management*

SITES 2006 was managed by a consortium involving the following partners and key staff:

- University of Twente: Tjeerd Plomp (study director), Hans Pelgrum (international coordinator and responsible for the development and reporting of the school questionnaires), Joke Voogt



2 See Appendix E for characteristics of the Australian sample.

3 Australia also administered the survey towards the end of the school year following a southern hemisphere timeline, but this occurred one year later, towards the end of 2007.

*Table 1.1 Participating Education Systems in SITES 2006*

| Education System | ISO 3166-1 Alpha-3 code | ISO 3166-1 Numeric code (IDCNTRY) | Hemisphere | SITES Module 1 Participation |
|---|---|---|---|---|
| Alberta Province, Canada | CAB* | 9134* | NH | |
| Catalonia, Spain | ECT* | 7241* | NH | |
| Chile | CHL | 152 | SH | |
| Chinese Taipei | TWN | 158 | NH | • |
| Denmark | DNK | 208 | NH | • |
| Estonia | EST | 233 | NH | |
| Finland | FIN | 246 | NH | • |
| France | FRA | 250 | NH | • |
| Hong Kong SAR | HKG | 344 | NH | • |
| Israel | ISR | 376 | NH | • |
| Italy | ITA | 380 | NH | • |
| Japan | JPN | 392 | SH | • |
| Lithuania | LTU | 440 | NH | • |
| Moscow, Russian Federation | RUM* | 6431* | NH | |
| Norway | NOR | 578 | NH | • |
| Ontario Province, Canada | COT* | 9132* | NH | |
| Russian Federation | RUS | 643 | NH | • |
| Singapore | SGP | 702 | SH | • |
| Slovak Republic | SVK | 703 | NH | |
| Slovenia | SVN | 705 | NH | • |
| South Africa | ZAF | 710 | SH | • |
| Thailand | THA | 764 | NH | • |
| **Benchmarking Participant** | | | | |
| Australia | AUS | 36 | SH | |

* Education systems marked with an asterisk are not part of the ISO 3166-1 definition. Codes have been defined by the IEA DPC.

- Hong Kong University: Nancy Law (co-international coordinator) and Angela Chow (research officer)
- IEA Data Processing and Research Center: Dirk Hastedt, Ralph Carstens, Falk Brese (procedures, manuals, data collection and processing, analysis), Olaf Zuehlke (sampling)
- IEA Secretariat: Barbara Malak-Minkiewicz (member relations, translation verification), Jur Hartenberg (financial management)
- University of Liege, Belgium: Christian Monseur (sampling referee and analysis).

A Steering Committee provided overall guidance. It consisted of Ron Anderson from the University of Minnesota and Alfons ten Brummelhuis from the Foundation for ICT at school in the Netherlands.

Each participating education system appointed a National Research Coordinator (NRC) who, together with staff members at their national center, was responsible for implementing the study within their education system in accordance with the SITES 2006 guidelines and procedures. The quality of the SITES 2006 collection and data was dependent on the work of the NRCs and their colleagues in carrying out the complex sampling, translation, and data collection tasks with dedication, competence, and energy.

A complete list of involved persons and their contact details is included in the SITES 2006 international report (Law, Pelgrum, & Plomp, 2008) as well as the SITES 2006 Technical Report (Carstens & Pelgrum, 2009).

### *1.2.3 Target Populations and Questionnaires*

SITES 2006 surveyed schools that enrolled students in the target grade that represents the 8th year of schooling, counting from the first year of ISCED Level 1. The target population included school principals, ICT coordinators, and mathematics and science teachers from those schools. For a detailed description of the target populations see Chapter 6 in the SITES 2006 Technical Report (Carstens & Pelgrum, 2009). On average, 400 schools enrolling students in the target grade and four teachers per school (two mathematics and two science teachers) were surveyed in each participating education system.

The study administered three questionnaires to respondents in schools: a school questionnaire to the principals, a technical questionnaire to ICT coordinators, and a teacher questionnaire to mathematics and science teachers. Furthermore, NRCs were asked to complete the National Context Questionnaire. This questionnaire was administered online and gathered data about system-level information related to structure, funding, curriculum, and educational processes. Appendices A to D contain all four questionnaires including the variable names as used in the international database.

To conduct a valid analysis of the SITES 2006 data and to correctly interpret the results, it is important to be aware of adaptations to the questionnaires that might have been made by national centers. In some instances, the international version of a question or item had to be adapted by all participating education systems, e.g. the target grade. In other cases, national centers adapted questions or items for socio-cultural reasons or because the international version was (partly or completely) not applicable in their education system. Users of the international database are encouraged to refer to Appendix D of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009) for more details about national adaptations in SITES 2006 and potential consequences for comparability across education systems.

### *1.2.4 Sampling and Survey Operations*

In SITES 2006, a two-stage stratified cluster sampling procedure was used. National centers provided a list of all target grade schools to the IEA DPC. The school samples were drawn by staff at the IEA DPC proportional to the school size, taking into account national stratification needs. After agreeing to participate in SITES 2006, schools provided national centers with a list of all eligible mathematics and science teachers teaching in the target grade. National centers drew two random samples of mathematics and science teachers using software provided by the IEA DPC.

Once schools and teachers had been sampled, administration of the survey began. National centers could opt to administer the survey questionnaires online or on paper. National centers were free to choose which modes would be the default at the national, school, or individual level. Usually, national centers asked individual respondents to select their preferred mode.

The SITES 2006 survey was administered from March to June 2006 in the northern hemisphere and from September to October 2006 in the southern hemisphere. Due to low initial response rates, several national centers were granted an extension of the administration period.

For more information about the sample design, survey operations, and online data collection procedures please refer to Chapters 6, 7, and 8 of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009).

After data collection and capture, several quality control and assurance procedures were implemented to ensure high quality and international comparability of the data from participation education systems. National centers ran standardized checks on their data in order to detect inconsistencies, duplicate records, or problematic reliability of data entry. During data processing, the IEA DPC investigated the quality of the data using about 135 different structural, validity, and consistency checks. The DPC and national centers worked closely to resolve any issues that were detected.

The cleaned data from participating education systems were then weighted and transformed to the international database structure such that every dataset consisted of the same variables with the same coding scheme. Adaptations done by national centers were recoded to recover the international data structure according to rules devised by the DPC and the national centers. In addition, school-level data from responses to the school and the technical questionnaires were merged into one file per education system at the school level. Furthermore, data from the teacher questionnaire were split into one file per education system containing data from mathematics teachers and one file per education system containing data from science teachers.

Please refer to Chapter 9 of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009) for details on data processing and the creation of the SITES 2006 international database, Chapter 10 for details of the weighting and variance estimation procedures, and Appendix D for details about education system-specific adaptations and their handling.

### *1.2.5 Quality of Samples and International Reporting*

The quality of the achieved sample within each education system participating in SITES 2006 was assessed by categorizing the participation rates of each of the three surveyed population (schools, mathematics teachers, and science teachers). The categorization resulted in either full reporting or annotated reporting due to the potentially reduced quality of the sample. In addition, education systems in which the achieved sample did not cover at least 90% of the desired population were flagged in the SITES 2006 international report. For teacher data, a flag also indicated one education system that collected data on teacher participation only after survey administration. Finally, annotated reporting was used for those education systems that did not completely follow the internationally defined procedure to randomly select and provide a target grade reference to teachers for answering Parts I–VI and Part VIII of the SITES 2006 Teacher Questionnaire.

**Attention Point**

To identify possible limitations, users of the SITES 2006 international database are encouraged to consult Chapter 10 of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009) for more details about the quality rating of the SITES 2006 samples and Chapter 12 for details about the flagging and reporting policy in the SITES 2006 international report.

## References

Carstens, R., & Pelgrum, W.J. (Eds.)(2009). *IEA SITES 2006 Technical Report*. Amsterdam: International Association for the Evaluation of Educational Achievement.

International Organization for Standardization (2008). *ISO 3166 Maintenance agency (ISO 3166/MA) - ISO's focal point for country codes*. Retrieved from http://www.iso.org/iso/country_codes.htm on July 8, 2008.

Law, N., Pelgrum, W.J., & Plomp, T. (Eds.). (2008). *Pedagogical practices and ICT use around the world: findings from an international comparative study*. CERC Studies in Comparative Education. Hong Kong: Comparative Education Research Centre, The University of Hong Kong, and Dordrecht: Springer.

Wikipedia (2008). *ISO 3166-1*. Retrieved from http://en.wikipedia.org/wiki/ISO_3166-1 on July 8, 2008.

# The SITES 2006 Data Files

2

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This SITES 2006 User Guide is produced as part of a larger package containing the SITES 2006 international database. The package is available at www.sites2006.net for download as a zipped archive, consisting of the following parts:

- CODEBOOKS: Codebook files with descriptions of all variables in the SITES 2006 data
- DATA: Data files containing data from school principals, ICT coordinators, and teachers in SPSS and SAS XPORT formats. The National Context Questionnaire data file is available in SPSS format only.
- PROGRAMS: IEA IDB Analyzer setup file
- REPORTS: The SITES 2006 IDB User Guide and the SITES 2006 Technical Report.

The file names within the package generally follow the DOS file naming convention: file names with up to eight characters, followed by a three-character extension (as in FILENAME.EXT). Files with the same names are complementary to each other, and the extension identifies their function or type. The extensions used for the files contained in the package are the following:

- .PDF – Codebooks and reports in PDF format
- .SDB – Codebooks in standard Dbase format (readable in Excel)
- .TXT – Codebooks in ASCII text format
- .XPT – SAS Export data files
- .SAV – SPSS data files
- .EXE – IEA IDB Analyzer setup executable file.

**Attention Point**

At a later stage, the IEA SITES 2006 IDB will also be made available through IEA's Study Data Repository system at http://rms.iea-dpc.org/

## 2.1 Data Files, Codebooks, and Formats

This section describes the file types, contents, and formats of the SITES 2006 data. For each file type, a separate file is available for each participating education systems. Files of the same type are structurally isomorphic, i.e. each file includes the same uniformly defined set of variables.

During data capture, one file type for the school principal data, one for the ICT coordinator data, and one for teacher data were used. Since both the principal and the ICT coordinator responses related to the school level and matched each other 1:1, they

were consequently merged to form a combined school-level data file for the international database. To simplify logistics, a single teacher data entry file was used. The file contained responses from both the mathematics and science teachers. Since teachers belonged to only one of two independently sampled populations, analysis of combined mathematics and science teacher data is neither conceptually meaningful nor possible from a sampling and weighting perspective. To reflect this, the international database includes one file for the mathematics teacher data and one for the science teacher data. Thus, the SITES 2006 international database consists of the following file types (file type acronyms in brackets):

- a school-level data file with information collected from principals and ICT coordinators (BCG),
- a mathematics teacher file with information collected from mathematics teachers (BTM), and
- a science teacher file with information collected from science teachers (BTS).

Additionally, there is a single national context questionnaire data file with all systems' data included (see Section 2.7).

The filenames consist of an eight-character string followed by a three-character file extension and use the following naming conventions:

- The first character of a file name is always "B", denoting populations associated with ISECD level 2 teaching and learning.
- The second character indicates the level of the information included in a file. The letter "N" indicates a national-level data file, the letter "C" a school-level data file, the letter "T" a teacher-level data file. Note that the letter "C" for the school-level may not be intuitive but was chosen for reasons of consistency with other IEA studies such as TIMSS and PIRLS.
- The third character indicates the context or scope of the information in a file. The letter "G" is used for general questionnaire data, the letter "M" for mathematics teacher-related data, and "S" for science teacher-related data.
- The fourth to sixth characters identify the participating education system using a three-character alphanumeric abbreviation based on the ISO 3166 coding scheme. Table 1.1 in Chapter 1 lists the codes of all participating education systems. The national context questionnaire data file uses the three-letter combination "SIT".
- The seventh and eighth characters indicate the study cycle. The combination "S1" is used for SITES 2006.
- The three-character file extensions used for the data files are .SAV for the SPSS format and .XPT for the SAS XPORT format.

For example, the file name "BTMZAFS1.SAV" indicates a SITES 2006 mathematics teacher file for South Africa in SPSS format.

All information related to the structure of the data files, as well as the source, format, descriptive labels, and response option codes for all variables, is additionally contained in codebook files. Each data file is accompanied by a codebook file. The naming convention for a codebook file is as follows:

- The first three characters of the filename are identical to the file naming convention presented above.
- The next three characters identify the files as a SITES 2006 codebook and are always "SIT".
- The seventh and eighth characters are always "S1" to indicate the SITES 2006 study cycle.
- The three-character file extension is either .SDB for standard dBase format, .TXT for plain ASCII format and .PDF for Adobe Acrobat format.

The standard dBase (.SDB) codebook files can be read using Microsoft Excel or most standard database and spreadsheet programs. Important codebook fields include FIELD_LABL, which contains extended textual information for all variables, QUEST_LOC, which provides the location of questions within their respective survey instruments, and FIELD_CODE, which lists all acceptable responses allowed in the database.

The SPSS dictionary information and the separate codebook files should be sufficient to inform any necessary conversion of data files into other formats for use outside of SPSS or SAS, such as raw ASCII, tab delimited, Microsoft Excel, Stata, or SPSS Portable.

The standard format for the SITES 2006 public-use international database is SPSS, which is accessible to virtually all secondary analysts. The SPSS files include full dictionary information, i.e. variable name, format (type, width, and decimals), label, value labels, missing values, and appropriately set measurement level (nominal, ordinal, or scale). The dictionary information can be accessed in list form through the SPSS "View → Variables" menu or in output form from through the "File → Display Data File Information" menu. Given this, SPSS users will most likely not need to consult the separate codebooks files as all relevant meta information has become part of the SPSS files.

The international database is additionally included in SAS XPORT transport format. The national context questionnaire data is only available in SPSS format and there is no separate codebook file describing its structure. Analytical support is provided for SPSS only, through the IEA IDB Analyzer (see Chapter 4 of this User Guide).

## 2.2 Cases Included

The international database includes all cases that satisfied the SITES 2006 sampling standards. Data from those respondents who either did not participate or did not pass adjudication, for example because within-school participation was not sufficient, were removed from the final data.

Detailed information about the data collection, capturing, processing, editing, weighting, and adjudication of the international database are included in the SITES 2006 Technical Report (Carstens & Pelgrum, 2009). Details regarding the file types and the variables they contain are described in the following sections.

For the international database the data cleaning process at the IEA DPC ensured that information coded in each variable was in fact internationally comparable, that national adaptations were reflected appropriately in all concerned variables, that questions not internationally comparable were removed from the database, and eventually that all entries could be successfully linked between levels.

## 2.3 Survey Variables

In addition to the data from the responses to the questions in the questionnaires (Section 2.4), the data files contain some more variables with identification (Section 2.3.1), tracking and administrative information (Section 2.3.2). Furthermore, sampling and weighting variables (Section 2.3.3) are included in all school-level and teacher-level data files.

### *2.3.1 Identification Variables*

The following identification variables are used to uniquely identify each record in the data files:

- IDCNTRY: Two- to four-digit numeric code identifying the education system. If possible, the ISO 3166-1 codes were used. For some education systems that are not

represented in the ISO 3166-1 code list, a numeric code was created and assigned by the IEA DPC (see Table 1.1).

- IDSCHOOL: In all school- and teacher-level files, this one- to four-digit numeric code identifies the school within an education system. The codes are only unique within an education system. To uniquely identify schools across education systems IDSCHOOL has to be used in combination with IDCNTRY.
- IDTECH: This three- to six-digit numeric code in the school-level file identifying ICT coordinators within schools within an education system is simply the combination of the school ID (IDSCHOOL) and the sequential number "01".
- IDTEACH: Five- to eight-digit numeric code to identify teachers within schools. It is composed of the school ID (IDSCHOOL), the teacher population identification ("01" for mathematics teachers and "02" for science teachers), and a sequential two-digit number within each school.
- IDPOP: Identifies the population. For SITES 2006 the value is always "2", indicating secondary education. This is similar to the population coding in previous IEA studies.

### *2.3.2 Tracking and Administrative Variables*

The SITES 2006 international database includes several variables that provide information about survey administration, participation, and some basic characteristics of respondents. The following variables are used for this purpose in the school- and teacher-level files:

- PSYSTEM, CSYSTEM, TSYSTEM: Numeric variable uniquely identifying each record in the original data files provided by participating education systems. PSYSTEM was used for records from the School Questionnaire data files, CSYSTEM for records from the Technical Questionnaire data files and TSYSTEM for records from the Teacher Questionnaire data files. An offset of 5,000 was added to the sequential numbers if the questionnaire was answered on-line. An offset of 10,000 was added if the information about the assigned questionnaire mode was omitted.
- PITPART, CITPART, ITPART: These variables provide the final participation information for school principals (PITPART), ICT coordinators (CITPART) and teachers (ITPART).
- PITODC, CITODC, ITODC: Indication of the questionnaire administration mode for school principals (PITODC), ICT coordinators (CITODC), and teachers (ITODC). The value was set to "0" for questionnaire administered on paper and "1" for questionnaires administered online.
- INSIT06: Indication if the record belongs to the SITES 2006 international sample. In the final international database, this variable takes the values "1" for all records.
- VERSION: Release version number of the SITES 2006 international database.
- DPCDATE: File creation date.

The teacher data files (BTM/BTS) consist of additional variables providing information about teachers and further details about the administration:

- ITSEX: Teacher gender information as stated in the Teacher Tracking Form. If the information was not available on the Tracking Form but the teacher provided the gender information in the questionnaire (question BTG32A1), the questionnaire information was copied over.
- ITBIRTHY: Teacher birth year information as stated in the Teacher Tracking Form.
- ITEXCLUD: Variable indicating if a teacher was excluded from the survey. In the final IDB, this variable takes the value "9" (not excluded) for all records.
- ITLANG: Language used for the Teacher Questionnaire. If an education system only used one language the value was set to "1" for all teachers.

- ITSUBJ: Teacher population identification with value "1" for mathematics teachers and value "2" for science teachers.
- ITMATH: Secondary ID for science teachers. Teachers teaching both mathematics and science (or one or more science subjects in education systems where science is taught in separate subjects) were listed twice, once in the tracking form for mathematics teachers and once in the tracking form for science teachers. On each mathematics teacher tracking form the corresponding ID from the science teacher tracking form was copied for teachers teaching both subjects.
- ITSCI: Secondary ID for math teachers. Teachers teaching both mathematics and science (or one or more science subjects in education systems where science is taught in separate subjects) were listed twice, once in the tracking form for mathematics teachers and once in the tracking form for science teachers. On each science teacher tracking form the corresponding ID from the mathematics teacher tracking form was copied for teachers teaching both subjects.

### *2.3.3 Sampling and Weighting Variables*

To calculate population estimates and correct jackknife variance estimates, sampling and weighting variables are provided in the data files. Further details about weighting and variance estimation are provided in Chapter 3 of this User Guide.

The following weight variables are included in the SITES 2006 international database:

- SCHWGT: School weight (included in the school-level files)
- MTOTWGT: Total mathematics teacher weight (included in the mathematics teacher-level files)
- STOTWGT: Total science teacher weight (included in the science teacher-level files).

In addition, the following weighting factors are included:

- WGTFAC1: School weighting factor (included in the school and teacher-level files)
- WGTADJ1: School non-response adjustment (included in the school and teacher-level files)
- WGTFAC2: Teacher weighting factor (included in the teacher-level files)
- WGTADJ2: Teacher non-response adjustment (included in the teacher-level files).

The following variance estimation variables (or "jackknife variables") are included in the SITES 2006 international database. The actual replicate weights are computed "on-the-fly" and are not part of the data files.

- JKCZONE: Jackknife zone to which the school is assigned (included in the school-level files)
- JKCREP: Jackknife replicate to which the school is assigned (included in the school-level files)
- JKZONE: Jackknife zone to which the teacher's school is assigned (included in the teacher-level files)
- JKREP: Jackknife replication unit to which the teacher's school is assigned (included in the teacher-level files).

Furthermore, the school-level and teacher-level files contain several stratification variables, which are listed below. See Chapter 6 and Appendix C of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009) for more details on national stratification variables and their meaning.

- IDSTRATE: Explicit stratum the school was allocated to. Stratification codes are comparable only within but not across education systems.
- IDSTRATI: Implicit stratum based on the sampling forms and plans and as assigned during the selection.

- IDSTRATU: Unique information about the implicit stratification that takes the same number for each level of IDSTRATE. Secondary analysts are therefore encouraged to use this variable for the purpose of analysis and for grouping schools and teachers sharing implicit stratification. Note however that the school and teacher samples selected for SITES 2006 may not have been optimized to yield precise estimates for domains or sub-populations that were only used in implicit stratification.

## 2.4 Questionnaire Variables

All variables in the SITES 2006 questionnaires can be identified by their variable names. The variable names follow a systematic naming convention.

- The first three digits indicate the source of the data: Variable names beginning with BCP indicate data from the Principal Questionnaire, variable names beginning with BCT indicate data from the Technical Questionnaire, and variable names beginning with BTG indicate data from the Teacher Questionnaire.
- The fourth and fifth digit represents the question number within the questionnaire.
- The sixth digit indicates the dimension of the question. For single item questions the letter A is used. If a question is further divided into several items, letters indicate the items in alphabetic order.
- If questions are even further divided, e.g. in complex matrix questions like Question 12 in the Technical Questionnaire, the seventh digit sequentially identifies the sub-items. If there is no such further division, this digit is set to 1.

## 2.5 Coding Missing Data

A response to a question can be missing for one or more reasons. The question could have been excluded from the questionnaire ("Not Administered"), the respondent may have chosen not to respond to the question ("Omitted" response), or simply did not have time to reach the question in the instrument ("Not Reached" response). SITES 2006 did not use a special code to indicate invalid responses. These kinds of missing data are handled differently during data processing and therefore are coded differently in the data files. Depending on the file format, different codes are used to represent the missing data. The following missing codes are used in the data files.

### *2.5.1 Not Administered Questions*

A response to a question is coded as "Not Administered" in the following cases:

- If a returned questionnaire is empty or a lost, all variables referring to that questionnaire are coded as not administered. For online questionnaires, this applies to respondents who never logged in.
- For socio-cultural reasons, a country may have chosen not to administer a certain question in its national questionnaire as documented in the "national adaptation forms." The variables corresponding to the question that was removed are coded as not administered.

The code for not administered questions in SPSS files is SYSMIS (.). The code for not administered questions in the SAS files is ".A".

This code was assigned at the IEA DPC after data collection.



### *2.5.2 Omitted or Invalid Responses*

The response to a question was coded as omitted when the question was administered but not answered, or when an invalid response was given. The following cases are coded as an omitted or invalid response:

- The question was administered but no response was provided.

- The respondent selected more than the expected number of checkboxes or gave a response to a question that was not interpretable.
- If a particular question (or a whole page) was misprinted or left out of a questionnaire or for other reasons was not available to the respondent.

The code for these responses in SPSS files are "9", "99", "999", and so on (depending on the field length of the variable). The code for omitted or invalid responses in SAS files is ".".

This code was assigned by the national center during data capture or by the IEA DPC during data cleaning and editing.

### *2.5.3 Logically Not Applicable*

The response to a variable is coded as "Logically Not Applicable" if:

- The previous filter question was answered in a way that made a response to dependent questions logically impossible, and the dependent questions were validly skipped.

This code was assigned at the IEA DPC after data collection.

Logically not applicable responses are coded in the SPSS files as "6", "96", "996", and so on (depending on the field length of the variable). The code for logically not applicable responses in SAS files is ".B".

**Attention Point**

Depending on the analysis attempted, it is recommended that analysts review the questionnaire to determine whether any of their included questions are dependent on previous responses, as in such a case coverage may be reduced. It might then be advisable to filter the dataset and only select respondents to which the question applied.

### *2.5.4 Not Reached*

A special missing code was assigned to questions that were deemed "Not Reached" to distinguish them from "Omitted" responses. "Omitted" questions are those that a respondent most certainly read, but either consciously decided not to answer or accidentally skipped. Not reached codes are assigned for questions the respondent did not reach; that is the respondent started answering the questionnaire but stopped answering before he or she reached the end of the questionnaire, most likely due to a lack of time. "Not reached" variables are exclusively located towards the end of questionnaire.

Before using the "Not Reached" code, the last valid answer given in a questionnaire was identified. The first omitted response after this last answer was coded as "Omitted", but all following responses were then coded as "Not Reached."

For example, and assuming the SPSS data file format, the response pattern "1 9 4 2 9 9 9 9 9 9" (where "9" represents "Omitted") is recoded to "1 9 4 2 9 7 7 7 7 7" (where "7" represents "Not Reached"). When recoding "Omitted" values to "Not Reached" all "Not administered" values were ignored. For example the pattern "3 1 5 2 9 9 9 8 9 9" (where "8" represents "Not Administered") would be recoded to "3 1 5 2 9 7 7 8 7 7."

This code was assigned by the IEA DPC after data collection.

In SPSS files "Not Reached" variables are coded to "7", "97", "997", and so on (depending on the field length of the variable). In SAS data files the code for "Not Reached" is ".R".

## 2.6 Variables and Scales Derived from the Questionnaire Data

The SITES 2006 international report (Law, Pelgrum, & Plomp, 2008) was based on analyses of individual variables as well as composites created from multiple variables. In the SITES 2006 questionnaires, there were several questions about various aspects of a single construct. In these cases, responses to the individual items were combined 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 key methods for extracting and verifying multi-item constructs were exploratory and confirmatory factor analysis. Scale variables in SITES 2006 were computed as simple sum scores of the manifest variables in contrast to other methods employed in similar research such as polytomous IRT scoring or regression-based factor scores based on score coefficients.

For example, teachers' self-reported technical competence as reported on Pages 191–194 in the international report was based on eight manifest variables from the teacher questionnaire (Question 21, Items A–H). The corresponding syntax in SPSS would be as follows:

*Figure 2.1 Example SPSS Syntax to Create a Sum-score for the scale GEN_IT*

```
GEN_IT=MEAN.8(BTG21A1,BTG21B1,BTG21C1,BTG21D1,BTG21E1,BTG21F1,BTG21G1,BTG21H1).
```

As can be seen, the mean GEN_IT of variables BTG21A1 to BTG21H1 is computed for any record that has data available for all eight variables. In the above SPSS function "MEAN", the ".8" portion specifies the minimum number of valid arguments.

In general, records were included in the derived variable calculation only if there were data available for all of the variables involved. This approach is usually referred to as "listwise deletion".

**Attention Point**
To consistently reproduce the composites and their analysis in the international report, it is necessary to follow the "listwise deletion" approach in secondary analysis.

Chapter 11 of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009) includes comprehensive information about the scale and indicator construction in the study. For the above example, information about the included variables, as well as country-by-country scale reliability coefficients, is included in Section 11.4.9 of the technical report.

Given that all scales and indicators reported in SITES 2006 followed the cautious and straightforward calculation described above, it should be easy for secondary analysts to re-compute a case's derived variable using the questionnaire data included in the international database and by following the documentation in Chapter 11 of the SITES 2006 Technical Report. Derived scale and indicator variables are therefore not included in the international database and should be computed as needed and desired by database users. The authors and editors of the international as well as the technical report are available for further support regarding the computation and any conceptual questions.

**Attention Point**
It is important to note that the SITES 2006 international report flagged education systems in relation to the achieved participation rate and whether the internationally defined procedures for the teacher's target class selection were followed. Details about these rules and reporting standards are included in Chapters 10 and 12 of the SITES 2006 Technical Report. Additionally, Chapter 11 of the SITES Technical Report may indicate limitations arising from low or only marginally acceptable scale reliabilities that may indicate reduced measurement invariance across education systems. Users of the SITES 2006 international database are strongly advised to consult these pieces of documentation carefully should the intended analysis involve the comparison of one or more derived composite variables across countries.

The school-level file BCG includes a set of derived variables for the Questions 5 and 15 in the SITES 2006 Technical Questionnaire.

- The variable BCT05A1O holds the original information for the total number of computers in the school as reported by ICT coordinators. Because implausible combinations were detected, the main questionnaire variable BCT05A1 was recoded if either the sum of the items B–D (computers available only to students plus those only available to teachers plus those only available to administrative staff) or any of the values in items E, F, or G was higher than the value in A.
- The variables BCT15A1O to BCT15H1O hold original information for the amount of time spent on ICT related support on average per week. If a value larger than 50 was detected in the first item A (time spent by the ICT coordinator), this and all values in items B–H were set to "omitted" in the main questionnaire variables BCT15A1 to BCT15H1.

The main value for including the original variables for Questions 5 and 15 in the database is for analysts who wish to apply a different data editing or cleaning approach to these data.

## 2.7 National Context Data

National or country aspects sometimes account for elements of the education system and educational processes. In SITES 2006, a National Context Questionnaire (NCQ) was designed to explore these possibilities. This section describes the format and content of the questionnaire.

The NCQ was administered to all National Research Coordinators (NRC) in English. Responses are qualitative in nature and were collected via the internet by means of an online questionnaire. The responses were verified, as far as possible, discussed with NRCs, and reconciled if needed. The final NCQ data set comprises data from all 22 core education systems plus Australia. Variables for data taken from the United Nations Development Program (UNDP) Human Development Report 2006 are set to system missing (".") for Australia, which entered the survey as a benchmarking participant at a stage where the NCQ file was almost finalized.

Full documentation of the NCQ design, contents, administration, analysis, outcomes, and reporting are provided in Chapter 3 of the international report (Law, Pelgrum, & Plomp, 2008) and Chapter 2 of the technical report (Carstens & Pelgrum, 2009). The questionnaire itself, including variable names, can be found in Appendix A of this User Guide.

The NCQ data is provided as a single file called BNGSITS1.sav in fully labeled SPSS format. Given its qualitative nature, there is neither a corresponding SAS file nor a separate codebook file.

## References

Carstens, R., & Pelgrum, W.J. (Eds.)(2009). *IEA SITES 2006 Technical Report*. Amsterdam: International Association for the Evaluation of Educational Achievement.

Law, N., Pelgrum, W. J., & tPlomp, T. (Eds.). (2008). *Pedagogical practices and ICT use around the world: Findings from an international comparative study*. CERC Studies in Comparative Education. Hong Kong: Comparative Education Research Centre, The University of Hong Kong, and Dordrecht: Springer.

# Weights and Variance Estimation

3

Olaf Zuehlke

## 3.1 Overview

This chapter gives a brief introduction to the use of weighting and variance estimation variables in SITES 2006. The names and locations of these variables in the international database are described and their specific roles in school and teacher analysis are explained. Examples for the importance of using the appropriate weighting and variance estimation techniques are given.

## 3.2 Sampling Weights

### *3.2.1 Why Weights Are Needed*

All data in the SITES 2006 international database are derived from randomly drawn samples of schools and teachers. Of course, the results of the study should not only hold for the sampled schools and teachers, but for the entire education system that is participating in the SITES 2006 study. To make correct inferences about the education system, it is necessary to take into account the complex nature of the sampling design implemented in SITES 2006.

Details about the sampling design are reported in Chapter 6 of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009).

The SITES 2006 sampling design called for different selection probabilities at the school and at the teacher sampling level. Sampling weights reflect and compensate the disproportional selection probabilities of the schools as well as of the teachers. If any unit of response had a small selection probability, this was compensated with a large weight, and vice versa. Given that some sampled schools and teachers refused to participate in SITES 2006, it was necessary to adjust the sampling weights for the sample size loss. Thus, the sampling weights were multiplied by non-response adjustments. The final (total) weights are the product of weight factors and adjustment factors that reflect the selection probabilities and the non-response patterns at all levels of analysis.

Details about weighting and adjustment are reported in Chapter 10 of the SITES 2006 Technical Report (Carstens & Pelgrum, 2009).

### *3.2.2 Selecting the Appropriate Weight Variable*

For analysis concerning a single level, different weights must be applied:

- For school level analyses (principals, technical coordinators), SCHWGT must be used.
- For mathematics teacher analyses, MTOTWGT must be used.
- For science teacher analyses, STOTWGT must be used.

If researchers plan to analyze data from more than one level, they must carefully choose the correct weight.

- Analyzing combined teacher data and school data is straightforward with the IDB Analyzer. The software can be used to easily add school-level data to the teacher data. This way, school information becomes an attribute of the teacher, and the user can analyze information from both files. For example, the research question could be of this type: "What percentage of teachers who use the internet for teaching work at schools that have computers in most classrooms?" MTOTWGT or STOTWGT respectively should be used for this type of data analysis.
- Descriptive statistics obtained from a combined file can deviate from results obtained from the two original files. If a school variable and a teacher variable are analyzed jointly, a missing value in the school variable can set the teacher variable to missing (and vice versa).
- If teacher information is regarded as an attribute of the school information (for example, the research questions could state: "what percentage of schools that have computers in most classrooms employ any teachers who use the Internet for teaching?"), this cannot be handled easily with the IDB Analyzer. The researcher must use other software (e.g., SPSS, SAS) to aggregate the teacher data and to merge the teacher information to the school file. When statements are made about schools that have aggregated teacher information attached, SCHWGT should be used.
- It is neither possible nor meaningful to combine the files of mathematics teachers and science teachers, and to make statements about "teachers who teach mathematics, or science, or both" for two key reasons. First, teachers of mathematics and science constitute two separate target populations and the questionnaires were administered within the subject areas. Secondly, some teachers taught both subjects and consequently could and actually were selected twice. This is not reflected by the sampling weights.
- When analyzing weighted school or teacher data for groups of education systems, the researchers must be aware of a pitfall. If the education system identification variable IDCNTRY is used as a grouping variable, all weighted results are correct within each education system. However, if any international average gets directly computed using SCHWGT, MTOTWGT or STOTWGT, larger education systems contribute more to this average than smaller education systems. Usually, this is not the intention of the researcher (though it might just well be). Instead of performing weighted analyses across groups of education systems, it would be necessary to do weighted analyses separately for each education system, and to calculate an average of these results afterwards (see also the section below about the senate weight).

### *3.2.3 Example for Analyzing Weighted Data*

Not using weights in data analysis can lead to severely biased results. The following example illustrates the importance of using weights in research with SITES 2006 data.

A researcher may be interested in the average number of girls in schools in Thailand (variable BCP19A1 in file BCG). Using unweighted data (e.g., in SPSS), it seems to him that the average number of girls in each school is approximately 547.

*Figure 3.1 Example of Un-weighted Analysis in SPSS*

**Descriptive Statistics**

| | N | Mean |
|---|---|---|
| SHCHA/TOTAL NUMBER OF GIRLS IN SCHOOL | 417 | 546,99 |
| Valid N Ilistwise) | 417 | |

Using weighted data with the IDB Analyzer, it shows that in Thailand, the estimate for the average number of girls per school, taking differential selection probabilities into consideration, is actually only 301.

*Figure 3.2 Example of Weighted Analysis Using the IDB Analyzer*

Average for BCP19A1 by (IDCNTRY)

| *COUNTRY ID* | N of Cases | Sum of SCHWGT | BCP19A1 (Mean) |
|---|---|---|---|
| Thailand | 417 | 9003 | 301,14 |

The large difference between the un-weighted and the weighted result can easily be explained by the SITES 2006 sampling design, in which the proportion of large schools in the sample is higher than in the population. The sampling weights compensate for that disproportional school sample allocation, and not using weights leads to an incorrect and biased population estimate.

Results equivalent to the above can be obtained by using the SPSS "Weight Cases ..:" menu item or "WEIGHT BY" syntax.

## 3.3 Normalizing Weights

In other IEA studies, a "senate weight" (SENWGT) and a "house weight" (HOUWGT) were calculated. These weights are not included in the SITES 2006 international database, but researchers can easily calculate them, since they are the result of a linear transformation of the SITES 2006 weighting variables.

For cross-education system analyses in which education systems should be treated equally, a "senate weight" can be computed that transforms the weights in such a way that the sum of weights across all cases is equal to a fixed constant, 500 in the example below.

For each mathematics teacher *i* the senate weight variable can be computed as

$$SENWGT_i = MTOTWGT_i \cdot \left( \frac{500}{\sum_i MTOTWGT_i} \right)$$

Similarly, researchers who are interested in science teachers should use STOTWGT instead of MTOTWGT, and those who are interested in schools, SCHWGT. Instead of 500, any other constant value can be used.

The senate weight will give inaccurate results if a lot of cases in a variable of interest are missing and if the missing data varies substantially between countries. In student achievement studies, where every student is assigned an achievement score, this is not a large problem. In SITES 2006, however, almost every variable has some entries set to missing; therefore, the senate weight should be used cautiously.

Some researchers pursuing advanced analyses may use software that does not automatically normalize weights but demands the sum of the weights to be equal to the achieved sample size (i.e. the mean of all weights is equal to 1).

A "house weight" with this property can easily be computed. With n being the number of responding mathematics teachers in an education system, for each mathematics teacher *i* the variable can be computed as

$$HOUWGT_i = MTOTWGT_i \cdot \left( \frac{n}{\sum_i MTOTWGT_i} \right)$$

Similarly for science teachers, STOTWGT instead of MTOTWGT should be used, and for schools, SCHWGT should be used.

## 3.4 Variance Estimation

### *3.4.1 Why Variance Estimation Is Needed*

Since all estimates, statements, and inferences in SITES 2006 are based on sample data, they can only be stated with a degree of uncertainty. With all research that is performed using SITES 2006 data, the precision of the population estimates should be reported.

Because of the complex sampling design used in SITES 2006, it is not possible to calculate standard errors or to easily perform significance tests with standard software packages. While these programs implicitly assume that the data is derived from a simple random sample, the SITES 2006 teacher data come from a two-stage stratified cluster sample (each school being regarded as a "cluster" of teachers). Any method for estimating sampling variance must take this design into account.

The SITES 2006 international database contains variables that allow for the use of a variance estimation method called "Jackknife Repeated Replication" (JRR). These variables are referred to as "jackknife zones" and as "jackknife replicates." With the IDB Analyzer software, it is possible to implement the JRR method easily (for details about the JRR technique, please refer to Chapter 10 of the SITES 2006 Technical Report).

### *3.4.2 Selecting the Appropriate Variance Estimation Variables*

For school level analysis, the variables to use are JKCZONE and JKCREP. For teacher level analysis, the variables to use are JKZONE and JKREP.

In most education systems, the teachers in a school are assigned to the same jackknife zone as the school itself. In some of the smaller participating education systems, schools and teachers had to be assigned to different zones. Just as with weights, researchers should choose the correct jackknife variables when working with combined data sets. When the calculations are performed with the IDB Analyzer, the correct variables will be selected automatically. If other software is used, "-zone" variables usually have to be specified as "stratum" or "strata" variables, while the "rep" variables commonly are referred to as "cluster" variables.

**Attention Point**
To limit the size and complexity of the IDB, the data files do not include the 100 replicate weight variables used for variance estimation. The IEA IDB Analyzer computes the replicate weights "on the fly" when an analysis is conducted.

### *3.4.3 Example for Variance Estimation*

Not using the jackknife variables in data analysis will lead to incorrect estimates of sampling precision. The following example illustrates the importance of using the JRR technique in research and analysis with SITES 2006 data. In this example, problems occur when the statistical analysis package SPSS is used for data analysis. The IEA IDB Analyzer was specifically designed to overcome these problems. Analysts should note that in addition to the IDB Analyzer, a growing number of other software packages become available to handle the paired jackknife replication method implemented in SITES 2006. The software package Wesvar (Westat, 2008) for complex sample analysis is made available free of charge by Westat Inc. and may be downloaded from Westat's webpage. SAS Version 9.2 (SAS Institute, 2008) also includes support for the replication method used in SITES 2006 and is commercially available from SAS Institute Inc.

A researcher may be interested in the average size of the SITES 2006 target class in Thailand (variable BTG01A1). Using SPSS directly and thereby ignoring the complex sample design and clustering effects, he finds that the (weighted) average class size is about 31.8, and the standard error seems to be close to 0.1.

*Figure 3.3 Example of Incorrect Variance Estimation in SPSS*

**Descriptive Statistics**

| | N | Mean | |
|---|---|---|---|
| | Statistic | Statistic | Std. Error |
| INF/HOW MANY STUDENTS IN TARGET CLASS | 11971 | 31,81 | ,104 |
| Valid N (listwise) | 11971 | | |

Using the JRR technique with the IDB Analyzer, it is apparent that the correct estimate for the actual standard error is almost three times as large.

*Figure 3.4 Example of Correct Variance Estimation using the IDB Analyzer*

```
Average for BTG01A1 by (IDCNTRY)
```

| *COUNTRY ID* | N of Cases | Sum of MTOTWGT | BTG01A1 (Mean) | BTG01A1 (s.e.) |
|---|---|---|---|---|
| Thailand | 664 | 11971 | 31,81 | ,30 |

This difference could be explained by the fact that classrooms within a school usually have a similar size. Teachers from the same school are likely to give similar answers to this question. This effect is not taken into account by SPSS directly, but by the IDB Analyzer.

## References

Carstens, R., & Pelgrum, W.J. (Eds.)(2009). *IEA SITES 2006 Technical Report*. Amsterdam: International Association for the Evaluation of Educational Achievement.

SAS Institute Inc. (2008). SAS® 9.2. Computer software. Cary, NC: SAS Institute Inc. Information retrieved from http://www.sas.com/software/sas9/ on February 23, 2009.

Westat Inc. (2008). *Wesvar® Version 5.1. Replication-Based Variance Estimation for Analysis of Complex Survey Data*. Computer software. Rockville, MD: Westat Inc. Retrieved from http://www.westat.com/westat/statistical_software/wesvar/ on February 23, 2009.

# Analyzing the SITES 2006 Data Using the IEA IDB Analyzer

4

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## 4.1 Overview

This chapter describes the use of the IEA International Database (IDB) Analyzer software (IEA, 2009) for analyzing the SITES 2006 international data files. Example analyses will illustrate the capabilities of the IEA IDB Analyzer to compute a variety of statistics, including percentages, means, regression coefficients, and correlations and their corresponding standard errors. The examples use school and mathematics teacher data to replicate some of the SITES 2006 results included in the main international publication for SITES 2006, *Pedagogical practices and ICT use around the world: findings from an international comparative study* (Law, Pelgrum, & Plomp, 2008), as well as other useful analyses for investigating policy-relevant research questions.

## 4.2 The IEA IDB Analyzer

Developed by the IEA Data Processing and Research Center (IEA DPC), the IEA IDB Analyzer is a stand-alone software that operates in conjunction with the Statistical Package for the Social Sciences (SPSS, 2008). The IEA IDB Analyzer enables users to combine SPSS data files from IEA's large-scale assessments and conduct analyses using SPSS without actually writing syntax code. The IEA IDB Analyzer generates SPSS syntax that takes into account information from the sampling design in the computation of statistics and their standard errors. In addition, the generated SPSS syntax correctly handles plausible values (multiple imputation)[5] for calculating estimates of achievement scores and their corresponding standard errors by combining both sampling and imputation variance.

The IEA IDB Analyzer consists of two modules, the merge module and the analysis module, which are executed as independent applications. The merge module is used to create analysis datasets by combining data files of different types and from different education systems, and selecting subsets of variables for analysis. The analysis module provides procedures for computing various statistics and their standard errors for variables of interest. These procedures can be applied for an education system and for specific subgroups within an education system. Both modules can be accessed by using the Windows Start menu (Start ➔ All Programs ➔ IEA ➔ IDB Analyzer ➔ Merge Module / Analysis Module).

The IEA IDB Analyzer requires PCs running Microsoft Windows 2000, XP, or any later version. The IEA IDB Analyzer further requires a working installation of the Microsoft .NET 2.0 framework and includes this, if required, as part of the setup routine. Local administrator rights are required for a successful installation of the IEA IDB



5 In SITES plausible values are not used so this functionality will not be discussed in this chapter.

Analyzer. The software will produce scripts to be run with SPSS. Therefore, SPSS needs to be installed for merging files and running analysis.

The IEA IDB Analyzer currently is available free of charge from the IEA website at: http://www.iea.nl.

## 4.3 Merging Files with the IEA IDB Analyzer

Data from IEA studies, such as SITES 2006, are generally distributed separately by education system and file type. The merge module of the IEA IDB Analyzer allows the user to combine data from different education systems into a single dataset for analysis. It also facilitates the combination of data from different sources (e.g., school and mathematics teacher files) into one SPSS dataset. Combining files from different education system will permit conducting cross-education system analyses.

When running the merge module, the IEA IDB Analyzer creates SPSS code that can be used later without need for the IEA IDB Analyzer itself. The data files created using the merge module can be processed either with the analysis module of the IEA IDB Analyzer, or by any other analysis software that accepts SPSS input files.

To create an SPSS data file with more than one education system's data or to combine more than one file type, analysts should do the following:

1. Open the merge module of the IEA IDB Analyzer from the Windows Start menu.
2. In the **Select Data Directory** field, browse to the folder where the SPSS IDB data files are located. For example, in Figure 4.1, all SPSS data files are located in the "C:\IntData\SITES\Data" folder. The program will automatically recognize and complete the study **Type**, **Year**, and **Grade** fields and list all education systems available in this folder as possible candidates for merging. If the folder contains data from more than one IEA study, or from more than one grade, the IEA IDB Analyzer will prompt users to select files from the desired study and grade for analyses.
3. Select the education systems of interest from the **Available Participants** list and use the arrow buttons to include them in the list of **Selected Participants**. To select multiple education systems, hold the CTRL key of the keyboard when selecting the education systems. In Figure 4.1, Chile, Chinese Taipei, Finland, Hong Kong SAR, and Israel have been selected (see page 31). Notice that the education systems are displayed in alphabetical order sorted by the education system's name and not by the system's three-letter code.
4. Press the **Next>>** button to proceed. The software will open the second window of the merge module, as shown in Figure 4.2, to select the file types and the variables to be included in the merged data file.
5. Select the file types for merging by checking the appropriate boxes to the left of the window. For example, in Figure 4.2, the school data file is selected.
6. Select the variables required from the list of variables available in left panel. Please note that identification and sampling variables are selected automatically by the IEA IDB Analyzer. In the example shown in Figure 4.2, all school variables are selected.
7. Specify 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 also will create an SPSS syntax file (*.SPS) of the same name and in the same folder with the code necessary to perform the merge. In the example shown in Figure 4.2, the merged file BCGALL.SAV and the syntax file BCGALL.SPS will both be stored in the root directory of your computer. The merged data file will contain school data with the variables shown in the **Selected Variables** panel to the right.

8. Click on the **Start SPSS** button to create the SPSS syntax file and open it in an SPSS syntax window ready for execution. The syntax file must be executed by opening the **Run** menu of SPSS and selecting the **A**ll menu option. The IEA IDB Analyzer will give a warning if it is about to overwrite an existing file in the specified folder.

*Figure 4.1 Merge Module – Selecting Participants*

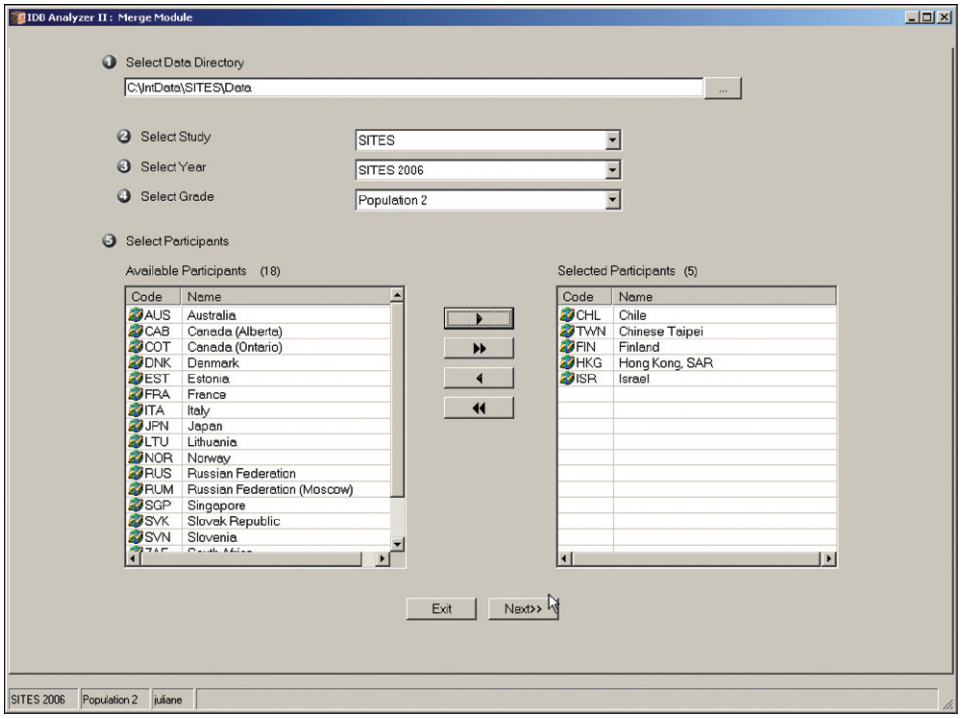
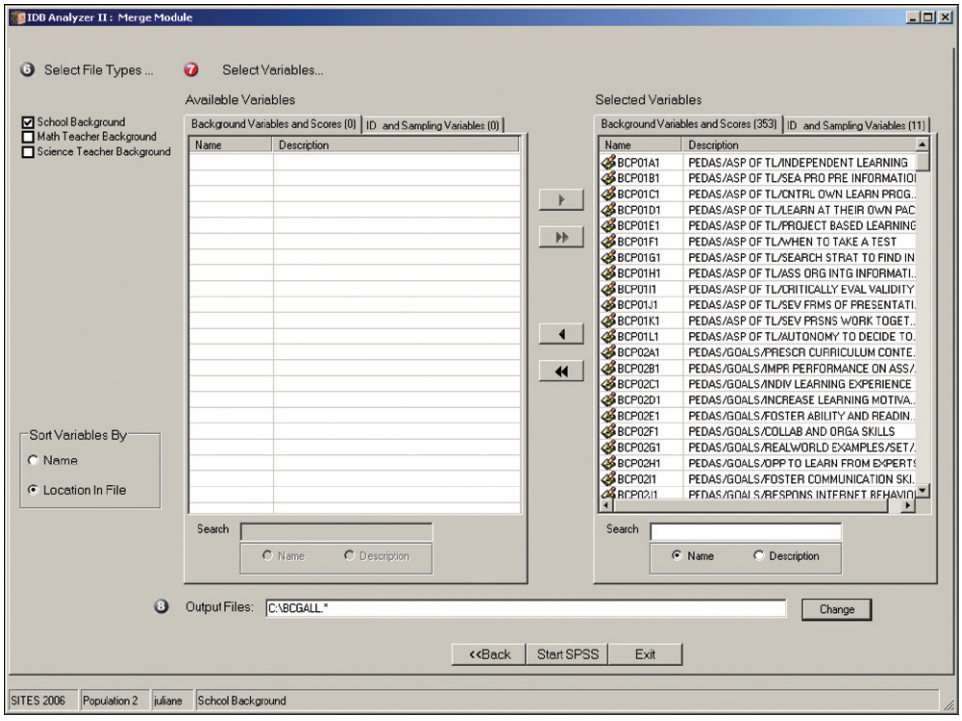



*Figure 4.2 Merge Module – Selecting File Types and Variables*



Researchers should check the resulting SPSS output file for possible warnings. If warnings appear, this may indicate that the merge process was not performed properly and the resulting merged data file might not be the one expected.

## 4.4 Performing Analyses with the IEA IDB Analyzer

This section describes a few analysis types available within the IEA IDB Analyzer to compute specific statistics with their correct standard errors. Making use of these analysis types for analyzing the SITES 2006 data is the best way to ensure that the analyses will be done properly. By using the IDB Analyzer, sampling weights are always used to analyze the SITES 2006 data and standard errors are correctly computed using the required jackknife repeated replication (JRR) method.

The analysis module of the IEA IDB Analyzer is used to analyze the data, whether or not these have been pre-processed with the merge module. It can also create code for several analysis procedures.

Table 4.1 lists the analysis available with the SITES 2006 data using the IEA IDB Analyzer:

*Table 4.1 Types of Analysis for SITES 2006 Data*

| Analysis Type | Description |
|---|---|
| Percentages (only) | Computes percentages by subgroups defined by grouping variable(s) |
| Percentages and Means | Computes percentages, means, and standard deviations for selected variables by subgroups defined by the grouping variable(s) |
| Regression | Computes regression coefficients for selected variables predicting a dependent variable by subgroups defined by grouping variable(s) |
| Correlations | Computes means, standard deviations, and correlation for selected variables by subgroups defined by the grouping variable(s) |

Depending on the type of analysis chosen, the analysis module of the IEA IDB Analyzer requires variables to be selected for the following purposes:

- **Grouping Variable(s)**
  This is the list of variables that are to be used to define the subgroups. The list can consist of one or more variables. The IEA IDB Analyzer always includes IDCNTRY as the first grouping variable and there should always be at least one grouping variable. If the option **Exclude Missing from Analysis** is checked, only cases that have non-missing values in the grouping variables will be used in the analysis. Note that this box needs to remain checked when reproducing results from the international report.
- **Analysis Variable(s)**
  This is the list of variables for which the statistics are to be computed. Researchers may select more than one analysis variable. Each of these variables will be analyzed separately.
- **Dependent Variable**
  This is the dependent variable to be predicted by the list of analysis or independent variables in regression analysis. Only one dependent variable can be listed for regression analysis.
- **Weight Variable**
  The sampling weight that will be used in the analysis. Generally, SCHWGT should be used when analyzing school data files. MTOTWGT should be used when analyzing mathematics teacher data files and STOTWGT should be used when analyzing science teacher data. The selection of a weight variable is mandatory.

- **Jackknifing Variables**
  This window lists the variables that capture the assignment of cases to sampling zones (JKCZONE/JKZONE) and whether the case is to be dropped or have its weight doubled when computing the set of replicate weights (JKCREP/JKREP). The IEA IDB Analyzer automatically uses these variables to compute the replicate weights that are used in all analysis types[6].

The examples presented in this section all use the SPSS data file called "BCGALL.SAV" as input, which contains the school data files for the five participating education systems (Chile, Chinese Taipei, Finland, Hong Kong SAR, and Israel) used in the merge example before. In this example all school variables were selected. The merged file was created using the merge module of the IEA IDB Analyzer.

### *4.4.1 Computing Percentages (only) and their Standard Errors*

To compute percentages of variables with their JRR standard errors analysts will need to select **Percentages only** as the type of analysis. This type can compute the percentages within specified subgroups and will also compute the appropriate standard errors for those.

This example will compute the percentages for school principals giving high priority to a decrease of the student-computer ratio (BCP06A1) and its standard error within each education system (IDCNTRY), using the weighting variable SCHWGT. The data will be read from the data file "BCGALL.SAV" and the standard errors will be computed based on 100 replicate weights.

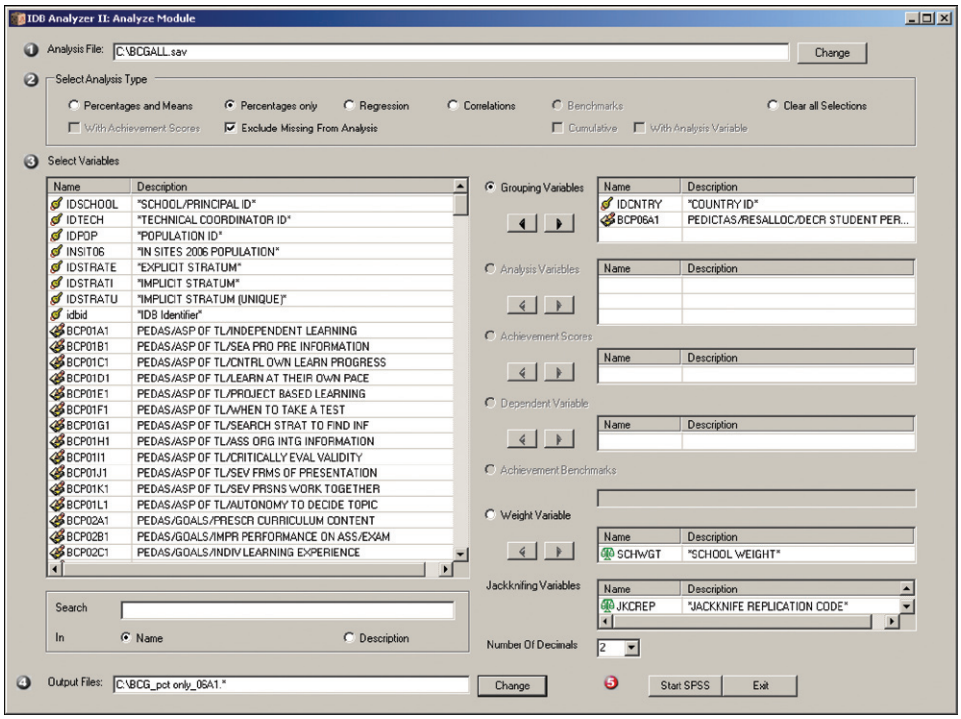
The steps in the IEA IDB Analyzer are as follows:

1. Open the analysis module of the IEA IDB Analyzer.
2. Select the data file called "BCGALL.SAV" that was merged in the previous step.
3. As type of the analysis select **Percentages only.** Note that the program by default will exclude missing values on the grouping variable from the analysis. This can be deactivated by removing the checkmark from the option **Exclude Missing from Analysis**.
4. In the next step analysts will need to define the grouping variables. As **Grouping Variable** the software always selects variable IDCNTRY by default since computing estimates for the entire SITES 2006 international database regardless of country is hardly ever desirable. Analysts will need to add BCP06A1 for this example. To do this, select the variable from the variable list on the left hand side of the window and press the right arrow button belonging to the section of the grouping variable. This will move the variable BCP06A1 from the variable list on the left hand side into the field for the grouping variables on the right hand side.
5. The weight variable is automatically defined by the software. As this is an example for analysis at the school level, the weight SCHWGT is selected by default. Additionally the jackknifing variables JKCZONE and JKCREP are defined.
6. Specify the name and folder of the output files in the **Output Files** field. The IEA IDB Analyzer will use this name and folder to create three output files: i) an SPSS syntax file that contains the code for performing the analysis, ii) an SPSS data file with the results, and iii) an Excel file with these same results.
7. Press the Start SPSS button to create the SPSS syntax file and open it in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **A**ll menu option. If necessary, the IEA IDB Analyzer will produce a prompt to confirm the overwriting of already existing files.



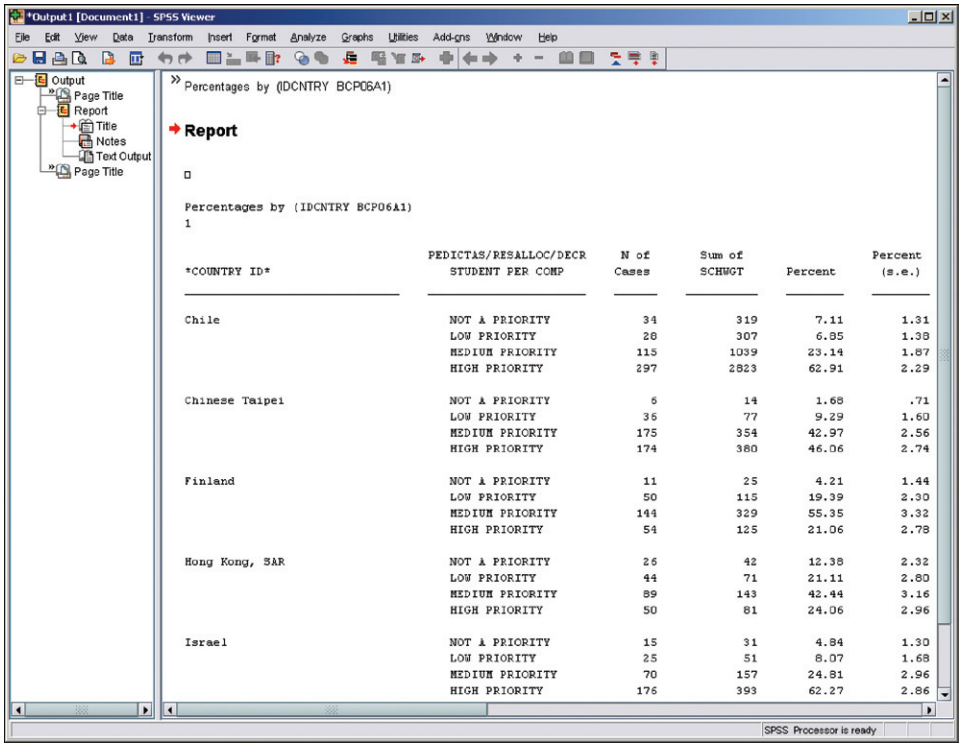
6 For information on the use of replicate weights please refer to the corresponding chapter in the SITES 2006 Technical Report and Chapter 3 in this User Guide.

*Figure 4.3 Analysis Module – Computing Percentages (only)*




A printout of the results is presented in Figure 4.4. It produces the percentages of school principals answering a decrease of the student-computer ratio has no, low, medium, or high priority for the selected five education systems.

*Figure 4.4 SPSS Output for Percentages (only)*



From the first four lines of the results shown in Figure 4.4, it can be seen that in Chile there are 34 schools in the sample where the school principal answered that decreasing the student-computer ratio is not a priority. The 34 schools in this category represent 319 schools in the whole population in Chile. Schools were the decrease of the student-computer ratio is not a priority made up 7.11% of Chilean school population. The standard error of this percentage is 1.31.

### *4.4.2 Computing Percentages and Means and their Standard Errors*

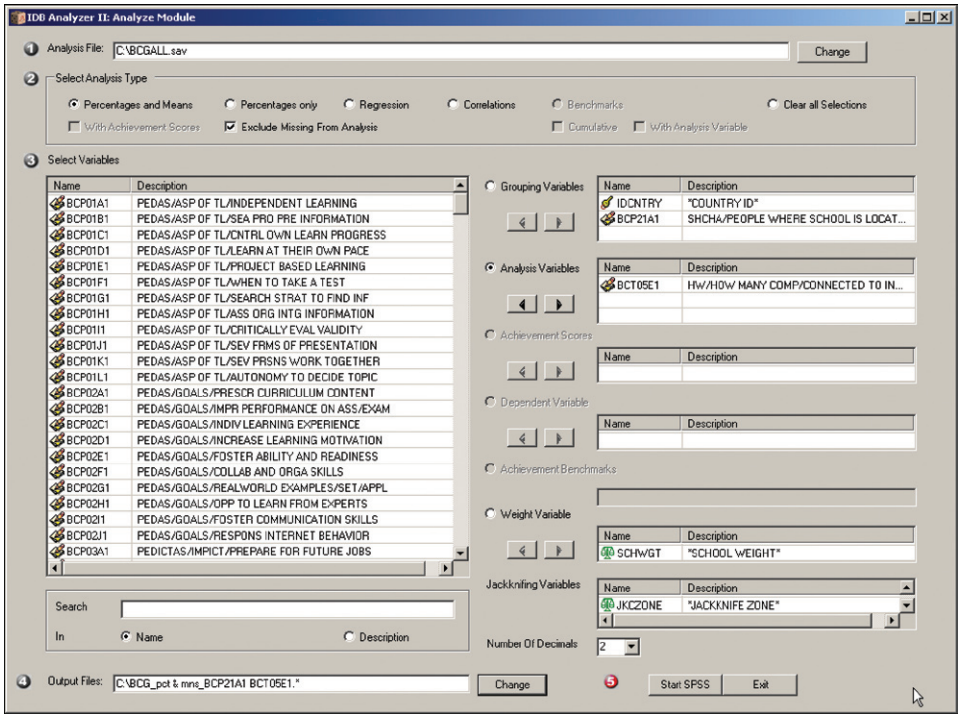
To compute percentages and means of continuous variables with their corresponding standard errors researchers will need to select **Percentages and Means** as type of analysis. An example will help to demonstrate this. This analysis type computes the percentages of schools within specified subgroups and their mean and standard deviation on the continuous variable selected. This analysis type also computes the appropriate standard errors for those percentages, means, and standard deviations.

This example will compute the average number of computers with internet access (BCT05E1) for each category of school location (BCP21A1) and their associated standard errors for each education system (IDCNTRY), using the weighting variable SCHWGT. The data will be read from the data file "BCGALL.SAV" and the standard errors will be computed based on 100 replicate weights.

The steps in the IEA IDB Analyzer are as follows:

1. Open the analysis module of the IEA IDB Analyzer.
2. Select the data file called "BCGALL.SAV" that was merged in the previous step.
3. As type of the analysis select **Percentages and Means**. Please note that the program will by default exclude from the analysis cases with missing grouping variables. This can be deactivated by removing the checkmark from the option **Exclude Missing from Analysis**.
4. In the next steps the variables need to be defined:
   a. As **Grouping Variables** the software always selects variable IDCNTRY by default. BCP21A1 will need to be added for this example. To do this, select the variable from the variable list on the left hand side of the window and press the right arrow button belonging to the section of the grouping variable. This will move the variable BCP21A1 from the variable list on the left hand side into the field for the grouping variables on the right hand side. Note that subgroups are created and reported using the order of the variables as they appear in this list.
   b. Next the analysis variables need to be defined. To activate this section, press the radio button **Analysis Variables**. This time select variable BCT05E1 from the list of variables and move it to the analysis variables field by pressing the right arrow button in this section. Note that more than one analysis variable can be selected.
5. The weight variable is automatically defined by the software. As this is an example for analysis on school level, the weight SCHWGT is selected by default. Additionally the jackknifing variables JKCZONE and JKCREP are defined.
6. Specify the name and folder of the output files in the **Output Files** field. The IEA IDB Analyzer will use this name and folder to create three output files: an SPSS syntax file that contains i) the code for performing the analysis, ii) an SPSS data file with the results, and iii) an Excel file with these same results.
7. Press the **Start SPSS** button to create the SPSS syntax file and open it in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **A**ll menu option. If necessary, the IEA IDB Analyzer will produce a prompt to confirm the overwriting of already existing files.

*Figure 4.5 Analysis Module – Computing Percentages and Means*




A printout of the results is presented in Figure 4.6. It shows the number of school principals answering in the area where their school is located and the average number of computers with internet access in each of the categories of school location for the selected five education systems.

*Figure 4.6 SPSS Output for Percentages and Means*

Average for BCT05E1 by (IDCNTRY BCP21A1)

| *COUNTRY ID* | SHCHA/PEOPLE WHERE SCHOOL IS LOCATED | N of Cases | Sum of SCHWGT | Percent | Percent (s.e.) | BCT05E1 (Mean) | BCT05E1 (s.e.) | Std.Dev. | Std.Dev. (s.e.) | Percent Missing |
|---|---|---|---|---|---|---|---|---|---|---|
| Chile | 3,000 PEOPLE OR FEWER | 53 | 689 | 16.40 | 1.55 | 5.47 | .62 | 5.62 | 1.33 | 6.99 |
| | 3,001 TO 15,000 PEOPLE | 63 | 594 | 14.12 | 1.56 | 14.68 | 1.50 | 11.52 | 1.09 | 5.99 |
| | 15,001 TO 50,000 PEOPLE | 66 | 623 | 14.82 | 1.56 | 17.44 | 1.87 | 14.45 | 1.65 | 5.16 |
| | 50,001 TO 100,000 PEOPLE | 56 | 492 | 11.70 | 1.43 | 20.21 | 2.62 | 19.14 | 2.76 | 6.10 |
| | 100,001 TO 500,000 PEOPLE | 127 | 1080 | 25.70 | 2.03 | 21.35 | 1.50 | 19.10 | 2.44 | 5.26 |
| | MORE THAN 500,000 PEOPLE | 80 | 725 | 17.25 | 1.89 | 27.39 | 2.82 | 25.89 | 3.07 | 6.30 |
| Chinese Taipei | 3,000 PEOPLE OR FEWER | 6 | 17 | 2.12 | .90 | 69.07 | 13.24 | 45.44 | 15.95 | .00 |
| | 3,001 TO 15,000 PEOPLE | 41 | 120 | 14.99 | 1.82 | 73.21 | 4.96 | 33.84 | 6.02 | .00 |
| | 15,001 TO 50,000 PEOPLE | 75 | 188 | 23.53 | 2.03 | 123.14 | 8.73 | 72.37 | 9.23 | 2.01 |
| | 50,001 TO 100,000 PEOPLE | 62 | 115 | 14.35 | 1.79 | 142.15 | 9.85 | 65.09 | 5.93 | .00 |
| | 100,001 TO 500,000 PEOPLE | 120 | 216 | 26.93 | 2.00 | 208.27 | 15.42 | 143.48 | 16.65 | .67 |
| | MORE THAN 500,000 PEOPLE | 76 | 145 | 18.08 | 1.56 | 212.01 | 13.39 | 106.23 | 14.43 | 2.30 |
| Finland | 3,000 PEOPLE OR FEWER | 19 | 57 | 11.19 | 2.38 | 34.15 | 3.17 | 13.90 | 2.71 | 2.58 |
| | 3,001 TO 15,000 PEOPLE | 83 | 192 | 37.59 | 3.35 | 51.79 | 2.75 | 24.31 | 1.87 | 10.70 |
| | 15,001 TO 50,000 PEOPLE | 55 | 113 | 22.06 | 2.87 | 65.17 | 3.37 | 24.69 | 2.37 | 11.88 |

In the first line of the results shown in Figure 4.6, in Chile there are 53 schools located in villages with "3,000 people or fewer" representing an estimated 689 schools in the whole population being located in such an area. On average, schools located in an area with "3,000 people or fewer" in Chile have only 5.47 computers with internet access available. The standard error of the mean estimate is 0.62. The standard deviation is 5.62 with a standard error of 1.33. The output's last column also reports the percentage of responses missing for the analysis variable BCT05E1 within each level of the grouping variables IDCNTRY and BCP21A1. For about 7% of the schools located in areas with 3,000 people or fewer, the school principals did not respond to the question about the number of computers with internet access.

Conversely, Chile has 80 schools representing an estimated 725 schools in the whole population being located in a city with "more than 500,000 people". Here the estimated mean number of computers with Internet access is 27.39 with a standard error of 2.82.

### *4.4.3 Computing Regression Coefficients and their Standard Errors*

The analysis type **Regression** is used to perform single or multiple linear regression between a dependent (explained) variable and one or more independent (to be explained) variables. This example demonstrates the use of this type of analysis, which computes the regression coefficients and their corresponding standard errors. Note that the IDB Analyzer provides convenient tools to estimate coefficients and sampling errors reflecting the sample design only and that analysts would need to verify any assumptions about the data's characteristics, distributions, etc. beforehand (e.g., normality, outliers, multicolinearity, or heteroscedascity).

This example will show a linear regression with the location of the school (recoded variable REC21A1) as a predictor of the student-computer-ratio (computed variable RECCSRAT), using the weight variable SCHWGT. It will compute the regression coefficients and their standard errors. The data will be read from the data file "BCGALL.SAV" and the standard errors will be computed based on 100 replicate weights.

Please note that this example uses the values of the variables BCP19A1 and BCP19B1 as well as the values of variable BCT05A1 to compute the student-computer-ratio in variable RECCSRAT. This is done by dividing the sum of the enrollment of girls (BCP19A1) and boys (BCP19B1) in the school by the number of computers in the school (BCT05A1). The values of the variable BCP21A1 (indicating the location of the school) are recoded into variable REC21A1. The categories were combined into two groups (often referred to as dummy-coding). The first group of schools is located in an area with "50,000 people or fewer." The other group of schools is located in an area with "more than 50,000 people." Please refer to the output section for an explanation of why this was done. These recodes should be done using SPSS directly. No recodes can be performed using the IEA IDB Analyzer.

The IEA IDB Analyzer does not support direct recoding of data. The SPSS code for the recodes that reads the merged data file BCGALL.SAV and saves it under the same name including the new variables RECCSRAT and REC21A1 is presented in Figure 4.7. Note that this code would need to be run directly in SPSS.

*Figure 4.7 Example SPSS Syntax to Dummy Recode Variables for Analysis*

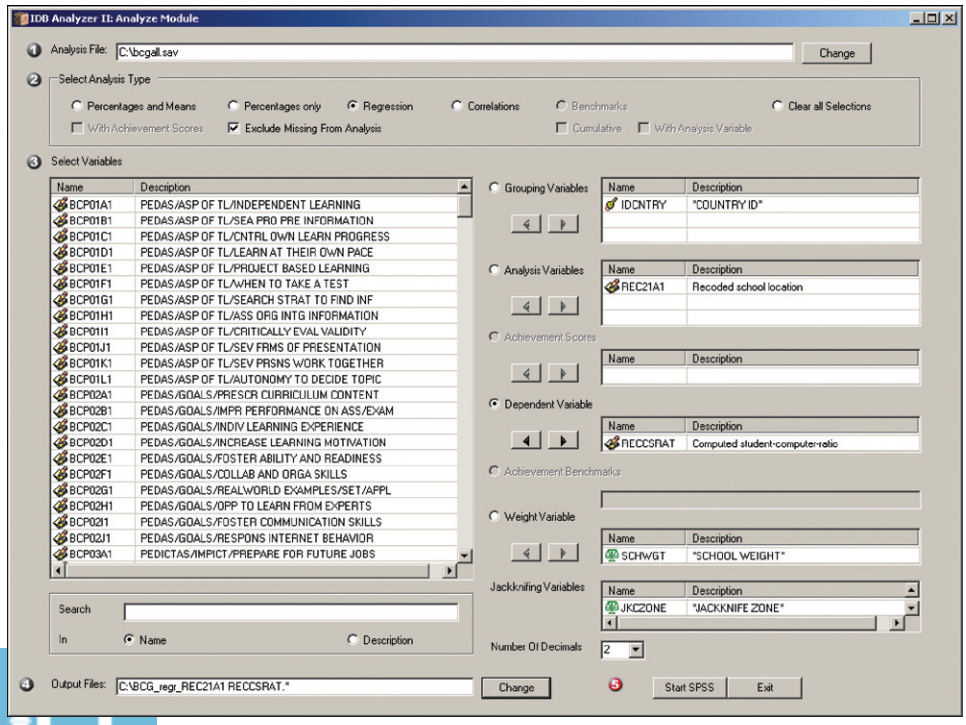
```
get file = "c:\bcgall.sav" .

* Compute new variable RECCSRAT as student-computer-ratio .
if (BCT05A1>0) RECCSRAT = (BCP19A1 + BCP19B1) / BCT05A1 .
variable labels RECCSRAT 'Computed student-computer-ratio' .

* Compute new variable REC21A1 .
recode BCP21A1
 (1=0) (2=0) (3=0) (4=1) (5=1) (6=1) (else=sysmis) into REC21A1 .
variable labels REC21A1 'Recoded school location' .
value labels REC21A1
                0 '50,000 people or fewer'
                1 'more than 50,000 people' .

save outfile = "c:\bcgall.sav" .
```

For the purpose of this example, analysts can simply copy the above SPSS code into the SPSS syntax window and run it. This will add the two recoded variables to the data file, which then can be selected for the regression analysis in the IEA IDB Analyzer.

The steps in the IEA IDB Analyzer are as follows:

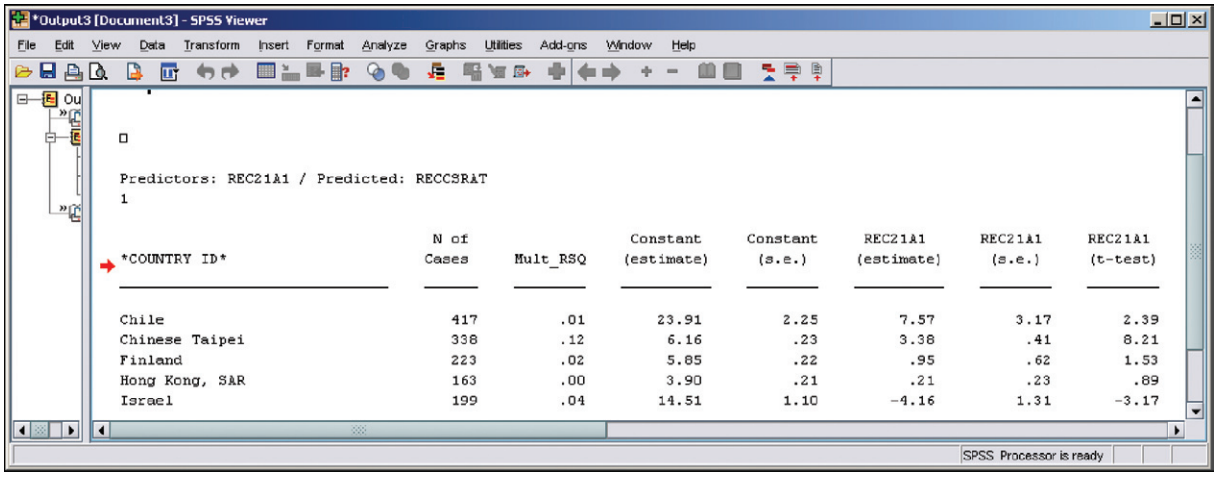
1. Open the Analysis module of the IEA IDB Analyzer.
2. Select the data file called "BCGALL.SAV" that was recoded earlier.
3. As type of the analysis select **Regression**.
4. In the next steps all variables need to be defined:
   a. As **Grouping Variable** the software always selects variable IDCNTRY by default. No other variable needs to be added for this example.
   b. Next the analysis variable needs to be defined. To activate this section, press the radio button **Analysis Variables**. This time select variable REC21A1 from the list of variables and move it to the analysis variables field by pressing the right arrow button in this section. Please note that if this variable does not exist in the variable list, the recoding step before was not conducted successfully.
   c. Select the radio button for the **Dependent Variable**. Select variable RECCSRAT from the variable list and move it to the dependent variable field by pressing the right arrow button in this section. Please note that if this variable does not exist in the variable list, the recoding step before was not conducted successfully.
5. The weight variable is automatically selected by the software. As this is an example for analysis on school level, the weight SCHWGT is selected by default. Additionally the jackknifing variables JKCZONE and JKCREP are defined.
6. Specify the name and folder of the output files in the **Output Files** field. The IEA IDB Analyzer will use this name and folder to create three output files: i) an SPSS syntax file that contains the code for performing the analysis, ii) an SPSS data file with the results, and iii) an Excel file with these same results.
7. Press the **Start SPSS** button to create the SPSS syntax file and open it in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **A**ll menu option. If necessary, the IEA IDB Analyzer will produce a prompt to confirm the overwriting of already existing files.

*Figure 4.8 Analysis Module – Computing Regression*



A printout of the results is presented in Figure 4.9. It performs a linear regression in each education system, with the community size variable (REC21A1) as a predictor of the student-computer-ratio (RECCSRAT)—it regresses RECCSRAT on REC21A1—and displays the results for the five selected education systems.

*Figure 4.9 SPSS Output for Regression*




| *COUNTRY ID* | N of Cases | Mult_RSQ | Constant (estimate) | Constant (s.e.) | REC21A1 (estimate) | REC21A1 (s.e.) | REC21A1 (t-test) |
|---|---|---|---|---|---|---|---|
| Chile | 417 | .01 | 23.91 | 2.25 | 7.57 | 3.17 | 2.39 |
| Chinese Taipei | 338 | .12 | 6.16 | .23 | 3.38 | .41 | 8.21 |
| Finland | 223 | .02 | 5.85 | .22 | .95 | .62 | 1.53 |
| Hong Kong, SAR | 163 | .00 | 3.90 | .21 | .21 | .23 | .89 |
| Israel | 199 | .04 | 14.51 | 1.10 | -4.16 | 1.31 | -3.17 |

The regression performed by our example uses the recoded variables REC21A1 and RECCSRAT. By using these variables, the intercept or constant will be the estimated student-computer-ratio for schools located in an area with "50,000 people or fewer", whereas the regression coefficient, REC21A1 (estimate), will be the estimated difference in the student-computer-ratio in schools located in an area with "more than 50,000 people". This will also allow us to perform a t-test to determine if the student-computer-ratio is significantly different between schools located in areas with "50,000 people or fewer" and schools located in areas with "more than 50,000 people".

The results displayed in Figure 4.9 show that in Chile the estimated mean student-computer-ratio in schools located in an area with "50,000 people or fewer" is 23.91 students per computer (Constant (estimate)), with a standard error of 2.25. Compared to this, if a school is located in an area with "more than 50,000 people" the estimated difference in the student-computer-ratio is 7.57 (REC21A1 (estimate)). This means that the student-computer-ratio is 31.48 students per computer in schools that are in an area with "more than 50,000 people," and therefore this ratio is higher than in schools which are located in an area with "50,000 people or fewer." With an estimated standard error of 3.17 (REC21A1 (s.e.)), this difference is statistically significant at a 95% confidence level because REC21A1 (t-test) is bigger than the absolute value of 1.96. In contrast, the computed t-test for Finland and Hong Kong suggests that the null hypothesis (no difference in student-computer-ratio due to community size) can not be rejected.

### *4.4.4Computing Correlations and their Standard Errors*

The analysis type **Correlations** is used to calculate correlation coefficients between selected analysis variables.

This example will compute the Pearson correlation between the priority of resource allocation that a school principal gives to improve the ability of teachers to make good pedagogical use of ICT (BCP06G1) and the priority of resource allocation to broaden teachers' pedagogical repertoire and to widen their pedagogical competence to engage in new methods of teaching and learning (BCP06H1).

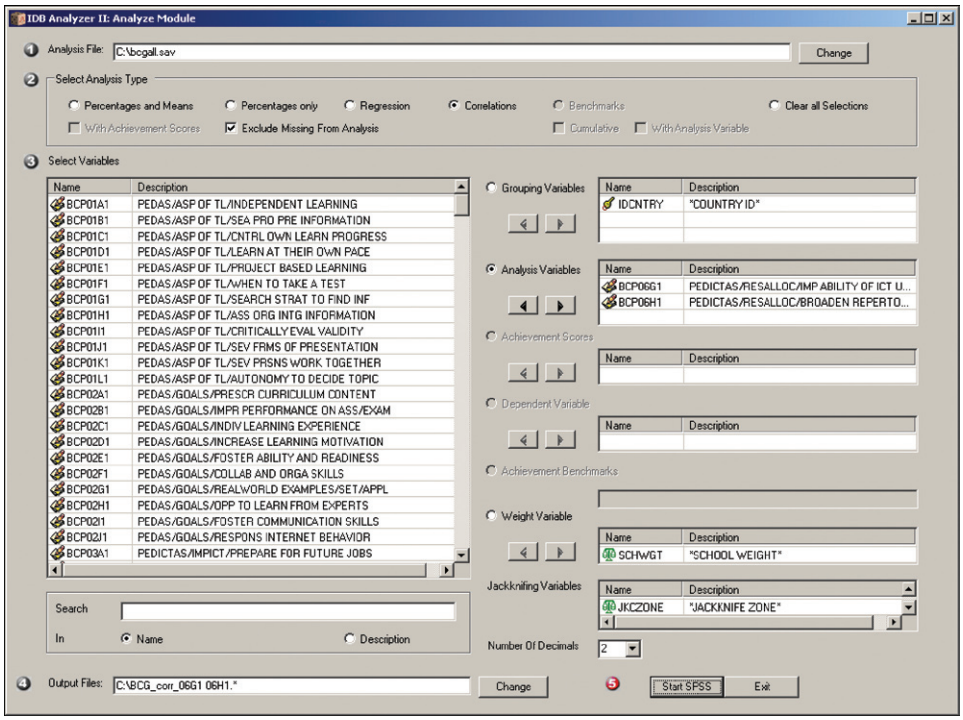
The steps in the IEA IDB Analyzer are as follows:

1. Open the analysis module of the IEA IDB Analyzer.

2. Select the data file called "BCGALL.SAV" that was merged in the previous step.
3. As type of the analysis select **Correlations**.
4. In the next steps all variables need to be defined:
   a. As **Grouping Variable** the software always selects variable IDCNTRY by default. No other variable needs to be added for this example.
   b. Next select the analysis variables. To activate this section, press the radio button **Analysis Variables**. This time select variables BCP06G1 and BCP06H1 from the list of variables and move them to the analysis variables window by pressing the right arrow button in this section.
5. The weight variable is automatically selected by the software. As this is an example for analysis at the school level, the weight SCHWGT is selected by default. Additionally the jackknifing variables JKCZONE and JKCREP are defined.
6. Specify the name and folder of the output files in the **Output Files** field. The IEA IDB Analyzer will use this name and folder to create three output files: i) an SPSS syntax file that contains the code for performing the analysis, ii) an SPSS data file with the results, and iii) an Excel file with these same results.
7. Press the **Start SPSS** button to create the SPSS syntax file and open it in an SPSS syntax window. The syntax file will be executed by opening the **Run** menu of SPSS and selecting the **A**ll menu option. If necessary, the IEA IDB Analyzer will produce a prompt to confirm the overwriting of already existing files.

Figure 4.10 shows the setup screen with the selections made for computing the correlations between the two selected variables. Figure 4.11 shows the results from the analysis.

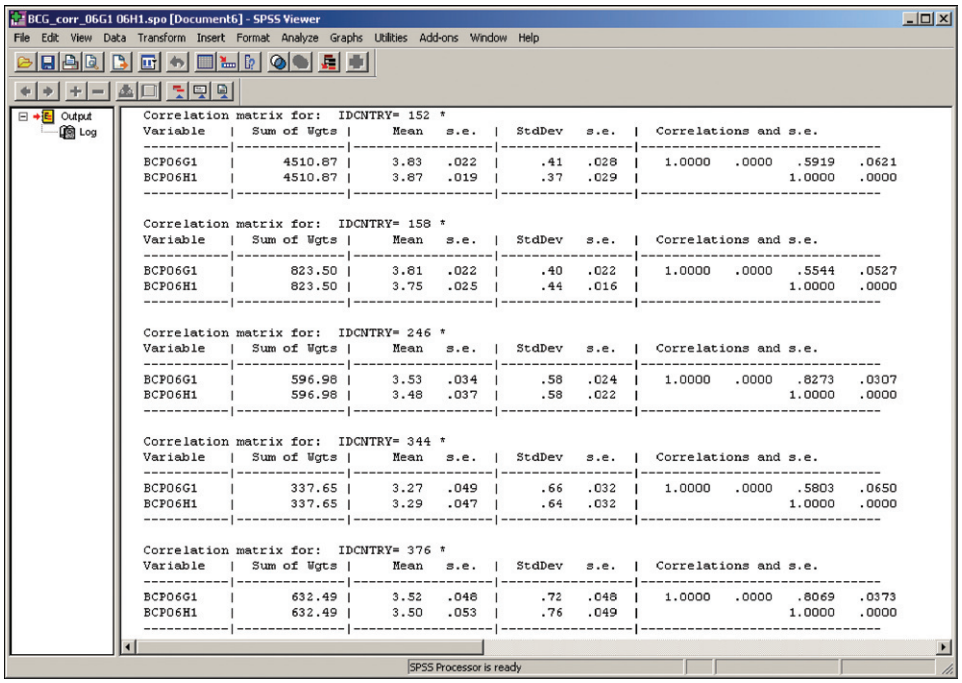
*Figure 4.10 Analysis Module – Computing Correlations*






The output in Figure 4.11 displays, for each group defined by the grouping variables, the correlation coefficients for each possible pair of variables. The diagonal and elements above the diagonal of the correlation matrix are displayed with their corresponding standard errors.

*Figure 4.11 SPSS Output for Correlations*




The results displayed in Figure 4.11 indicate that the correlation between the two variables in the analysis for the first group (IDCNTRY=152 [Chile]) is 0.5919, whereas the standard error is 0.0621. For the second group (IDCNTRY = 158 [Chinese Taipei]) the correlation between these variables is 0.5544 and the standard error for the correlation is 0.0527. In addition to the correlations the output also displays the mean and standard deviation for each variable in the analysis, together with the corresponding standard errors.

Due to limitations in the current implementation of the correlation analysis, the grouping variables are not displayed with labels. The user will need to keep a record of the labels for each of the values of the grouping variables in order to interpret the results. These are available in the technical documentation for the study and can also be obtained by using the **Percentages Only** procedure within the IEA IDB Analyzer or looking them up in the codebooks for the files.

## 4.5 Performing Analyses from the SITES 2006 Report

### *4.5.1 Analysis with School-level Variables*

The example of a school-level analysis will investigate the percentages and standard errors of schools in which common types of technology applications and facilities were available. The results of this analysis are presented in Table 4.5 of the SITES 2006 international report (see Figure 4.12 below). Parts of the results are also reproduced here in Figure 4.15. This example uses the analysis type **Percentages only** since the purpose is to compute the percentage of schools having equipment and hands-on materials available.

The first step in the analysis is to identify the variables of interest in the appropriate data files and to review the documentation for any specific cultural and national adaptations to the questions of interest (Appendix D of the SITES 2006 Technical Report). The variable BCT04A1 in the school files contains information on the availability of equipment and hands-on materials. The next step is to review the documentation of national adaptations to the questionnaires to ensure that there were no deviations listed

for this variable (see Appendix D of the SITES 2006 Technical Report). If no adaptations were made, the analysis can continue without additional modifications.

The next step is to identify the variables relevant to the analysis in the appropriate files. Since this example uses a school-level variable, it should be identified in the school file. To support this, the appendices of this User Guide provide all questionnaires and include the respective variables names as used in the international database. This data file will provide the variable that contains the information about the availability of equipment and hands-on materials (BCT04A1).

The merge module of the IEA IDB Analyzer will combine data from the school files of the desired education systems. The school data for five education systems (Chile, Chinese Taipei, Finland, Hong Kong SAR, and Israel) are merged by clicking on the **Merge button**. The merged data file will be called "BCGALL.SAV".

*Figure 4.12 Table 4.5 from the SITES 2006 International Report for Example School-level Analysis (Law, Pelgrum, & Plomp, 2008, pp. 81)*

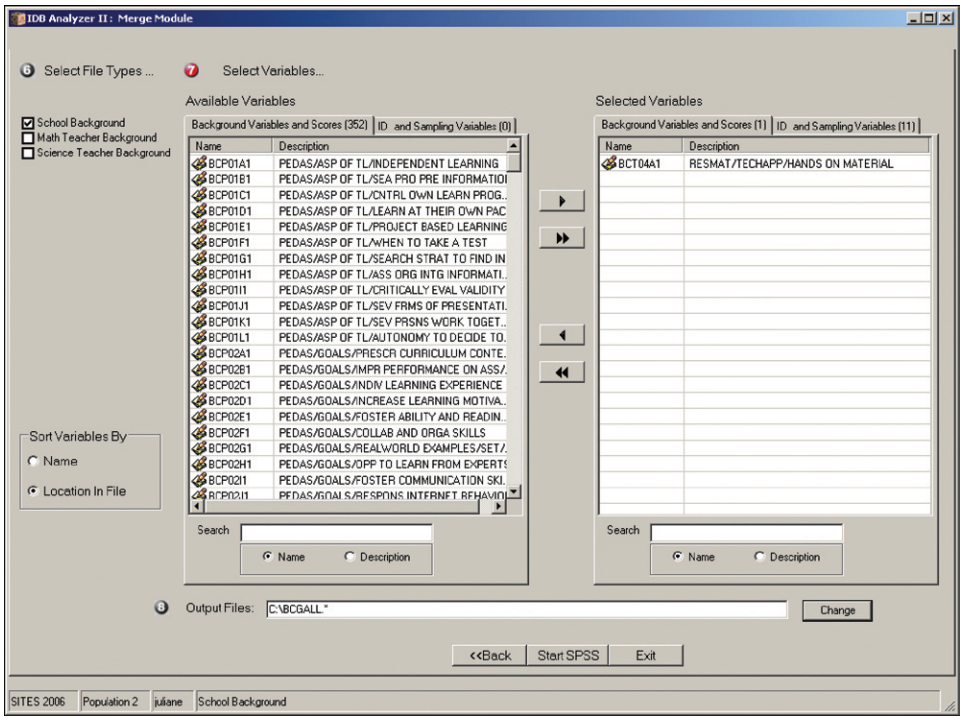
*Table 4.5 Percentages (standard errors) of schools in which common types of technology applications and facilities were* ***available***

| Education system | Equipment | Tutorial software | General software | Multimedia production | Data-logging | Simulation | Communi-cation software | Digital resources | Mobile devices | Smart board | LMS | Mail accounts (teachers) | Mail accounts (students) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [2,3] Alberta Province, Canada | 88 (3.0) | 68 (4.0) | 100 (0.0) | 81 (3.1) | 44 (3.6) | 43 (4.0) | 76 (3.5) | 87 (3.1) | 22 (3.4) | 47 (4.1) | 48 (4.1) | 95 (1.5) | 53 (4.3) |
| Catalonia, Spain | 88 (1.6) | 57 (2.7) | 99 (0.7) | 84 (2.3) | 73 (2.8) | 59 (3.0) | 89 (1.9) | 87 (1.7) | 21 (2.1) | 07 (1.6) | 44 (2.9) | 88 (1.9) | 49 (2.7) |
| [1] Chile | 47 (1.8) | 45 (2.2) | 90 (1.3) | 54 (2.4) | 63 (2.1) | 48 (2.2) | 79 (1.8) | 72 (1.9) | 13 (1.5) | 06 (1.3) | 39 (2.4) | 68 (2.0) | 52 (2.2) |
| Chinese Taipei | 96 (1.1) | 48 (2.5) | 99 (0.4) | 89 (1.6) | 54 (2.5) | 21 (2.1) | 93 (1.3) | 74 (2.5) | 10 (1.7) | 07 (1.3) | 42 (2.8) | 95 (1.2) | 74 (2.2) |
| [2] Finland | 96 (1.2) | 66 (2.8) | 99 (0.7) | 77 (2.6) | 64 (3.2) | 20 (2.4) | 92 (1.7) | 78 (2.6) | 11 (2.1) | 10 (1.8) | 46 (2.7) | 97 (1.1) | 59 (2.8) |
| [2] Hong Kong SAR | 97 (1.1) | 72 (3.0) | 100 (0.0) | 97 (1.0) | 77 (2.7) | 47 (3.0) | 98 (0.8) | 89 (2.0) | 20 (2.7) | 26 (2.7) | 91 (1.8) | 98 (1.0) | 88 (2.0) |
| [4] Israel | 70 (2.9) | 46 (3.3) | 96 (1.3) | 44 (3.1) | 55 (3.6) | 16 (2.1) | 84 (2.5) | 53 (3.1) | 13 (1.7) | 08 (1.5) | 46 (3.0) | 54 (3.1) | 40 (3.1) |
| [1] Italy | 85 (2.1) | 60 (3.2) | 99 (0.6) | 63 (2.9) | 70 (2.6) | 37 (2.8) | 73 (2.8) | 60 (3.1) | 11 (2.0) | 11 (1.6) | 19 (2.2) | 64 (2.7) | 14 (2.0) |
| [1] Japan | 94 (1.2) | 58 (2.5) | 97 (0.7) | 76 (2.4) | 22 (2.1) | 39 (2.2) | 62 (2.5) | 51 (2.4) | 03 (0.8) | 20 (2.2) | 35 (2.4) | 56 (2.2) | 22 (2.1) |
| [2] Lithuania | 72 (3.1) | 74 (2.9) | 90 (2.1) | 70 (2.9) | 70 (3.4) | 37 (3.8) | 94 (1.5) | 87 (2.4) | 38 (3.2) | 32 (2.9) | 19 (2.6) | 62 (3.5) | 58 (3.6) |
| Moscow, Russian Federation | 65 (2.6) | 65 (2.4) | 81 (2.1) | 47 (2.9) | 24 (2.4) | 24 (2.4) | 81 (2.0) | 55 (2.6) | 26 (2.3) | 21 (1.9) | 09 (1.4) | 53 (2.5) | 38 (2.3) |
| [2] Ontario Province, Canada | 81 (2.5) | 78 (2.7) | 99 (0.5) | 83 (2.4) | 75 (3.0) | 59 (3.4) | 64 (3.2) | 90 (1.9) | 09 (2.0) | 21 (2.3) | 54 (3.0) | 100 (0.2) | 32 (3.1) |
| Russian Federation | 47 (3.9) | 61 (3.2) | 73 (3.5) | 34 (2.7) | 10 (1.8) | 27 (3.2) | 36 (2.7) | 49 (3.9) | 15 (2.1) | 02 (0.5) | 05 (1.2) | 18 (2.3) | 13 (2.1) |
| Singapore | 98 (1.1) | 85 (2.9) | 100 (0.0) | 93 (2.1) | 95 (1.8) | 66 (4.2) | 98 (1.2) | 92 (2.2) | 34 (3.5) | 28 (3.4) | 95 (1.8) | 100 (0.0) | 58 (3.9) |
| Slovak Republic | 75 (2.3) | 48 (2.8) | 97 (0.9) | 68 (2.6) | 25 (2.3) | 40 (2.9) | 97 (1.0) | 83 (2.0) | 21 (2.0) | 17 (2.3) | 25 (2.6) | 81 (2.0) | 72 (2.7) |
| Slovenia | 92 (1.4) | 87 (2.0) | 100 (0.3) | 80 (2.1) | 93 (1.3) | 55 (2.6) | 98 (0.7) | 78 (2.1) | 21 (2.3) | 04 (1.0) | 48 (2.5) | 97 (1.0) | 91 (1.5) |
| South Africa | 17 (1.4) | 10 (1.4) | 35 (2.2) | 07 (1.0) | 11 (1.6) | 04 (0.8) | 14 (1.4) | 20 (2.0) | 13 (1.8) | 09 (1.0) | 07 (1.3) | 13 (1.4) | 08 (1.4) |
| [1] Thailand | 40 (2.4) | 17 (2.0) | 51 (2.8) | 22 (1.9) | 04 (1.0) | 06 (1.2) | 44 (2.4) | 49 (2.7) | 05 (1.1) | 06 (1.2) | 13 (1.8) | 11 (1.5) | 10 (1.3) |
| [#] Denmark | 94 (2.0) | 93 (1.9) | 99 (1.0) | 89 (2.4) | 44 (3.7) | 53 (3.9) | 97 (1.2) | 93 (2.0) | 11 (2.3) | 25 (3.2) | 51 (3.7) | 96 (1.4) | 89 (2.3) |
| [#] Estonia | 66 (3.8) | 64 (3.6) | 98 (1.1) | 57 (4.1) | 35 (3.4) | 21 (3.4) | 93 (2.0) | 67 (3.8) | 22 (3.2) | 21 (2.8) | 21 (3.4) | 94 (1.8) | 57 (4.2) |
| [#] France | 86 (2.5) | 80 (3.5) | 99 (1.0) | 68 (3.3) | 76 (3.5) | 50 (3.6) | 71 (3.3) | 83 (2.6) | 18 (2.7) | 14 (2.6) | 26 (3.5) | 78 (2.8) | 48 (3.7) |
| [#] Norway | 92 (2.4) | 88 (2.5) | 100 (0.0) | 78 (3.2) | 28 (3.3) | 34 (3.9) | 95 (1.3) | 83 (3.1) | 13 (2.7) | 07 (1.8) | 70 (4.0) | 89 (2.6) | 54 (4.5) |

*Notes:*
[#] School participation rate after including replacement schools is below 70%
[1] School participation rate before including replacement schools is below 85%
[2] School participation rate after including replacement schools is below 85%
[3] Less than 70% of the school-level questionnaires in the participating schools were returned
[4] Nationally defined population covers less than 90% of the nationally desired population.

Figure 4.13 below shows the set-up screen for the IEA IDB Analyzer Merge module with the variables selected for the analysis. Notice that the school file (BCG) is selected. The identification variables are automatically selected by the IEA IDB Analyzer.

*Figure 4.13 Merge Module for Example School-level Analysis*




For this analysis there is no need to recode the data. The analysis is conducted with the IEA IDB Analyzer analysis module. Figure 4.14 shows the set-up for this analysis and Figure 4.15 shows the results. In the set-up screen for the analysis module the analysis type selected is **Percentages only**. Variables IDCNTRY and BCT04A1 have been selected as **Grouping Variables**. As **Weight Variable** the IEA IDB Analyzer automatically selected the variable SCHWGT.

*Figure 4.14 Analysis Module for Example School-level Analysis*

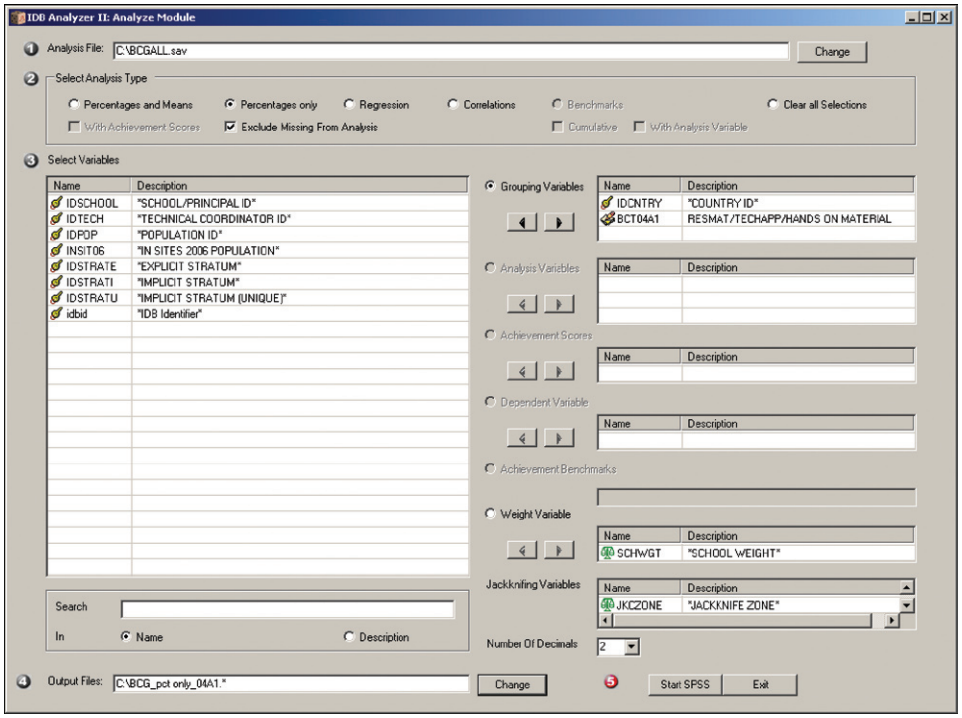
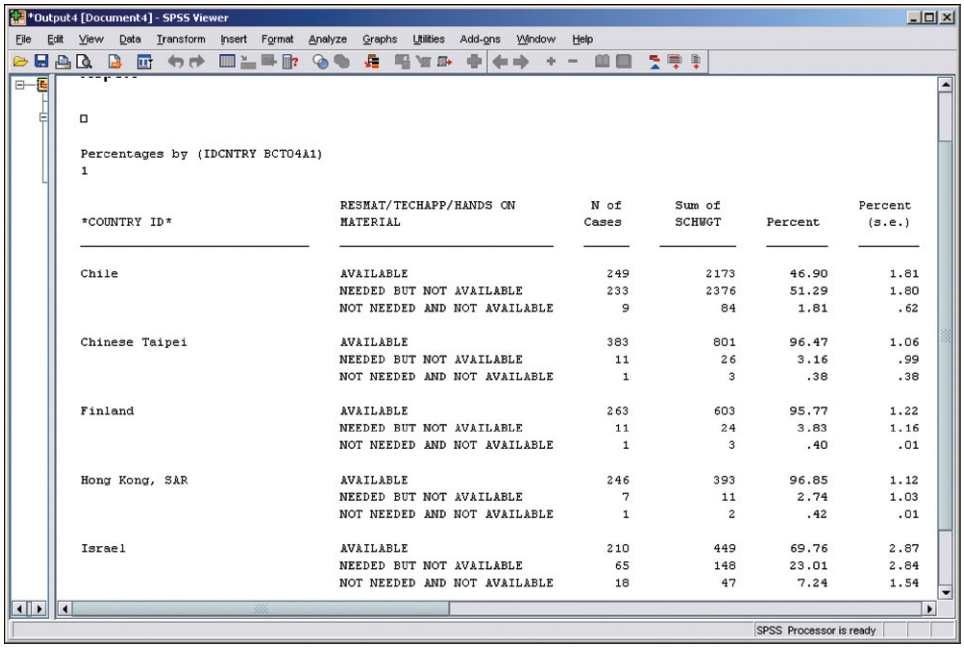


*Figure 4.15 SPSS Output for Example School-level Analysis*



*Output4 [Document4] - SPSS Viewer

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Percentages by (IDCNTRY BCT04A1)
1

| *COUNTRY ID* | RESMAT/TECHAPP/HANDS ON MATERIAL | N of Cases | Sum of SCHWGT | Percent | Percent (s.e.) |
|---|---|---|---|---|---|
| Chile | AVAILABLE | 249 | 2173 | 46.90 | 1.81 |
| | NEEDED BUT NOT AVAILABLE | 233 | 2376 | 51.29 | 1.80 |
| | NOT NEEDED AND NOT AVAILABLE | 9 | 84 | 1.81 | .62 |
| Chinese Taipei | AVAILABLE | 383 | 801 | 96.47 | 1.06 |
| | NEEDED BUT NOT AVAILABLE | 11 | 26 | 3.16 | .99 |
| | NOT NEEDED AND NOT AVAILABLE | 1 | 3 | .38 | .38 |
| Finland | AVAILABLE | 263 | 603 | 95.77 | 1.22 |
| | NEEDED BUT NOT AVAILABLE | 11 | 24 | 3.83 | 1.16 |
| | NOT NEEDED AND NOT AVAILABLE | 1 | 3 | .40 | .01 |
| Hong Kong, SAR | AVAILABLE | 246 | 393 | 96.85 | 1.12 |
| | NEEDED BUT NOT AVAILABLE | 7 | 11 | 2.74 | 1.03 |
| | NOT NEEDED AND NOT AVAILABLE | 1 | 2 | .42 | .01 |
| Israel | AVAILABLE | 210 | 449 | 69.76 | 2.87 |
| | NEEDED BUT NOT AVAILABLE | 65 | 148 | 23.01 | 2.84 |
| | NOT NEEDED AND NOT AVAILABLE | 18 | 47 | 7.24 | 1.54 |

SPSS Processor is ready

In this example, each education system's results are presented in three lines, one for each value of the BCT04A1 variable. The education systems are identified in the first column. The second column describes the categories of BCT04A1 being reported. The third column reports the number of valid cases and the fourth the sum of weights of the sampled schools. The last two columns display the percentage of schools in each category and its standard error.

The first three lines in Figure 4.15 show that in Chile 46.90% of schools have equipment and hands-on materials available, 51.29% of schools need equipment and hands-on materials, but do not have it available, and 1.81% of schools reported that they do not have and do not need this type of technology applications and facilities available. They also show the standard errors for the percentages in each category.

Note that the first line for each education system in the output in Figure 4.15 matches the percentages and standard errors reported in Table 4.5 (Figure 4.12) in the SITES 2006 international report.

### *4.5.2 Analysis with Teacher-level Variables*

The example of a teacher-level analysis will investigate the percentage of mathematics teachers using ICT by gender. The results of such an analysis are presented in Table 6.2 of the SITES 2006 international report (Figure 4.16). Parts of it are reproduced here in Figure 4.19. After merging the mathematics teacher data for five education systems (Chile, Chinese Taipei, Finland, Hong Kong SAR, and Israel), the example will use the analysis type **Percentages only**.

*Figure 4.16 Table 6.2 from the SITES 2006 International Report for the Example Teacher-level Analysis (Law, Pelgrum, & Plomp, 2008, pp. 187)*

*Table 6.2 Number of male teachers and female teachers and the percentage of teachers in each gender group who used ICT with their target classes*

| Education system | Mathematics teachers | | | | | Science teachers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Sig. | Male | | Female | | Sig. |
| | *N* | use ICT % | *N* | use ICT % | | *N* | use ICT % | *N* | use ICT % | |
| Catalonia, Spain | 318 | 37 (0.03) | 344 | 40 (0.03) | | 215 | 54 (0.03) | 318 | 57 (0.03) | |
| [1] Chile | 225 | 51 (0.04) | 319 | 59 (0.03) | ** | 135 | 67 (0.04) | 389 | 65 (0.03) | |
| Chinese Taipei | 419 | 39 (0.02) | 429 | 32 (0.02) | ** | 493 | 51 (0.02) | 301 | 45 (0.03) | ** |
| [2] Finland | 224 | 51 (0.04) | 327 | 45 (0.03) | ** | 213 | 63 (0.04) | 331 | 59 (0.03) | * |
| [2] Hong Kong SAR | 330 | 68 (0.03) | 240 | 73 (0.03) | | 263 | 78 (0.03) | 184 | 89 (0.02) | ** |
| [4] Israel | 185 | 25 (0.03) | 653 | 22 (0.02) | | 125 | 55 (0.05) | 572 | 53 (0.03) | |
| [1] Italy | 121 | 59 (0.05) | 533 | 58 (0.02) | | 124 | 64 (0.05) | 545 | 57 (0.03) | ** |
| [1,3] Japan | 315 | 25 (0.03) | 151 | 18 (0.03) | ** | 345 | 46 (0.02) | 94 | 36 (0.06) | ** |
| [2] Ontario Province, Canada | 182 | 78 (0.03) | 228 | 74 (0.03) | ** | 128 | 76 (0.04) | 177 | 76 (0.03) | |
| Singapore | 179 | 73 (0.04) | 301 | 73 (0.03) | | 169 | 82 (0.03) | 279 | 85 (0.02) | |
| Slovak Republic | 105 | 52 (0.05) | 452 | 51 (0.02) | | 265 | 56 (0.04) | 796 | 56 (0.02) | |
| Slovenia | 143 | 51 (0.04) | 568 | 37 (0.02) | ** | 137 | 77 (0.04) | 555 | 66 (0.02) | ** |
| [1, 2] Alberta Province, Canada | 179 | 62 (0.04) | 171 | 62 (0.04) | | 174 | 80 (0.03) | 154 | 78 (0.04) | |
| [#] Denmark | 222 | 78 (0.03) | 123 | 76 (0.04) | | 280 | 67 (0.03) | 128 | 77 (0.04) | ** |
| [#] Estonia | 25 | 45 (0.10) | 209 | 39 (0.04) | | 70 | 56 (0.06) | 302 | 54 (0.03) | |
| [#] France | 200 | 55 (0.04) | 219 | 44 (0.04) | ** | 189 | 59 (0.04) | 225 | 51 (0.04) | ** |
| [1, 2] Lithuania | 26 | 56 (0.10) | 350 | 62 (0.03) | | 71 | 64 (0.07) | 396 | 66 (0.03) | |
| [†] Moscow, Russian Federation | 17 | 19 (0.10) | 581 | 46 (0.02) | ** | 137 | 59 (0.04) | 1435 | 57 (0.02) | |
| [#] Norway | 179 | 81 (0.03) | 114 | 80 (0.04) | | 175 | 76 (0.03) | 101 | 72 (0.04) | |
| [†] Russian Federation | 53 | 38 (0.11) | 1182 | 41 (0.04) | ** | 319 | 53 (0.04) | 2702 | 48 (0.03) | ** |
| [†] South Africa | 230 | 19 (0.03) | 259 | 17 (0.02) | ** | 183 | 15 (0.03) | 242 | 17 (0.03) | |
| [†, 1] Thailand | 200 | 47 (0.04) | 457 | 43 (0.03) | ** | 188 | 60 (0.04) | 466 | 56 (0.03) | ** |

*Notes:*
ICT-use percentages are weighted statistics. However, N listed in the tables is the unweighted number of teachers. Gender was not part of the sampling criteria and N is included to indicate the size of the actual sample within each gender
Value labels for the response categories: 1=never, 2=sometimes, 3=often, 4=nearly always
[#] School participation rate after including replacement schools is below 70%
[†] International procedures for target-class selection was not followed in all schools

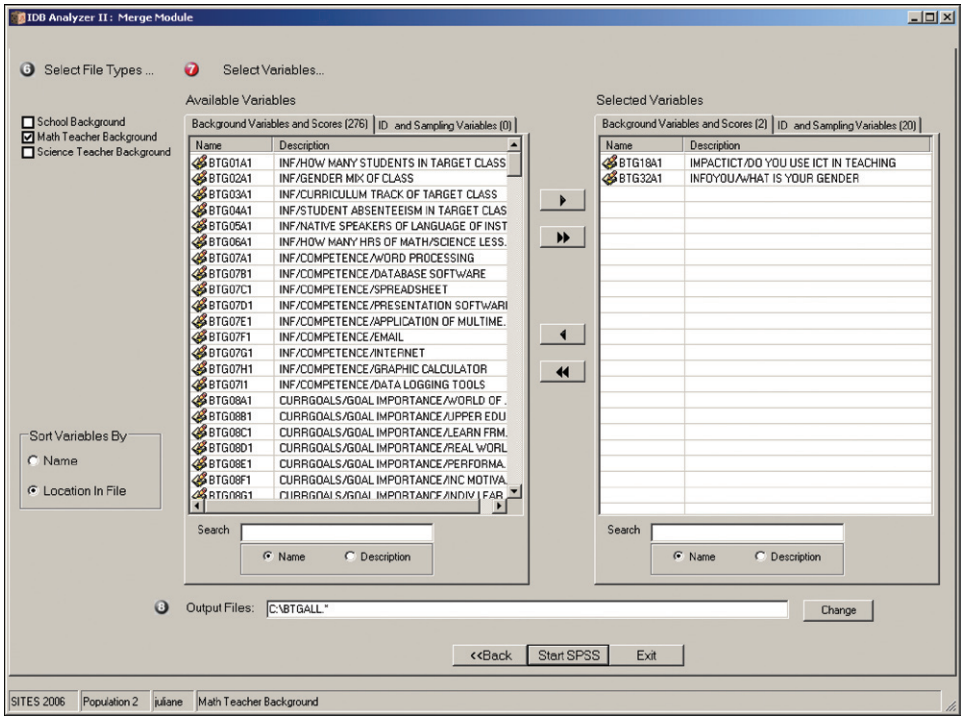
* Differences between male teachers and female teachers is significant at $p < 0.05$
** Differences between male teachers and female teachers is significant at $p < 0.01$
[1] School participation rate before including replacement schools is below 85%
[2] School participation rate after including replacement schools is below 85%
[3] Teacher participation data were collected after survey administration
[4] Nationally defined population covers less than 90% of the nationally desired population.

As with the previous analysis, the first step is to identify the variables relevant to the analysis in the appropriate files, and review the documentation for any specific cultural and national adaptations to the questions of interest (Appendix D of the SITES 2006 Technical Report). Since the example uses a teacher-level variable, the relevant variables can be found in the mathematics teacher file. From this file the variable that contains the information on the teachers' gender (BTG32A1) and the variable that contains the information on teachers' ICT usage in the target class (BTG18A1) are extracted.

For combining the data from the desired education systems this example will use the merge module of IEA IDB Analyzer. The mathematics teacher data for five education systems (Chile, Chinese Taipei, Finland, Hong Kong SAR, and Israel) are merged by clicking on the **Merge** button. In general, merging teacher data files works the same way as merging school data files.

Figure 4.17 shows the set-up screen of the IEA IDB Analyzer merge module where BTM has been selected as the file type. In this example the merged file will be saved to a file called "BTMALL.SAV". The identification variables are automatically selected by the IEA IDB Analyzer.

*Figure 4.17 Merge Module for Example Teacher-level Analysis*




For this analysis there is no need to recode the data, and conducting the analysis with the IEA IDB Analyzer analysis module is the next step. Figure 4.18 shows how the set-up screen of the analysis module looks when performing this analysis. Notice that for analysis type **Percentages only** is selected. Under **Grouping Variables** IDCNTRY, BTG32A1, and BTG18A1 are selected. MTOTWGT is selected as the **Weight Variable** since this analysis used mathematics teacher data. This is unlike the analysis at the school level, where the IDB Analyzer predefines the appropriate weight variable. When conducting teacher-level analysis with the IEA IDB Analyzer, the user has to define the weight. The output of this set-up is shown in Figure 4.19.

*Figure 4.18 Analysis Module for Example Teacher-level Analysis*

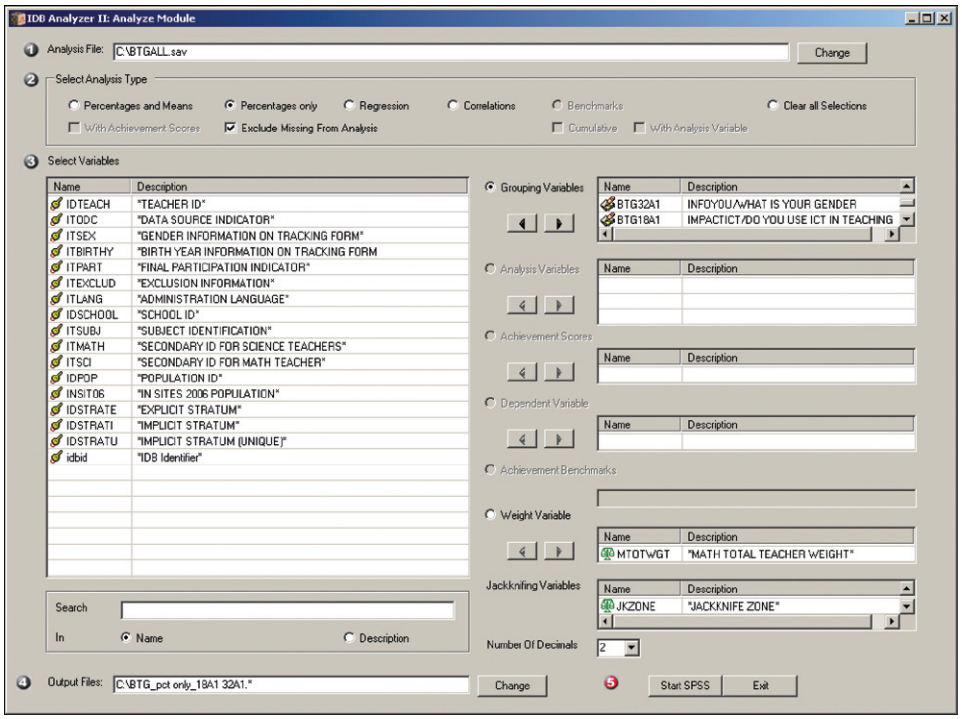
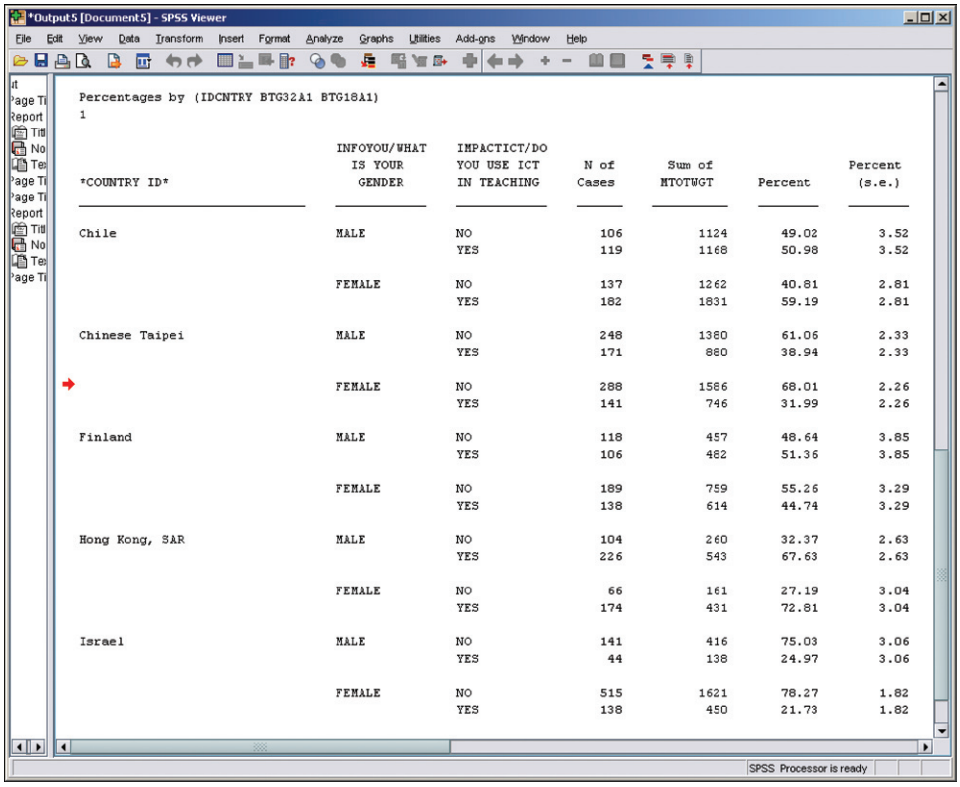



*Figure 4.19 SPSS Output for Example Teacher-level Analysis*






In this example, each education system's results are presented in four lines: two lines for each value of teachers' gender (variable BTG32A1) and one line for each value of usage of ICT (variable BTG18A1) within each teachers' gender group. The results are presented in much the same manner as in the previous example, where the education systems are identified in the first column and the second and third columns describe the

categories of BTG32A1 (gender) and BTG18A1 (ICT use) being reported. The first two lines in Figure 4.19, show that in Chile there are 49.02% male mathematics teachers using no ICT in the teaching and learning activities of the target class, while 50.98% of the male mathematics teachers use ICT. In comparison, 40.81% of the female mathematics teachers in Chile do not use ICT, whereas 59.19% of the female mathematics teachers use ICT in their teaching and learning activities in the target class. For all four percentages the appropriate standard errors are displayed in the last column of the output.

Please note that the second and the fourth line for each education system match the results presented in Columns 3 and 5 in Table 6.2 of the SITES 2006 international report (see Figure 4.16). The standard errors in Figure 4.19 are correct.

**Attention Point**
Note that the standard errors are different from those displayed in the SITES 2006 international report because the standard errors in Chapter 6 of the SITES 2006 international report were mistakenly reported 100 times lower than the correct values.

## 4.6 Other Analyses using the IEA IDB Analyzer

The examples above are just illustrations of the possible analyses that can be conducted using the IEA IDB Analyzer. Questions about the IEA IDB Analyzer should be directed to sites@iea-dpc.de.

### References

Carstens, R., & Pelgrum, W.J. (Eds.)(2009). *IEA SITES 2006 Technical Report*. Amsterdam: International Association for the Evaluation of Educational Achievement.

IEA (2009). International database analyzer (version 2.0.0.0). Computer software. Hamburg, Germany: IEA Data Processing and Research Center.

Law, N., Pelgrum, W. J., & Plomp, T. (Eds.). (2008). P*edagogical practices and ICT use around the world: Findings from an international comparative study. CERC Studies in Comparative Education*. Hong Kong: Comparative Education Research Centre, The University of Hong Kong, and Dordrecht: Springer.

SPSS Inc. (2008). *SPSS for Windows* (version 16.0). Computer software. Chicago, IL: SPSS Inc.

# Appendices

# Appendix A – SITES 2006 National Context Questionnaire





## IEA SITES 2006
## National Context Questionnaire (NCQ)

Dear NRC,

As discussed at the NRC meeting last December in Phuket (Thailand) we are asking each NRC to complete this questionnaire so that we have up-to-date characteristics of each system for purposes of our analysis. As you may recall, this information will be used in writing one of the chapters of the final report (chapter 2). In addition, it will be used in analyzing and interpreting the school and teacher results from the study. It is very important for the study that you provide this information.

For some open ended questions, you may want to write a long answer or revise a section of the chapter written about your country/system in 2001, and published in 2003 in the *Cross-national ICT Policy…* book by Plomp, Anderson, Law & Quale. If so, you may attach such answers to this questionnaire. (Among the SITES2006 countries, only Canada and Estonia did not have such a chapter.). You will be interested to know that the publisher has invited us to publish a 2nd edition of that volume. Our plan is to finalize the revised chapters by next summer. You will be invited to help us with that project in the near future.

**Instructions**

This questionnaire consists of four brief subtopics:
A) Educational system structure and responsibility,
B) Teacher preparation,
C) Change in past 5 years, and
D) System wide ICT policies.

Answers to the questions in all of these sections are needed to contextualize the findings from the school and teacher survey data. School-specific policies are not sufficient for understanding the sources and root causes of pedagogical practices, especially with respect to ICT, of teachers and the programs they participate in. These questions attempt to characterize, using fixed choice and open ended questions, the critically important activities and policies at educational levels higher than schools. You may want to involve other experts in your country or education system to validate your answers.
Please note that:

- While most questions refer to your overall system, some refer only to schools with the target grade.
- When questions refer to your overall system but school types in your system differ greatly, please answer for the school type within which your target grade of the SITES 2006 study belongs; and then explain how the school types differ in the area marked "Explanations as needed."

This questionnaire has been developed by Ron Anderson (ISC member) in collaboration with Nancy Law, Tjeerd Plomp, Hans Pelgrum, and Alfons ten Brumelhuis (ISC member).

If you have any questions, please don't hesitate to contact Ron Anderson and/or Tjeerd Plomp.

We are looking forward to your responses,

Ron Anderson (rea@umn.edu) & Tjeerd Plomp (Study Director)

| (Your name) | (Country/System) | (Date) |
|---|---|---|

## 1 Educational System Structure and Responsibility

**1. Which government levels take the responsibility for the formulation of educational policies regarding structure (overall organization) of the school system for compulsory education?**

*(Please Tick ☑ all that apply.)*

a Central government NCQ011a ☐
b State and/or provincial government NCQ011b ☐
c District and/or Local government NCQ011c ☐
d Non-statutory and/or professional body NCQ011d ☐
e Schools are free to decide NCQ011e ☐
f Other: (Please specify.) NCQ011f ..... NCQ011ft ☐

If you selected more than one of the above answers, please answer 1.1 and 1.2.

1.1 Which level has the primary (most) responsibility for these policies?
*Enter a to f:*..... NCQ012

1.2 Which level has the secondary (second most) responsibility for these policies?
*Enter a to f or "none":* ..... NCQ013

Explanations as needed:

.....

.....

..... NCQ014

**2. Which government levels take the responsibility for monitoring and implementing the examinations for compulsory education?**

*(Please Tick ☑ all that apply.)*

a Central government NCQ021a ☐
b State and/or provincial government NCQ021b ☐
c District and/or Local government NCQ021c) ☐
d Non-statutory and/or professional body NCQ021d ☐
e Schools are free to decide NCQ021e ☐
f Other: (Please specify.) NCQ021f ..... NCQ021ft ☐

If you selected more than one of the above answers, please answer 2.1 and 2.2.

2.1 Which level has the primary (most) responsibility for these policies?
*Enter a to f:*..... NCQ022

2.2 Which level has the secondary (second most) responsibility for these policies?
*Enter a to f or "none":* ..... NCQ023)

Explanations as needed: NCQ024

.....

.....

.....

**3. Which government levels take the responsibility for determining requirements for teacher certification?**

*(Please Tick ☑ all that apply.)*

a Central government NCQ031a ☐
b State and/or provincial government NCQ031b ☐
c District and/or Local government NCQ031c ☐
d Non-statutory and/or professional body NCQ031d ☐
e Schools are free to decide NCQ031e ☐
f Other: (Please specify.) NCQ031f ..... NCQ031ft ☐

If you selected more than one of the above answers, please answer 3.1 and 3.2.

3.1 Which level has the primary (most) responsibility for these policies?
*Enter a to f:* ..... NCQ032

3.2 Which level has the secondary (second most) responsibility for these policies?
*Enter a to f or "none":*..... NCQ033

Explanations as needed:

.....

.....

..... NCQ034

**4. What is the main funding source for public (constitutionally mandated) schooling?**

*(Please Tick ☑ only one source, the primary source.)*

a Central government NCQ041 ☐
b State and/or provincial government NCQ041 ☐
c District and/or Local government NCQ041 ☐
d Other: ((Please specify.) NCQ041) ..... NCQ041t ☐
e There are no publicly funded schools in our system NCQ041 ☐

Explanations as needed:

.....

.....

..... NCQ042

**5. What percentile of schools at the SITES 2006 target grade is funded by the government at the central and/or state/provincial levels?**

*(Tick only one choice.)* NCQ05

| None | < 10% | 10% - 25% | 26% - 50% | 51% - 75% | 76% - 90% | >90% |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**6. What percentile of the schools at the SITES 2006 target grade is funded at the local or district government levels?**

*(Tick only one choice)* NCQ06

| None | < 10% | 10% - 25% | 26% - 50% | 51% - 75% | 76% - 90% | >90% |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**7. For schools that have the target grade and also are funded by the government, which alternative below best describes your system?**

*(Tick only one choice.)* NCQ071

a Only attainment targets are prescribed ..... ☐
b Only attainment targets and curriculum are prescribed ..... ☐
c Attainment targets, curriculum, and textbook lists are prescribed ..... ☐
d Attainment targets, curriculum, textbook lists, and teaching methods are prescribed ..... ☐
e None of above prescriptions are prescribed ..... ☐

Explanations as needed: (Please explain if your situation does not fit above categories.)

.....

.....

.....NCQ072

**8. Which government levels take the responsibility for determining the curriculum taught in the schools?**

*(Please Tick ☑ all that apply.)*

a Central government NCQ081a ..... ☐
b State and/or provincial government NCQ081b ..... ☐
c District and/or Local government NCQ081c ..... ☐
d Non-statutory and/or professional body NCQ081d ..... ☐
e Schools are free to decide NCQ081f ..... ☐
f Other: (Please specify.) NCQ081f ..... NCQ081ft ☐

If you selected more than one of the above answers, please answer 8.1 and 8.2.

8.1 Which level has the primary (most) responsibility for these policies?
*Enter a to f:* ..... NCQ082

8.2 Which level has the secondary (second most) responsibility for these policies?
*Enter a to f or "none":*..... NCQ083

Explanations as needed:

.....

.....

.....NCQ084

**9. What is the approximate percentage of schools in the sector containing the target grade that are classified as special education schools and do not follow the mainstream syllabi or curriculum?**
*(This does not include schools for gifted students only.)* NCQ091

..... %

Remarks:

.....

.....

..... NCQ092

**10. What is the method for evaluating student progress in order to decide on promoting students from the target grade to the next grade level?**

*(Tick all that apply.)*

a National examination NCQ101a ..... ☐
b School internal examination NCQ101b ..... ☐
c Oral and/or written examinations throughout the school year NCQ101c ..... ☐
d Portfolio of student work during the school year NCQ101d ..... ☐
e Other NCQ101e ..... ☐

Explanations as needed:

.....

.....

..... NCQ102

**11. Would all students in the target grade be required to attain specific standards in none, all, or only some of the school subjects in order to be promoted to the next grade level?**
*(Tick ☑ all that apply.)*

No subjects NCQ111a ..... ☐
All school subjects NCQ111b ..... ☐
Only some subjects NCQ111c ..... ☐

11.1 If you have answered 'only some subjects,' please indicate if these subjects are any of the following by ticking the boxes as appropriate:

Mother Tongue NCQ112a ☐
Mathematics NCQ112b ☐
Science NCQ112c ☐

Remarks (if any):

.....

.....

.....NCQ113

**12. Does your system have a system-wide curriculum that includes mathematics at the target grade?**

Yes ☐
Yes, for some NCQ121 ☐
No ☐

If only "yes, for some" types of students or schools, please describe these types: NCQ122)
Remarks (if any):

.....

.....NCQ123

If "no", skip to question 14.

**13. How much emphasis does the mathematics curriculum at the target grade place on each of the following?**

| | None | Very Little | Some | A lot | |
|---|---|---|---|---|---|
| a Mastering basic skills | ☐ | ☐ | ☐ | ☐ | NCQ131a |
| b Applying math in real-life contexts | ☐ | ☐ | ☐ | ☐ | NCQ131b |
| c Communicating about math | ☐ | ☐ | ☐ | ☐ | NCQ131c |
| d Integrating math with ICT | ☐ | ☐ | ☐ | ☐ | NCQ131d |

Comments: NCQ132

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**14. Does your system have a system-wide curriculum that includes science at the target grade?**

Yes ☐
Yes, for some NCQ141 ☐
No ☐

If only "yes, for some" types of students or schools, please describe these types: NCQ142

Remarks (if any):

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.....NCQ143

If "no", skip to question 16

**15. How much emphasis does the science curriculum at the target grade place on each of the following?**

| | None | Very Little | Some | A lot | |
|---|---|---|---|---|---|
| a Knowing basic science facts | ☐ | ☐ | ☐ | ☐ | NCQ151a |
| b Applying science to real-life problems | ☐ | ☐ | ☐ | ☐ | NCQ151b |
| c Communicating about science | ☐ | ☐ | ☐ | ☐ | NCQ151c |
| d Integrating science with ICT | ☐ | ☐ | ☐ | ☐ | NCQ151d |

Remarks (For example, if there are several science subjects at the target level with differing emphasis across them, please describe the situation.):

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.....NCQ152

## 2 Teacher Preparation

Reminder. Questions in this section refer to your overall educational system, that is, the target grade is not explicitly specified. However, if school types in your system differ greatly, please answer for the school type within which your target grade of the SITES 2006 study belongs; and then explain how the school types differ in the area marked "Explanations as needed."

**16. What is the normal requirement for being certified as a teacher?**
*(Tick only one choice.)* NCQ161

a Postsecondary diploma and/or certificate in education only ☐
b Postsecondary degree in a major discipline only ☐
c Postsecondary degree in a major discipline and diploma and/or certificate in education ☐
d Other requirements (please specify) NCQ161t ☐
e Requirements are defined only at local or school level ☐

Explanations as needed:

.....

.....

..... NCQ162

**17. Are there ICT specific requirements for being certified as a teacher?**
*(Tick ☑ all that apply.)*

a No requirements NCQ171a ☐
b Requirement to meet specified benchmarks in technical competence NCQ171b ☐
c Requirement to meet specified benchmarks in using ICT in subject-based teaching NCQ171c ☐
d Requirement to meet specified benchmarks in general pedagogical ICT competence NCQ171d
(i.e. competence in integrating ICT into students' learning activities) ☐
e Others (please specify) NCQ171e ☐
f Requirements are defined only at local or school level NCQ171f ☐

Explanations as needed

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..... NCQ172

**18. Are qualified teachers in the target grade required to undertake regularly any inservice and or professional development activities on any of the following**

**aspects?**
*(Tick ☑ all that apply.)*

a Major subject area of teaching NCQ181a ☐
b Pedagogical practice NCQ181b ☐
c Enhancing students' motivation to learn NCQ181c ☐
d Child development NCQ181d ☐
e ICT skills NCQ181e ☐
f Use of ICT in subject-based or cross-curricular teaching NCQ181f ☐
g Use of ICT in project-based learning NCQ181g ☐
h Others (please specify) NCQ181h ☐
i Requirements are defined only at local or school level NCQ181i ☐

Explanations as needed:

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..... NCQ182

**19. Do any government agencies subsidize inservice training or professional development courses for teachers in any of the following areas?**
*(Tick ☑ all that apply.)*

a ICT skills NCQ191a ☐
b Use of ICT in subject-based or cross-curricular teaching NCQ191b ☐
c Use of ICT in school and/or classroom administration and/or management work NCQ191c ☐
d Use of ICT for new approaches in learning and teaching NCQ191d ☐

Explanations as needed:

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..... NCQ192

## 3 Change in past five years

**Note:** The next question block applies to your entire compulsory educational system in the past five years. (Keep in mind that the country chapters were written about five years ago, in 2001.)

**20. In the past five years to what extent have each of these items decreased, not changed, or increased?**
*(Tick ☑ all that apply.)*

| | | Decreased | N o | | | |
|---|---|---|---|---|---|---|
| Increased | | Increased | Don't Change | Slightly | A Lot | Know |
| | ***[Spending for ICT in education]*** | | | | | |
| a | Total spending on ICT in Education NCQ201a | ☐ | ☐ | ☐ | ☐ | ☐ |
| b | Spending on Internet connections and networking NCQ201b | ☐ | ☐ | ☐ | ☐ | ☐ |
| c | Spending on classroom ICT (hardware and software) NCQ201c | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Spending on instructional technology support staffing NCQ201d | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Spending on professional development related to ICT NCQ201e | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Funding for professional development related to using ICT in teaching NCQ201f | ☐ | ☐ | ☐ | ☐ | ☐ |
| g | Funding for professional development related to using ICT in teaching for such methods as inquiry, collaboration, and authentic assessment NCQ201g | ☐ | ☐ | ☐ | ☐ | ☐ |
| h | Funding for school level leadership development for strategic implementation of ICT in learning and teaching NCQ201h | ☐ | ☐ | ☐ | ☐ | ☐ |
| | ***[Pedagogy]*** | | | | | |
| i | Emphasis on students completing set tasks to demonstrate mastery NCQ201i | ☐ | ☐ | ☐ | ☐ | ☐ |
| j | Emphasis on providing individualized student learning experiences to address different learning needs NCQ201j | ☐ | ☐ | ☐ | ☐ | ☐ |
| k | Emphasis on open-ended inquiry-based learning learning tasks in classrooms NCQ201k | ☐ | ☐ | ☐ | ☐ | ☐ |
| l | Emphasis on student collaboration for project based learning NCQ201l | ☐ | ☐ | ☐ | ☐ | ☐ |
| m | Emphasis on inter-classroom collaboration within schools NCQ201m | ☐ | ☐ | ☐ | ☐ | ☐ |
| n | Emphasis on inter-school collaboration among teachers NCQ201n | ☐ | ☐ | ☐ | ☐ | ☐ |
| | ***[Assessment]*** | | | | | |
| o | Encouragements and support to set up international collaborative learning projects NCQ201o | ☐ | ☐ | ☐ | ☐ | ☐ |
| p | Importance of students' performance in standardized tests for tracking student progress NCQ201p | ☐ | ☐ | ☐ | ☐ | ☐ |
| q | Importance of students' performance in standardized tests for assessing school effectiveness NCQ201q | ☐ | ☐ | ☐ | ☐ | ☐ |

| | | | | | | |
|---|---|---|---|---|---|---|
| r | Importance of alternative, authentic modes of assessment NCQ201r | ☐ | ☐ | ☐ | ☐ | ☐ |
| s | Encouragement of collaborative tasks and peers assessment NCQ201s | ☐ | ☐ | ☐ | ☐ | ☐ |

Explanations as needed: ..... NCQ202

**21. Please review your answers to the previous question (question 20) regarding recent 5-year trends in ICT spending, pedagogy, and assessment. Consider if there were any trends that were different for the schools with the target grade. Please describe any such trends and how these differed from compulsory schools as a whole within your system.** NCQ21

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**22. In the past 5 years were there any national or system-wide curriculum priorities in Math and/or Science that changed or policies in these areas that were initiated? Please summarize these changes and how they might help to explain findings from the principal and teacher surveys.** NCQ22

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## 4 National or system wide policies and practices on the use of ICT

**23. Does your system have a national or system wide ICT policy in education? Such a policy may consist of several separate policies.**

Yes. ☐ Please continue with next question.
No. ☐ (Go to question 25)
NCQ23

**24. Which of the following components are included in this ICT policy?**
*(Tick ☑ all that apply.)*

a Clear vision and goals for ICT NCQ24a ☐
b An explicit goal that the use of ICT is to support curriculum innovation NCQ24b ☐
c Descriptions of specific desired modes for integrating ICT in teaching and learning NCQ24c ☐
d Desired minimum level of access, e.g., student-computer ratio NCQ24d ☐
e Desired level of internet connectivity NCQ24e ☐
f Goal to reduce the digital divide NCQ24f ☐
g Steps to be taken to ensure ICT access outside of school NCQ24g ☐
h Specifications on teachers' professional development requirement in ICT NCQ24h ☐
i Policy to stimulate greater teachers' professional development in ICT NCQ24i ☐
j Specifications on evaluation of implementations of the policy on ICT in education NCQ24j ☐
k Specifications on funding level and/or arrangement associated with the policy NCQ24k ☐
l Other, specify NCQ24l ☐

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NCQ24lt

**25. How is the provision of hardware and software to schools managed?**
*(Tick ☑ all that apply.)*

a Schools' hardware and/or software are specified and provided through a centralized system run by the government. NCQ25a ☐
b Schools are allocated funding for the purchase of hardware and/or software as specified in pre-approved applications submitted by schools. NCQ25b ☐
c Schools are only given partial funding for the purchase of hardware and/or software as specified in pre-approved applications and have to supplement the difference from the schools' own funds. NCQ25c ☐
d Schools are provided with government funding (total or partial) for computer connectivity and internet access. NCQ2d ☐
e Funding for ICT has moved from being earmarked provisions to being an integral part of the total school funding from the government and the school is free to decide the percentage of school funds a ctually spent on ICT. NCQ25e ☐
f Schools do not receive any government funding for purchasing hardware and/or software. NCQ25f ☐
g Other NCQ25g ☐
(Please be specific.)

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NCQ25gt

**26. Is language an obstacle for schools in ICT implementation in learning and teaching in your system?** (For example, important websites may not be written in a language that students can read.)

Yes, language is an obstacle ☐
No, not an obstacle ☐
NCQ26

27. If language is an obstacle, please describe to what extent it is an obstacle and what steps have been taken to minimize it.

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.....NCQ27

**28. Does your system have a system-wide program regarding student ICT-related skills at the target grade?**

Yes ☐
No ☐
NCQ281

If YES, is part of the school curriculum? Is it associated with a specific subject? If so, what subject?

.....NCQ282

If no, skip to question 30.

**29. Does the program promote using ICT in**

| | | Yes | No | |
|---|---|---|---|---|
| a | traditionally important approaches | ☐ | ☐ | NCQ29a |
| b | student-centered pedagogies | ☐ | ☐ | NCQ29b |
| c | online learning or distance education | ☐ | ☐ | NCQ29c |
| d | connecting with other schools and cultures | ☐ | ☐ | NCQ29d |
| e | collaborative team learning | ☐ | ☐ | NCQ29e |
| f | communication and presentation | ☐ | ☐ | NCQ29f |

**30. Do any of your educational system's policy documents promote approaches that mention "21st Century skills"? (The SITES2006 Conceptual Framework document defines 21st Century skills as having two components: "collaborative inquiry and connectedness.")**

| | Yes | No | |
|---|---|---|---|
| 21st Century skills | ☐ | ☐ | NCQ301 |

If yes, please describe the policy and how it relates to ICT. Also describe how "21st Century skills" are defined. And include a website address for any relevant documents.

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..... NCQ302

**31. Please list other useful website addresses with key information for understanding either the general education policies or the ICT in education policies and practices in your country and/or system:**

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..... NCQ321

**32. Are there any other things that we should know about your educational system for purposes of SITES2006 analysis?**

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..... NCQ322

Thank you very much for your time and effort in completing this questionnaire for SITES2006.
It will contribute greatly to the study!

# SITES 2006

# Second Information Technology in Education Study

## Principal Questionnaire

(International English Version)

## Introduction

The Second Information Technology in Education Study (SITES 2006) is an international assessment of teaching and learning practices and of how Information and Communication Technologies (ICT) support these in secondary schools around the world. Approximately 20 countries will provide information from representative samples of teachers on how they organize their teaching and learning, the ICT facilities they have available at school, how they use ICT for teaching and learning, and the obstacles or difficulties they experience in relation to these technologies. This information will give better insight into the current state of pedagogical approaches and of how technologies support them. It will also allow educational practitioners and policy-makers to gain a better understanding of areas needing intervention and additional support.

[Name of country], along with about 20 other countries, is taking part in this international study of pedagogical practices and the way that ICT supports these. The study is being conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA).

We are asking you for your help in order to determine the current state of pedagogical approaches to and the use of ICT. Please try to answer each question as accurately as you can.

## Confidentiality

All information that is collected in this study will be treated confidentially. At no time will the name of any school or individual be identified. While results will be made available by country and by type of school within a country, you are guaranteed that neither your school nor any of its personnel will be identified in any report of the results of the study. [*For countries which have ethical survey guidelines which emphasize voluntary participation:* Participation in this survey is voluntary and any individual may withdraw at any time.]

## About this Questionnaire

- This questionnaire asks for information from schools about education and policy matters related to pedagogical practices and computers. We would like the person who completes this questionnaire to be the principal of the school. **If you do not have the information to answer particular questions, please consult other persons in the school**. This questionnaire will take approximately 30 minutes to complete.
- The words computers and ICT (Information and Communication Technologies) are used interchangeably in this questionnaire.
- Please note that some questions refer to the entire school, while other questions refer to Grade <target grade> only. [*For countries, in which the definition of 'school' is not obvious to respondents add appropriate description depending on how sampling units were defined in the national sampling plan:* When questions refer to 'your school' we mean by 'school': <national school definition>.]
- Guidelines for answering the questions are typed in italics. Most questions can be answered by marking the one most appropriate answer.
- If you are completing the paper version of this questionnaire, please use a writing pen or ballpoint to write your answers.
- When you have completed this questionnaire, please [National Return Procedures and Date].

## Further information

- When in doubt about any aspect of the questionnaire, or if you would like more information about it or the study, you can reach us by phone at the following numbers: [National Center Contact Information]

**Thank you very much for your cooperation!**

## Pedagogy at Your School

The following questions address the characteristics of teaching and learning in your school.

**1. To what extent is each of the following aspects of teaching and learning currently present in your school?**

*Please mark only one choice in each row.*

| | | 1<br>Not at all | 2<br>To some extent | 3<br>A lot |
|---|---|---|---|---|
| A | Students develop abilities to undertake independent learning. BCP01A1 | ☐ | ☐ | ☐ |
| B | Students learn to search for, process and present information. BCP01B1 | ☐ | ☐ | ☐ |
| C | Students are largely responsible for controlling their own learning progress. BCP01C1 | ☐ | ☐ | ☐ |
| D | Students learn and/or work during lessons at their own pace. BCP01D1 | ☐ | ☐ | ☐ |
| E | Students are involved in cooperative and/or project-based learning. BCP01E1 | ☐ | ☐ | ☐ |
| F | Students determine for themselves when to take a test. BCP01F1 | ☐ | ☐ | ☐ |
| G | Students learn search strategies to find diverse types of relevant information. BCP01G1 | ☐ | ☐ | ☐ |
| H | Students learn to assemble, organize and integrate information. BCP01H1 | ☐ | ☐ | ☐ |
| I | Students learn to critically evaluate the validity and value of information obtained from their searches on the Internet. BCP01I1 | ☐ | ☐ | ☐ |
| J | Students present work using several forms of presentation (e.g., text, visual, verbal, electronic). BCP01J1 | ☐ | ☐ | ☐ |
| K | Students are assigned projects that require several persons working together for an extended period of time. BCP01K1 | ☐ | ☐ | ☐ |
| L | Students have autonomy to decide what topics to study. BCP01L1 | ☐ | ☐ | ☐ |

**2. To what extent do you agree or disagree that the school leadership (you and/or other school leaders) encourages Mathematics and Science teachers at Grade <target grade> to achieve the following goals?**

*Please mark only one choice in each row.*

| | | 1 Strongly disagree | 2 Disagree | 3 Agree | 4 Strongly agree |
|---|---|---|---|---|---|
| A | To cover the prescribed curriculum content BCP02A1 | ☐ | ☐ | ☐ | ☐ |
| B | To improve students' performance on assessments/examinations BCP02B1 | ☐ | ☐ | ☐ | ☐ |
| C | To individualize student learning experiences in order to address different learning needs BCP02C1 | ☐ | ☐ | ☐ | ☐ |
| D | To increase learning motivation and make learning more interesting BCP02D1 | ☐ | ☐ | ☐ | ☐ |
| E | To foster students' ability and readiness to set own learning goals and to plan, monitor and evaluate own progress BCP02E1 | ☐ | ☐ | ☐ | ☐ |
| F | To foster collaborative and organizational skills when working in teams BCP02F1 | ☐ | ☐ | ☐ | ☐ |
| G | To provide activities which incorporate real-world examples/settings/applications for student learning BCP02G1 | ☐ | ☐ | ☐ | ☐ |
| H | To provide opportunities for students to learn from experts and peers from other schools/organizations/countries BCP02H1 | ☐ | ☐ | ☐ | ☐ |
| I | To foster communication skills in face-to-face and/or on-line situations BCP02I1 | ☐ | ☐ | ☐ | ☐ |
| J | To prepare students for responsible Internet behavior (e.g., not to commit mail-bombing, such as spam, etc.) and/or to cope with cybercrime (e.g., Internet fraud, illegal access to secure information, etc.) BCP02J1 | ☐ | ☐ | ☐ | ☐ |

## Pedagogy and ICT in your school

This section asks you to answer questions about pedagogy and ICT in your school.

**3. For each of the following, how important is the use of ICT at Grade <target grade> in your school?**
*Please mark only one choice in each row.*

| | | 1<br>Not at all<br>disagree | 2<br>A little | 3<br>Somewhat | 4<br>A lot<br>agree |
|---|---|---|---|---|---|
| A | To prepare students for the world of work BCP03A1 | ☐ | ☐ | ☐ | ☐ |
| B | To improve students' performance on assessments/examinations BCP03B1 | ☐ | ☐ | ☐ | ☐ |
| C | To promote active learning strategies BCP03C1 | ☐ | ☐ | ☐ | ☐ |
| D | To individualize student learning experiences in order to address different learning needs BCP03D1 | ☐ | ☐ | ☐ | ☐ |
| E | To foster collaborative and organizational skills when working in teams BCP03E1 | ☐ | ☐ | ☐ | ☐ |
| F | To develop students' independence and responsibility for their own learning BCP03F1 | ☐ | ☐ | ☐ | ☐ |
| G | To do exercises to practice skills and procedures BCP03G1 | ☐ | ☐ | ☐ | ☐ |
| H | To increase learning motivation and make learning more interesting BCP03H1 | ☐ | ☐ | ☐ | ☐ |
| I | To satisfy parents' and the community 's expectations BCP03I1 | ☐ | ☐ | ☐ | ☐ |
| J | To act as a catalyst in changing the pedagogical approaches of teachers BCP03J1 | ☐ | ☐ | ☐ | ☐ |

**4. To what extent do you agree or disagree that the school leadership (you and/or other school leaders) encourages teachers at Grade <target grade> to use ICT in each of the following activities?**
*Please mark only one choice in each row.*

| | | 1 Strongly disagree | 2 Disagree | 3 Agree | 4 Strongly agree |
|---|---|---|---|---|---|
| A | Organize, monitor and support team-building and collaboration among students BCP04A1 | ☐ | ☐ | ☐ | ☐ |
| B | Organize and/or mediate communication between students and experts/external mentors BCP04B1 | ☐ | ☐ | ☐ | ☐ |
| C | Facilitate collaboration (within or outside of school) on student activities BCP04C1 | ☐ | ☐ | ☐ | ☐ |
| D | Collaborate with parents/guardians/ caretakers in supporting/monitoring students' learning a nd/or in providing counseling BCP04D1 | ☐ | ☐ | ☐ | ☐ |
| E | Provide students with experiences that show them how certain activities are done in real life or by experts BCP04E1 | ☐ | ☐ | ☐ | ☐ |

**5. Are the following actions with regard to ICT at Grade <target grade> taken in your school?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Setting up security measures to prevent unauthorized system access or entry BCP05A1 | ☐ | ☐ |
| B | Restricting the number of hours students are allowed to use the computer BCP05B1 | ☐ | ☐ |
| C | Allowing students to access school computers outside school hours BCP05C1 | ☐ | ☐ |
| D | Allowing students to access computers outside class hours (but during school hours) BCP05D1 | ☐ | ☐ |
| E | Honouring of intellectual property rights (e.g., software copyrights) BCP05E1 | ☐ | ☐ |
| F | Prohibiting access to adult-only material (e.g., pornography, violence) BCP05F1 | ☐ | ☐ |
| G | Restricting the playing of games on school computers BCP05G1 | ☐ | ☐ |
| H | Specifying the compulsory computer-related knowledge and skills that students need BCP05H1 | ☐ | ☐ |
| I | Giving the local community (parents and/or others) access to school computers and/or the Internet BCP05I1 | ☐ | ☐ |
| J | Complementing printed lesson materials with digital resources for teaching and learning BCP05J1 | ☐ | ☐ |
| K | Providing teachers with laptop computers and/or other mobile learning devices BCP05K1 | ☐ | ☐ |
| L | Providing students with laptop computers and/or other mobile learning devices BCP05L1 | ☐ | ☐ |

**6. What priority level do you give to resource allocation in your school in order to enhance the use of ICT in teaching and learning for the Grade <target grade> students in your school?**
*Please mark only one choice in each row.*

| | | 1 Not a priority | 2 Low priority | 3 Medium priority | 4 High priority |
|---|---|---|---|---|---|
| A | To decrease the number of students per computer BCP06A1 | ☐ | ☐ | ☐ | ☐ |
| B | To increase the number of computers connected to the Internet BCP06B1 | ☐ | ☐ | ☐ | ☐ |
| C | To increase the bandwidth for Internet access of the computers connected to the Internet BCP06C1 | ☐ | ☐ | ☐ | ☐ |
| D | To increase the range of digital learning resources related to the school curriculum BCP06D1 | ☐ | ☐ | ☐ | ☐ |
| E | To establish/enhance an online learning support platform and its management so that teaching and learning can take place any time, anywhere BCP06E1 | ☐ | ☐ | ☐ | ☐ |
| F | To improve the technical skills of teachers BCP06F1 | ☐ | ☐ | ☐ | ☐ |
| G | To improve the ability of teachers to make good pedagogical use of ICT BCP06G1 | ☐ | ☐ | ☐ | ☐ |
| H | To broaden teachers' pedagogical repertoire and to widen their pedagogical competence to engage in new methods of teaching and learning BCP06H1 | ☐ | ☐ | ☐ | ☐ |
| I | To improve students' ICT skills BCP06I1 | ☐ | ☐ | ☐ | ☐ |
| J | To provide teachers with incentives (including salary adjustment, promotion, etc.) to integrate ICT use in their teaching BCP06J1 | ☐ | ☐ | ☐ | ☐ |
| K | To increase the number of teachers using ICT for teaching/learning purposes BCP06K1 | ☐ | ☐ | ☐ | ☐ |

**7. Has the school leadership (you and/or other school leaders) taken any of the following actions during the past few years?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Re-allocating workload to allow for collaborative planning for innovations in the classrooms BCP07A1 | ☐ | ☐ |
| B | Re-allocating workload to allow for the provision of technical support for innovations BCP07B1 | ☐ | ☐ |
| C | Organizing workshops to demonstrate the use of ICT-supported teaching and learning BCP07C1 | ☐ | ☐ |
| D | Meeting teachers to review their pedagogical approach BCP07D1 | ☐ | ☐ |
| E | Monitoring and evaluating the implementation of pedagogical changes BCP07E1 | ☐ | ☐ |
| F | Establishing new teacher teams to coordinate the implementation of innovations in teachers' teaching and learning BCP07F1 | ☐ | ☐ |
| G | Changing class schedules to facilitate the implementation of innovations BCP07G1 | ☐ | ☐ |
| H | Implementing incentive schemes to encourage teachers to integrate ICT in their lessons BCP07H1 | ☐ | ☐ |
| I | Encouraging teachers collaborate with external experts to improve their teaching and learning practices BCP07I1 | ☐ | ☐ |
| J | Featuring new instructional methods in the school newspaper and/or other me dia (e.g., the school website) BCP07J1 | ☐ | ☐ |
| K | Involving parents in ICT related activities BCP07K1 | ☐ | ☐ |

**8. To what extent do you agree or disagree that the school leadership (you and/or other school leaders) encourages teachers in Grade <target grade> to undertake the following activities**

*Please mark only one choice in each row.*

| | | 1<br>Strongly disagree | 2<br>Disagree | 3<br>Agree | 4<br>Strongly agree |
|---|---|---|---|---|---|
| A | Assigning extended projects (2 weeks or longer) BCP08A1 | ☐ | ☐ | ☐ | ☐ |
| B | Assigning short-task projects BCP08B1 | ☐ | ☐ | ☐ | ☐ |
| C | Assigning production projects (e.g. making models or reports) BCP08C1 | ☐ | ☐ | ☐ | ☐ |
| D | Involving students in self-accessed courses and/or learning activities BCP08D1 | | | | |
| E | Involving students in open-ended scientific investigations BCP08E1 | ☐ | ☐ | ☐ | ☐ |
| F | Undertaking field study activities BCP08F1 | ☐ | ☐ | ☐ | ☐ |
| G | Using virtual laboratories, simulations BCP08G1 | | | | |
| H | Applying exercises to practice skills and procedures BCP08H1 | ☐ | ☐ | ☐ | ☐ |
| I | Involving students in laboratory experiments with clear instructions and well-defined outcomes BCP08I1 | ☐ | ☐ | ☐ | ☐ |
| J | Involving students in studying natural phenomena through simulations BCP08J1 | ☐ | ☐ | ☐ | ☐ |
| K | Involving students in processing and analyzing data BCP08K1 | ☐ | ☐ | ☐ | ☐ |

**9. During this school year, how often did the school leadership (you and/or other school leaders) undertake each of the following?**

*Please mark only one choice in each row.*

| | | 1 Not at All | 2 A few times | 3 Monthly | 4 Weekly |
|---|---|---|---|---|---|
| A | Organize activities to develop a common vision of what is meant by quality education BCP09A1 | ☐ | ☐ | ☐ | ☐ |
| B | Inform teachers about pedagogical changes taking place in the school BCP09B1 | ☐ | ☐ | ☐ | ☐ |
| C | Inform teachers about educational developments outside the school BCP09C1 | ☐ | ☐ | ☐ | ☐ |
| D | Consult teachers about desired pedagogical changes BCP09D1 | ☐ | ☐ | ☐ | ☐ |
| E | Discuss with teachers what they want to achieve through their lessons BCP09E1 | ☐ | ☐ | ☐ | ☐ |
| F | Motivate teachers to critically assess their own educational practices critically BCP09F1 | ☐ | ☐ | ☐ | ☐ |
| G | Encourage teachers to assess their educational practices in the context of our school's goals BCP09G1 | | | | |
| H | Discuss with parents/guardians/caretakers what pedagogical changes are taking place in our school BCP09H1 | ☐ | ☐ | ☐ | ☐ |
| I | Discuss with students the teaching and learning in our school BCP09I1 | ☐ | ☐ | ☐ | ☐ |

**10. To what extent do you agree or disagree that the school leadership (you and/or other school leaders) encourages the following activities to take place in Grade <target grade>?**
*Please mark only one choice in each row.*

| | | 1 Strongly disagree | 2 Disagree | 3 Agree | 4 Strongly agree |
|---|---|---|---|---|---|
| A | Teachers co-teach with their colleagues BCP10A1 | ☐ | ☐ | ☐ | ☐ |
| B | Teachers collaborate with teachers from other schools BCP10B1 | ☐ | ☐ | ☐ | ☐ |
| C | Teachers discuss the problems that they experience at work with their colleagues BCP10C1 | ☐ | ☐ | ☐ | ☐ |
| D | Teachers collaborate with teachers from other countries BCP10D1 | ☐ | ☐ | ☐ | ☐ |

11. To what extent do you agree or disagree that the school leadership (you and/or other school leaders) **encourages teachers to use each of the following types of assessment at Grade <target grade>?**
*Please mark only one choice in each row.*

| | | 1 Strongly disagree | 2 Disagree | 3 Agree | 4 Strongly agree |
|---|---|---|---|---|---|
| A | Written test/examination BCP11A1 | ☐ | ☐ | ☐ | ☐ |
| B | Written task/exercise BCP11B1 | ☐ | ☐ | ☐ | ☐ |
| C | Individual oral presentation BCP11C1 | ☐ | ☐ | ☐ | ☐ |
| D | Group presentation (oral/written) BCP11D1 | ☐ | ☐ | ☐ | ☐ |
| E | Project report and/or (multimedia) product BCP11E1 | ☐ | ☐ | ☐ | ☐ |
| F | Students' peer evaluations BCP11F1 | ☐ | ☐ | ☐ | ☐ |
| G | Portfolio/learning log BCP11G1 | ☐ | ☐ | ☐ | ☐ |
| H | Group assessment scores for collaborative tasks BCP11H1 | ☐ | ☐ | ☐ | ☐ |

## Staff Development for Teachers and the School Leadership

The following contains a number of questions about staff development for Mathematics and/or Science teachers teaching Grade <target grade> and for the school leadership.

**12. Are teachers of Mathematics and/or Science at Grade <target grade> required or encouraged to acquire knowledge and skills in each of the following?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes Encouraged | 3 Yes Required |
|---|---|---|---|---|
| A | Integrating Web-based learning in their instructional practice BCP12A1 | ☐ | ☐ | ☐ |
| B | Using new ways of assessment (portfolios, peer reviews, etc.) BCP12B1 | ☐ | ☐ | ☐ |
| C | Developing real-life assignments for students BCP12C1 | ☐ | ☐ | ☐ |
| D | Using real-life assignments developed by others BCP12D1 | ☐ | ☐ | ☐ |
| E | Using computers for monitoring student progress BCP12E1 | ☐ | ☐ | ☐ |
| F | Organizing forms of team-teaching BCP12F1 | ☐ | ☐ | ☐ |
| G | Collaborating with other teachers via ICT BCP12G1 | ☐ | ☐ | ☐ |
| H | Communicating with parents via ICT BCP12H1 | ☐ | ☐ | ☐ |
| I | Being knowledgeable about the pedagogical issues of integrating ICT into teaching and learning BCP12I1 | ☐ | ☐ | ☐ |
| J | Using subject-specific learning software (e.g., tutorials, simulation) BCP12J1 | ☐ | ☐ | ☐ |

**13. How much of a priority is it for your school leadership (you and/or other school leaders) to acquire competencies in the following areas?**
*Please mark only one choice in each row.*

| | | 1 Not considered | 2 Low priority | 3 Medium priority | 4 High priority |
|---|---|---|---|---|---|
| A | Developing a common pedagogical vision among teaching staff in the school BCP13A1 | ☐ | ☐ | ☐ | ☐ |
| B | Managing the innovation of pedagogical practices in the school BCP13B1 | ☐ | ☐ | ☐ | ☐ |
| C | Explaining to teachers the relevance of encouraging students to be responsible for their own learning process and outcomes BCP13C1 | ☐ | ☐ | ☐ | ☐ |
| D | Identifying best practices that exist outside the school regarding the integration of ICT in learning BCP13D1 | ☐ | ☐ | ☐ | ☐ |
| E | Promoting collaboration between teachers of different subjects BCP13E1 | ☐ | ☐ | ☐ | ☐ |
| F | Managing the adoption of ICT-supported methods for assessing student progress BCP13F1 | ☐ | ☐ | ☐ | ☐ |
| G | Organizing cooperation with other schools regarding the development of teaching and learning materials BCP13G1 | ☐ | ☐ | ☐ | ☐ |
| H | Organizing cooperation with other schools regarding the development of ICT-based teaching and learning BCP13H1 | ☐ | ☐ | ☐ | ☐ |
| I | Promoting the integration of ICT in the teaching and learning of traditional subjects BCP13I1 | ☐ | ☐ | ☐ | ☐ |
| J | Developing a strategic plan for integrating ICT use in teaching and learning BCP13J1 | ☐ | ☐ | ☐ | ☐ |

## Pedagogical Support for Persons Using ICT

**14. How frequently does each of the following persons provide pedagogical support to those teachers in Grade <target grade> who want to use ICT for their teaching and learning activities?**

*Note: Pedagogical support may consist of giving advice and guidance on issues related to teaching and learning. Please do not consider support that is only technical.*

*Please mark only one choice in each row.*

| | | 1 Never | 2 Few times a year | 3 Monthly | 4 Weekly | 5 Not applicable |
|---|---|---|---|---|---|---|
| A | Experienced colleagues BCP14A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | The school principal BCP14B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | The technology coordinator BCP14C1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Other staff from the school BCP14D1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Experts from outside the school BCP14E1 | ☐ | ☐ | ☐ | ☐ | ☐ |

**15. For each of the following activities, to what extent is pedagogical support available for teachers in Grade <target grade>?**

*Note: Pedagogical support may consist of advice and guidance (via persons, manuals, etc.) with regard to the activities mentioned below. Please do not consider support that is only technical.*

Please mark only one choice in each row.

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot | 5 Not applicable |
|---|---|---|---|---|---|---|
| A | Having students produce outcomes of media production projects (e.g., development of websites) BCP15A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Having students work on short projects (2 weeks or shorter) BCP15B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Having students work on extended projects (longer than 2 weeks) BCP15C1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Having students collaborate with others by online means, such as online discussion forums BCP15D1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Having students conduct open-ended scientific investigations BCP15E1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Having students engage in field study activities BCP15F1 | ☐ | ☐ | ☐ | ☐ | ☐ |

## Obstacles

**16. To what extent is your school's capacity to realize its pedagogical goals hindered by each of the following obstacles?**
*Please mark only one choice in each row.*

| | ICT-related obstacles | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot | 5 Not applicable |
|---|---|---|---|---|---|---|
| A | Insufficient qualified technical personnel to support the use of ICT BCP16A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Insufficient number of computers connected to the Internet BCP16B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Insufficient Internet bandwidth or speed BCP16C1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Lack of special ICT equipment for disabled students BCP16D1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Insufficient ICT equipment for instruction BCP16E1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Computers are out of date BCP16F1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Not enough digital educational resources for instruction BCP16G1 | | | | | |
| H | Lack of ICT tools for science laboratory work BCP16H1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Teachers' lack of ICT skills BCP16I1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| J | Insufficient time for teachers to use ICT BCP16J1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| | **Other obstacles** | | | | | |
| K | Pressure to score highly on standardized tests BCP16K1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| L | Prescribed curricula are too strict BCP16L1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| M | Insufficient or inappropriate space to accommodate the school's pedagogical approaches BCP16M1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| N | Insufficient budget for non ICT-supplies (e.g., paper, pencils) BCP16N1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| O | Using ICT for teaching and/or learning is not a goal of our school BCP16O1 | ☐ | ☐ | ☐ | ☐ | ☐ |

## Organization of Learning

The questions below are about grouping of students and time schedules.

**17. How often would visitors, who walk into a lesson in your school on a typical day, observe the following in Grade <target grade>?**
*Please mark only one choice in each row.*

| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always |
|---|---|---|---|---|---|
| A | Whole classes of students in their classroom with one teacher BCP17A1 | ☐ | ☐ | ☐ | ☐ |
| B | In large classrooms, students working under the supervision of a team of teachers BCP17B1 | ☐ | ☐ | ☐ | ☐ |
| C | Individuals or small groups of students being coached by teachers BCP17C1 | ☐ | ☐ | ☐ | ☐ |
| D | Individuals or small groups of students working on their own at places they choose themselves BCP17D1 | ☐ | ☐ | ☐ | ☐ |

**18. How often could students at your school expect the following to occur at Grade <target grade>?**
*Please mark only one choice in each row.*

| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always |
|---|---|---|---|---|---|
| A | Students working in different groups according to the projects they are engaged in or the subjects they are taking BCP18A1 | ☐ | ☐ | ☐ | ☐ |
| B | Students all working in the same group (class) BCP18B1 | ☐ | ☐ | ☐ | ☐ |
| C | Students spending their time in school following lessons according to a fixed schedule BCP18C1 | ☐ | ☐ | ☐ | ☐ |
| D | Changes to the usual time schedule if students need time to complete their projects BCP18D1 | ☐ | ☐ | ☐ | ☐ |
| E | Students having a lot of freedom to plan their own learning time BCP18E1 | ☐ | ☐ | ☐ | ☐ |

## School Characteristics

The intention of this set of questions is to describe the general characteristics of your school.

**19. What is the total number of boys and girls in the entire school?**
*Please write a whole number. Write 0 (zero), if none.*

☐☐☐☐ Total number of girls BCP19A1

☐☐☐☐ Total number of boys BCP19B1

**20. What are the lowest and highest grade levels in your school?**
*Please mark only one choice in each row.*

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kindergarten | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| A | Lowest BCP20A1 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Highest BCP20B1 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**21. How many people live in the city, town, or village where your school is located?** BCP21A1
*Please mark only one choice.*

1 ☐ 3,000 people or fewer
2 ☐ 3,001 to 15,000 people
3 ☐ 15,001 to 50,000 people
4 ☐ 50,001 to 100,000 people
5 ☐ 100,001 to 500,000 people
6 ☐ More than 500,000 people

22. **Approximately what percentage of students are absent from your school on a typical school day?** BCP22A1
*Please mark only one choice.*

1 ☐ Less than 5%
2 ☐ 5–10%
3 ☐ 11–20%
4 ☐ More than 20%

23. **Approximately what percentage of students in your school are native speakers of <national language = language of instruction>?** BCP23A1
*Please mark only one choice.*

1 ☐ Less than 50%
2 ☐ 50-75%
3 ☐ 76-90%
4 ☐ More than 90%

24. **Has your school been involved in any of the following activities during the past few years?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Making changes to pedagogical practices BCP24A1 | ☐ | ☐ |
| B | Adopting new assessment practices BCP24B1 | ☐ | ☐ |
| C | Connecting to the Internet BCP24C1 | ☐ | ☐ |
| D | Adapting buildings to suit the school's pedagogical approaches BCP24D1 | ☐ | ☐ |
| E | Setting up computers in classrooms BCP24E1 | ☐ | ☐ |
| F | Installing computer laboratories BCP24F1 | ☐ | ☐ |

**25. Who at your school has the primary responsibility for making decisions about each of the following?**
*Please mark only one choice in each row.*

| | | 1 External agency | 2 School leadership | 3 Subject department | 4 Teachers | 5 Not applicable |
|---|---|---|---|---|---|---|
| A | Purchasing ICT equipment BCP25A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Selecting subject content to be learned BCP25B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Determining which pedagogical approaches will be used BCP25C1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Choosing whether ICT is used BCP25D1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Assessing learning progress in the classroom BCP25E1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Using mobiles and/or handheld devices for instructional purposes BCP25F1 | ☐ | ☐ | ☐ | ☐ | ☐ |

## Personal Background Information

Below are a few questions about your personal background.

**26. Think about a new development/change that you consider highly satisfying, related to the learning experiences of students, that occurred in your school and under your principalship during the current academic year. Did you play any of the following roles in this new development?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | I initiated the change, and teachers in our school further developed and implemented it. BCP26A1 | ☐ | ☐ |
| B | I initiated the change, and I contributed substantially to its development and implementation. BCP26B1 | ☐ | ☐ |
| C | Teachers initiated the change. The change was basically a bottom-up initiative that did not require my support. BCP26C1 | ☐ | ☐ |
| D | Teachers initiated the change. My role was mainly in the form of moral support. BCP26D1 | ☐ | ☐ |
| E | Teachers initiated the change, and I allocated resources and necessary staffing to support it. BCP26E1 | ☐ | ☐ |
| F | The school management board initiated the change, and I led its development and implementation. BCP26F1 | ☐ | ☐ |
| G | Parents/community groups initiated the change, and I supported its realization. BCP26G1 | ☐ | ☐ |
| H | Students initiated the change, and I supported its realization. BCP26H1 | ☐ | ☐ |

**27. Including this school year, how many years have you been:**
*Please mark only one choice in each row.*

| | | 1 Less than 3 years | 2 3-5 years | 3 6-10 years | 4 11-20 years | 5 21 years or more |
|---|---|---|---|---|---|---|
| A | Principal of any school (including years as principal in this school) BCP27A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Principal of this school BCP27B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Working in any professional capacity at this school (including years as teacher, vice-principal, and principal) BCP27C1 | ☐ | ☐ | ☐ | ☐ | ☐ |

**28. What is your age?** BCP28A1

1 ☐ 30 years or less
2 ☐ 31-35 years
3 ☐ 36–45 years
4 ☐ 46-55 years
5 ☐ More than 55 years

**29. Please indicate whether you are:** BCP29A1

1 ☐ Female
2 ☐ Male

30. **Are you involved in fundraising for ICT-related matters in your school?** BCP30A1
*Please mark only one choice.*

1 ☐ Yes, I personally spend quite some time doing this.
2 ☐ I am involved in this, but another person/other people in the school do the major part of the job.
3 ☐ No, we outsource fundraising matters.
4 ☐ No, I and those of my colleagues involved in the school's leadership, spend no or very little time on this.
5 ☐ Not applicable

31. **Altogether, how often do you personally use a computer?** BCP31A1 Filter
*Please mark only one choice.*

1 ☐ Never→ ***Please proceed to the end of the questionnaire.***
2 ☐ A few times per year
3 ☐ Almost monthly
4 ☐ Weekly
5 ☐ Daily

**32. Do you use your computer for any of the following?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Writing documents and letters BCP32A1 Dependent | ☐ | ☐ |
| B | Budgeting, monitoring or controlling expenses BCP32B1 Dependent | ☐ | ☐ |
| C | Planning purposes BCP32C1 Dependent | ☐ | ☐ |
| D | Communicating with teachers BCP32D1 Dependent | ☐ | ☐ |
| E | Communicating with parents BCP32E1 Dependent | ☐ | ☐ |
| F | Teaching/instruction BCP32F1 Dependent | ☐ | ☐ |
| G | Time tabling BCP32G1 Dependent | ☐ | ☐ |
| H | Searching for information BCP32H1 Dependent | ☐ | ☐ |
| I | Developing and making presentations BCP32I1 Dependent | ☐ | ☐ |
| J | Own professional development BCP32J1 Dependent | ☐ | ☐ |

**33. Do you have access to a computer at home?** BCP33A1 Filter

1 ☐ No → ***Please proceed to the end of the questionnaire.***
2 ☐ Yes → ***Please continue.***

**34. Do you use this computer for the following activities?**
*Please mark only one choice in each row.*

| | | 1<br>No | 2<br>Yes |
|---|---|---|---|
| A | School related activities BCP34A1 Dependent | ☐ | ☐ |
| B | Connecting to the internet BCP34B1 Dependent | ☐ | ☐ |

**This is the end of the questionnaire.**
**Thank you very much for your cooperation!**

[**Return Instructions**]

# AppendixC – SITES 2006 Technical Questionnaire

## SITES 2006

## Second Information Technology in Education Study


## Technical Questionnaire

(International English Version)

## Introduction

The Second Information Technology in Education Study (SITES 2006) is an international assessment of teaching and learning practices and of how Information and Communication Technologies (ICT) support these in secondary schools around the world. Approximately 20 countries will provide information from representative samples of teachers on how they organize their teaching and learning, the ICT facilities they have available at school, how they use ICT for teaching and learning, and the obstacles or difficulties they experience in relation to these technologies. This information will give better insight into the current state of pedagogical approaches and of how technologies support them. It will also allow educational practitioners and policy-makers to gain a better understanding of areas needing intervention and additional support.

[Name of country], along with about 20 other countries, is taking part in this international study of pedagogical practices and the way that ICT supports these. The study is being conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA).

We are asking you for your help in order to determine the current state of pedagogical approaches to and the use of ICT. Please try to answer each question as accurately as you can.

## Confidentiality

All information that is collected in this study will be treated confidentially. At no time will the name of any school or individual be identified. While results will be made available by country and by type of school within a country, you are guaranteed that neither your school nor any of its personnel will be identified in any report of the results of the study. [*For countries which have ethical survey guidelines which emphasize voluntary participation:* Participation in this survey is voluntary and any individual may withdraw at any time.]

## About this Questionnaire

- This questionnaire asks for information from schools about education and policy matters related to pedagogical practices and ICT. **If you are the person answering this questionnaire, it is important that you are someone who knows about the ICT facilities in your school and about practices regarding their use in your school.** If you do not have the information to answer particular questions, then please consult other persons in your school. The questionnaire will take you approximately 30 minutes to complete.
- The words computers and ICT (Information and Communication Technologies) are used interchangeably in this questionnaire.
- Please note that some questions refer to the entire school, other questions refer to Grades <grade range>, while some questions pertain to Grade <target grade> only. [*For countries, in which the definition of 'school' is not obvious to respondents add appropriate description depending on how sampling units were defined in the national sampling plan:* When questions refer to 'your school' we mean by 'school': <national school definition>.]
- Guidelines for answering the questions are typed in italics. Most questions can be answered by marking the one most appropriate answer. When a question states, "*Please mark all that apply*", you may give more than one answer.
- If you are completing the paper version of this questionnaire, please use a writing pen or ballpoint to write your answers.
- When you have completed this questionnaire, please [National Return Procedures and Date].

## Further information

- When in doubt about any aspect of the questionnaire, or if you would like more information about it or the study, you can reach us by phone at the following numbers: [National Center Contact Information]

**Thank you very much for your cooperation!**

## ICT in Your School

**1. How many years has your school been using ICT for teaching and/or learning purposes for students in Grades <grade range>?** BCT01A1

*Please mark only one choice.*

1 ☐ 0–2 years
2 ☐ 3–5 years
3 ☐ 6–10 years
4 ☐ 11–15 years
5 ☐ More than 15 years
6 ☐ Don't know

**2. To what extent do you agree with each of the following statements about the use of ICT in your school?**

*Please mark only one choice in each row.*

| | | 1 Strongly disagree | 2 Disagree | 3 Agree | 4 Strongly agree |
|---|---|---|---|---|---|
| A | ICT is considered relevant in our school. BCT02A1 | ☐ | ☐ | ☐ | ☐ |
| B | Our school has integrated ICT in most of our teaching and learning practices. BCT02B1 | ☐ | ☐ | ☐ | ☐ |
| C | We have started to use ICT in the teaching and learning of school subjects. BCT02C1 | ☐ | ☐ | ☐ | ☐ |
| D | We still do not know which ICT applications are useful for our school. BCT02D1 | ☐ | ☐ | ☐ | ☐ |
| E | Constraints rule out the use of ICT in our school. BCT02E1 | ☐ | ☐ | ☐ | ☐ |

**3. Approximately how often during this school year will students in Grade <target grade> be using ICT for learning in the following subject domains?**

*Please mark only one choice in each row.*

| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always |
|---|---|---|---|---|---|
| A | Mathematics BCT03A1 | ☐ | ☐ | ☐ | ☐ |
| B | Natural Sciences BCT03B1 | ☐ | ☐ | ☐ | ☐ |
| C | Social Sciences BCT03C1 | ☐ | ☐ | ☐ | ☐ |
| D | Language of instruction (mother tongue) BCT03D1 | ☐ | ☐ | ☐ | ☐ |
| E | Foreign languages BCT03E1 | ☐ | ☐ | ☐ | ☐ |
| F | ICT as separate subject BCT03F1 | ☐ | ☐ | ☐ | ☐ |

## Resource Materials

**4. For each of the following technology applications, indicate whether it is available and whether you need it in your school for teaching and/or learning in Grade <target grade>.**
*Please mark only one choice in each row.*

| | | 1 Available | 2 Needed but not available | 3 Not needed and not available |
|---|---|---|---|---|
| A | Equipment and hands-on materials (e.g., laboratory equipment, musical instruments, art materials, overhead projectors, slide projectors, electronic calculators) BCT04A1 | ☐ | ☐ | ☐ |
| B | Tutorial/exercise software BCT04B1 | ☐ | ☐ | ☐ |
| C | General office suite (e.g., word-processing, database, spreadsheet, presentation software) BCT04C1 | ☐ | ☐ | ☐ |
| D | Multimedia production tools (e.g., media capture and editing equipment, drawing programs, webpage/ multimedia production tools) BCT04D1 | ☐ | ☐ | ☐ |
| E | Data-logging tools BCT04E1 | ☐ | ☐ | ☐ |
| F | Simulations/modeling software/digital learning games BCT04F1 | ☐ | ☐ | ☐ |
| G | Communication software (e.g., e-mail, chat, discussion forum) BCT04G1 | ☐ | ☐ | ☐ |
| H | Digital resources (e.g., portal, dictionaries, encyclopedia) BCT04H1 | ☐ | ☐ | ☐ |
| I | Mobile devices (e.g., Personal Digital Assistant (PDA), cell phone) BCT04I1 | ☐ | ☐ | ☐ |
| J | Smart board/interactive whiteboard BCT04J1 | ☐ | ☐ | ☐ |
| K | Learning management system (e.g., web-based learning environments) BCT04K1 | ☐ | ☐ | ☐ |
| L | Mail accounts for teachers BCT04L1 | ☐ | ☐ | ☐ |
| M | Mail accounts for students BCT04M1 | ☐ | ☐ | ☐ |

## Hardware

**5. In your school, about how many computers (including laptops) are:**
*Count terminals (if they have a keyboard and a screen) as computers*
*Count laptops as computers*
*Exclude computers which are not in use*
*Exclude computers which are only used as servers*
*Exclude graphical calculators and Personal Digital Assistants (PDAs), hand-held computers and smartphones (phone integrated with PDA)*
*Please write a whole number. Write 0 (zero), if none*

☐☐☐☐ Available in the school altogether? BCT05A1
☐☐☐☐ Available to students in Grades <grade range>? BCT05B1
☐☐☐☐ Available only to teachers? BCT05C1
☐☐☐☐ Available only to administrative staff? BCT05D1
☐☐☐☐ Connected to the Internet/World Wide Web? BCT05E1
☐☐☐☐ Connected to a local area network (LAN)? BCT05F1
☐☐☐☐ Multimedia computers (equipped with a CD-ROM and/or DVD)? BCT05G1

6. **How many of the computers in your school are laptops?**
*Please write a whole number. Write 0 (zero), if none*
☐☐☐☐ Laptops BCT06A1

7. **In your school, about how many of the following (school-owned) technologies are available?**
**A Personal Digital Assistant (PDA) is a palmtop with roughly the same functionalities as a PC.**
*Please write a whole number. Write 0 (zero), if none.*

☐☐☐☐ PDAs and smartphones (phone integrated with PDA) BCT07A1
☐☐☐☐ Graphic calculators BCT07B1
☐☐☐☐ Smartboards (interactive whiteboard system) BCT07C1
☐☐☐☐ Projectors for presentation of digital materials BCT07D1

8. **In your school, about what percentage of students bring any of the following to school?**
*Please mark only one choice in each row.*

| | 1<br>Less than 10% | 2<br>10–24% | 3<br>25–49% | 4<br>50–75% | 5<br>More than 75% |
|---|---|---|---|---|---|
| PDAs/smartphones BCT08A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| Graphic calculators BCT08B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| Laptops BCT08C1 | ☐ | ☐ | ☐ | ☐ | ☐ |

**9. Where are the computers for teaching and learning in Grade <target grade> located?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Most classrooms BCT09A1 | ☐ | ☐ |
| B | Some classrooms BCT09B1 | ☐ | ☐ |
| C | Computer laboratories BCT09C1 | ☐ | ☐ |
| D | Library BCT09D1 | ☐ | ☐ |
| E | Other places BCT09E1 | ☐ | ☐ |

**10. Who is involved in the maintenance of computers in your school?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | The school's own staff BCT10A1 | ☐ | ☐ |
| B | Staff from other schools BCT10B1 | ☐ | ☐ |
| C | An external company hired by the school BCT10C1 | ☐ | ☐ |
| D | An external unit arranged by the ministry/local/regional authorities BCT10D1 | ☐ | ☐ |

## Staff Development

**11. Have teachers in your school acquired knowledge and skills in using ICT for teaching and learning in any of the following ways?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Via informal contacts/communication BCT11A1 | ☐ | ☐ |
| B | Via the ICT coordinator or technical assistant BCT11B1 | ☐ | ☐ |
| C | Via in-school courses BCT11C1 | ☐ | ☐ |
| D | Via training from a teacher who has attended a course BCT11D1 | ☐ | ☐ |
| E | Via the school's working group or committee for ICT in education BCT11E1 | ☐ | ☐ |
| F | During meetings of the teaching staff where the use of ICT/computers in education is a regular item for discussion BCT11F1 | ☐ | ☐ |
| G | Via a regular newsletter (printed or electronic) BCT11G1 | ☐ | ☐ |
| H | Via courses conducted by an external agency or expert (in the school or on distance) BCT11H1 | ☐ | ☐ |
| I | Via observation of and discussion with colleagues BCT11I1 | ☐ | ☐ |
| J | Via reading professional journals and similar publications BCT11J1 | ☐ | ☐ |

**12. For each of the following ICT-related courses, please indicate whether it is available to teachers in your school and who provides the course (inside or outside the school).**
*Please mark all that apply in each row.*
1 – checked ; 2 – not checked
For all variables

| | | Filter<br>Not available | Dependent<br>Available provider is school-based | Dependent<br>Available provider is an external organization |
|---|---|---|---|---|
| A | Introductory course for Internet use and general applications (basic word-processing, spreadsheet, databases, etc.) | BCT12A1 ☐ | BCT12A2 ☐ | BCT12A3 ☐ |
| B | Technical course for operating and maintaining computer systems | BCT12B1 ☐ | BCT12B2 ☐ | BCT12B3 ☐ |
| C | Advanced course for applications/standard tools (e.g., advanced word-processing, complex relational databases) | BCT12C1 ☐ | BCT12C2 ☐ | BCT12C3 ☐ |
| D | Advanced course for Internet use (e.g., creating websites/ developing a home page, advanced use of Internet, video conferencing) | BCT12D1 ☐ | BCT12D2 ☐ | BCT12D3 ☐ |
| E | Course on pedagogical issues related to integrating ICT into teaching and learning | BCT12E1 ☐ | BCT12E2 ☐ | BCT12E3 ☐ |
| F | Subject-specific training with learning software for s pecific content goals (e.g., tutorials, simulation, etc.) | BCT12F1 ☐ | BCT12F2 ☐ | BCT12F3 ☐ |
| G | Course on multimedia use (e.g., digital video and/or audio equipment) | BCT12G1 ☐ | BCT12G2 ☐ | BCT12G3 ☐ |

## Support Facilities for ICT

**13. Do you hold any of the following positions at your school?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Principal BCT13A1 | ☐ | ☐ |
| B | Deputy principal BCT13B1 | ☐ | ☐ |
| C | Head of department BCT13C1 | ☐ | ☐ |
| D | Teacher BCT13D1 | ☐ | ☐ |
| E | Librarian BCT13E1 | ☐ | ☐ |
| F | Other than above BCT13F1 | ☐ | ☐ |

**14. Which of the following duties do you have?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | I teach ICT courses to students. BCT14A1 | ☐ | ☐ |
| B | I teach ICT courses to teachers and other school staff. BCT14B1 | ☐ | ☐ |
| C | I teach Mathematics and/or Science. BCT14C1 | ☐ | ☐ |
| D | I teach other subjects. BCT14D1 | ☐ | ☐ |
| E | I formally serve as ICT coordinator. BCT14E1 | ☐ | ☐ |
| F | I informally serve as ICT coordinator. BCT14F1 | ☐ | ☐ |

**15. Approximately how many 60 minute periods, on average per week, do the following persons spend on providing ICT support to teachers and students at your school?**
*Note: "Support" includes any services (formal or informal, technical or pedagogical) that help teachers and students use ICT.*
*Please write a whole number. Write 0 (zero) if none.*

☐☐ Yourself BCT15A1
☐☐ ICT staff (not including yourself) BCT15B1
☐☐ Other administrators and staff (e.g., media specialist) BCT15C1
☐☐ Teachers BCT15D1
☐☐ Students from own school who are assigned to provide this service BCT15E1
☐☐ Volunteers from outside the school (e.g., parents) BCT15F1
☐☐ Personnel from external companies BCT15G1
☐☐ Others BCT15H1

**16. To what extent is technical support available in your school if teachers want to use ICT for the following activities?**

*Please mark only one choice in each row.*

| | | 1 No support | 2 Some support | 3 Extensive support | 4 Not applicable |
|---|---|---|---|---|---|
| A | Assigning extended projects (2 weeks or longer) BCT16A1 | ☐ | ☐ | ☐ | ☐ |
| B | Assigning short-task projects BCT16B1 | ☐ | ☐ | ☐ | ☐ |
| C | Assigning production projects (e.g. making models or reports) BCT16C1 | ☐ | ☐ | ☐ | ☐ |
| D | Involving students in self-accessed courses and/ or learning activities BCT16D1 | ☐ | ☐ | ☐ | ☐ |
| E | Involving students in scientific investigations (open-ended) BCT16E1 | ☐ | ☐ | ☐ | ☐ |
| F | Undertaking field study activities BCT16F1 | ☐ | ☐ | ☐ | ☐ |
| G | Using virtual laboratories, simulations BCT16G1 | ☐ | ☐ | ☐ | ☐ |
| H | Applying exercises to practice skills and procedures BCT16H1 | ☐ | ☐ | ☐ | ☐ |
| I | Involving students in laboratory experiments with clear instructions and well-defined outcomes BCT16I1 | ☐ | ☐ | ☐ | ☐ |
| J | Involving students in studying natural phenomena through simulations BCT16J1 | ☐ | ☐ | ☐ | ☐ |
| K | Involving students in processing and analyzing data BCT16K1 | ☐ | ☐ | ☐ | ☐ |

## Obstacles

17. **To what extent is your school's capacity to realize its pedagogical goals hindered by each of the following obstacles?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 Very little | 3 Somewhat | 4 To a great extent | 5 Not applicable |
|---|---|---|---|---|---|---|
| A | Insufficient qualified technical personnel to support the use of ICT BCT17A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Insufficient number of computers connected to the Internet BCT17B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Insufficient Internet bandwidth or speed BCT17C1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Lack of special ICT equipment for disabled students BCT17D1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Insufficient ICT equipment for instruction BCT17E1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Computers are out of date BCT17F1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Not enough digital educational resources for instruction BCT17G1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| H | Lack of ICT tools for science laboratory work BCT17H1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Teachers' lack of ICT skills BCT17I1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| J | Insufficient time for teachers to use ICT BCT17J1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Other obstacles** | | | | | | |
| K | Pressure to score highly on standardized tests BCT17K1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| L | Prescribed curricula are too strict BCT17L1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| M | Insufficient or inappropriate space to accommodate the school's pedagogical approaches BCT17M1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| N | Insufficient budget for non ICT-supplies (e.g., paper, pencils) BCT17N1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| O | Using ICT for teaching and learning is not a goal of our school BCT17O1 | ☐ | ☐ | ☐ | ☐ | ☐ |

18. **Do you have access to a computer at home?** BCT18A1 Filter

1 ☐ No → ***Please proceed to the end of the questionnaire.***

2 ☐ Yes → ***Please continue.***

19. **Do you use this computer for the following activities?**
*Please mark only one choice in each row.*

| | | 1<br>No | 2<br>Yes |
|---|---|---|---|
| A | School related activities BCT19A1 Dependent | ☐ | ☐ |
| B | Connecting to the internet BCT19B1 Dependent | ☐ | ☐ |

**This is the end of the questionnaire.**
**Thank you very much for your cooperation!**

[**Return Instructions**]

# Appendix D – SITES 2006 Teacher Questionnaire

D

# SITES 2006

# Second Information Technology in Education Study


## Teacher Questionnaire

(International English Version)

**This questionnaire comprises the following parts:**

**Part I:** Information about the Target Class
**Part II:** Curriculum Goals
**Part III:** Teacher Practice
**Part IV:** Student Practice
**Part V:** Learning Resources and Technology Infrastructure
**Part VI:** Impact of ICT Use
**Part VII:** Information about You and Your School
**Part VIII:** Specific Pedagogical Practice that Uses ICT




International Association for the Evaluation of Educational Achievement

## Introduction

The Second Information Technology in Education Study (SITES 2006) is an international assessment of teaching and learning practices and of how Information and Communication Technologies (ICT) support these in secondary schools around the world. Approximately 20 countries will provide information from representative samples of teachers on how they organize their teaching and learning, the ICT facilities they have available at school, how they use ICT for teaching and learning, and the obstacles or difficulties they experience in relation to these technologies. This information will give better insight into the current state of pedagogical approaches and of how technologies support them. It will also allow educational practitioners and policy-makers to gain a better understanding of areas needing intervention and additional support.

[Name of country], along with about 20 other countries, is taking part in this international study of pedagogical practices and the way that ICT supports these. This questionnaire is being administered to representative samples of teachers in these countries. The study is being conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA).

We are asking you for your help in order to determine the current state of pedagogical approaches to and the use of ICT in [Name of country]. Please try to answer each question as accurately as you can.

## Confidentiality

All information that is collected in this study will be treated confidentially. At no time will the name of any school or individual be identified. While results will be made available by country and by type of school within a country, you are guaranteed that neither your school nor any of its personnel will be identified in any report of the results of the study. [*For countries which have ethical survey guidelines which emphasize voluntary participation:* Participation in this survey is voluntary and any individual may withdraw at any time.]

## About this Questionnaire

- This questionnaire asks for information from teachers about education and policy matters related to pedagogical practices and computers. The questionnaire will take you approximately 30 minutes to complete.
- The words computers and ICT (Information and Communication Technologies) are used interchangeably in this questionnaire.
- Guidelines for answering the questions are typed in *italics*.
- Most questions can be answered by marking the one most appropriate answer. A few questions (9, 14, 15, and 16) require responses to two parts, (a) and (b). Mark one most appropriate answer for each of the two parts in each row.
- If you are completing a paper version of this questionnaire, please use a writing pen or ballpoint to write your answers.
- When you have completed this questionnaire, please [National Return Procedures and Return Date].

## Further information

- When in doubt about any aspect of the questionnaire, or if you would like more information about it or the study, you can reach us by phone at the following numbers: [National Center Contact Information]

**Thank you very much for your cooperation!**

## Subject and Target Class References

**When a question refers to the "target class", please think only about the class/course you are teaching in this school year that is specified on the cover page. You will answer all questions with reference to the teaching of the subject (domain) that is specified on the cover page in this class.**

## Part I: Information about the Target Class

**1. How many students are there in the target class?**

☐☐☐☐ BTG01A1

**2. What is the gender mix of this class?** BTG02A1

| 1 | 2 | 3 |
|---|---|---|
| All boys | All girls | Both boys and girls |
| ☐ | ☐ | ☐ |

**3. Which curriculum track is the target class in?** BTG03A1

| 1 | 2 | 3 |
|---|---|---|
| Academic | Vocational | No tracking |
| ☐ | ☐ | ☐ |

**4. Approximately what percentage of students are absent in the target class on a typical school day?** BTG04A1

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Less than 5% | 5–10% | 11–20% | More than 20% |
| ☐ | ☐ | ☐ | ☐ |

**5. Approximately what percentage of students in the target class are native speakers of the language of instruction?** BTG05A1

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| More than 90% | 76–90% | 50–75% | Less than 50% |
| ☐ | ☐ | ☐ | ☐ |

**6. How many hours of scheduled class time do you spend with the target class on Mathematics/Science lessons per week?** BTG06A1

*Please answer this questions with reference to the subject (domain) that is specified on the cover page.*

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Less than two hours | 2– 4 hrs | 5– 6 hrs | 7– 8 hrs | More than 8 hrs |
| ☐ | ☐ | ☐ | ☐ | ☐ |

**7. What proportion of students in your class has competence in the following?**
*Please mark only one choice in each row.*

| | | 1 Operation skills | 2 Nearly none | 3 Some students | 4 Majority of students | 5 Don't know |
|---|---|---|---|---|---|---|
| A | Word-processing BTG07A1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Database software BTG07B1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Spreadsheet BTG07C1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Presentation software BTG07D1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Application of multimedia BTG07E1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | E-mail BTG07F1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Internet BTG07G1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| H | Graphic calculator BTG07H1 | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Data-logging tools BTG07I1 | ☐ | ☐ | ☐ | ☐ | ☐ |

## Part II: Curriculum Goals

**8. In your teaching of the target class in this school year, how important is it for you to achieve the following goals?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 Very much |
|---|---|---|---|---|---|
| A | To prepare students for the world of work BTG08A1 | ☐ | ☐ | ☐ | ☐ |
| B | To prepare students for upper secondary education and beyond BTG08B1 | ☐ | ☐ | ☐ | ☐ |
| C | To provide opportunities for students to learn from experts and peers from other schools/ countries BTG08C1 | ☐ | ☐ | ☐ | ☐ |
| D | To provide activities which incorporate real-world examples/settings/applications for student learning BTG08D1 | ☐ | ☐ | ☐ | ☐ |
| E | To improve students' performance in assessments/examinations BTG08E1 | ☐ | ☐ | ☐ | ☐ |
| F | To increase learning motivation and make learning more interesting BTG08F1 | ☐ | ☐ | ☐ | ☐ |
| G | To individualize student learning experiences in order to address different learning needs BTG08G1 | ☐ | ☐ | ☐ | ☐ |
| H | To foster students' ability and readiness to set their own learning goals and to plan, monitor and evaluate their own progress BTG08H1 | ☐ | ☐ | ☐ | ☐ |
| I | To foster students' collaborative and organizational skills for working in teams BTG08I1 | ☐ | ☐ | ☐ | ☐ |
| J | To foster students' communication skills in face-to-face and/or online situations BTG08J1 | ☐ | ☐ | ☐ | ☐ |
| K | To satisfy parents' and the community's expectations BTG08K1 | ☐ | ☐ | ☐ | ☐ |
| L | To prepare students for competent ICT use BTG08L1 | ☐ | ☐ | ☐ | ☐ |
| M | To prepare students for responsible Internet behavior (e.g., not to commit mail-bombing, etc.) and/or to cope with cybercrime (e.g., Internet fraud, illegal access to secure information, etc.) BTG08M1 | ☐ | ☐ | ☐ | ☐ |

## Part III: Teacher Practice

**9. In your teaching of the target class in this school year,**
**(a) How often is the scheduled learning time of the class used for the following activities?**
**(b) Has ICT been used when these activities took place?**
*Please mark only one choice for each of the two parts in each row.*

| | | (a) How often is the scheduled learning time used for the following activities? | | | | (b) ICT used? | |
|---|---|---|---|---|---|---|---|
| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always | 1 No | 2 Yes |
| A | Extended projects (2 weeks or longer) BTG09A1/BTG09A2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Short-task projects BTG09B1/BTG09B2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Product creation (e.g., making a model or a report) BTG09C1/BTG09C2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Self-accessed courses and/or learning activities BTG09D1/BTG09D2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Scientific investigations (open-ended) BTG09E1/ BTG09E2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Field study activities BTG09F1/BTG 09F2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Teacher's lectures BTG09G1/BTG09G2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| H | Exercises to practice skills and procedures BTG09H1/ BTG09H2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Laboratory experiments with clear instructions and well-defined outcomes BTG09I1/BTG0912 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| J | Discovering mathematics principles and concepts BTG09J1/BTG 09J2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| K | Studying natural phenomena through simulations BTG09K1/BTG09K2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| L | Looking up ideas and information BTG09L1/BTG 09L2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| M | Processing and analyzing data BTG09M1/BTG 09M2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**10. When I am instructing students in the target class (excluding field trips), they are:**

BTG10A1

*Please mark only one choice.*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Always in the same location with me | Sometimes in locations away from me | Often in locations way from me | Always in locations away from me |
| ☐ | ☐ | ☐ | ☐ |

**11. When students in the target class participate in planned learning activities, they:**

BTG11A1

*Please mark only one choice.*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Always work in the same location | Sometimes work in ifferent locations | Often work in different locations | Always work in different locations |
| ☐ | ☐ | ☐ | ☐ |

**12. The learning activities for students in the target class are planned so that these take place:**

BTG12A1

*Please mark only one choice.*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Always during scheduled school hours | Sometimes outside scheduled school hours | Often outside scheduled school hours | At any time (no scheduled school hours) |
| ☐ | ☐ | ☐ | ☐ |

**13. I provide feedback to students in the target class:**

BTG13A1

*Please mark only one choice.*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Always during school hours | Sometimes outside scheduled school hours | Often outside scheduled school hours | At any time (no scheduled school hours) |
| ☐ | ☐ | ☐ | ☐ |

**14. In your teaching of the target class in this school year:**
**(a) How often do you conduct the following?**
**(b) Do you use ICT for these activities?**
*Please mark only one choice for each of the two parts in each row.*

| | | (a) How often do you conduct the following? | | | | (b) ICT used? | |
|---|---|---|---|---|---|---|---|
| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always | 1 No | 2 Yes |
| A | Present information/demonstrations and/or give class instructions BTG14A1/ BTG14A2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Provide remedial or enrichment instruction to individual students and/or small groups of students BTG14B1/BTG14B2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Help/advise students in exploratory and inquiry activities BTG14C1/ BTG14C2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Organize, observe or monitor student-led whole-class discussions, demonstrations, presentations BTG14D1/ BTG14D2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Assess students' learning through tests/ quizzes BTG14E1/ BTG14E2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Provide feedback to individuals and/or small groups of students BTG14F1/BTG14F2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Use classroom management to ensure an orderly, attentive classroom BTG14G1/BTG 14G2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| H | Organize, monitor and support team-building and collaboration among students BTG14H1/ BTG14H2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Organize and/or mediate communication between students and experts/external mentors BTG14I1/BTG14I2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| J | Liaise with collaborators (within or outside school) for student collaborative activities BTG14J1/ BTG14J2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| K | Provide counseling to individual students BTG14K1/ BTG14K2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| L | Collaborate with parents/guardians/ caretakers in supporting/monitoring students' learning and/or in providing counseling BTG14L1/ BTG14L2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**15. In your teaching of the target class in this school year:**
**(a) Do you use the following methods of assessing student performance?**
**(b) Do you use ICT to carry out these assessments?**
*Please mark only one choice for each of the two parts in each row.*

| | | (a) Assessment method used? | | (b) ICT used? | |
|---|---|---|---|---|---|
| | | 1 No | 2 Yes | 1 No | 2 Yes |
| A | Written test/examination BTG15A1/BTG15A2 | ☐ | ☐ | ☐ | ☐ |
| B | Written task/exercise BTG15B1/BTG15B2 | ☐ | ☐ | ☐ | ☐ |
| C | Individual oral presentation BTG15C1/BTG15C2 | ☐ | ☐ | ☐ | ☐ |
| D | Group presentation (oral/written) BTG15D1/BTG15D2 | ☐ | ☐ | ☐ | ☐ |
| E | Project report and/or (multimedia) product BTG15E1/BTG15E2 | ☐ | ☐ | ☐ | ☐ |
| F | Students' peer evaluations BTG15F1/ BTG15F2 | ☐ | ☐ | ☐ | ☐ |
| G | Portfolio/learning log BTG15G1/BTG15G2 | ☐ | ☐ | ☐ | ☐ |
| H | Assessment of group performance on collaborative tasks BTG15H1/ BTG15H2 | ☐ | ☐ | ☐ | ☐ |

## Part IV: Student Practice

**16. In your teaching of the target class in this school year**
**(a) How often do your students engage in the following activities?**
**(b) Do your students use ICT for these activities?**
*Please mark only one choice for each of the two parts in each row.*

| | | (a) How often do your students engage in the following? | | | | (b) ICT used? | |
|---|---|---|---|---|---|---|---|
| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always | 1 No | 2 Yes |
| A | Students working on the same learnings materials at the same pace and/or sequence BTG10A1/BTG16A2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Students learning and/or working during lessons at their own pace BTG16B1/BTG16B2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Complete worksheets, exercises BTG16C1/BTG16C2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Give presentations BTG16D1/BTG16D2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Determine own content goals for s learning (e.g., theme/topic for project) BTG16E1/ BTG 16E2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Explain and discuss own ideas with s teacher and peers BTG16F1/BTG16F2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Collaborate with peers from other schools within and/or outside the country BTG16G1/ BTG 16G2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| H | Answer tests or respond to evaluations BTG16H1/ BTG 16H2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Self and/or peer evaluation BTG16I1/ BTG 16I2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| J | Reflect on own learning experience s review (e.g., writing a learning log) and adjust own learning strategy BTG16J1/BTG 16J2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| K | Communicate with outside parties s (e.g., with experts) BTG16K1/BTG16K2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| L | Contribute to the community through their own learning activities (e.g., by conducting an environmental protection project) BTG16L1/ BTG16L2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

## Part V: Learning Resources and Tools

**17. How often do you incorporate the following in your teaching of the target class in this school year?**
*Please mark only one choice in each row.*

| | | 1 Never | 2 Sometimes | 3 Often | 4 Nearly always |
|---|---|---|---|---|---|
| A | Equipment and hands-on materials (e.g., laboratory equipment, musical instruments, art materials, overhead projectors, slide projectors, electronic calculators) BTG17A1 | ☐ | ☐ | ☐ | ☐ |
| B | Tutorial/exercise software BTG17B1 | ☐ | ☐ | ☐ | ☐ |
| C | General office suite (e.g., word-processing, database, spreadsheet, presentation software) BTG17C1 | ☐ | ☐ | ☐ | ☐ |
| D | Multimedia production tools (e.g., media capture and editing equipment, drawing programs, webpage/multimedia production tools) BTG17D1 | ☐ | ☐ | ☐ | ☐ |
| E | Data-logging tools BTG17E1 | ☐ | ☐ | ☐ | ☐ |
| F | Simulations/modeling software/digital learning games BTG17F1 | ☐ | ☐ | ☐ | ☐ |
| G | Communication software (e.g., e-mail, chat, discussion forum) BTG17G1 | ☐ | ☐ | ☐ | ☐ |
| H | Digital resources (e.g., portal, dictionaries, encyclopedia) BTG17H1 | ☐ | ☐ | ☐ | ☐ |
| I | Mobile devices (e.g., Personal Digital Assistant (PDA), cell phone) BTG17I1 | ☐ | ☐ | ☐ | ☐ |
| J | Smart board/interactive whiteboard BTG17J1 | ☐ | ☐ | ☐ | ☐ |
| K | Learning management system (e.g., web-based learning environments) BTG17K1 | ☐ | ☐ | ☐ | ☐ |

## Part VI: Impact of ICT Use

**18. Do you use ICT in the teaching and learning activities of the target class?**
BTG18A1 Filter

1 ☐ No → ***Please go to question 21.***
2 ☐ Yes → ***Please continue.***

**19. To what extent do you agree that the use of ICT has had the following impacts on you?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot |
|---|---|---|---|---|---|
| A | My ICT skills have improved. BTG19A1 Dependent | ☐ | ☐ | ☐ | ☐ |
| B | I incorporate new teaching methods. BTG19B1 Dependent | ☐ | ☐ | ☐ | ☐ |
| C | I provide more individualized feedback to students. BTG19C1 Dependent | ☐ | ☐ | ☐ | ☐ |
| D | I incorporate new ways of organizing student learning. BTG19D1 Dependent | ☐ | ☐ | ☐ | ☐ |
| E | I monitor more easily students' learning progress. BTG19E1 Dependent | ☐ | ☐ | ☐ | ☐ |
| F | I access more diverse/higher quality learning resources. BTG19F1 Dependent | ☐ | ☐ | ☐ | ☐ |
| G | I collaborate more with colleagues within my school. BTG19G1 Dependent | ☐ | ☐ | ☐ | ☐ |
| H | I collaborate more with peers and experts outside my school. BTG19H1 Dependent | ☐ | ☐ | ☐ | ☐ |
| I | I complete my administrative tasks more easily. BTG19I1 Dependent | ☐ | ☐ | ☐ | ☐ |
| J | My workload has increased. BTG19J1 Dependent | ☐ | ☐ | ☐ | ☐ |
| K | There is increased work pressure. BTG19K1 Dependent | ☐ | ☐ | ☐ | ☐ |
| L | I have become less effective as a teacher. BTG19L1 Dependent | ☐ | ☐ | ☐ | ☐ |

**20. To what extent has the use of ICT impacted your students in the target class in the following areas?**
*Please mark only one choice in each row.*

| | | 1 Decreased a lot | 2 Decreased a little | 3 No impact | 4 Increased a little | 5 Increased a lot |
|---|---|---|---|---|---|---|
| A | Subject matter knowledge BTG20A1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| B | Learning motivation BTG20B1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| C | Information-handling skills BTG20C1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| D | Problem-solving skills BTG20D1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| E | Self-directed learning skills BTG20E1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| F | Collaborative skills BTG20F1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| G | Communication skills BTG20G1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| H | ICT skills BTG20H1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| I | Ability to learn at their own pace BTG20I1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| J | Self esteem BTG20J1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| K | Achievement gap among students BTG20K1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| L | Time spent on learning BTG20L1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| M | School attendance BTG20M1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| N | Assessment results BTG20N1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |
| O | Digital divide (i.e., inequity between students from different socioeconomic backgrounds) BTG20O1 Dependent | ☐ | ☐ | ☐ | ☐ | ☐ |

## Part VII: Information about You and Your School

**21. To what extent are you confident in accomplishing the following?**
*Please mark only one choice in each row.*

**General use of ICT**

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot |
|---|---|---|---|---|---|
| A | I can produce a letter using a word-processing program. BTG21A1 | ☐ | ☐ | ☐ | ☐ |
| B | I can e-mail a file (e.g., the notes of a meeting) to a colleague. BTG21B1 | ☐ | ☐ | ☐ | ☐ |
| C | I can take photos and show them on the computer. BTG21C1 | ☐ | ☐ | ☐ | ☐ |
| D | I can file electronic documents in folders and sub-folders on the computer. BTG21D1 | ☐ | ☐ | ☐ | ☐ |
| E | I can use a spreadsheet program for budgeting or student administration. BTG21E1 | ☐ | ☐ | ☐ | ☐ |
| F | I can share knowledge and experiences with others in a discussion forum/user group on the Internet. BTG21F1 | ☐ | ☐ | ☐ | ☐ |
| G | I can produce presentations with simple animation functions. BTG21G1 | ☐ | ☐ | ☐ | ☐ |
| H | I can use the Internet for online purchases and payments. BTG21H1 | ☐ | ☐ | ☐ | ☐ |
| | **Pedagogical Use of ICT** | | | | |
| I | I can prepare lessons that involve the use of ICT by students. BTG21I1 | ☐ | ☐ | ☐ | ☐ |
| J | I know which teaching/learning situations are suitable for ICT use. BTG21J1 | ☐ | ☐ | ☐ | ☐ |
| K | I can find useful curriculum resources on the Internet. BTG21K1 | ☐ | ☐ | ☐ | ☐ |
| L | I can use ICT for monitoring students' progress and evaluating learning outcomes. BTG21L1 | ☐ | ☐ | ☐ | ☐ |
| M | I can use ICT to give effective presentations/ explanations. BTG21M1 | ☐ | ☐ | ☐ | ☐ |
| N | I can use ICT for collaboration with others. BTG21N1 | ☐ | ☐ | ☐ | ☐ |
| O | I can install educational software on my computer. BTG21O1 | ☐ | ☐ | ☐ | ☐ |
| P | I can use the Internet (e.g., select suitable websites, user groups/discussion forums) to support student learning. BTG21P1 | ☐ | ☐ | ☐ | ☐ |

**22. Looking ahead to the coming two years, what priority will you give to the use of ICT in enhancing your teaching practice in the following areas?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 Low priority | 3 Medium priority | 4 High priority |
|---|---|---|---|---|---|
| A | To monitor more effectively the progress of my students BTG22A1 | ☐ | ☐ | ☐ | ☐ |
| B | To provide exercises to students in order to practice skills and procedures BTG22B1 | ☐ | ☐ | ☐ | ☐ |
| C | To provide better and more interesting lectures/ presentations to my students BTG22C1 | ☐ | ☐ | ☐ | ☐ |
| D | To engage students in multimedia production projects BTG22D1 | ☐ | ☐ | ☐ | ☐ |
| E | To provide more activities that address the individual differences among my students BTG22E1 | ☐ | ☐ | ☐ | ☐ |
| F | To involve students in collaborative, short projects (2 weeks or shorter) BTG22F1 | ☐ | ☐ | ☐ | ☐ |
| G | To involve students in extended collaborative projects (longer than 2 weeks) BTG22G1 | ☐ | ☐ | ☐ | ☐ |
| H | To involve my students in scientific investigations (involving laboratory work) BTG22H1 | ☐ | ☐ | ☐ | ☐ |
| I | To provide more opportunities for my students to collaborate with or learn from people outside of their classroom, including peers and external experts BTG22I1 | ☐ | ☐ | ☐ | ☐ |
| J | To collaborate more with fellow teachers and others within and outside my school BTG22J1 | ☐ | ☐ | ☐ | ☐ |
| K | To provide more opportunities for my students to collaborate with their classmates BTG22K1 | ☐ | ☐ | ☐ | ☐ |
| L | To arrange self-accessed activities for my students BTG22L1 | ☐ | ☐ | ☐ | ☐ |

**23. Do you experience the following obstacles in using ICT in your teaching?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | ICT is not considered to be useful in my school. BTG23A1 | ☐ | ☐ |
| B | My school does not have the required ICT infrastructure. BTG23B1 | ☐ | ☐ |
| C | I do not have the required ICT-related skills. BTG23C1 | ☐ | ☐ |
| D | I do not have the necessary ICT-related pedagogical skills. BTG23D1 | ☐ | ☐ |
| E | I do not have sufficient confidence to try new approaches alone. BTG23E1 | ☐ | ☐ |
| F | My students do not possess the required ICT skills. BTG23F1 | ☐ | ☐ |
| G | My students do not have access to the required ICT tools outside of the school premises. BTG23G1 | ☐ | ☐ |
| H | I do not have the time necessary to develop and implement the activities. BTG23H1 | ☐ | ☐ |
| I | I do not know how to identify which ICT tools will be useful. BTG23I1 | ☐ | ☐ |
| J | My school lacks digital learning resources. BTG23J1 | ☐ | ☐ |
| K | I do not have the flexibility to make my own decisions when planning lessons with ICT. BTG23K1 | ☐ | ☐ |
| L | I do not have access to ICT outside of the school. BTG23L1 | ☐ | ☐ |

**24. Have you participated in any of the following professional development activities? If no, would you wish to attend?**
*Please mark only one choice in each row.*

| | | 1 No, I do not wish to attend | 2 No, I would like to attend if available | 3 Yes, I have |
|---|---|---|---|---|
| A | Introductory course for Internet use and general applications (e.g., basic word-processing, spreadsheets, databases, etc.) BTG24A1 | ☐ | ☐ | ☐ |
| B | Technical course for operating and maintaining computer systems BTG24B1 | ☐ | ☐ | ☐ |
| C | Advanced course for applications/standard tools (e.g., advanced word-processing, complex relational databases) BTG24C1 | ☐ | ☐ | ☐ |
| D | Advanced course for Internet use (e.g., creating websites/developing a home page, advanced use of the Internet, video conferencing) BTG24D1 | ☐ | ☐ | ☐ |
| E | Course on pedagogical issues related to integrating ICT into teaching and learning BTG24E1 | ☐ | ☐ | ☐ |
| F | Subject-specific training with learning software for specific content goals (e.g., tutorials, simulation, etc.) BTG24F1 | ☐ | ☐ | ☐ |
| G | Course on multimedia operations (e.g., using digital video and/or audio equipment) BTG24G1 | ☐ | ☐ | ☐ |

**25. To what extent do the following statements about school vision apply to the staff in your school?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot |
|---|---|---|---|---|---|
| A | We discuss what we want to achieve through our lessons. BTG25A1 | ☐ | ☐ | ☐ | ☐ |
| B | Teachers are constantly motivated to critically assess their own educational practices. BTG25B1 | ☐ | ☐ | ☐ | ☐ |
| C | Teachers are expected to think about the school's vision and strategies with regard to educational practices. BTG25C1 | ☐ | ☐ | ☐ | ☐ |

**26. To what extent do the following statements about teachers' participation in decision-making apply to you?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot |
|---|---|---|---|---|---|
| A | I can influence the development of the school's innovation implementation plans. BTG26A1 | ☐ | ☐ | ☐ | ☐ |
| B | When implementing innovations, our school considers teachers' opinions and adjusts its action plan as needed. BTG26B1 | ☐ | ☐ | ☐ | ☐ |
| C | I am able to implement innovations in my classroom according to my own judgment and insights. BTG26C1 | ☐ | ☐ | ☐ | ☐ |

**27. To what extent do the following statements about professional collaboration among teachers apply to you?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot |
|---|---|---|---|---|---|
| A | I co-teach with my colleagues. BTG27A1 | ☐ | ☐ | ☐ | ☐ |
| B | I discuss the problems that I experience at work with my colleagues. BTG27B1 | ☐ | ☐ | ☐ | ☐ |
| C | I work with teachers in other schools on collaborative activities. BTG27C1 | ☐ | ☐ | ☐ | ☐ |
| D | I work with teachers in other countries on collaborative activities. BTG27D1 | ☐ | ☐ | ☐ | ☐ |

**28. To what extent do the following statements about support to teachers apply to you?**
*Please mark only one choice in each row.*

| | | 1 Not at all | 2 A little | 3 Somewhat | 4 A lot |
|---|---|---|---|---|---|
| A | When necessary, I receive sufficient technical support from my school/region/state (e.g., by having a technician in my classes) to support my teaching. BTG28A1 | ☐ | ☐ | ☐ | ☐ |
| B | My students can access computers easily outside scheduled class time without my help. BTG28B1 | ☐ | ☐ | ☐ | ☐ |
| C | The administrative work arising from the use of ICT in my teaching (e.g., booking computer laboratories, changing class schedules) is easy to do in my school. BTG28C1 | ☐ | ☐ | ☐ | ☐ |

**29. Do you have access to a computer at home?**
BTG29A1 Filter

1 ☐ No → Please go to question 31.
2 ☐ Yes → Please continue.

**30. Do you use this computer for the following activities?**
*Please mark only one choice in each row.*

| | | 1 No | 2 Yes |
|---|---|---|---|
| A | Teaching related activities BTG30A1 Dependent | ☐ | ☐ |
| B | Connecting to the internet BTG30B1 Dependent | ☐ | ☐ |

**31. To what age group do you belong?**
BTG31A1

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Below 25 | 25–29 | 30–39 | 40–49 | 50–59 | 60 or above |
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**32. What is your gender?**
BTG32A1

| 1 | 2 |
|---|---|
| Male | Female |
| ☐ | ☐ |

**33. What is your highest level of education?**

BTG33A1

*Please mark only one choice.*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Secondary or high school | Post-secondary education (e.g., teachers college) | Bachelor's degree | Master's degree or above |
| ☐ | ☐ | ☐ | ☐ |

**34. Do you have a Bachelor's degree in Science or Mathematics?**

BTG34A1

*Please mark only one choice.*

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| No | Degree in Mathematics only | Degree in Science Science only | Degree in both Mathematics and Science |
| ☐ | ☐ | ☐ | ☐ |

**35. Do you have a teaching license or certificate?**

BTG35A1

| 1 | 2 |
|---|---|
| No | Yes |
| ☐ | ☐ |

**36. How many years of experience do you have in teaching Mathematics or Science?**

BTG36A1

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Less than 2 years | 2–4 years | 5– 9 years | 10–19 years | 20 years or more |
| ☐ | ☐ | ☐ | ☐ | ☐ |

## Part VIII: Specific Pedagogical Practice that Uses ICT

**37. Which of the following description is applicable to you?**

BTG37A1 Filter

*Please mark only one choice.*

1 ☐ I use ICT once a week or more in the target class. → Please continue.

2 ☐ I use ICT extensively in the target class during a limited period during the year (e.g., in a project or a theme) → ***Please continue.***

3 ☐ None of the above → ***Please go to the end of the questionnaire.***

**38. Please describe the one most satisfying pedagogical practice (that you applied in the target class) in this school year, in which you and/or your students used ICT extensively with specific content related to mathematics/science.**

BTG38AT Dependent

*Please describe the pedagogical practice (e.g., a research project or a multimedia production), the ICT used (e.g., data logging tools, spreadsheets or web search) and its content (e.g., curricular goals; topic) in a maximum of 20 words.*

_____

_____

_____

_____

**39. Has the use of ICT in this pedagogical practice contributed to changes in the following students' outcomes in the target class:**

*Please mark only one choice in each row.*

| | | 1 Decreased | 2 Made no difference | 3 Increased |
|---|---|---|---|---|
| A | Subject-matter knowledge mastery BTG39A1 Dependent | ☐ | ☐ | ☐ |
| B | ICT skills BTG39B1 Dependent | ☐ | ☐ | ☐ |
| C | Learning motivation BTG39C1 Dependent | ☐ | ☐ | ☐ |
| D | Ability to learn at own pace BTG39D1 Dependent | ☐ | ☐ | ☐ |
| E | Communication skills BTG39E1 Dependent | ☐ | ☐ | ☐ |
| F | Information-handling skills BTG39F1 Dependent | ☐ | ☐ | ☐ |
| G | Collaborative skills BTG39G1 Dependent | ☐ | ☐ | ☐ |
| H | Self-directed learning skills BTG39H1 Dependent | ☐ | ☐ | ☐ |
| I | Problem-solving skills BTG39I1 Dependent | ☐ | ☐ | ☐ |
| J | Achievement gap among students BTG39J1 Dependent | ☐ | ☐ | ☐ |
| K | Self esteem BTG39K1 Dependent | ☐ | ☐ | ☐ |

**40. Has the use of ICT in this pedagogical practice contributed to changes in the following aspects of your teaching of the target class:**
*Please mark only one choice in each row.*

| | | 1 Decreased | 2 Made no difference | 3 Increased |
|---|---|---|---|---|
| A | Quality of coaching students BTG40A1 Dependent | ☐ | ☐ | ☐ |
| B | Time available to help individual students BTG40B1 Dependent | ☐ | ☐ | ☐ |
| C | Time needed to solve technical problems BTG40C1 Dependent | ☐ | ☐ | ☐ |
| D | Time needed for preparation BTG40D1 Dependent | ☐ | ☐ | ☐ |
| E | Quality of instructions given to students BTG40E1 Dependent | ☐ | ☐ | ☐ |
| F | Time needed for classroom management BTG40F1 Dependent | ☐ | ☐ | ☐ |
| G | Quality of classroom discussion BTG40G1 Dependent | ☐ | ☐ | ☐ |
| H | Collaboration between students BTG40H1 Dependent | ☐ | ☐ | ☐ |
| I | Communication with the outside world BTG40I1 Dependent | ☐ | ☐ | ☐ |
| J | Availability of new learning content BTG40J1 Dependent | ☐ | ☐ | ☐ |
| K | Variety of learning resources/materials BTG40K1 Dependent | ☐ | ☐ | ☐ |
| L | Variety of learning activities BTG40L1 Dependent | ☐ | ☐ | ☐ |
| M | Adaptation to individual needs of students BTG40M1 Dependent | ☐ | ☐ | ☐ |
| N | Amount of effort needed to motivate students BTG40N1 Dependent | ☐ | ☐ | ☐ |
| O | Insight into the progress of student performance BTG40O1 Dependent | ☐ | ☐ | ☐ |
| P | Self-confidence BTG40P1 Dependent | ☐ | ☐ | ☐ |

**41. In this pedagogical practice, who was the main actor in initiating the following aspects of teaching and learning:**

*Please mark only one choice in each row.*

*NA: Not applicable for this specific pedagogical practice*

| | | 1 Teacher | 2 Students | 3 NA |
|---|---|---|---|---|
| A | Determining content BTG41A1 Dependent | ☐ | ☐ | ☐ |
| B | Determining learning goals BTG41B1 Dependent | ☐ | ☐ | ☐ |
| C | Getting started BTG41C1 Dependent | ☐ | ☐ | ☐ |
| D | Organizing grouping BTG41D1 Dependent | | | |
| E | Choosing learning resources/materials BTG41E1 Dependent | ☐ | ☐ | ☐ |
| F | Deciding on the location of learning BTG41F1 Dependent | ☐ | ☐ | ☐ |
| G | Planning of time BTG41G1 Dependent | ☐ | ☐ | ☐ |
| H | Deciding on the time needed for learning BTG41H1 Dependent | ☐ | ☐ | ☐ |
| I | Deciding on when to take a test BTG41I1 Dependent | ☐ | ☐ | ☐ |
| J | Demonstrating learning achievement BTG41J1 Dependent | ☐ | ☐ | ☐ |
| K | Monitoring progress BTG41K1 Dependent | ☐ | ☐ | ☐ |
| L | Providing feedback BTG41L1 Dependent | ☐ | ☐ | ☐ |
| M | Choosing learning activities/ strategies BTG41M1 Dependent | ☐ | ☐ | ☐ |

**This is the end of the questionnaire.**
**Thank you very much for your time and effort!**

[**Return Instructions**].

# Appendix E – Characteristics of the Australian Sample



## E.1 Australia – Characteristics of National Sample

- School level exclusions consisted of all non-mainstream schools, e.g., correctional schools, hospital schools, environmental schools, distance education schools, language support centers, non-English curriculum schools and special schools.
- Explicit stratification by region (Tasmania, Continent) and school size.
- Implicit stratification by state (for 'Continent') and school type (Government, Catholic, Independent), for a total of 100 implicit strata.

*Table E.1 Allocation of School Sample in Australia*

| Explicit Stratum | Total Sampled Schools | Ineligible Schools | Requirements Not Met | Participating Schools | | | Non Participating Schools |
|---|---|---|---|---|---|---|---|
| | | | | *Sampled* | *1st Replacement* | *2nd Replacement* | |
| Tasmania – (Very) Large Schools | 7 | 0 | 0 | 3 | 2 | 0 | 2 |
| Tasmania – Medium Size Schools | 8 | 0 | 0 | 6 | 0 | 0 | 2 |
| Tasmania – (Very) Small Schools | 15 | 0 | 2 | 5 | 1 | 1 | 6 |
| Continent – Very Large Schools | 54 | 0 | 0 | 26 | 7 | 7 | 14 |
| Continent – Large Schools | 60 | 0 | 0 | 33 | 12 | 5 | 10 |
| Continent – Medium Size Schools | 65 | 0 | 1 | 32 | 19 | 3 | 10 |
| Continent – Small Schools | 72 | 0 | 1 | 24 | 17 | 10 | 20 |
| Continent – Very Small Schools | 135 | 0 | 4 | 44 | 34 | 10 | 43 |
| **Total** | **416** | **0** | **8** | **173** | **92** | **36** | **107** |

## E.2 Australia – Sample Implementation

Australian data did not undergo a formal sampling adjudication process. However, some participation statistics can be given here.

### *E.2.1 Exclusion Rates*

- School exclusion rate: 0.4%;
- Mathematics teacher exclusion rate: 0.3%;
- Science teacher exclusion rate: 0.3%.

### *E.2.2 Participation Rates*

*Table E.2 Participation Rates in Australia*

| | un-weighted | weighted |
|---|---|---|
| School participation rate before replacement | 41.6% | 38.9% |
| School participation rate after replacement | 72.4% | 70.7% |
| Mathematics teacher participation rate | 83.9% | 84.0% |
| Science teacher participation rate | 85.9% | 86.2% |
| School principal participation rate | 84.4% | 85.5% |
| ICT coordinator participation rate | 87.4% | 86.8% |