SURVEY OF SCHOOLS: ICT in Education

SMART 2010/0039

CONTENTS

Overview of the Study Design

This study collected data from schools (school heads), classrooms (teachers), and students at ISCED[1] level 1 (primary level of education), ISCED level 2 (lower secondary level of education) and ISCED level 3 (upper secondary level of education). Due to financial, technical and time constraints, no student questionnaire has been administered at ISCED level 1.

The international sample design framework for ESSIE is a stratified two-stage cluster sample design.

- In a first stage, the schools has been stratified, explicitly and/or implicitly, and selected with probabilities according to their size. Replacement schools have been identified in advance to compensate for school refusal.
- In a second stage, one classroom has been randomly selected within the sampled and participating schools, and all the students in the selected classroom surveyed. Classrooms were selected with equal probabilities within schools.

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[1] ISCED is the International Standard Classification in Education (ISCED-97) adopted in 1997 by the UNESCO General Conference.

Table 1: Overview of the Study design

		ISCED1	ISCED2	ISCED3 ACADEMIC	ISCED3 VOCATIONAL
Schools	Schools	N=300	N=300	N=300	N=300
	Head of Teachers	N=300	N=300	N=300	N=300
		Head of Teachers Questionnaire	Head of Teachers Questionnaire	Head of Teachers Questionnaire	Head of Teachers Questionnaire
Classrooms Within Schools	Classrooms	N=1	N=1	N=1	N=1
	Teachers	N=1	N=3	N=3	N=3
		Teacher Questionnaire	Teacher Questionnaire	Teacher Questionnaire	Teacher Questionnaire
Students Within classrooms and schools		N=0	N=All students in sampled classroom	N=All students in sampled classroom	N=All students in sampled classroom
		No student questionnaire	Student questionnaire	Student questionnaire	Student questionnaire

This sampling procedure has been applied at ISCED level 1, 2 and 3 academic and vocational (see Table 1). For small countries with less than 300 schools, all schools have been sampled.

At the classroom-level, a teacher questionnaire has been filled out at ISCED level 1 by the teacher who has the main responsibility of the class. At ISCED level 2 and 3, the teacher questionnaire was filled out by three teachers (a Science, Mathematics and Language teacher – L1 not foreign languages).

At the school-level, a School heads' questionnaire is completed by the school principal.

Sampling Design

TARGET POPULATIONS

STUDENT TARGET POPULATIONS

Unlike the two previous surveys[2] on ICT, the SMART (renamed ESSIE) survey has a student questionnaire component and therefore it raises the question of defining the student target populations. It would have been inappropriate and moreover unfeasible to sample students across all grades present in a particular school.

For this study, the international student target populations have been defined as follows:

1. ISCED 1 Level: all students enrolled in the grade that represents four years of schooling, counting from the first year of ISCED Level 1, providing the mean age at the time of the testing is at least 9.5 years.
2. ISCED 2 Level: all students enrolled in the grade that represents eight years of schooling, counting from the first year of ISCED Level 1, providing the mean age at the time of the testing is at least 13.5 years.
3. ISCED 3 Level academic: all students enrolled in an academic track that represents eleven years of schooling, counting from the first year of ISCED Level 1, providing the mean age at the time of the testing is at least 16.5 years.
4. ISCED 3 Level vocational: all students enrolled in a prevocational or vocational track that represents eleven years of schooling, counting from the first year of ISCED Level 1, providing the mean age at the time of the testing is at least 16.5 years.

Thus, four different student populations need to be identified in each country. In most countries, these will be grade 4 (ISCED level 1), grade 8 (ISCED level 2), grade 11 academic (ISCED level 3), and grade 11 vocational (ISCED level 3). Note that we include an age restriction in the definition. In some countries, students may start primary education at an earlier age than in other countries. Therefore, we require students to have a minimum mean age to ensure that we are testing students at an age when they are developmentally ready. Differences between countries in school entry age may result in differences in target grades between countries. The target grades for each country are presented in table 2:

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[2] eEurope 2002 and eEurope 2005

Table 2: Target grade by country and by level of education

	ISCED 1		ISCED 2		ISCED 3		Comment
	Target grade	Min mean age	Target grade	Min mean age	Target grade	Min mean age	
Austria	4	9.5	8	13.5	11	16.5	
Belgium	4	9.5	8	13.5	11	16.5	
Bulgaria	4	9.5	8	13.5	12	17.5	
Croatia	4	9.5	8	13.5	11	16.5	
Cyprus	4	9.5	8	13.5	11	16.5	
Czech Rep.	4	9.5	8	13.5	11	16.5	
Denmark	4	9.5	8	13.5	12	17.5	Grade 11 is either ISCED2 or ISCED3
Estonia	4	10.5	8	14.5	11	17.5	
Finland	4	10.5	8	14.5	11	17.5	
France	4	9.5	9	14.5	11	16.5	
Germany	4	9.5	8	13.5	11	16.5	
Greece	4	9.5	8	13.5	11	16.5	
Hungary	4	9.5	8	13.5	12	17.5	Grade 11 is either ISCED2 or ISCED3
Iceland	4	9.5	8	13.5	11	16.5	
Ireland	4	9.5	8	13.5	11	16.5	
Italy	4	9.5	8	13.5	11	16.5	
Latvia	4	10.5	8	14.5	11	17.5	
Lithuania	4	10.5	8	14.5	11	17.5	
Luxembourg	4	9.5	8	13.5	11	16.5	
Malta	5	9.5	9	13.5	12	16.5	First grade of compulsory primary school is earlier and is ISCED0
Netherlands	5	9.5	9	13.5	12	16.5	First grade of compulsory primary school is earlier and is ISCED0
Norway	4	9.5	8	13.5	11	16.5	
Poland	4	10.5	8	14.5	11	17.5	
Portugal	4	9.5	8	13.5	11	16.5	
Romania	4	9.5	8	13.5	11	16.5	
Slovakia	4	9.5	8	13.5	11	16.5	
Slovenia	4	9.5	8	13.5	11	16.5	
Spain	4	9.5	8	13.5	11	16.5	We suggest to exclude artistic education due to ISCED level shift in this program
Sweden	4	10.5	8	14.5	11	17.5	
Turkey	4	9.5	8	13.5	11	16.5	
UK England	5	9.5	9	13.5	12	16.5	First grade of compulsory primary school is earlier
UK Wales	5	9.5	9	13.5	12	16.5	First grade of compulsory primary school is earlier
UK North. Ireland	6	9.5	10	13.5	13	16.5	
UK Scotland	5	9.5	9	13.5	12	16.5	First grade of compulsory primary school is earlier

In this report, we will use the general labels 'ISCED1', 'ISCED2', 'ISCED3A' and 'ISCED3B' to describe the target grades.

SCHOOL TARGET POPULATIONS

Schools eligible for ESSIE are schools that are under the authority of the Ministry of Education including target grade students.

The definition of the school target population is derived from the definition of the student target populations, i.e.

1. ISCED 1: all schools with students enrolled in the selected ISCED 1 target grade (i.e. grade 4 in most cases);
2. ISCED 2: all schools with students enrolled in the selected ISCED 2 target grade (i.e. grade 8 in most cases);
3. ISCED 3 academic: all schools with students enrolled in an academic track in the ISCED 3 target grade, (i.e. grade 11 in most cases);
4. ISCED 3 vocational: all schools with students enrolled in a prevocational or vocational track in the ISCED 3 selected grade (i.e. grade 11 in most cases).

In a few countries (i.e. Spain, Lithuania and Slovakia), the proposed ISCED 2 target grade counts pre-vocational or vocational students. In this study, academic and vocational tracks at ISCED 2 have been merged. The alternative would have been to associate these ISCED 2 vocational students to ISCED 3 vocational students, but this would have generated undesirable variability of the student age and additional and undesirable within school sampling issues.

SCHOOL HEAD TARGET POPULATIONS

Within each sampled school, the school head/school principal completed the School heads' Questionnaire. As this questionnaire covered technical topics as well as more educational topics, the school principal could be supported by the schools' ICT coordinator (or equivalent) for completing questions about technical aspects if needed.

CLASS/TEACHER TARGET POPULATIONS

Within schools, a simple random sample of one class has been drawn from the list of the classes for the target grade. At ISCED level 1, the teacher who has the main responsibility of the class will be part of the teacher target population. If more than one teacher have the main responsibility, than one of the teacher was randomly selected.

In ISCED 2 and ISCED 3 level, it was first necessary to define the concept of class, as students might move from one class to another depending on the subject. For this study, the class has been defined as the learning group of students for the language of the test (i.e. a class learning the language of instruction English in England, German in Austria). At ISCED level 2 and ISCED level 3 academic, all mathematics, science, and language teachers who teach any student in the sampled class belong to the teacher target population.

For ISCED level 3 vocational, another definition of the class has been used because language is not a compulsory subject for vocational students in certain countries. Preferentially, the class should be defined as for ISCED level 3 academic, i.e. as the learning group of students for the language of the test. If this definition is not possible, the administrative unit has been used. Within each sampled classroom, the sampled teachers consisted of the three teachers that have the most contact hours with the students.

EXCLUSIONS

REDUCTION OF COVERAGE

Although the countries were encouraged to include the complete coverage of their target population, for some countries it was rather unavoidable to reduce the coverage due to political, organizational, or linguistic constraints. In case of reduction of coverage, the national target population differed from the international desired target populations.

SCHOOL EXCLUSIONS

Schools were excluded from the study for following reasons:

- They were teaching only mentally or physically disabled students (SEN schools)

- They offered instruction in a different language from the test language

- They were extremely small size

- They offered a curriculum, or school structure, radically different from the mainstream education system

Table 3 presents the percentage of students excluded at school level. Note that the reliability of the computed rates depends of the accuracy of the lists of schools and sampling forms that the National coordinators provided to the consortium. As will be describe in the data cleaning section different procedures have been implemented for validating the school sampling frames. However, the consortium cannot guarantee that some schools haven't been omitted in some countries. In addition some countries might have omitted to include in the sampling frames some schools that should have been excluded. Another difficulty is the estimation of Special Education Needs (SEN) students at the target grades because in most countries SEN schools are organized by age of students instead of by grade.

Germany education system is organized by lander and 6 landers only agreed to participate at the ESSIE study: Berlin, Brandenburg, Bremen, Hessen, Lower Saxony and Saxony. The data below are given for these 6 landers together.

Table 3: Percentage of students excluded at school level

	Type of exclusion			ISCED1	ISCED2	ISCED3A	ISCED3B
	SEN school	Small school	Other reason				
Austria	x	x		0,05	0,01	0,02	0,00
Belgium	x	x	Minor language (German)				
Bulgaria	x	x	corrective schools	1,21	1,48	0,37	0,38
Croatia*			Minor langages (Czech, Serbian, Hungarian, Italian)	3,65	3,65	0,00	3,45
Cyprus	x	x	Minor langages (Armenian, French,Arabic, Russian,)	1,84	0,75	1,02	0,18
Czech_Rep*	x		Minor langages (Polish)	4,51	4,51	0,80	5,60
Denmark				0,00	0,00	0,00	0,00
Estonia		x	Minor langages (English)	0,57	0,23	0,10	0,00
Finland	x	x	Minor langages (Saame)	4,32	2,00	0,01	0,00
France				N/A	N/A	N/A	N/A
Germany	x	x	Private (Brandenburg), Minor language (Bremen, Hessen)	4,14	5,95	2,29	0,29
Greece	x	x	Foreign students	2,70	0,46	0,05	0,01
Hungary		x		0,06	0,07	0,02	0,03
Iceland	x	x		0,91	0,47	0,00	0,42
Ireland				N/A	N/A	N/A	N/A
Italy		x		0,00	0,00	0,00	0,04
Latvia	x	x		4,02	4,18	0,28	0,00
Lithuania	x	x	Minor langages (Bielorusian, English)	1,92	1,52	0,23	0,00
Luxembourg			Language (German)	0,00	2,77	0,00	0,00
Malta		x		0,02	0,34	0,38	-
Netherlands	x	x		6,54	0,00	0,03	-
Norway	x	x	Private schools	4,42	2,69	0,35	0,26
Poland	x	x		1,53	2,58	0,19	4,36
Portugal		x	Non portuguese curricula	2,65	0,67	0,84	0,02
Romania	x	x	Minor language (Slovekan, Maghiara, German, Bulgarian, Serbian)	1,58	1,39	1,54	0,70
Slovakia	x	x	-	4,03	3,17	0,01	2,76
Slovenia		x	Private schools	0,24	0,19	0,05	0,03
Spain		x	Minor langage	0,02	0,00	0,00	0,03
Sweden			-	0,00	0,00	0,00	-
Turkey		x	Private schools	1,57	1,57	0,02	0,00
United-Kingdom				0,00	0,00	0,00	-

*: The percentages are given in percentage of schools instead of percentage of students because the measure of size was not available

Next to these exclusions, school could be excluded for technical reason, which means that the school has no email address and/or internet connexion.

The table 4 presents the percentage of students excluded for technical reason.

Table 4: Percentage of students excluded due to no internet connexion

	ISCED1	ISCED2	ISCED3A	ISCED3B
Austria	0,35%	0,23%	0,00%	4,54%
Belgium	0,00%	0,00%	0,00%	0,00%
Bulgaria	0,00%	0,02%	0,00%	0,00%
Croatia*	0,12%	0,12%	1,35%	0,00%
Cyprus	0,00%	0,00%	0,00%	0,00%
Czech_Rep*	0,09%	0,09%	0,00%	0,01%
Denmark	0,00%	0,00%	0,00%	*0,01%
Estonia	0,00%	0,00%	0,00%	0,00%
Finland	0,00%	0,00%	0,00%	0,00%
France	N/A	N/A	N/A	N/A
Germany	0,00%	0,00%	0,00%	0,00%
Greece	4,24%	1,53%	2,73%	0,70%
Hungary	0,00%	0,00%	0,00%	0,00%
Iceland	0,00%	0,77%	0,71%	0,00%
Ireland	N/A	N/A	N/A	-
Italy	0,00%	0,00%	0,00%	0,00%
Latvia	0,00%	0,00%	0,00%	0,00%
Lithuania	0,19%	0,94%	0,05%	0,00%
Luxembourg	0,00%	0,00%	0,00%	0,00%
Malta	0,00%	0,00%	0,00%	-
Netherlands	0,00%	0,00%	0,00%	-
Norway	0,00%	0,00%	0,00%	0,00%
Poland	0,41%	1,02%	0,96%	1,25%
Portugal	1,44%	1,15%	0,89%	0,39%
Romania	7,22%	6,57%	3,20%	2,84%
Slovakia	0,08%	0,10%	0,00%	0,00%
Slovenia	0,00%	0,00%	0,00%	0,00%
Spain	0,00%	0,08%	0,35%	0,23%
Sweden	0,00%	0,00%	0,00%	0,00%
Turkey	0,00%	0,00%	0,00%	0,00%
United-Kingdom	0,00%	0,00%	0,00%	0,00%

*: The percentages are given in percentage of schools instead of percentage of students because the measure of size was not available

WITHIN SCHOOL EXCLUSIONS

Schools also had the possibility to exclude students that present a permanent disability or because they follow the instruction in the educational system for less than one year and do not master the

testing language. As school principal did not exclude many students, it has been deemed unnecessary to report these percentages.

SELECTION OF THE SAMPLES

SCHOOL SAMPLES

A key element of the quality of any international comparative study is the selection of quality samples. This study collected data at three levels:

1. The school level, through a school questionnaire administered to the principal or to the head of teachers;
2. The classroom level, through a teacher questionnaire;
3. The student level.

The sample design is a *two-stage stratified cluster sampling*. First, a sample of schools was selected with a probability proportional to the school size (PPS) from a complete list of schools containing the student population of interest. Principals of participating schools have to provide the list of classes for the target grade. In most countries, one class of students was then randomly sampled within the selected schools with equal probabilities. In some small systems, two or more classes of students have been selected in order to increase the amount of data

Finally, one (or three depending of the education level) of the teachers associated with the selected class was sampled according to a simple random sample procedure.

Also the student samples were drawn within a sample of schools, the school sample is designed to optimize the resulting sample of students, rather than give an optimal sample of schools. For this reason, we highly recommend to analyze the school-level and the teacher level variables as attributes of students.

Beyond these statistical considerations, analyzing the school and teacher data at the student level also make sense from an educational point of view (as underlined in the previous section about the analytical reference framework). It can be argued that the student is the final and single recipient of the educational process and therefore what does matter is not the percentage of schools connected to Internet but the percentage of students attending a school connected to Internet. Depending on the correlation between the school size and the school characteristic, both statistics can be substantially different.

For the two previous EU surveys on ICT at schools, it is very likely that school indicators were computed at the school level. For this survey, we computed all the indicators at the student level. However, for trends purposes, school indicators have been computed at the school level as well.

Table 5 lists the system where more than one class were selected:

Table 5: Number of sampled classes within school in small countries

	ISCED1	ISCED2	ISCED3A	ISCED3B
Cyprus	All classes	2 classes	2 classes (1 class in private schools)	2 classes
Luxembourg	All classes	All classes	All classes	All classes
Malta	All classes	2 classes	2 classes	-

The samples of IEA and OECD PISA surveys are usually designed to obtain an accuracy equivalent to the accuracy of a simple random sample of 400 sampling units. This rule, if applied, would have meant to sample 400 ISCED 1 schools, 400 ISCED 2 schools, 400 ISCED 3 academic schools and 400 ISCED 3 vocational schools.

A global sample size of 1600 schools would not have been manageable for the countries. Therefore we limited the sample size to 300 schools per country and per level. If a country counts less than 300 schools for a particular level, then a census has been organised.

The PPS approach requires getting a measure of size for each school in the list. Some countries were not able to provide this reliable data for each school. For these countries, SRS of schools were implemented. The table 6 presents the sampling methodology implemented by level and by country.

Table 6: Sampling methodology by country and by level of education

	ISCED1	ISCED2	ISCED3A	ISCED3B
Austria	PPS	PPS	PPS	PPS
Belgium	PPS	PPS	PPS	PPS
Bulgaria	PPS	PPS	PPS	PPS
Croatia	SRS	SRS	SRS	SRS
Cyprus	Census	Census	Census	Census
Czech Republic	SRS	SRS	SRS	SRS
Denmark	PPS	PPS	PPS	Census
Estonia	PPS	PPS	Census	Census
Finland	PPS	PPS	PPS	Census
France[3]	SRS	SRS	SRS	SRS
Germany	PPS	PPS	PPS	PPS
Greece	PPS	PPS	PPS	PPS
Hungary	PPS	PPS	PPS	PPS
Iceland	Census	Census	Census	Census
Ireland	PPS	PPS	PPS	-
Italy	PPS	PPS	PPS	PPS
Latvia	PPS	PPS	PPS	Census
Lithuania	PPS	PPS	PPS	Census
Luxembourg	Census	Census	Census	Census
Malta	Census	Census	Census	-
Netherlands	PPS	PPS	PPS	-
Norway	PPS	PPS	PPS	PPS
Poland	PPS	PPS	PPS	PPS
Portugal	PPS	PPS	PPS	PPS
Romania	PPS	PPS	PPS	PPS
Slovakia	PPS	PPS	Census	PPS
Slovenia	PPS	PPS	Census	Census
Spain	PPS	PPS	PPS	PPS
Sweden	PPS	PPS	PPS	PPS
Turkey	PPS	PPS	PPS	PPS
UK	PPS	PPS	PPS	-

STRATIFICATION

Before drawing the sampling, the schools were grouping into strata that share common characteristics. Stratification is generally used for the following reasons:

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[3] Like for most international surveys in Education, France didn't communicated their full lists of schools.in order to drawn the samples. A responsible of DEPP (Département de l'évaluation, de la Prospective et de la Performance) from the Ministry of Education took in charge the sampling tasks for the ESSIE survey. Despite our recommendations the Sample Random Sampling (SRS) method were implemented.

- to improve the efficiency of the sample design, thereby making survey estimates more reliable;
- to apply different sample designs, such as disproportionate sample allocations, to specific groups of schools, such as those in states, provinces, or other regions;
- to ensure that all parts of a population are included in the sample;
- to ensure adequate representation of specific groups of the target population in the sample;
- to obtain reliable estimates for each stratum, if so required.

Use of stratification variables is desirable but not compulsory. A classification variable must be available and suitable for every school in order to be considered as a stratification variable.

For improving the accuracy of the surveys estimates, it is essential to identify within each country, stratification variables that correlate as much as possible with ICT environment and practices at schools.

Sampling theory usually differentiates implicit and explicit stratification variable. A particular variable can be considered as an implicit or explicit stratification variable depending on the educational system of the country.

EXPLICIT STRATIFICATION

Explicit stratification entails the grouping of schools into different strata. This result in the creation of separate school lists according to the strata (i.e. each explicit strata is a "box" where several schools are obligatory selected). Every school belongs to one and only one stratum ("box") and all the strata together cover the whole target school population. After schools have been stratified, independent samples of schools are drawn from each of these different strata or school lists.

IMPLICIT STRATIFICATION

Implicit stratification entails the sorting the school sampling frame by a set of implicit stratification variables. This sorting takes place within the explicit strata, or within the whole frame if explicit stratification is not used (i.e. each implicit stratification variable will be used to sort the schools within each "box"). As a minimum, in all countries, school frames will be sorted within explicit strata by school size prior to sampling schools. The combined use of implicit strata and systematic sampling is a very effective and a simple way of ensuring a strictly proportional sample allocation of students across all implicit strata.

Table 7 provides the explicit stratification variables used by each country, as well as the number of explicit strata and the number and name of the implicit variables. Note that for some countries, the number of explicit strata is different depending of the level. The table 7 present a global vision of the stratification.

Table 7: Stratification variables

	Explicit stratification variables	N explicit strata	Implicit stratification variables
Austria	Region (9)	9	None
Belgium	Community(2) , private/public(3)	6	Province(10)
Bulgaria	None	1	None
Croatia	None	1	None
Cyprus	Public/private(2), Urban/Rural(2)(not at ISCED3A and ISCED3B)	4 2	None
Czech Republic	Region(14)	14	None
Denmark	Public/Private(2)	2	None
Estonia	Language (3)	3	None
Finland	Region(5)	10	Language(2), type of owner(4)
France	None		Region(5), Public/private(2)
Germany			
Greece	Region(13)	13	Public/Private(2),Prefecture(58)
Hungary	County(20)	20	None
Iceland	None	1	None
Ireland	DEIS disadvantaged(2)	2	None
Italy	Region(18)	18	None
Latvia	Public/Private(2), Language of instruction(4)	5	Urban/Rural(2)
Lithuania	Urban/Rural(2)	2	None
Luxembourg	None (census)	1	None
Malta	None (census)	1	None
Netherlands	None	1	None
Norway	Language(2)	2	None
Poland	Region(16)	16	None
Portugal	Public/private(2), Region(5)	10	None
Romania	Language(2)	2	Region(8)
Slovakia	Language(2), Region(8) for Slovak schools	9	None
Slovenia	Region (12)	12	None
Spain	Public/private(3)	3	None
Sweden	Public/Private(2)	2	None
Turkey	Region(7)	7	None
United Kingdom	Country(4)	4	None

REPLACEMENT SCHOOLS

With any survey in education, it is not possible to obtain the participation of all sampled schools. This is especially true with an online survey where schools were contacted by email only. Two strategies can be implemented to potentially reduce the impact of school refusals: (i) identification of replacement schools and (ii) computation of a school non response adjustment.

Compensating for school refusal requires identification *a priori* of replacement schools for non-participating sampled schools. This also avoids the use of convenience schools as replacements. In ESSIE, each sampled school was assigned two replacement schools (if the number of schools within

the stratum has allowed it). In the ordered list, within each stratum, the first replacement schools immediately follows the sampled schools and the second replacement schools immediately precedes the sampled schools. The ordering of the list (by size and by implicit stratification variable) ensures that the replacements schools had stratification characteristics similar to those of the sampled schools.

OVERLAP BETWEEN LEVELS

ESSIE study was implemented at four ISCED levels. In the countries that have adopted a single structure, ISCED level 1 and ISCED level 2 schools are usually merged into one. In some other countries, ISCED level 2 and ISCED level 3(A) schools are usually combined. Finally, a school can also propose ISCED level 2 and more than one ISCED level 3 orientation. The country had to decide whether they want to minimize or to maximize the overlapping between the two or three samples:

- *minimize the number of sampled schools that would be involved in more than one target grade*. This option increases the number of schools sampled, but reduces the workload for the selected schools and may increase their willingness to participate.

- *maximize the number of sampled schools that would be involved in more than target grade*. This option reduces the number of schools sampled but increase the burden at the school level, or

- *ignore the school sample overlap*, and select the target grades independently.

In ESSIE, we used sampling techniques adopted in PISA surveys in order to minimize or maximize the overlapping between the two samples. This technique is a modification of the approach due to Keyfitz (1951).

Following this approach, a conditional probability of selection is determined according to both the initial probability of selection and the probability of selection in the compared level. As an example, suppose that the overlap need to be controlled between ISCED1 and ISCED2 samples. The conditional probability of selection into ISCED2 is determined as follows:

$$CPROB = \begin{cases} \max\left[0, \left(PROB_{ISCED1} + PROB_{ISCED2} - \dfrac{1}{PROB_{ISCED1}}\right)\right] & if\ the\ school\ was\ ISCED1\ selected \\ \min\left[1, \dfrac{PROB_{ISCED2}}{1 - PROB_{ISCED1}}\right] & if\ the\ school\ was\ not\ ISCED1\ selected \\ PROB_{ISCED2} & if\ the\ school\ was\ not\ an\ ISCED1\ eligible\ school \end{cases}$$

WITHIN SCHOOL SAMPLES

A school coordinator was designated within each sampled and participating school. A web tool was developed to help school coordinator to draw the class and the teacher samples. With the school username and password, the school coordinator had to recode the name of all target grade classes, as well as their size. The software automatically returned the sampled class(es).

At ISCED 2 and ISCED 3 academic tracks, the system also returned 3 letters for the selection of one teacher in the language of instruction, one teacher of mathematics and one teacher of science and the teacher teaching to the sampled class and with a last name starting with that letter will be sampled. If no teacher has a last name starting with the selected letter, the following letter will be used and so on until a teacher is sampled.

Data collection

IMPLEMENTATION PROCESS

EUN has worked with the ministries of education in the 31 countries to identify the most recent version of their official school databases and provide access to them.

In each country, a national coordinator (NC) has been identified, having the full support of the ministry, but not necessarily a member of the ministry staff. Preference was given to experts who already have experience with school survey administration at national or, preferably, international level. These coordinators have been remunerated for the support they provided during the data collection phase.

The role of the NC was to conduct the tasks described in the sampling manual, and to prepare the school sampling frames, i.e. the Excel files containing all schools that count students at grades 4,8 and 11 respectively for ISCED1, ISCED2, ISCED3A and ISCED3B populations. The sampling frames have to include the variables required by the sampling manual (email address, school size, etc.) and the stratification variables considered as relevant at the national level.. After reception, conformity checks of such were implemented before drawing the sample for each target population.

The IEA data processing centre (IEA DPC) developed an automatic system to contact selected schools and their replacement schools if needed. Emails were sent to the sampled schools to inform them that they have been selected to participate to the whole survey, provide information about the investigation, and ask them to register into the online participation module developed by the IEA DPC. The school head who accepted to participate had to identify a school coordinator and introduce his/her email address into the module when registering. The national coordinator followed-up such a registration process by the participating schools on the basis of reports (two reports during the process) sent by the consortium and contacted schools not reacting to try to convince the head teacher to participate in the survey.

When a school answers positively, i.e. when a school registered itself on the database, the system automatically sent an e-mail to the school coordinator inviting him/her to get from the IEA database all the information needed about how to support the random selection of the classes at the target grades, the teachers and the students. The school coordinator had to introduce into the online sampling module some basic data (mainly number of classes at the grades concerned and their respective class size) and the system automatically drew the different samples. After this step, the role of the school coordinator was to make sure that the head teacher, the sampled teachers and the sampled students answered the online survey questionnaires. The school coordinator was responsible for ensuring easy access to ICT equipment in the school for all the surveys participants.

To support them, the school coordinator received by email guidelines in his/her own language, including a model letter to parents explaining the purpose of SMART (ESSIE). If a school coordinator encounters difficulties with the online platform, he/she contacted the national coordinator or the consortium if needed.

If a school answers negatively, the national coordinator was expected to document the refusal of his/her school in the online data base provided by the IEA data centre. As soon as a school recorded its refusal, the replacement schools (again randomly selected by the system) were automatically contacted (see Section 2.5 Sampling).

Once a week during the data collection period, a state of the art of the participation rates was sent by the IEA DPC to the consortium. After two automatic reminders sent to selected schools and if there is no answer from the school after that, the national coordinator was asked to contact personally the school by using the most appropriate means for that (phone calls, e-mails, etc.). In practice, this follow-up revealed to be unfeasible due to the large number of schools involved in the process.

The figures 1 and 2 show the schemes of the automatic email system to contact selected schools respectively about their participation and about the class sampling tasks.

Figure1: Scheme of the automatic Email system to contact selected schools and register their participation

Figure 1: Automatic Email System (Participation Module)

Note:
1. Feedback: School participation status in Participatoin DB. It can happen that school head login to participatoin questionnaire and leave the web page without giving any status.
2. Colored process: The connection between a single step and the requested database.
3. No 1: Text email No 1
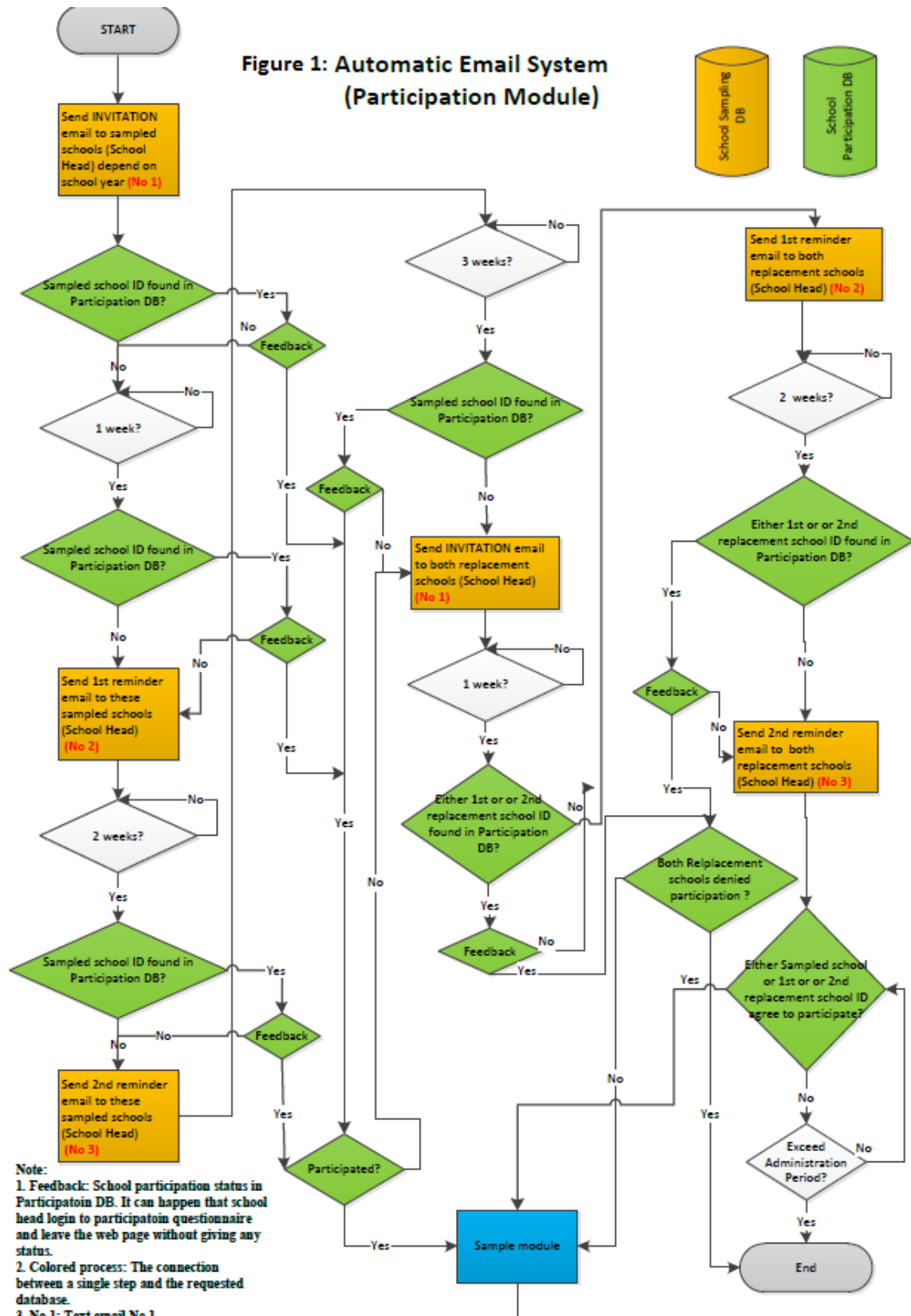
Figure2: Scheme of the automatic email system to contact school coordinator to invite him/her to perform the class sampling tasks and organise the data collection

Figure2: Automatic Email System (Sampling Module)
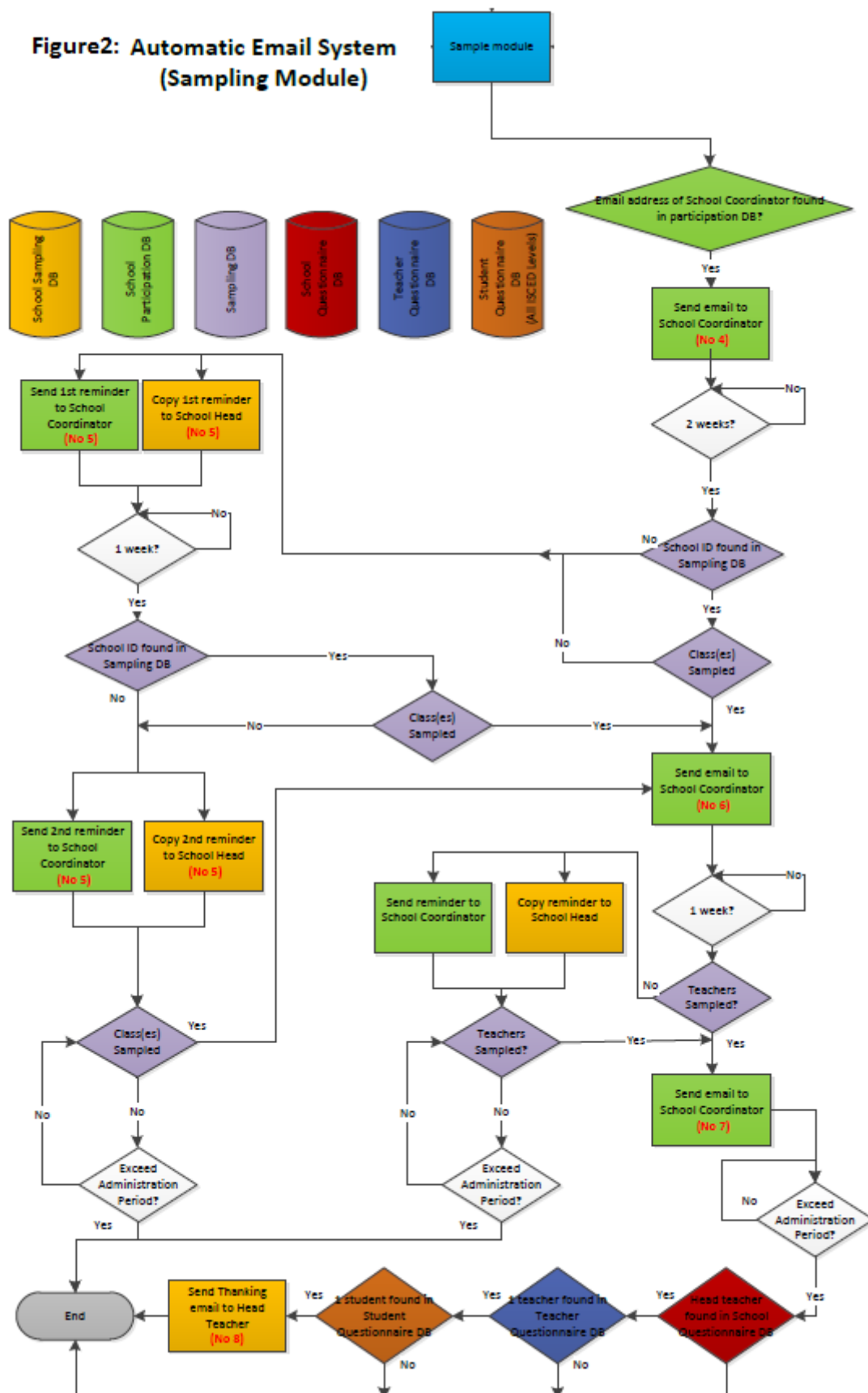
The automatic emails, the participation module, the sampling manual and the sampling class module were translated into the official languages of the 31 countries. The figure 3 shows an example of lay out of the sampling module in German.

Figure 3: example of completed class listing form on the sampling class module, in German

Sie sind in angemeldet ISCED Level1.

Bitte tragen Sie die Bezeichnung der für die Schulumfrage ausgewählten Klassen in die erste Textspalte ein; die Gesamtzahl der Schüler, die an der Umfrage teilnehmen, sind je ausgewählter Klasse in die zweite Textspalte einzutragen. Die Anzahl der Schüler, die zu den jeweiligen ausgewählten Klassen gehören und nicht an der Umfrage teilnehmen, sind in die letzte Textspalte einzutragen

Bezeichnung der Klasse	Anzahl der SchülerInnen in dieser Klasse	Gesamtzahl der an der Umfrage nicht beteiligten Schüler je Klasse
Klasse 4A	25	2
Klasse 4B	20	0
Klasse 4C	22	0
Klasse 4D	21	0

Sampling   Zurück

Logout

ADMINISTRATION PROCESS

The three survey questionnaires has been translated into the official language(s) of the 31 countries and made available to the respondents in all those languages.

The administration of the survey was online. The school coordinator had to distribute the URL, IDs and passwords to school head, teachers and students which have been selected. Principal and teachers had flexibility to choose when completing the questionnaire. For students, we advised to organise a unique session in order to reduce the loss of instruction time. However, organising several student sessions may be necessary if the number of computers with internet access was lower than the number of students in the class. The online completion of the questionnaires was estimated around 15 to 20 minutes.

ADMINISTRATION TIME SCHEDULE

Depending of the country and the national scholar calendar, the survey questionnaires were available from mid-September to December 2011. However, for several countries and for replacement schools which were contacted later in the process, the time window for implementing the survey in the school was rather short. Due to high administrative constraints in Germany, the period of administration has been postponed to March 2012.

Participation

Surveys usually report participation rates. Such information allows (or should allow) the reader to assess the quality of the data and the presence of potential biases due to non-response. This section presents the participation rates.

A participating school has been defined as a school where at least one student, one teacher, or one principal has completed a questionnaire.

Tables 8 to 17 provide information about participation:

- Number by country and by ISCED level (table 8)

- Percentage by country and by ISCED level (table 9)

- Number and percentage of schools that participated, refused, didn't respond, stopped during the administration process, by status and by country. There is a table by ISCED level (tables 10 to 13)

- Percentage of participating schools by explicit strata and by country. There is a table by ISCED level (tables 14 to 17)

Table 8: Number of participating schools, principals, teachers and students by country and ISCED level

	ISCED1			ISCED2				ISCED3A				ISCED3B			
	N_schools	N_Principals	N_Teachers	N_schools	N_Principals	N_Teachers	N_Students	N_schools	N_Principals	N_Teachers	N_Students	N_schools	N_Principals	N_Teachers	N_Students
Austria	108	104	82	100	96	230	1466	45	43	103	746	80	68	189	1393
Belgium	105	99	79	80	64	181	922	63	54	125	706	75	61	178	760
Bulgaria	176	165	167	211	197	545	3509	135	130	361	2599	139	134	382	2519
Croatia	159	158	148	190	188	501	3138	39	38	105	986	124	116	331	2490
Cyprus	196	177	317	68	63	328	2201	55	51	243	1683	7	7	27	139
Czech Republic	132	118	115	124	110	281	1703	126	111	305	2790	162	137	438	3109
Denmark	42	38	28	59	52	90	721	59	55	109	1087	15	13	33	252
Estonia	100	94	86	132	124	271	1888	86	77	185	1604	15	14	38	128
Finland	132	116	112	151	131	365	2313	134	114	325	2541	59	48	122	702
France	51	46	30	59	49	131	993	50	41	94	798	40	30	70	334
Germany	28	23	17	26	16	29	125	14	11	29	148	21	20	30	167
Greece	121	119	100	106	101	274	1753	130	124	329	2373	22	19	52	292
Hungary	152	136	142	180	165	499	3376	133	124	362	3342	137	128	392	3155
Iceland	9	9	5	23	18	36	301	9	8	19	170	4	4	6	34
Ireland	46	43	37	42	40	102	883	32	31	78	539	N/A	N/A	N/A	N/A
Italy	233	208	222	206	188	498	3761	201	170	539	3860	207	182	563	3588
Latvia	132	127	122	148	137	358	2076	117	108	279	2005	25	21	59	401
Lithuania	194	172	188	217	204	557	3672	183	166	449	3586	51	49	140	981
Luxembourg	50	47	67	6	4	33	376	4	3	29	221	6	5	10	252
Malta	28	27	43	26	23	92	821	2	2	10	61	N/A	N/A	N/A	N/A
Netherlands	31	23	23	9	5	16	137	7	3	20	227	N/A	N/A	N/A	N/A
Norway	85	77	60	66	55	122	1237	48	41	96	864	33	28	63	395
Poland	185	182	184	221	213	615	4417	206	198	567	5273	202	189	554	4323
Portugal	88	79	82	130	116	340	2303	87	74	201	1392	111	95	283	1532
Romania	184	176	169	186	170	466	3105	168	148	444	3920	147	130	394	2840
Slovakia	236	216	224	238	220	640	3991	116	106	304	2361	192	181	535	3950
Slovenia	106	85	94	106	81	248	1431	22	19	49	473	19	14	44	301
Spain	84	80	75	110	103	292	2065	116	109	288	2370	116	107	286	1802
Sweden	32	26	23	43	25	75	572	17	8	28	255	16	11	31	182
Turkey	52	47	46	45	38	68	508	87	80	206	1483	76	73	195	1394
United Kingdom	14	11	13	10	5	22	129	12	10	22	163	N/A	N/A	N/A	N/A

Table 9: Percentage of participating schools

	ISCED1			ISCED2			ISCED3A			ISCED3B		
	N_Participating_Schools	N_SampledSchools	%_PartSchools	N_Participating_schools	N_SampledSchools	%_PartSchools	N_Participating_schools	N_SampledSchools	%_PartSchools	N_Participating_schools	N_SampledSchools	%_PartSchools
Austria	108	298	36,2	100	298	33,6	45	299	15,1	80	300	26,7
Belgium	105	299	35,1	80	301	26,6	63	296	21,3	75	300	25
Bulgaria	176	300	58,7	211	321	65,7	135	294	45,9	139	300	46,3
Croatia	159	299	53,2	190	295	64,4	39	73	53,4	124	280	44,3
Cyprus	196	278	70,5	68	93	73,1	55	69	79,7	7	13	53,8
Czech Republic	132	300	44	124	301	41,2	126	300	42	162	299	54,2
Denmark	42	300	14	59	300	19,7	59	197	29,9	15	115	13
Estonia	100	291	34,4	132	301	43,9	86	213	40,4	15	36	41,7
Finland	132	299	44,1	151	299	50,5	134	287	46,7	59	137	43,1
France	51	295	17,3	59	300	19,7	50	300	16,7	40	300	13,3
Germany	28	425	6,6	26	424	6,1	14	423	3,3	21	425	4,9
Greece	121	299	40,5	106	302	35,1	130	301	43,2	22	300	7,3
Hungary	152	300	50,7	180	270	66,7	133	299	44,5	137	301	45,5
Iceland	9	133	6,8	23	148	15,5	9	32	28,1	4	24	16,7
Ireland	46	116	39,7	42	168	25	32	171	18,7	N/A	N/A	N/A
Italy	233	302	77,2	206	297	69,4	201	302	66,6	207	300	69
Latvia	132	300	44	148	334	44,3	117	296	39,5	25	90	27,8
Lithuania	194	300	64,7	217	300	72,3	183	298	61,4	51	69	73,9
Luxembourg	50	153	32,7	6	26	23,1	4	28	14,3	6	15	40
Malta	28	96	29,2	26	54	48,1	2	4	50	N/A	N/A	N/A
Netherlands	31	300	10,3	9	268	3,4	7	210	3,3	N/A	N/A	N/A
Norway	85	300	28,3	66	295	22,4	48	300	16	33	300	11
Poland	185	300	61,7	221	301	73,4	206	299	68,9	202	300	67,3
Portugal	88	304	28,9	130	301	43,2	87	300	29	111	301	36,9
Romania	184	300	61,3	186	305	61	168	296	56,8	147	294	50
Slovakia	236	301	78,4	238	310	76,8	116	240	48,3	192	300	64
Slovenia	106	299	35,5	106	284	37,3	22	73	30,1	19	110	17,3
Spain	84	301	27,9	110	299	36,8	116	298	38,9	116	295	39,3
Sweden	32	300	10,7	43	300	14,3	17	300	5,7	16	300	5,3
Turkey	52	301	17,3	45	310	14,5	87	300	29	76	300	25,3
United Kingdom	14	297	4,7	10	300	3,3	12	299	4	N/A	N/A	N/A

Table 10: Number and percentage of schools that participated, refused to participate, that didn't respond, replacement schools that were never contacted, and schools that stopped participating during the data administration in <u>ISCED1</u> by country.

	status	TotalNSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Austria	s	298	50	16,8	38	12,8	146	49	/	/	64	21,5
Austria	r1	297	27	9,1	35	11,8	91	30,6	112	37.7	32	10,8
Austria	r2	291	31	10,7	32	11	85	29,2	111	38.1	32	11
Belgium	s	299	51	17,1	32	10,7	157	52,5	/	/	59	19,7
Belgium	r1	299	26	8,7	22	7,4	109	36,5	108	36.1	34	11,4
Belgium	r2	299	28	9,4	18	6	115	38,5	108	36.1	30	10
Bulgaria	s	300	67	22,3	3	1	166	55,3	/	/	64	21,3
Bulgaria	r1	284	57	20,1	6	2,1	75	26,4	118	41.5	28	9,9
Bulgaria	r2	225	52	23,1	6	2,7	57	25,3	94	41.8	16	7,1
Croatia	s	299	101	33,8	0	0	172	57,5	/	/	26	8,7
Croatia	r1	242	27	11,2	4	1,7	100	41,3	101	41.7	10	4,1
Croatia	r2	177	31	17,5	1	0,6	74	41,8	65	36.7	6	3,4
Cyprus	s	278	196	70,5	1	0,4	51	18,3	/	/	30	10,8
Czech Republic	s	300	79	26,3	58	19,3	87	29	/	/	76	25,3
Czech Republic	r1	300	23	7,7	27	9	74	24,7	150	50	26	8,7
Czech Republic	r2	300	30	10	21	7	72	24	150	50	27	9
Denmark	s	300	21	7	32	10,7	206	68,7	/	/	41	13,7
Denmark	r1	300	11	3,7	18	6	183	61	61	20.3	27	9
Denmark	r2	284	10	3,5	17	6	177	62,3	61	21.5	19	6,7
Estonia	s	291	83	28,5	16	5,5	123	42,3	/	/	69	23,7
Estonia	r1	89	13	14,6	5	5,6	22	24,7	45	50.6	4	4,5
Estonia	r2	50	4	8	2	4	14	28	29	58	1	2
Finland	s	299	76	25,4	19	6,4	153	51,2	/	/	51	17,1
Finland	r1	291	32	11	17	5,8	85	29,2	119	40.9	38	13,1
Finland	r2	264	24	9,1	24	9,1	80	30,3	108	40.9	28	10,6
France	s	295	17	5,8	24	8,1	212	71,9	/	/	42	14,2
France	r1	294	23	7,8	21	7,1	157	53,4	57	19.4	36	12,2
France	r2	289	11	3,8	17	5,9	169	58,5	57	19.7	35	12,1
Germany	s	425	13	3,1	14	3,3	388	91,3	/	/	10	2,4
Germany	r1	424	6	1,4	11	2,6	381	89,9	14	3.3	12	2,8
Germany	r2	423	9	2,1	10	2,4	382	90,3	14	3.3	8	1,9
Greece	s	299	61	20,4	20	6,7	187	62,5	/	/	31	10,4

	status	TotalNSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoReponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Greece	r1	299	27	9	18	6	141	47,2	87	29.1	26	8,7
Greece	r2	299	33	11	21	7	128	42,8	87	29.1	30	10
Hungary	s	300	78	26	7	2,3	180	60	/	/	35	11,7
Hungary	r1	295	41	13,9	6	2	119	40,3	106	35.9	23	7,8
Hungary	r2	273	33	12,1	3	1,1	112	41	101	37	24	8,8
Iceland	s	133	9	6,8	6	4,5	95	71,4	/	/	23	17,3
Ireland	s	116	46	39,7	2	1,7	36	31	/	/	32	27,6
Italy	s	302	100	33,1	29	9,6	132	43,7	/	/	41	13,6
Italy	r1	302	64	21,2	19	6,3	59	19,5	133	44	27	8,9
Italy	r2	302	69	22,8	11	3,6	62	20,5	133	44	27	8,9
Latvia	s	300	104	34,7	20	6,7	117	39	/	/	59	19,7
Latvia	r1	134	23	17,2	6	4,5	17	12,7	72	53.7	16	11,9
Latvia	r2	78	5	6,4	1	1,3	23	29,5	38	48.7	11	14,1
Lithuania	s	300	135	45	10	3,3	119	39,7	/	/	36	12
Lithuania	r1	207	37	17,9	3	1,4	41	19,8	114	55.1	12	5,8
Lithuania	r2	117	22	18,8	1	0,9	23	19,7	62	53	9	7,7
Luxembourg	s	153	50	32,7	31	20,3	49	32	/	/	23	15
Malta	s	96	28	29,2	4	4,2	50	52,1	/	/	14	14,6
Netherlands	s	300	18	6	42	14	204	68	/	/	36	12
Netherlands	r1	284	9	3,2	22	7,7	174	61,3	44	15.5	35	12,3
Netherlands	r2	286	4	1,4	31	10,8	183	64	46	16.1	22	7,7
Norway	s	300	34	11,3	51	17	184	61,3	/	/	31	10,3
Norway	r1	299	26	8,7	39	13	140	46,8	64	21.4	30	10
Norway	r2	283	25	8,8	21	7,4	160	56,5	61	21.6	16	5,7
Poland	s	300	132	44	1	0,3	153	51	/	/	14	4,7
Poland	r1	300	25	8,3	1	0,3	122	40,7	144	48	8	2,7
Poland	r2	299	28	9,4	1	0,3	120	40,1	144	48.2	6	2
Portugal	s	304	44	14,5	5	1,6	231	76	/	/	24	7,9
Portugal	r1	263	27	10,3	2	0,8	162	61,6	53	20.2	19	7,2
Portugal	r2	156	17	10,9	0	0	89	57,1	33	21.2	17	10,9
Romania	s	300	98	32,7	10	3,3	151	50,3	/	/	41	13,7
Romania	r1	281	44	15,7	8	2,8	78	27,8	132	47	19	6,8
Romania	r2	300	42	14	7	2,3	89	29,7	137	45.7	25	8,3
Slovakia	s	301	156	51,8	21	7	70	23,3	/	/	54	17,9
Slovakia	r1	293	44	15	6	2	24	8,2	206	70.3	13	4,4
Slovakia	r2	249	36	14,5	4	1,6	26	10,4	171	68.7	12	4,8

	status	TotalNSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoReponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Slovenia	s	299	82	27,4	21	7	131	43,8	/	/	65	21,7
Slovenia	r1	91	16	17,6	4	4,4	25	27,5	39	42.9	7	7,7
Slovenia	r2	32	8	25	1	3,1	9	28,1	12	37.5	2	6,3
Spain	s	301	53	17,6	10	3,3	202	67,1	/	/	36	12
Spain	r1	300	19	6,3	11	3,7	158	52,7	87	29	25	8,3
Spain	r2	300	12	4	8	2,7	166	55,3	87	29	27	9
Sweden	s	300	18	6	17	5,7	225	75	/	/	40	13,3
Sweden	r1	281	4	1,4	23	8,2	177	63	49	17.4	28	10
Sweden	r2	265	10	3,8	20	7,5	168	63,4	47	17.7	20	7,5
Turkey	s	301	21	7	2	0,7	254	84,4	/	/	24	8
Turkey	r1	301	13	4,3	7	2,3	214	71,1	43	14.3	24	8
Turkey	r2	301	18	6	4	1,3	217	72,1	43	14.3	19	6,3
United Kingdom	s	297	6	2	3	1	263	88,6	/	/	25	8,4
United Kingdom	r1	208	3	1,4	4	1,9	164	78,8	21	10.1	16	7,7
United Kingdom	r2	221	5	2,3	1	0,5	180	81,4	23	10.4	12	5,4

Note: 's'=selected school, 'r1'=first replacement school and 'r2'=second replacement school

Table 11: Number and percentage of schools that participated, refused to participate, that didn't respond, replacement schools that were never contacted, and schools that stopped participating during the data administration in <u>ISCED2</u> by country

	status	TotalINschools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Austria	s	298	46	15,4	36	12,1	168	56,4	/	/	48	16,1
Austria	r1	292	30	10,3	39	13,4	193	66,1	0	0	30	10,3
Austria	r2	249	24	9,6	34	13,7	167	67,1	0	0	24	9,6
Belgium	s	301	49	16,3	40	13,3	179	59,5	/	/	33	11
Belgium	r1	235	19	8,1	22	9,4	171	72,8	0	0	23	9,8
Belgium	r2	135	12	8,9	9	6,7	103	76,3	0	0	11	8,1
Bulgaria	s	321	128	39,9	6	1,9	131	40,8	/	/	56	17,4
Bulgaria	r1	267	44	16,5	16	6	191	71,5	0	0	16	6
Bulgaria	r2	210	39	18,6	7	3,3	147	70	0	0	17	8,1
Croatia	s	295	119	40,3	16	5,4	131	44,4	/	/	29	9,8
Croatia	r1	294	45	15,3	9	3,1	223	75,9	0	0	17	5,8
Croatia	r2	161	26	16,1	10	6,2	120	74,5	0	0	5	3,1
Cyprus	s	93	67	72	2	2,2	17	18,3	/	/	7	7,5
Czech Republic	s	301	76	25,2	72	23,9	89	29,6	/	/	64	21,3
Czech Republic	r1	301	23	7,6	38	12,6	212	70,4	0	0	28	9,3
Czech Republic	r2	301	25	8,3	32	10,6	213	70,8	0	0	31	10,3
Denmark	s	300	19	6,3	74	24,7	164	54,7	/	/	43	14,3
Denmark	r1	299	15	5	57	19,1	198	66,2	0	0	29	9,7
Denmark	r2	263	25	9,5	41	15,6	168	63,9	0	0	29	11
Estonia	s	301	114	37,9	11	3,7	124	41,2	/	/	52	17,3
Estonia	r1	86	13	15,1	4	4,7	59	68,6	0	0	10	11,6
Estonia	r2	33	5	15,2	3	9,1	21	63,6	0	0	4	12,1
Finland	s	299	108	36,1	29	9,7	126	42,1	/	/	36	12
Finland	r1	209	31	14,8	11	5,3	148	70,8	0	0	19	9,1
Finland	r2	85	12	14,1	2	2,4	61	71,8	0	0	10	11,8
France	s	300	31	10,3	40	13,3	172	57,3	/	/	57	19
France	r1	296	18	6,1	24	8,1	212	71,6	0	0	42	14,2
France	r2	287	10	3,5	24	8,4	216	75,3	0	0	37	12,9
Germany	s	424	9	2,1	17	4	387	91,3	/	/	11	2,6
Germany	r1	418	8	1,9	10	2,4	392	93,8	0	0	8	1,9
Germany	r2	386	8	2,1	7	1,8	362	93,8	0	0	9	2,3
Greece	s	302	66	21,9	13	4,3	181	59,9	/	/	42	13,9
Greece	r1	301	18	6	12	4	239	79,4	0	0	32	10,6

	status	TotalINSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Greece	r2	287	22	7,7	10	3,5	221	77	0	0	34	11,8
Hungary	s	270	122	45,2	10	3,7	107	39,6	/	/	31	11,5
Hungary	r1	245	34	13,9	8	3,3	183	74,7	0	0	20	8,2
Hungary	r2	207	24	11,6	6	2,9	157	75,8	0	0	20	9,7
Iceland	s	148	23	15,5	13	8,8	81	54,7	/	/	31	20,9
Ireland	s	168	42	25	5	3	86	51,2	/	/	35	20,8
Italy	s	297	84	28,3	25	8,4	146	49,2	/	/	42	14,1
Italy	r1	294	65	22,1	13	4,4	184	62,6	0	0	32	10,9
Italy	r2	287	57	19,9	16	5,6	186	64,8	0	0	28	9,8
Latvia	s	334	113	33,8	12	3,6	152	45,5	/	/	57	17,1
Latvia	r1	152	25	16,4	4	2,6	100	65,8	0	0	23	15,1
Latvia	r2	115	10	8,7	3	2,6	85	73,9	0	0	17	14,8
Lithuania	s	300	180	60	17	5,7	74	24,7	/	/	29	9,7
Lithuania	r1	171	26	15,2	4	2,3	132	77,2	0	0	9	5,3
Lithuania	r2	95	11	11,6	1	1,1	79	83,2	0	0	4	4,2
Luxembourg	s	26	6	23,1	2	7,7	15	57,7	/	/	3	11,5
Malta	s	54	26	48,1	1	1,9	22	40,7	/	/	5	9,3
Netherlands	s	268	8	3	29	10,8	203	75,7	/	/	28	10,4
Netherlands	r1	149	0	0	13	8,7	133	89,3	0	0	3	2
Netherlands	r2	109	1	0,9	10	9,2	92	84,4	0	0	6	5,5
Norway	s	295	36	12,2	46	15,6	181	61,4	/	/	32	10,8
Norway	r1	243	24	9,9	30	12,3	172	70,8	0	0	17	7
Norway	r2	130	6	4,6	22	16,9	93	71,5	0	0	9	6,9
Poland	s	301	141	46,8	8	2,7	138	45,8	/	/	14	4,7
Poland	r1	300	41	13,7	13	4,3	235	78,3	0	0	11	3,7
Poland	r2	301	39	13	12	4	242	80,4	0	0	8	2,7
Portugal	s	301	63	20,9	5	1,7	198	65,8	/	/	35	11,6
Portugal	r1	286	38	13,3	10	3,5	222	77,6	0	0	16	5,6
Portugal	r2	217	29	13,4	4	1,8	162	74,7	0	0	22	10,1
Romania	s	305	116	38	9	3	155	50,8	/	/	25	8,2
Romania	r1	278	34	12,2	8	2,9	212	76,3	0	0	24	8,6
Romania	r2	303	36	11,9	3	1	239	78,9	0	0	25	8,3
Slovakia	s	310	164	52,9	17	5,5	85	27,4	/	/	44	14,2
Slovakia	r1	286	43	15	6	2,1	219	76,6	0	0	18	6,3
Slovakia	r2	238	32	13,4	8	3,4	181	76,1	0	0	17	7,1
Slovenia	s	284	94	33,1	21	7,4	114	40,1	/	/	55	19,4

	status	TotalINschools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Slovenia	r1	60	11	18,3	1	1,7	39	65	0	0	9	15
Slovenia	r2	17	1	5,9	1	5,9	13	76,5	0	0	2	11,8
Spain	s	299	68	22,7	11	3,7	179	59,9	/	/	41	13,7
Spain	r1	300	26	8,7	16	5,3	241	80,3	0	0	17	5,7
Spain	r2	300	16	5,3	16	5,3	241	80,3	0	0	27	9
Sweden	s	300	19	6,3	27	9	214	71,3	/	/	40	13,3
Sweden	r1	284	16	5,6	27	9,5	217	76,4	0	0	24	8,5
Sweden	r2	236	8	3,4	18	7,6	194	82,2	0	0	16	6,8
Turkey	s	310	22	7,1	1	0,3	264	85,2	/	/	23	7,4
Turkey	r1	310	15	4,8	4	1,3	268	86,5	0	0	23	7,4
Turkey	r2	310	8	2,6	3	1	275	88,7	0	0	24	7,7
United Kingdom	s	300	2	0,7	5	1,7	282	94	/	/	11	3,7
United Kingdom	r1	235	7	3	2	0,9	211	89,8	0	0	15	6,4
United Kingdom	r2	250	1	0,4	5	2	229	91,6	0	0	15	6

Note: 's'=selected school, 'r1'=first replacement school and 'r2'=second replacement school

Table 12: Number and percentage of schools that participated, refused to participate, that didn't respond, replacement schools that were never contacted, and schools that stopped participating during the data during the administration in <u>ISCED3A</u> by country

	status	TotalNSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoResponseSchools	%_NoReponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Austria	s	299	42	14	38	12,7	184	61,5	/	/	35	11,7
Austria	r1	16	3	18,8	2	12,5	10	62,5	0	0	1	6,3
Belgium	s	296	33	11,1	50	16,9	184	62,2	/	/	29	9,8
Belgium	r1	183	21	11,5	16	8,7	135	73,8	0	0	11	6
Belgium	r2	93	9	9,7	8	8,6	70	75,3	0	0	6	6,5
Bulgaria	s	294	110	37,4	8	2,7	129	43,9	/	/	47	16
Bulgaria	r1	131	20	15,3	4	3,1	98	74,8	0	0	9	6,9
Bulgaria	r2	66	5	7,6	2	3	50	75,8	0	0	9	13,6
Croatia	s	73	39	53,4	8	11	22	30,1	/	/	4	5,5
Cyprus	s	69	55	79,7	0	0	10	14,5	/	/	4	5,8
Czech Republic	s	300	116	38,7	40	13,3	79	26,3	/	/	65	21,7
Czech Republic	r1	72	10	13,9	4	5,6	54	75	0	0	4	5,6
Denmark	s	197	59	29,9	30	15,2	70	35,5	/	/	38	19,3
Estonia	s	213	86	40,4	11	5,2	84	39,4	/	/	32	15
Finland	s	287	121	42,2	12	4,2	104	36,2	/	/	50	17,4
Finland	r1	59	9	15,3	0	0	44	74,6	0	0	6	10,2
Finland	r2	31	4	12,9	0	0	24	77,4	0	0	3	9,7
France	s	300	28	9,3	23	7,7	203	67,7	/	/	46	15,3
France	r1	289	11	3,8	17	5,9	215	74,4	0	0	46	15,9
France	r2	279	11	3,9	28	10	205	73,5	0	0	35	12,5
Germany	s	423	9	2,1	18	4,3	384	90,8	/	/	12	2,8
Germany	r1	269	4	1,5	5	1,9	254	94,4	0	0	6	2,2
Germany	r2	91	1	1,1	3	3,3	86	94,5	0	0	1	1,1
Greece	s	301	75	24,9	18	6	173	57,5	/	/	35	11,6
Greece	r1	288	36	12,5	10	3,5	212	73,6	0	0	30	10,4
Greece	r2	185	19	10,3	7	3,8	145	78,4	0	0	14	7,6
Hungary	s	299	115	38,5	23	7,7	127	42,5	/	/	34	11,4
Hungary	r1	133	14	10,5	5	3,8	101	75,9	0	0	13	9,8
Hungary	r2	54	4	7,4	1	1,9	42	77,8	0	0	7	13
Iceland	s	32	9	28,1	3	9,4	15	46,9	/	/	5	15,6
Ireland	s	171	32	18,7	8	4,7	89	52	/	/	42	24,6
Italy	s	302	104	34,4	16	5,3	133	44	/	/	49	16,2

	status	TotalNSchools	N_ParticipatingSchools	%__ParticipatingSchools	N_RefusedSchools	%__RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Italy	r1	299	54	18,1	9	3	214	71,6	0	0	22	7,4
Italy	r2	253	43	17	7	2,8	187	73,9	0	0	16	6,3
Latvia	s	296	106	35,8	21	7,1	120	40,5	/	/	49	16,6
Latvia	r1	49	7	14,3	2	4,1	36	73,5	0	0	4	8,2
Latvia	r2	27	4	14,8	0	0	21	77,8	0	0	2	7,4
Lithuania	s	298	163	54,7	19	6,4	79	26,5	/	/	37	12,4
Lithuania	r1	64	14	21,9	2	3,1	47	73,4	0	0	1	1,6
Lithuania	r2	39	6	15,4	1	2,6	29	74,4	0	0	3	7,7
Luxembourg	s	28	4	14,3	3	10,7	19	67,9	/	/	2	7,1
Malta	s	4	2	50	0	0	2	50	/	/	0	0
Netherlands	s	210	6	2,9	18	8,6	166	79	/	/	20	9,5
Netherlands	r1	61	1	1,6	4	6,6	53	86,9	0	0	3	4,9
Netherlands	r2	23	0	0	0	0	23	100	0	0	0	0
Norway	s	300	45	15	34	11,3	181	60,3	/	/	40	13,3
Norway	r1	44	3	6,8	9	20,5	26	59,1	0	0	6	13,6
Norway	r2	9	0	0	2	22,2	7	77,8	0	0	0	0
Poland	s	299	127	42,5	9	3	147	49,2	/	/	16	5,4
Poland	r1	297	38	12,8	5	1,7	236	79,5	0	0	18	6,1
Poland	r2	277	41	14,8	7	2,5	220	79,4	0	0	9	3,2
Portugal	s	300	64	21,3	8	2,7	199	66,3	/	/	29	9,7
Portugal	r1	118	15	12,7	4	3,4	86	72,9	0	0	13	11
Portugal	r2	51	8	15,7	1	2	42	82,4	0	0	0	0
Romania	s	296	134	45,3	3	1	138	46,6	/	/	21	7,1
Romania	r1	190	25	13,2	3	1,6	153	80,5	0	0	9	4,7
Romania	r2	69	9	13	1	1,4	52	75,4	0	0	7	10,1
Slovakia	s	240	116	48,3	16	6,7	82	34,2	/	/	26	10,8
Slovenia	s	73	22	30,1	3	4,1	31	42,5	/	/	17	23,3
Spain	s	298	62	20,8	24	8,1	163	54,7	/	/	49	16,4
Spain	r1	287	27	9,4	15	5,2	221	77	0	0	24	8,4
Spain	r2	276	27	9,8	12	4,3	206	74,6	0	0	31	11,2
Sweden	s	300	13	4,3	24	8	217	72,3	/	/	46	15,3
Sweden	r1	97	2	2,1	6	6,2	83	85,6	0	0	6	6,2
Sweden	r2	51	2	3,9	2	3,9	42	82,4	0	0	5	9,8
Turkey	s	300	28	9,3	4	1,3	245	81,7	/	/	23	7,7
Turkey	r1	300	27	9	5	1,7	244	81,3	0	0	24	8
Turkey	r2	279	32	11,5	6	2,2	216	77,4	0	0	25	9

	status	TotalNSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
United Kingdom	s	299	5	1,7	9	3	266	89	/	/	19	6,4
United Kingdom	r1	229	2	0,9	8	3,5	206	90	0	0	13	5,7
United Kingdom	r2	263	5	1,9	2	0,8	234	89	0	0	22	8,4

Note: 's'=selected school, 'r1'=first replacement school and 'r2'=second replacement school

Table 13: Number and percentage of schools that participated, refused to participate, that didn't respond, replacement schools that were never contacted, and schools that stopped participating during the data administration in <u>ISCED3B</u> by country

	status	TotalNSchools	N_ParticipatingSchools	%_ParticipatingSchools	N_RefusedSchools	%_RefusedSchools	N_NoReponseSchools	%_NoReponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Austria	s	300	64	21,3	20	6,7	187	62,3	/	/	29	9,7
Austria	r1	83	15	18,1	7	8,4	55	66,3	0	0	6	7,2
Austria	r2	25	1	4	0	0	19	76	0	0	5	20
Belgium	s	300	51	17	23	7,7	203	67,7	/	/	23	7,7
Belgium	r1	187	17	9,1	28	15	125	66,8	0	0	17	9,1
Belgium	r2	103	7	6,8	9	8,7	79	76,7	0	0	8	7,8
Bulgaria	s	300	115	38,3	5	1,7	126	42	/	/	54	18
Bulgaria	r1	85	22	25,9	0	0	57	67,1	0	0	6	7,1
Bulgaria	r2	24	2	8,3	2	8,3	16	66,7	0	0	4	16,7
Croatia	s	280	124	44,3	16	5,7	114	40,7	/	/	26	9,3
Cyprus	s	13	7	53,8	0	0	4	30,8	/	/	2	15,4
Czech Republic	s	299	90	30,1	39	13	94	31,4	/	/	76	25,4
Czech Republic	r1	299	45	15,1	12	4	215	71,9	0	0	27	9
Czech Republic	r2	293	27	9,2	20	6,8	218	74,4	0	0	28	9,6
Denmark	s	115	15	13	15	13	62	53,9	/	/	23	20
Estonia	s	36	15	41,7	1	2,8	8	22,2	/	/	12	33,3
Finland	s	137	59	43,1	8	5,8	47	34,3	/	/	23	16,8
France	s	300	18	6	36	12	193	64,3	/	/	53	17,7
France	r1	283	12	4,2	18	6,4	217	76,7	0	0	36	12,7
France	r2	268	10	3,7	22	8,2	205	76,5	0	0	31	11,6
Germany	s	425	16	3,8	12	2,8	384	90,4	/	/	13	3,1
Germany	r1	98	4	4,1	4	4,1	85	86,7	0	0	5	5,1
Germany	r2	27	0	0	0	0	27	100	0	0	0	0
Greece	s	300	21	7	4	1,3	266	88,7	/	/	9	3
Greece	r1	82	1	1,2	1	1,2	76	92,7	0	0	4	4,9
Greece	r2	26	0	0	1	3,8	23	88,5	0	0	2	7,7
Hungary	s	301	105	34,9	12	4	159	52,8	/	/	25	8,3
Hungary	r1	165	23	13,9	5	3	117	70,9	0	0	20	12,1
Hungary	r2	88	9	10,2	4	4,5	67	76,1	0	0	8	9,1
Iceland	s	24	4	16,7	1	4,2	16	66,7	/	/	3	12,5
Italy	s	300	89	29,7	9	3	165	55	/	/	37	12,3
Italy	r1	299	54	18,1	6	2	211	70,6	0	0	28	9,4
Italy	r2	295	64	21,7	8	2,7	188	63,7	0	0	35	11,9
Latvia	s	90	25	27,8	8	8,9	29	32,2	/	/	28	31,1

	status	TotalNSchools	N_ParticipatingSchools	%__ParticipatingSchools	N_RefusedSchools	%__RefusedSchools	N_NoReponseSchools	%_NoResponseSchools	N_RschoolNeverContacted	%_RschoolNeverContacted	N_StoppedDuringProcess	%_StoppedDuringProgress
Lithuania	s	69	51	73,9	1	1,4	11	15,9	/	/	6	8,7
Luxembourg	s	15	6	40	2	13,3	6	40	/	/	1	6,7
Norway	s	300	32	10,7	44	14,7	185	61,7	/	/	39	13
Norway	r1	24	1	4,2	3	12,5	15	62,5	0	0	5	20,8
Norway	r2	6	0	0	1	16,7	5	83,3	0	0	0	0
Poland	s	300	138	46	13	4,3	132	44	/	/	17	5,7
Poland	r1	257	30	11,7	10	3,9	208	80,9	0	0	9	3,5
Poland	r2	233	34	14,6	8	3,4	184	79	0	0	7	3
Portugal	s	301	76	25,2	3	1	184	61,1	/	/	38	12,6
Portugal	r1	178	24	13,5	2	1,1	141	79,2	0	0	11	6,2
Portugal	r2	91	11	12,1	1	1,1	70	76,9	0	0	9	9,9
Romania	s	294	132	44,9	2	0,7	134	45,6	/	/	26	8,8
Romania	r1	96	12	12,5	1	1	78	81,3	0	0	5	5,2
Romania	r2	34	3	8,8	0	0	28	82,4	0	0	3	8,8
Slovakia	s	300	169	56,3	19	6,3	74	24,7	/	/	38	12,7
Slovakia	r1	109	15	13,8	2	1,8	87	79,8	0	0	5	4,6
Slovakia	r2	42	8	19	3	7,1	31	73,8	0	0	0	0
Slovenia	s	110	19	17,3	11	10	61	55,5	/	/	19	17,3
Spain	s	295	66	22,4	13	4,4	169	57,3	/	/	47	15,9
Spain	r1	283	30	10,6	11	3,9	220	77,7	0	0	22	7,8
Spain	r2	263	20	7,6	13	4,9	209	79,5	0	0	21	8
Sweden	s	300	13	4,3	32	10,7	219	73	/	/	36	12
Sweden	r1	145	1	0,7	8	5,5	115	79,3	0	0	21	14,5
Sweden	r2	76	2	2,6	10	13,2	58	76,3	0	0	6	7,9
Turkey	s	300	23	7,7	2	0,7	255	85	/	/	20	6,7
Turkey	r1	295	24	8,1	4	1,4	246	83,4	0	0	21	7,1
Turkey	r2	276	29	10,5	3	1,1	227	82,2	0	0	17	6,2

Note: 's'=selected school, 'r1'=first replacement school and 'r2'=second replacement school

The following tables report the school response rate per explicit strata within each participating countries. Differential response rate between explicit strata might a source of potential biases. Therefore, a school non response adjustment was computed at the explicit stratum level for minimizing the effect of differential response rate. In short, the school non response adjustment is equal to the weighted number of sample schools, divided by the weighted number of participating school.

Table 14: Percentage of sampled and replacement schools by explicit strata and by country in <u>ISCED1</u>

	STRATUM	Stratum name	N Sampled Schools	N Participating Schools	%_Participating_Schools
Austria	1	Burgenland	7	1	14,3
Austria	2	Kärnten	19	12	63,2
Austria	3	Niederösterreich	58	24	41,4
Austria	4	Oberösterreich	55	24	43,6
Austria	5	Salzburg	21	6	28,6
Austria	6	Steiermark	39	12	30,8
Austria	7	Tirol	24	11	45,8
Austria	8	Vorarlberg	15	6	40
Austria	9	Wien	60	12	20
Belgium	1	FL_Gemeenschapsonderwijs	23	8	34,8
Belgium	2	FL_Officieelgesubsidieerdonderwijs	37	23	62,2
Belgium	3	FL_Vrijgesubsidieerdonderwijs	103	36	35,0
Belgium	4	FR_Communautéfrançaise	20	7	35,0
Belgium	5	FR_Libre subventionné	31	10	32,3
Belgium	6	FR_Officielsubventionné	85	21	24,7
Bulgaria	1	N/A	300	176	58,7
Croatia	1	N/A	299	159	53,2
Cyprus	1	Public_Urban	94	66	70,2
Cyprus	2	Public_Rural	167	120	71,9
Cyprus	3	Private_Urban	15	8	53,3
Cyprus	4	Private_Rural	2	2	100
Czech Republic	1	Hlavní mesto Praha	20	8	40
Czech Republic	2	Jihoceský kraj	17	7	41,2
Czech Republic	3	Jihomoravský kraj	37	14	37,8
Czech Republic	4	Karlovarský kraj	8	3	37,5
Czech Republic	5	Královéhradecký kraj	18	4	22,2
Czech Republic	6	Liberecký kraj	15	8	53,3
Czech Republic	7	Moravskoslezský kraj	34	16	47,1
Czech Republic	8	Olomoucký kraj	24	10	41,7
Czech Republic	9	Pardubický kraj	17	7	41,2
Czech Republic	10	Plzenský kraj	17	8	47,1
Czech Republic	11	Stredoceský kraj	35	17	48,6
Czech Republic	12	Vysocina	19	10	52,6
Czech Republic	13	Zlínský kraj	20	11	55
Czech Republic	14	Ústecký kraj	19	9	47,4
Denmark	1	Folkeskoler	261	39	14,9
Denmark	2	Friskoler og private grundskoler	39	3	7,7
Estonia	1	Estonian	109	53	48,6
Estonia	2	Russian	6	3	50
Estonia	99	Very large schools (certainty stratum)	176	44	25

	STRATUM	Stratum name	N Sampled Schools	N Participating Schools	%_Participating_Schools
Finland	1	Nord_Urban,town,city	23	12	52,2
Finland	2	Nord_Village	8	2	25
Finland	3	Nord_Rural	9	2	22,2
Finland	4	Sud_Urban,town,city	119	61	51,3
Finland	5	Sud_Village	17	7	41,2
Finland	6	Sud_Rural	12	7	58,3
Finland	7	Ouest_Urban,town,city	39	20	51,3
Finland	8	Ouest_Village	19	6	31,6
Finland	9	Ouest_Rural	15	3	20
Finland	10	Est_Urban,town,city	17	6	35,3
Finland	11	Est_Village	6	2	33,3
Finland	12	Est_Rural	10	4	40
Finland	13	SRS because MOS not valid	4	0	0
Finland	99	Very large schools (certainty stratum)	1	0	0
France	1	N/A	295	51	17,3
Germany	1	Berlin	63	1	1,6
Germany	2	Hessen	91	3	3,3
Germany	3	Lower Saxony	117	4	3,4
Germany	4	Brandenburg	39	4	10,3
Germany	5	Bremen	25	7	28
Germany	6	Saxony	90	9	10
Greece	1	ATTIKI	98	24	24,5
Greece	2	CENTRAL GREECE	15	4	26,7
Greece	3	CENTRAL MACEDONIA	58	31	53,4
Greece	4	CRETE	20	7	35
Greece	5	EAST MACEDONIA AND THRACE	15	5	33,3
Greece	6	EPIRUS	8	5	62,5
Greece	7	IONIAN ISLANDS	6	2	33,3
Greece	8	NORTH AEGEAN	5	3	60
Greece	9	PELOPONESSE	16	14	87,5
Greece	10	SOUTH AEGEAN	10	6	60
Greece	11	THESSALY	21	8	38,1
Greece	12	WEST GREECE	19	9	47,4
Greece	13	WEST MACEDONIA	8	3	37,5
Hungary	1	Baranya	11	6	54,5
Hungary	2	Borsod-Abaúj-Zemplén	25	11	44
Hungary	3	Budapest	44	16	36,4
Hungary	4	Bács-Kiskun	15	9	60
Hungary	5	Békés	11	8	72,7
Hungary	6	Csongrád	12	6	50
Hungary	7	Fejér	12	4	33,3

	STRATUM	Stratum name	N Sampled Schools	N Participating Schools	%_Participating_Schools
Hungary	8	Gyor-Moson-Sopron	12	6	50
Hungary	9	Hajdú-Bihar	18	7	38,9
Hungary	10	Heves	10	6	60
Hungary	11	Jász-Nagykun-Szolnok	13	8	61,5
Hungary	12	Komárom-Esztergom	9	6	66,7
Hungary	13	Nógrád	5	4	80
Hungary	14	Pest	38	22	57,9
Hungary	15	Somogy	9	3	33,3
Hungary	16	Szabolcs-Szatmár-Bereg	21	13	61,9
Hungary	17	Tolna	7	6	85,7
Hungary	18	Vas	7	1	14,3
Hungary	19	Veszprém	10	5	50
Hungary	20	Zala	8	4	50
Hungary	99	Very large schools (certainty stratum)	3	1	33,3
Iceland	1	N/A	133	9	6,8
Ireland	1	DEIS_NO	89	36	40,4
Ireland	2	DEIS_YES	23	8	34,8
Ireland	99	Very large schools (certainty stratum)	4	2	50
Italy	1	Abruzzo	6	4	66,7
Italy	2	Basilicata	3	3	100
Italy	3	Calabria	11	7	63,6
Italy	4	Campania	34	27	79,4
Italy	5	Emilia Romagna	21	12	57,1
Italy	6	Friuli V.G.	6	4	66,7
Italy	7	Lazio	27	18	66,7
Italy	8	Liguria	7	5	71,4
Italy	9	Lombardia	49	36	73,5
Italy	10	Marche	8	8	100
Italy	11	Molise	2	3	150
Italy	12	Piemonte	21	20	95,2
Italy	13	Puglia	24	20	83,3
Italy	14	Sardegna	8	6	75
Italy	15	Sicilia	29	28	96,6
Italy	16	Toscana	17	12	70,6
Italy	17	Umbria	4	5	125
Italy	18	Veneto	25	15	60
Latvia	1	PU_Latvian	140	72	51,4
Latvia	2	PU_Russian	19	9	47,4
Latvia	3	PU_LatvianandRussian	19	7	36,8
Latvia	4	PU_Other	2	0	0
Latvia	5	PR_Latvian	3	3	100

	STRATUM	Stratum name	N Sampled Schools	N Participating Schools	%_Participating_Schools
Latvia	99	Very large schools (certainty stratum)	117	41	35
Lithuania	1	town	205	124	60,5
Lithuania	2	country	74	59	79,7
Lithuania	99	Very large schools (certainty stratum)	21	11	52,4
Luxembourg	1	N/A	153	50	32,7
Malta	1	N/A	96	28	29,2
Netherlands	1	N/A	300	31	10,3
Norway	1	Bokmal	258	78	30,2
Norway	2	Nynorsk	42	7	16,7
Poland	1	dolnoslaskie	20	12	60
Poland	2	kujawsko-pomorskie	17	11	64,7
Poland	3	lubelskie	18	16	88,9
Poland	4	lubuskie	8	3	37,5
Poland	5	lódzkie	18	13	72,2
Poland	6	malopolskie	28	15	53,6
Poland	7	mazowieckie	41	7	17,1
Poland	8	opolskie	7	4	57,1
Poland	9	podkarpackie	18	7	38,9
Poland	10	podlaskie	9	7	77,8
Poland	11	pomorskie	19	19	100
Poland	12	slaskie	33	32	97
Poland	13	swietokrzyskie	10	4	40
Poland	14	warminsko-mazurskie	12	5	41,7
Poland	15	wielkopolskie	29	22	75,9
Poland	16	zachodniopomorskie	13	8	61,5
Portugal	1	Public_101	104	36	34,6
Portugal	2	Public_102	59	20	33,9
Portugal	3	Public_103	73	16	21,9
Portugal	4	Public_104	20	4	20
Portugal	5	Public_105	13	3	23,1
Portugal	6	Private_101	10	1	10
Portugal	7	Private_102	4	1	25
Portugal	8	Private_103	17	7	41,2
Portugal	9	Private_104	2	0	0
Portugal	10	Private_105	2	0	0
Romania	1	Romanian	290	178	61,4
Romania	2	Hungarian	10	6	60
Slovakia	1	Slovak_banskobystrickykraj	31	30	96,8
Slovakia	2	Slovak_bratislavskykraj	29	16	55,2
Slovakia	3	Slovak_kosickykraj	46	27	58,7
Slovakia	4	Slovak_nitrianskykraj	28	28	100

	STRATUM	Stratum name	N Sampled Schools	N Participating Schools	%_Participating_Schools
Slovakia	5	Slovak_presovskykraj	53	47	88,7
Slovakia	6	Slovak_trencianskykraj	29	21	72,4
Slovakia	7	Slovak_trnavskykraj	23	18	78,3
Slovakia	8	Slovak_zilinskykraj	42	40	95,2
Slovakia	9	Hungarian_banskobystrickykraj	20	9	45
Slovakia	9	Hungarian_bratislavskykraj	20	9	45
Slovakia	9	Hungarian_kosickykraj	20	9	45
Slovakia	9	Hungarian_nitrianskykraj	20	9	45
Slovakia	9	Hungarian_trnavskykraj	20	9	45
Slovenia	1	Pomurska	14	6	42,9
Slovenia	2	Podravska	39	17	43,6
Slovenia	3	Koroška	6	3	50
Slovenia	4	Savinjska	27	7	25,9
Slovenia	5	Zasavska	3	2	66,7
Slovenia	6	Posavska	7	3	42,9
Slovenia	7	Jugovzhodna Slovenija	12	4	33,3
Slovenia	8	Osrednjeslovenska	35	15	42,9
Slovenia	9	Gorenjska	5	3	60
Slovenia	10	Notranjsko-kraška	5	4	80
Slovenia	11	Goriška	14	6	42,9
Slovenia	12	Obalno-kraška	10	3	30
Slovenia	99	Very large schools (certainty stratum)	122	33	27
Spain	1	público	218	66	30,3
Spain	2	privado	11	2	18,2
Spain	3	concertado	72	16	22,2
Sweden	1	Public_SCHOOL_AUTHORITY_01	260	28	10,8
Sweden	1	Public_SCHOOL_AUTHORITY_03	260	28	10,8
Sweden	1	Public_SCHOOL_AUTHORITY_04	260	28	10,8
Sweden	2	Private_SCHOOL_AUTHORITY_05	30	3	10
Sweden	99	Very large schools (certainty stratum)	10	1	10
Turkey	1	Marmara Region	78	7	9
Turkey	2	Aegean Region	32	6	18,8
Turkey	3	Black Sea Region	27	8	29,6
Turkey	4	Central Anatolia Region	44	12	27,3
Turkey	5	Mediterranean Region	40	7	17,5
Turkey	6	Eastern Anatolia Region	32	3	9,4
Turkey	7	Southeastern Anatolia Region	48	9	18,8
United Kingdom	1	England	252	12	4,8
United Kingdom	2	Northen Ireland	9	1	11,1
United Kingdom	3	Scotland	22	1	4,5
United Kingdom	4	Wales	14	0	0

Table 15: Percentage of sampled and replacement schools by explicit strata and country in ISCED2

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%_Participating_Schools
Austria	1	Burgenland	9	4	44,4
Austria	2	Kärnten	21	8	38,1
Austria	3	Niederösterreich	54	21	38,9
Austria	4	Oberösterreich	55	26	47,3
Austria	5	Salzburg	20	5	25
Austria	6	Steiermark	41	7	17,1
Austria	7	Tirol	27	14	51,9
Austria	8	Vorarlberg	16	2	12,5
Austria	9	Wien	55	13	23,6
Belgium	1	FL_Gemeenschapsonderwijs	27	9	33,3
Belgium	2	FL_Officieelgesubsidieerdonderwijs	15	7	46,7
Belgium	3	FL_Vrijgesubsidieerdonderwijs	109	28	25,7
Belgium	4	FR_Communautéfrançaise	32	9	28,1
Belgium	5	FR_Officielsubventionné	16	3	18,8
Belgium	6	FR_Libresubventionné	77	20	26
Belgium	99	Very large schools (certainty stratum)	25	4	16
Bulgaria	1	N/A	321	211	65,7
Croatia	1	N/A	295	190	64,4
Cyprus	1	Public_Urban	30	22	73,3
Cyprus	2	Public_Rural	38	29	76,3
Cyprus	3	Private_Urban	16	9	56,3
Cyprus	4	Private_Rural	9	7	77,8
Czech Republic	1	Hlavní mesto Praha	20	12	60
Czech Republic	2	Jihoceský kraj	17	9	52,9
Czech Republic	3	Jihomoravský kraj	37	14	37,8
Czech Republic	4	Karlovarský kraj	8	2	25
Czech Republic	5	Královéhradecký kraj	18	10	55,6
Czech Republic	6	Liberecký kraj	15	6	40
Czech Republic	7	Moravskoslezský kraj	34	14	41,2
Czech Republic	8	Olomoucký kraj	24	9	37,5
Czech Republic	9	Pardubický kraj	18	8	44,4
Czech Republic	10	Plzenský kraj	17	9	52,9
Czech Republic	11	Stredoceský kraj	35	8	22,9
Czech Republic	12	Vysocina	19	5	26,3
Czech Republic	13	Zlínský kraj	20	8	40
Czech Republic	14	Ústecký kraj	19	10	52,6
Denmark	1	Folkeskoler	251	53	21,1

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%_Participating_Schools
Denmark	2	Friskoler og private grundskoler	49	6	12,2
Estonia	1	Estonian	29	18	62,1
Estonia	2	Russian	58	27	46,6
Estonia	99	Very large schools (certainty stratum)	214	87	40,7
Finland	1	Nord_Urban,town,city	20	8	40
Finland	2	Nord_Village	8	4	50
Finland	3	Nord_Rural	10	8	80
Finland	4	Sud_Urban,town,city	113	51	45,1
Finland	5	Sud_Village	17	8	47,1
Finland	6	Sud_Rural	12	4	33,3
Finland	7	Ouest_Urban,town,city	37	24	64,9
Finland	8	Ouest_Village	19	10	52,6
Finland	9	Ouest_Rural	17	13	76,5
Finland	10	Est_Urban,town,city	16	7	43,8
Finland	11	Est_Village	6	4	66,7
Finland	12	Est_Rural	12	7	58,3
Finland	13	SRS because MOS not valid	3	0	0
Finland	99	Very large schools (certainty stratum)	9	3	33,3
France	1	N/A	300	59	19,7
Germany	1	Berlin	62	0	0
Germany	2	Hessen	91	2	2,2
Germany	3	Lower Saxony	117	15	12,8
Germany	4	Brandenburg	40	1	2,5
Germany	5	Bremen	24	4	16,7
Germany	6	Saxony	90	3	3,3
Greece	1	Attiki	96	23	24
Greece	2	Central Greece	15	5	33,3
Greece	3	Central Macedonia	56	24	42,9
Greece	4	Crete	20	8	40
Greece	5	East Macedonia and Thrace	17	8	47,1
Greece	6	Epirus	9	3	33,3
Greece	7	Ionian Islands	6	2	33,3
Greece	8	North Aegean	6	3	50
Greece	9	Peloponesse	16	2	12,5
Greece	10	South Aegean	11	7	63,6
Greece	11	Thessalia	21	9	42,9
Greece	12	West Greece	20	8	40
Greece	13	West Macedonia	9	4	44,4
Hungary	1	Baranya	10	9	90
Hungary	2	Borsod-Abaúj-Zemplén	19	10	52,6

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%_Participating_Schools
Hungary	3	Budapest	41	26	63,4
Hungary	4	Bács-Kiskun	15	12	80
Hungary	5	Békés	11	8	72,7
Hungary	6	Csongrád	12	7	58,3
Hungary	7	Fejér	12	8	66,7
Hungary	8	Gyor-Moson-Sopron	10	9	90
Hungary	9	Hajdú-Bihar	17	12	70,6
Hungary	10	Heves	8	6	75
Hungary	11	Jász-Nagykun-Szolnok	12	9	75
Hungary	12	Komárom-Esztergom	9	5	55,6
Hungary	13	Nógrád	4	3	75
Hungary	14	Pest	32	18	56,3
Hungary	15	Somogy	8	6	75
Hungary	16	Szabolcs-Szatmár-Bereg	18	14	77,8
Hungary	17	Tolna	7	3	42,9
Hungary	18	Vas	6	0	0
Hungary	19	Veszprém	9	8	88,9
Hungary	20	Zala	7	5	71,4
Hungary	99	Very large schools (certainty stratum)	3	2	66,7
Iceland	1	N/A	148	23	15,5
Ireland	1	DEIS_NO	44	11	25
Ireland	2	DEIS_YES	12	4	33,3
Ireland	99	Very large schools (certainty stratum)	112	27	24,1
Italy	1	Abruzzo	7	4	57,1
Italy	2	Basilicata	3	2	66,7
Italy	3	Calabria	11	7	63,6
Italy	4	Campania	38	27	71,1
Italy	5	Emilia Romagna	19	11	57,9
Italy	6	Friuli V.G.	5	4	80
Italy	7	Lazio	29	17	58,6
Italy	8	Liguria	7	5	71,4
Italy	9	Lombardia	43	31	72,1
Italy	10	Marche	8	7	87,5
Italy	11	Molise	2	2	100
Italy	12	Piemonte	20	16	80
Italy	13	Puglia	23	18	78,3
Italy	14	Sardegna	8	2	25
Italy	15	Sicilia	31	23	74,2
Italy	16	Toscana	16	11	68,8
Italy	17	Umbria	4	6	150

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	% _Participating_Schools
Italy	18	Veneto	23	13	56,5
Latvia	1	PU_Latvian	98	48	49
Latvia	2	PU_Russian	31	9	29
Latvia	3	PU_LatvianandRussian	20	9	45
Latvia	4	PU_Other	2	0	0
Latvia	5	PR_Latvian	24	11	45,8
Latvia	6	PR_LatvianandRussian	70	41	58,6
Latvia	99	Very large schools (certainty stratum)	89	30	33,7
Lithuania	1	Town	174	125	71,8
Lithuania	2	Country	71	63	88,7
Lithuania	99	Very large schools (certainty stratum)	55	29	52,7
Luxembourg	1	N/A	26	6	23,1
Malta	1	N/A	54	26	48,1
Netherlands	1	N/A	268	9	3,4
Norway	1	Bokmal	257	56	21,8
Norway	2	Nynorsk	37	10	27
Norway	99	Very large schools (certainty stratum)	1	0	0
Poland	1	dolnoslaskie	21	18	85,7
Poland	2	gra	17	9	52,9
Poland	3	kujawsko-pomorskie	18	18	100
Poland	4	lubelskie	8	3	37,5
Poland	5	lubuskie	19	18	94,7
Poland	6	lódzkie	27	18	66,7
Poland	7	malopolskie	40	15	37,5
Poland	8	mazowieckie	8	6	75
Poland	9	opolskie	19	7	36,8
Poland	10	podkarpackie	10	9	90
Poland	11	podlaskie	18	11	61,1
Poland	12	pomorskie	33	37	112,1
Poland	13	slaskie	10	5	50
Poland	14	swietokrzyskie	12	9	75
Poland	15	warminsko-mazurskie	28	25	89,3
Poland	16	wielkopolskie	13	13	100
Portugal	1	Public_101	107	47	43,9
Portugal	2	Public_102	55	37	67,3
Portugal	3	Public_103	69	20	29
Portugal	4	Public_104	19	9	47,4
Portugal	5	Public_105	12	4	33,3
Portugal	6	Private_101	13	3	23,1
Portugal	7	Private_102	13	4	30,8

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%_Participating_Schools
Portugal	8	Private_103	11	5	45,5
Portugal	9	Private_104	2	1	50
Portugal	9	Private_105	2	1	50
Romania	1	Romanian	295	182	61,7
Romania	2	Hungarian	10	4	40
Slovakia	1	Slovak_banskobystrickykraj	33	26	78,8
Slovakia	2	Slovak_bratislavskykraj	26	21	80,8
Slovakia	3	Slovak_kosickykraj	42	30	71,4
Slovakia	4	Slovak_nitrianskykraj	33	34	103
Slovakia	5	Slovak_presovskykraj	54	39	72,2
Slovakia	6	Slovak_trencianskykraj	34	31	91,2
Slovakia	7	Slovak_trnavskykraj	24	19	79,2
Slovakia	8	Slovak_zilinskykraj	45	29	64,4
Slovakia	9	Hungarian_banskobystrickykraj	19	10	52,6
Slovakia	9	Hungarian_bratislavskykraj	19	10	52,6
Slovakia	9	Hungarian_kosickykraj	19	10	52,6
Slovakia	9	Hungarian_nitrianskykraj	19	10	52,6
Slovakia	9	Hungarian_trnavskykraj	19	10	52,6
Slovenia	1	Pomurska	9	4	44,4
Slovenia	2	Podravska	40	21	52,5
Slovenia	3	Koroška	4	1	25
Slovenia	4	Savinjska	26	6	23,1
Slovenia	5	Zasavska	3	3	100
Slovenia	6	Posavska	4	2	50
Slovenia	7	Jugovzhodna Slovenija	12	6	50
Slovenia	8	Osrednjeslovenska	40	16	40
Slovenia	9	Gorenjska	5	1	20
Slovenia	10	Notranjsko-kraška	2	0	0
Slovenia	11	Goriška	8	0	0
Slovenia	12	Obalno-kraška	9	3	33,3
Slovenia	99	Very large schools (certainty stratum)	122	43	35,2
Spain	1	público	200	74	37
Spain	2	privado	10	1	10
Spain	3	concertado	89	35	39,3
Sweden	1	Public_SCHOOL_AUTHORITY_01	249	32	12,9
Sweden	1	Public_SCHOOL_AUTHORITY_03	249	32	12,9
Sweden	2	Private_SCHOOL_AUTHORITY_05	45	10	22,2
Sweden	99	Very large schools (certainty stratum)	6	1	16,7
Turkey	1	Marmara Region	80	8	10
Turkey	2	Aegean Region	33	4	12,1

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%_Participating_Schools
Turkey	3	Black Sea Region	27	15	55,6
Turkey	4	Central Anatolia Region	46	9	19,6
Turkey	5	Mediterranean Region	41	5	12,2
Turkey	6	Eastern Anatolia Region	33	0	0
Turkey	7	Southeastern Anatolia Region	50	4	8
United Kingdom	1	England	253	7	2,8
United Kingdom	2	Northen Ireland	10	0	0
United Kingdom	3	Scotland	23	2	8,7
United Kingdom	4	Wales	14	1	7,1

Table 16: Percentage of sampled and replacement schools by explicit strata and country in ISCED3A

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Austria	1	Burgenland	3	0	0
Austria	2	Kärnten	10	2	20
Austria	3	Niederösterreich	19	7	36,8
Austria	4	Oberösterreich	4	2	50
Austria	5	Salzburg	12	0	0
Austria	6	Steiermark	4	1	25
Austria	99	Very large schools (certainty stratum)	247	33	13,4
Belgium	1	FL_Gemeenschapsonderwijs	33	7	21,2
Belgium	2	FL_Officieelgesubsidieerdonderwijs	4	2	50
Belgium	3	FL_Vrijgesubsidieerdonderwijs	101	27	26,7
Belgium	4	FR_Communauté française	29	6	20,7
Belgium	5	FR_Officiel subventionné	11	2	18,2
Belgium	6	FR_Libre subventionné	73	17	23,3
Belgium	99	Very large schools (certainty stratum)	45	2	4,4
Bulgaria	1	N/A	294	135	45,9
Croatia	1	N/A	73	39	53,4
Cyprus	1	Public	44	41	93,2
Cyprus	2	Private	25	14	56

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Czech Republic	1	Hlavní mesto Praha	56	14	25
Czech Republic	2	Jihoceský kraj	21	4	19
Czech Republic	3	Jihomoravský kraj	34	19	55,9
Czech Republic	4	Karlovarský kraj	9	2	22,2
Czech Republic	5	Královéhradecký kraj	16	3	18,8
Czech Republic	6	Liberecký kraj	10	4	40
Czech Republic	7	Moravskoslezský kraj	35	22	62,9
Czech Republic	8	Olomoucký kraj	16	11	68,8
Czech Republic	9	Pardubický kraj	17	10	58,8
Czech Republic	10	Plzenský kraj	12	7	58,3
Czech Republic	11	Stredoceský kraj	27	11	40,7
Czech Republic	12	Vysocina	15	6	40
Czech Republic	13	Zlínský kraj	13	6	46,2
Czech Republic	14	Ústecký kraj	19	7	36,8
Denmark	1	Erhvervsskoler m.v.	197	59	29,9
Estonia	1	Estonian	154	69	44,8
Estonia	2	Russian	43	13	30,2
Estonia	3	Estonian/English or Estonian/Russian	16	4	25
Finland	1	Nord_Urban,town,city	6	4	66,7
Finland	2	Nord_Village	7	5	71,4
Finland	3	Nord_Rural	11	7	63,6
Finland	4	Sud_Urban,town,city	5	4	80
Finland	5	Sud_Village	15	10	66,7
Finland	6	Sud_Rural	13	11	84,6
Finland	7	Ouest_Urban,town,city	4	3	75
Finland	8	Ouest_Village	9	5	55,6
Finland	99	Very large schools (certainty stratum)	217	85	39,2
France	1	N/A	300	50	16,7
Germany	1	Berlin	66	0	0
Germany	2	Hessen	86	0	0
Germany	3	Lower Saxony	117	7	6
Germany	4	Brandenburg	45	2	4,4
Germany	5	Bremen	19	1	5,3
Germany	6	Saxony	90	4	4,4
Greece	1	Attiki	105	37	35,2
Greece	2	Central Greece	15	4	26,7

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Greece	3	Central Macedonia	54	25	46,3
Greece	4	Crete	17	9	52,9
Greece	5	East Macedonia and Thrace	15	7	46,7
Greece	6	Epirus	10	6	60
Greece	7	Ionian Islands	6	4	66,7
Greece	8	North Aegean	5	3	60
Greece	9	Peloponesse	17	7	41,2
Greece	10	South Aegean	9	6	66,7
Greece	11	Thessaly	19	10	52,6
Greece	12	West Greece	19	8	42,1
Greece	13	West Macedonia	9	4	44,4
Greece	99	Very large schools (certainty stratum)	1	0	0
Hungary	1	Baranya	9	5	55,6
Hungary	2	Borsod-Abaúj-Zemplén	12	7	58,3
Hungary	3	Budapest	58	23	39,7
Hungary	4	Bács-Kiskun	11	7	63,6
Hungary	5	Békés	9	4	44,4
Hungary	6	Csongrád	4	1	25
Hungary	7	Fejér	9	6	66,7
Hungary	8	Gyor-Moson-Sopron	10	6	60
Hungary	9	Hajdú-Bihar	9	5	55,6
Hungary	10	Heves	3	1	33,3
Hungary	11	Jász-Nagykun-Szolnok	9	5	55,6
Hungary	12	Komárom-Esztergom	7	5	71,4
Hungary	13	Nógrád	4	3	75
Hungary	14	Pest	19	7	36,8
Hungary	15	Somogy	5	1	20
Hungary	16	Szabolcs-Szatmár-Bereg	12	6	50
Hungary	17	Tolna	7	5	71,4
Hungary	18	Vas	6	3	50
Hungary	19	Veszprém	9	4	44,4
Hungary	20	Zala	5	2	40
Hungary	99	Very large schools (certainty stratum)	82	27	32,9
Iceland	1	N/A	32	9	28,1
Ireland	1	DEIS_NO	37	10	27
Ireland	2	DEIS_YES	23	4	17,4

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Ireland	99	Very large schools (certainty stratum)	111	18	16,2
Italy	1	Abruzzo	8	4	50
Italy	2	Basilicata	4	4	100
Italy	3	Calabria	13	7	53,8
Italy	4	Campania	42	24	57,1
Italy	5	Emilia Romagna	16	13	81,3
Italy	6	Friuli V.G.	5	5	100
Italy	7	Lazio	34	17	50
Italy	8	Liguria	7	8	114,3
Italy	9	Lombardia	35	22	62,9
Italy	10	Marche	8	8	100
Italy	11	Molise	2	2	100
Italy	12	Piemonte	18	11	61,1
Italy	13	Puglia	25	21	84
Italy	14	Sardegna	9	7	77,8
Italy	15	Sicilia	34	24	70,6
Italy	16	Toscana	17	11	64,7
Italy	17	Umbria	5	3	60
Italy	18	Veneto	19	10	52,6
Italy	99	Very large schools (certainty stratum)	1	0	0
Latvia	1	PU_Latvian	46	17	37
Latvia	2	PU_Russian	32	10	31,3
Latvia	3	PU_LatvianandRussian	2	0	0
Latvia	4	PU_Other	24	12	50
Latvia	99	Very large schools (certainty stratum)	192	78	40,6
Lithuania	1	town	79	50	63,3
Lithuania	2	country	41	34	82,9
Lithuania	99	Very large schools (certainty stratum)	178	99	55,6
Luxembourg	1	N/A	28	4	14,3
Malta	1	N/A	4	2	50
Netherlands	1	N/A	210	7	3,3
Norway	1	Bokmal	53	5	9,4
Norway	2	Nynorsk	21	5	23,8
Norway	99	Very large schools (certainty stratum)	226	38	16,8
Poland	1	dolnoslaskie	20	17	85
Poland	2	kujawsko-pomorskie	14	8	57,1

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Poland	3	lubelskie	22	19	86,4
Poland	4	lubuskie	7	2	28,6
Poland	5	lódzkie	20	19	95
Poland	6	malopolskie	28	10	35,7
Poland	7	mazowieckie	46	21	45,7
Poland	8	opolskie	6	4	66,7
Poland	9	podkarpackie	18	12	66,7
Poland	10	podlaskie	11	9	81,8
Poland	11	pomorskie	16	13	81,3
Poland	12	slaskie	31	34	109,7
Poland	13	swietokrzyskie	11	4	36,4
Poland	14	warminsko-mazurskie	11	7	63,6
Poland	15	wielkopolskie	25	19	76
Poland	16	zachodniopomorskie	13	8	61,5
Portugal	1	Public_101	55	13	23,6
Portugal	2	Public_102	47	20	42,6
Portugal	3	Public_103	35	10	28,6
Portugal	4	Public_104	17	5	29,4
Portugal	5	Public_105	6	2	33,3
Portugal	6	Private_101	13	6	46,2
Portugal	7	Private_102	9	3	33,3
Portugal	8	Private_103	8	5	62,5
Portugal	8	Private_104	8	5	62,5
Portugal	8	Private_105	8	5	62,5
Portugal	99	Very large schools (certainty stratum)	110	23	20,9
Romania	1	Romanian	274	155	56,6
Romania	2	Hungarian	8	5	62,5
Romania	99	Very large schools (certainty stratum)	14	8	57,1
Slovakia	1	Slovak_banskobystrickykraj	29	17	58,6
Slovakia	2	Slovak_bratislavskykraj	38	11	28,9
Slovakia	3	Slovak_kosickykraj	33	17	51,5
Slovakia	4	Slovak_nitrianskykraj	21	14	66,7
Slovakia	5	Slovak_presovskykraj	39	25	64,1
Slovakia	6	Slovak_trencianskykraj	19	3	15,8
Slovakia	7	Slovak_trnavskykraj	16	8	50
Slovakia	8	Slovak_zilinskykraj	27	12	44,4

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Slovakia	9	Hungarian_banskobystrickykraj	18	9	50
Slovakia	9	Hungarian_bratislavskykraj	18	9	50
Slovakia	9	Hungarian_kosickykraj	18	9	50
Slovakia	9	Hungarian_nitrianskykraj	18	9	50
Slovakia	9	Hungarian_trnavskykraj	18	9	50
Slovenia	1	N/A	73	22	30,1
Spain	1	público	220	92	41,8
Spain	2	privado	49	17	34,7
Spain	3	concertado	29	7	24,1
Sweden	1	Public_SCHOOL_AUTHORITY_01	89	3	3,4
Sweden	2	Private_SCHOOL_AUTHORITY_05	60	4	6,7
Sweden	99	Very large schools (certainty stratum)	151	10	6,6
Turkey	1	Marmara Region	79	19	24,1
Turkey	2	Aegean Region	32	15	46,9
Turkey	3	Black Sea Region	26	12	46,2
Turkey	4	Central Anatolia Region	48	17	35,4
Turkey	5	Mediterranean Region	44	13	29,5
Turkey	6	Eastern Anatolia Region	28	6	21,4
Turkey	7	Southeastern Anatolia Region	43	5	11,6
United Kingdom	1	England	235	10	4,3
United Kingdom	2	Northern Ireland	16	0	0
United Kingdom	3	Scotland	31	0	0
United Kingdom	4	Wales	17	2	11,8

Table 17: Percentage of sampled and replacement schools by explicit strata and country in <u>ISCED3B</u>

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Austria	1	Burgenland	6	2	33,3
Austria	2	Kärnten	10	3	30
Austria	3	Niederösterreich	28	15	53,6
Austria	4	Oberösterreich	22	7	31,8
Austria	5	Salzburg	13	4	30,8
Austria	6	Steiermark	14	4	28,6
Austria	7	Tirol	18	7	38,9
Austria	8	Vorarlberg	9	2	22,2
Austria	9	Wien	20	7	35
Austria	99	Very large schools (certainty stratum)	160	29	18,1
Belgium	1	FL_Gemeenschapsonderwijs	41	9	22
Belgium	2	FL_Officieelgesubsidieerdonderwijs	20	8	40
Belgium	3	FL_ Vrijgesubsidieerdonderwijs	122	28	23
Belgium	4	FR_Communautéfrançaise	14	4	28,6
Belgium	5	FR_Officiel subventionné	18	7	38,9
Belgium	6	FR_Libre subventionné	38	9	23,7
Belgium	99	Very large schools (certainty stratum)	47	10	21,3
Bulgaria	1	N/A	300	139	46,3
Croatia	1	N/A	280	124	44,3
Cyprus	1	N/A	13	7	53,8
Czech Republic	1	Hlavní mesto Praha	37	18	48,6
Czech Republic	2	Jihoceský kraj	21	11	52,4
Czech Republic	3	Jihomoravský kraj	29	17	58,6
Czech Republic	4	Karlovarský kraj	8	4	50
Czech Republic	5	Královéhradecký kraj	17	10	58,8
Czech Republic	6	Liberecký kraj	12	2	16,7
Czech Republic	7	Moravskoslezský kraj	32	18	56,3
Czech Republic	8	Olomoucký kraj	23	20	87
Czech Republic	9	Pardubický kraj	16	6	37,5
Czech Republic	10	Plzenský kraj	14	4	28,6
Czech Republic	11	Stredoceský kraj	32	16	50
Czech Republic	12	Vysocina	15	7	46,7
Czech Republic	13	Zlínský kraj	18	13	72,2

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Czech Republic	14	Ústecký kraj	25	16	64
Denmark	1	N/A	115	15	13
Estonia	1	Estonian	23	12	52,2
Estonia	2	Russian	3	0	0
Estonia	3	Estonian/English or Estonian/Russian	10	3	30
Finland	1	Nord	33	18	54,5
Finland	2	Sud	61	23	37,7
Finland	3	Ouest	26	8	30,8
Finland	4	Est	17	10	58,8
France	1	N/A	300	40	13,3
Germany	1	Berlin	63	1	1,6
Germany	2	Hessen	92	1	1,1
Germany	3	Lower Saxony	116	7	6
Germany	4	Brandenburg	39	2	5,1
Germany	5	Bremen	25	8	32
Germany	6	Saxony	90	1	1,1
Greece	1	ATTIKI	16	2	12,5
Greece	2	CENTRAL GREECE	9	0	0
Greece	3	CENTRAL MACEDONIA	18	2	11,1
Greece	4	CRETE	3	1	33,3
Greece	5	EAST MACEDONIA AND THRACE	5	3	60
Greece	6	EPIRUS	6	0	0
Greece	7	IONIAN ISLANDS	4	0	0
Greece	8	NORTH AEGEAN	5	0	0
Greece	9	PELOPONESSE	12	1	8,3
Greece	10	SOUTH AEGEAN	9	1	11,1
Greece	11	THESSALY	14	0	0
Greece	12	WEST GREECE	13	1	7,7
Greece	13	WEST MACEDONIA	7	1	14,3
Greece	99	Very large schools (certainty stratum)	179	10	5,6
Hungary	1	Baranya	8	3	37,5
Hungary	2	Borsod-Abaúj-Zemplén	21	11	52,4
Hungary	3	Budapest	44	24	54,5
Hungary	4	Bács-Kiskun	7	4	57,1
Hungary	5	Békés	6	2	33,3

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Hungary	6	Csongrád	4	1	25
Hungary	7	Fejér	10	4	40
Hungary	8	Gyor-Moson-Sopron	14	8	57,1
Hungary	9	Hajdú-Bihar	14	5	35,7
Hungary	10	Heves	9	1	11,1
Hungary	11	Jász-Nagykun-Szolnok	11	5	45,5
Hungary	12	Komárom-Esztergom	9	5	55,6
Hungary	13	Nógrád	5	0	0
Hungary	14	Pest	16	9	56,3
Hungary	15	Somogy	5	1	20
Hungary	16	Szabolcs-Szatmár-Bereg	13	9	69,2
Hungary	17	Tolna	3	0	0
Hungary	18	Vas	8	8	100
Hungary	19	Veszprém	10	3	30
Hungary	20	Zala	5	2	40
Hungary	99	Very large schools (certainty stratum)	79	32	40,5
Iceland	1	N/A	24	4	16,7
Italy	1	Abruzzo	7	5	71,4
Italy	2	Basilicata	4	5	125
Italy	3	Calabria	12	13	108,3
Italy	4	Campania	34	18	52,9
Italy	5	Emilia Romagna	20	12	60
Italy	6	Friuli V.G.	5	2	40
Italy	7	Lazio	25	15	60
Italy	8	Liguria	7	4	57,1
Italy	9	Lombardia	45	30	66,7
Italy	10	Marche	9	7	77,8
Italy	11	Molise	2	3	150
Italy	12	Piemonte	20	16	80
Italy	13	Puglia	26	23	88,5
Italy	14	Sardegna	9	4	44,4
Italy	15	Sicilia	27	20	74,1
Italy	16	Toscana	18	16	88,9
Italy	17	Umbria	4	3	75
Italy	18	Veneto	26	11	42,3

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Latvia	1	PR_Latvian	90	25	27,8
Lithuania	1	town	52	41	78,8
Lithuania	2	country	17	10	58,8
Luxembourg	1	N/A	15	6	40
Norway	1	Bokmal	22	2	9,1
Norway	2	Nynorsk	26	2	7,7
Norway	99	Very large schools (certainty stratum)	252	29	11,5
Poland	1	dolnoslaskie	22	14	63,6
Poland	2	kujawsko-pomorskie	18	10	55,6
Poland	3	lubelskie	15	14	93,3
Poland	4	lubuskie	9	3	33,3
Poland	5	lódzkie	16	13	81,3
Poland	6	malopolskie	29	12	41,4
Poland	7	mazowieckie	33	18	54,5
Poland	8	opolskie	9	7	77,8
Poland	9	podkarpackie	18	7	38,9
Poland	10	podlaskie	10	9	90
Poland	11	pomorskie	19	16	84,2
Poland	12	slaskie	35	36	102,9
Poland	13	swietokrzyskie	12	5	41,7
Poland	14	warminsko-mazurskie	13	7	53,8
Poland	15	wielkopolskie	30	23	76,7
Poland	16	zachodniopomorskie	12	8	66,7
Portugal	1	Public_101	59	15	25,4
Portugal	2	Public_102	43	18	41,9
Portugal	3	Public_103	40	15	37,5
Portugal	4	Public_104	13	3	23,1
Portugal	5	Public_105	10	1	10
Portugal	6	Private_101	37	14	37,8
Portugal	7	Private_102	25	15	60
Portugal	8	Private_103	16	10	62,5
Portugal	9	Private_104	8	6	75
Portugal	10	Private_105	2	1	50
Portugal	99	Very large schools (certainty stratum)	48	13	27,1
Romania	1	Romanian	164	86	52,4

	STRATUM	stratum_name	N_Sampled_Schools	N_Participating_Schools	%a_Participating_Schools
Romania	2	Hungarian	9	4	44,4
Romania	99	Very large schools (certainty stratum)	121	57	47,1
Slovakia	1	Slovak_banskobystrickykraj	26	19	73,1
Slovakia	2	Slovak_bratislavskykraj	26	21	80,8
Slovakia	3	Slovak_kosickykraj	28	15	53,6
Slovakia	4	Slovak_nitrianskykraj	24	21	87,5
Slovakia	5	Slovak_presovskykraj	35	23	65,7
Slovakia	6	Slovak_trencianskykraj	13	3	23,1
Slovakia	7	Slovak_trnavskykraj	18	9	50
Slovakia	8	Slovak_zilinskykraj	20	17	85
Slovakia	9	Hungarian_nitrianskykraj	4	0	0
Slovakia	9	Hungarian_trnavskykraj	4	0	0
Slovakia	99	Very large schools (certainty stratum)	106	64	60,4
Slovenia	1	N/A	110	19	17,3
Spain	1	público	220	84	38,2
Spain	2	privado	11	1	9,1
Spain	3	concertado	61	31	50,8
Spain	99	Very large schools (certainty stratum)	3	0	0
Sweden	1	Public_SCHOOL_AUTHORITY_01	123	4	3,3
Sweden	1	Public_SCHOOL_AUTHORITY_02	123	4	3,3
Sweden	2	Private_SCHOOL_AUTHORITY_05	79	8	10,1
Sweden	99	Very large schools (certainty stratum)	98	4	4,1
Turkey	1	Marmara Region	92	17	18,5
Turkey	2	Aegean Region	42	12	28,6
Turkey	3	Black Sea Region	39	21	53,8
Turkey	4	Central Anatolia Region	51	14	27,5
Turkey	5	Mediterranean Region	37	5	13,5
Turkey	6	Eastern Anatolia Region	20	5	25
Turkey	7	Southeastern Anatolia Region	19	2	10,5

Cleaning

Data cleaning is an important step because it guarantees the integrity of the data and the quality of the reported results.

Data cleaning starts with the school sample frames. Indeed, it is of prime importance to check the quality and the exhaustiveness of the school sample frames. Uncoverage problems are source of potential biases To this end, the student population size at grade 4 and at grade 8 were compared with the population size estimates using the PIRLS and TIMSS databases. Indeed, the sum of the student final weights from these surveys is an unbiased estimate of population sizes, after exclusion. Using these estimates combined with the exclusion rates published in the international reports and/or technical reports, it was possible to have a relatively precise estimate of the population size. Further, for a particular country, the school frames were compared between the four target populations.

The school sample frames were also checked for duplicate records, using the school national identification and/or the e-mail address, for missing data in the stratification variables. This cleaning phase took more time than expected as several countries couldn't respect the recommendation of the data file submission.

For reminder, the data were collected online. The online data collection system (ODC) developed by the DPC allows the implementation of validity check during the data collection process. For this survey, two data entry validity checks were implemented:

1. The school, teacher or student unique identification is checked. If case of invalid identification, the ODC system does not allow the user to enter any data;

2. For each variable in the principal, teacher and student questionnaires, validation rules were defined. If the variable was categorical, the validation rules simply consist of a list of valid numbers. For continuous variables, the validation process requires the specification of a minimum and a maximum value.

The data files sent by the DPC should therefore contain only data that respects the validation rules described here above. Data files sent by the IEA Data Processing Centre are structured as followed: per ISCED level, all country confounded, (i) a school principal questionnaire file, (ii) a teacher questionnaire file and (iii) a student questionnaire file (except for ISCED level 1). In addition, several files providing information on school participation and class sampling process were returned by the DPC.

The first cleaning step consisted of comparing the questionnaire data files with the sampling and participation information files. Indeed, for instance, several schools recorded their participation but gave up just after registration. This long and tedious process ended up, per country and per ISCED level, with a list of participating school.

Several tests were then implemented for checking the plausibility of the respondent answers to open-ended questions. For instance, the school principal had to provide the number of students and the number of computer. The number of students was compared systematically with the school size of the school sample frame. The ratio between the number of students and the number of computers was computed and implausible ratios were recorded as missing.

Continuous variables were also standardized and outlying values could also lead to the recording of the data into missing information. For instance, question 1 of the school head questionnaire is related to student enrolment figures. If the school principal provided figures for boys and no figures for girls, the missing information was recorded as 0. Question 18 of the same questionnaire consists of 8 YES/NO items. If nearly all items were YES and one or two items were missing, these missing were recorded as NO.

Weighting and non-response adjustments

If the sampling units do not have the same chance of being selected and if the population parameters are estimated without taking into account these varying probabilities, then survey estimates might be biased. Therefore, data need to be weighted in order to compensate for these varying probabilities and to ensure that each sampled student represent the correct number of students in the full population as defined in ESSIE. Three weights have been computed: (i) principal (or school) weight, (ii) 'teacher' weight and (iii) the student weight.

SCHOOL WEIGHT

BASIC SCHOOL WEIGHT

With PPS, the probability of selection of school *i* is given as:

$$p_{ij} = \frac{MOS_{ij}.n_j}{MOS_j},$$

Where MOS_{ij} represents the number of students of the school *I* of explicit stratum *J* in the school sampling frame, MOS_j the total number of student for the explicit stratum *J* and n_j the number of sampled schools in the explicit stratum *J*.

The basic school weight is therefore equal to:

$$BSCWT_{ij} = \frac{1}{p_{ij}} = \frac{MOS_j}{MOS_{ij}n_j}$$

The Basic school weight was then adjusted for school non response within each explicit stratum. The school non response adjustment is equal to:

$$Ad\_SC_j = \frac{\sum_{i=1} MOS_{ij} BSCWT_{ij}}{\sum_{j=1} MOS_{ij} BSCWT_{ij}},$$ where the sum of the denominator is across all sampled schools,

while the denominator is the sum across only participating schools.

FINAL SCHOOL WEIGHT

The final school weight is therefore equal to:

$$FSCWT_{ij} = BSCWT_{ij}Ad\_SC_j$$

This is the weight that needs to be used for the computation of the trends estimates.

SCHOOL HEAD WEIGHT

Even if the school has been considered as a participating school, a non-negligible percentage of principals refuse to fill in the school head questionnaire. IEA and PISA surveys usually do not apply an adjustment for such non response. In ESSIE surveys, it was deemed appropriate to implement such adjustment. This adjustment is therefore equal to

$$Ad\_PR_j = \frac{\sum_{i=1} MOS_{ij}FSCWT_{ij}}{\sum_{j=1} MOS_{ij}FSCWT_{ij}}$$, where the denominator includes all participating schools, while

the denominator only includes schools with Head of School questionnaire data.

The final principal weight is therefore equal to the school final weight, times the principal nonresponse adjustment factor. This weight was only used for the computation of the trends estimates.

For analysing any school head questionnaire variable as an attribute of students, school and student databases must be merged. Therefore, some schools might have school head data without student data. This mismatch was in most cases below 15 % of the total number of records. In the merge data file, only schools with school head and student data were kept. It was therefore necessary to apply a new adjustment to the principal final weight.

STUDENT WEIGHT

BASIC STUDENT WEIGHT

According to the sampling design in the ESSIE surveys, at least in all countries were schools were drawn according to their size, the student data should be theoretically be self-weighted. However, different elements, such as non-response, contribute to the variability of the weights.

For reminder, within participating schools, a simple random sample of at least one class was drawn from a complete list of classes for a particular target grade. The probability of selection for a particular class was therefore equal to the number of sample classes divided by the total number of classes in that particular school. Then as wall students were invited to participate, the student initial student weight within a specific class was equal 1. This initial within class weight was then adjusted

for student non-response, which is simply equal to the number of students who should have participated, divided by the number of students who has participated.

The basic student weight is therefore equal to:

$BSTWT_{hij} = FSCWT_{ij} \dfrac{N\_cl_{ij}}{n\_cl_{ij}} Ad\_ST$, where N_cl_{ij} represents the total number of classes in

school *IJ*, n_cl_{ij} the number of classes selected in school *IJ* (usually 1) and Ad_ST the within school student non response. It should be noted that if more than 1 class was selected, then a specific student non response adjustment was computed per class.

FINAL STUDENT WEIGHT

The final student weight is the product of the basic school weight, adjusted for schools with no student data.

$FSTWT_{hij} = BSTWT_{hij} \dfrac{\sum\limits_{i=1} MOS_{ij} FSCWT_{ij}}{\sum\limits_{j=1} MOS_{ij} FSCWT_{ij}}$, where the denominator of the ratio consists of all

participating schools, and the denominator, all participating schools with students data.

TEACHER WEIGHT

All teacher variables are analysed as attributes of students, therefore there is not a real teacher weighting. Teacher and student databases must be merged[4] and the student weight has to be adjusted for teacher non response.

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[4] « Many to many » merging step, i.e. that the number of lines for each student is the number of linked teachers that have filled in the questionnaire (from one to three). It's the reason why the student weight must be divided by the number or teachers who have participated within class.

Sampling Variance and Standard Error

Any survey statistic based on a sample should be associated with its standard error. A two stage sample should not be considered as a simple random sample. Indeed, selected students attending the same school cannot be considered as independent observations as they can be with a simple random sample because they are usually more similar than students attending distinct educational institutions. For instance, they are offered the same school resources, may have the same teachers and therefore taught a common implemented curriculum, and so on.

The sample design implemented in IEA and OECD PISA surveys is so complex that no mathematical formulae exist for the computation of standard errors. Since the IEA reading Literacy study in 1991, international surveys in education are using replication methods for estimating the standard errors.

Like the IEA PIRLS and TIMSS surveys, the standard error has been estimated by using the Jackknife repeated replication technique for stratified sample. For ESSIE, the Jackknife method 1 has been applied. Its computation is straightforward and provides approximately unbiased estimates of standard errors. It consists of subsamples (called replicates) of N-1 schools from the sample of N schools. For replicate i, school i is removed and the statistic of interest is computed using this set of N-1 schools. The statistic is therefore computed N times and the sampling variance is estimated from the variability between these replicates and the original sample.

To compute a statistic *t* from the sample, the formula for the JRR variance estimate of the statistic *t* is given by:

$$Var_{JRR}(t) = \sum_{j=1}^{N}\left[t(J_j) - t(S)\right]^2 ,$$

where $t(S)$ corresponds to any weighted or unweighted statistic for the whole sample and $t(J_h)$ is the same statistic computed for the jth jacknife replicate.

Scaling procedures

OVERVIEW

There were three questionnaires administered in ESSIE 2011. The school questionnaire includes items measuring schools' background characteristics, ICT infrastructure, support to teachers using ICT, schools' strategies concerning ICT and school autonomy. The teacher questionnaire includes items measuring experience, use and access of ICT during lessons, support to teachers using ICT, skills and competence, and attitudes. The student questionnaire measures the access and use of ICT at home and at school, their confidence in skills and competence and their attitudes.

Some of the items were designed to be used in analyses as single items (for example, gender). However, most questionnaire items were designed to be combined in some way so as to measure latent constructs that cannot be observed directly. For these items, transformations or scaling procedures are needed to construct meaningful indices. This chapter describes how student, school and teacher questionnaire indices were constructed and validated

SCALING METHODOLOGY AND CONSTRUCT VALIDATION

In a first step, we performed exploratory factor analyses using varimax rotation with SAS software. We performed the analyses at the EU level and used senate weights as this ensures that every EU country contributes equally. When determining the number of factors we not only took into account statistical criteria (eigenvalue larger than one) but also criteria of interpretability and similarity across the different surveys populations. This means that we looked for a solution that was interpretable and that fitted each target grade.

In a next step, we calculated the Cronbach alpha's, at the EU level but also within each participating countries in order to validate the construct.

When the Cronbach alpha's were sufficiently large (at least .75) in most countries, we calculated scale scores by computing the mean of the scores on the items belonging to the same factor or construct. If less than half of the scores on the items were missing, then we replaced the missing value by the country mean before calculating the scale score. If at least half of the scores on the

items were missing, we didn't compute a scale score. If the Cronbach alpha in a country was below .50, we didn't calculate scale scores.

SCALES INDICES FROM THE STUDENT QUESTIONNAIRE

STUDENT HOME ACTIVITIES NOT RELATED TO SCHOOLWORK: 3 SCALES

An exploratory factor analysis on the 13 items of question 5 of the student questionnaire (ST05), which asked students about the frequency of their activities using ICT at home that are not related to schoolwork, resulted in three scales: 'Information & Communication', 'Games', and 'Fun'.

Table 18: Items of the scale 'Information & Communication'

ST05	**How often do you take part in the following activities in your free time, at home or any place other than school?**
ST05Q01	Sending and reading emails
ST05Q03	Reading or watching the news online
ST05Q04	Using an online dictionary or encyclopaedia (Wikipedia, etc.)
ST05Q05	Searching online for practical information (e.g. seats at a match/concert, shopping, train times, health)
ST05Q06	Searching different sources online for information and learning about a particular topic you're interested in

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 19. Items of the scale 'Games'

ST05	**How often do you take part in the following activities in your free time, at home or any place other than school?**
ST05Q08	Taking part in online group discussions or forums
ST05Q09	Playing one player games online
ST05Q10	Playing multi-player online games

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 20: Items of the scale 'Fun'

ST05	**How often do you take part in the following activities in your free time, at home or any place other than school?**

ST05Q02	Chatting online (e.g. Facebook, Instant Messenger)
ST05Q11	Browsing the Internet for fun
ST05Q12	Watching video clips, downloading music, games, software from the Internet
ST05Q13	Keeping your own website, Facebook page, blog

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 21: Cronbach Alpha's of the scales 'Information & Communication', 'Games', and ''Fun' by country and ISCED level

| | ISCED2 | | | ISCED3A | | | ISCED3B | | |
	ST05_InfAndCommun	ST05_Games	ST05_Fun	ST05_InfAndCommun	ST05_Games	ST05_Fun	ST05_InfAndCommun	ST05_Games	ST05_Fun
Austria	0,62	0,67	0,81	0,68	0,65	0,76	0,73	0,71	0,72
Belgium	0,61	0,63	0,70	0,63	0,69	0,59	0,63	0,72	0,59
Bulgaria	0,79	0,76	0,77	0,74	0,77	0,60	0,79	0,78	0,69
Croatia	0,72	0,66	0,75	0,76	0,73	0,61	0,73	0,70	0,65
Cyprus	0,63	0,71	0,75	0,72	0,75	0,76	0,78	0,78	0,86
Czech_Rep	0,70	0,65	0,73	0,67	0,72	0,64	0,72	0,72	0,65
Denmark	0,69	0,66	0,53	0,74	0,66	0,54	0,60	0,59	0,48
Estonia	0,70	0,73	0,71	0,72	0,77	0,70	0,80	0,72	0,78
Finland	0,75	0,70	0,78	0,73	0,75	0,69	0,83	0,75	0,78
France	0,67	0,70	0,73	0,69	0,79	0,72	0,66	0,73	0,76
Greece	0,66	0,73	0,79	0,72	0,78	0,77	0,73	0,77	0,83
Hungary	0,71	0,64	0,76	0,69	0,65	0,67	0,73	0,70	0,70
Ireland	0,64	0,75	0,72	0,70	0,71	0,73			
Italy	0,64	0,66	0,78	0,68	0,70	0,72	0,70	0,71	0,78
Latvia	0,72	0,72	0,69	0,72	0,75	0,63	0,73	0,74	0,61
Lithuania	0,75	0,71	0,67	0,75	0,74	0,65	0,77	0,71	0,69
Luxembourg	0,66	0,72	0,74	0,79	0,71	0,74	0,72	0,74	0,69
Malta	0,60	0,63	0,66	0,59	0,79	0,68			
Norway	0,74	0,76	0,62	0,71	0,80	0,49	0,81	0,82	0,55
Poland	0,71	0,64	0,63	0,72	0,72	0,59	0,76	0,71	0,64
Portugal	0,70	0,74	0,78	0,71	0,79	0,73	0,76	0,81	0,79
Romania	0,74	0,69	0,72	0,73	0,72	0,63	0,74	0,76	0,71
Slovakia	0,71	0,66	0,74	0,67	0,72	0,61	0,71	0,70	0,66
Slovenia	0,73	0,67	0,75	0,70	0,74	0,68	0,74	0,75	0,78
Spain	0,64	0,74	0,72	0,68	0,77	0,67	0,76	0,77	0,77
Sweden	0,73	0,79	0,71	0,66	0,75	0,48	0,74	0,81	0,68
Turkey	0,82	0,78	0,86	0,83	0,82	0,84	0,78	0,79	0,81
EU	0,70	0,70	0,72	0,72	0,74	0,67	0,75	0,75	0,72

STUDENT HOME ACTIVITIES RELATED TO SCHOOLWORK: 2 SCALES

An exploratory factor analysis on the 10 items of question 6 of the student questionnaire (ST06), which asked students about the frequency of their ICT activities related to schoolwork at home, resulted in two scales: 'Schoolwork activities centered on student ' and 'Schoolwork activities connected with school'. The item ST06Q04 has been dropped out the scales because high loadings on both factors.

Table 22: Items of the scale 'ActSchWork_st'

ST06	**How often do you do the following at home or locations other than schools?**
ST06Q01	Do homework on the computer
ST06Q02	Search the Internet for information for schoolwork
ST06Q03	Collect information online and organise it in files to be retrieved when I want
ST06Q05	Use the online tools (Instant Messenger, Facebook,etc.) to contact other students about schoolwork

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 23: Items of the scale 'ActSchWork_sc

ST06	**How often do you do the following at home or locations other than schools?**
ST06Q06	Email teachers
ST06Q07	Use the online tools (Instant Messenger, Facebook,etc.) to contact teachers about schoolwork
ST06Q08	Send schoolwork by email or by upload it to the virtual learning platform
ST06Q09	Download, upload or browse learning material on your school's website
ST06Q10	Check the school website for announcements, dates, etc.

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 24: Cronbach Alpha's of the scales 'Student centered activities at home related to schoolwork' and 'School centered activities at home related to schoolwork' by country and ISCED level

	ISCED2		ISCED3A		ISCED3B	
	ST06_actschwork_st	ST06_actschwork_sc	ST06_actschwork_st	ST06_actschwork_sc	ST06_actschwork_st	ST06_actschwork_sc
Austria	0,60	0,70	0,74	0,72	0,77	0,78
Belgium	0,66	0,76	0,77	0,77	0,71	0,80
Bulgaria	0,77	0,82	0,76	0,83	0,78	0,88
Croatia	0,74	0,68	0,76	0,75	0,72	0,86
Cyprus	0,69	0,78	0,75	0,80	0,77	0,90
Czech_Rep	0,71	0,71	0,72	0,64	0,69	0,80
Denmark	0,72	0,68	0,66	0,64	0,53	0,84
Estonia	0,70	0,76	0,75	0,76	0,78	0,84
Finland	0,72	0,80	0,75	0,78	0,76	0,88
France	0,67	0,64	0,73	0,73	0,69	0,68
Greece	0,68	0,78	0,67	0,79	0,71	0,81
Hungary	0,76	0,78	0,75	0,79	0,74	0,83
Ireland	0,69	0,71	0,73	0,68		
Italy	0,65	0,60	0,65	0,55	0,64	0,81
Latvia	0,71	0,78	0,72	0,78	0,72	0,84
Lithuania	0,72	0,82	0,73	0,81	0,75	0,86
Luxembourg	0,63	0,75	0,76	0,92	0,63	0,82
Malta	0,71	0,67	0,68	0,77		
Norway	0,76	0,78	0,74	0,80	0,78	0,86
Poland	0,73	0,81	0,73	0,77	0,67	0,85
Portugal	0,75	0,83	0,77	0,84	0,77	0,88
Romania	0,74	0,77	0,71	0,76	0,64	0,85
Slovakia	0,69	0,76	0,70	0,68	0,65	0,81
Slovenia	0,68	0,74	0,70	0,75	0,74	0,87
Spain	0,69	0,76	0,71	0,76	0,72	0,81
Sweden	0,76	0,80	0,77	0,73	0,80	0,87
Turkey	0,79	0,86	0,82	0,84	0,67	0,84
EU	0,71	0,75	0,75	0,75	0,75	0,85

ICT BASED ACTIVITIES DURING LESSONS: 1 SCALE

An exploratory factor analysis on the 8 items of question 13 of the student questionnaire (ST13), which asked students about the frequency of their activities using ICT during lessons, resulted in one scale: 'Computer Use'.

Table 25: Items of the scale 'ComputerUse'

ST13	**How often do you use a computer for the following learning activities during lessons?**

ST13Q01	Send or read email messages
ST13Q02	Chat online for school work
ST13Q03	Search the internet to collect information
ST13Q04	Download/upload/browse material from your school's website
ST13Q05	Post your work on the school website
ST13Q06	Use computers when working in groups
ST13Q07	Use computers to conduct experiments (collecting data and/or images,…)
ST13Q08	Contribute to and/or create blogs or discussion forums for school work

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 26: Cronbach Alpha's of the scale 'Computer Use at school' by country and ISCED level.

	ISCED2 ST13_compuse	ISCED3A ST13_compuse	ISCED3B ST13_compuse
Austria	0,83	0,88	0,80
Belgium	0,88	0,89	0,83
Bulgaria	0,87	0,89	0,90
Croatia	0,82	0,84	0,88
Cyprus	0,85	0,89	0,92
Czech_Rep	0,82	0,82	0,82
Denmark	0,84	0,82	0,72
Estonia	0,90	0,88	0,91
Finland	0,88	0,88	0,86
France	0,80	0,83	0,78
Greece	0,84	0,86	0,84
Hungary	0,84	0,88	0,90
Ireland	0,86	0,79	
Italy	0,83	0,85	0,86
Latvia	0,89	0,88	0,87
Lithuania	0,86	0,85	0,87
Luxembourg	0,86	0,92	0,90
Malta	0,83	0,82	
Norway	0,87	0,85	0,85
Poland	0,86	0,90	0,89
Portugal	0,90	0,90	0,88
Romania	0,86	0,84	0,86
Slovakia	0,86	0,83	0,91
Slovenia	0,87	0,89	0,90
Spain	0,83	0,86	0,83
Sweden	0,86	0,87	0,91
Turkey	0,87	0,91	0,89
EU	0,86	0,88	0,87

LEARNING ACTIVITIES IN GENERAL: 2 SCALES

An exploratory factor analysis on the 12 items of question 14 of the student questionnaire (ST14), which asked students about their learning activities, resulted in two scales: 'Teacher centered' and 'Student centered'. Similar scales have been constructed from the teacher questionnaires (see later).

Table 27: Items of the scale 'Teacher centered'

ST14	**In lessons, how often are you engaged in the following (whether using ICT or not)?**
ST14Q01	We all listen to teacher presentation or explanation
ST14Q02	We all listen to a student presentation or explanation
ST14Q03	We all read a book or look at films or videos at the same time
ST14Q04	We all do exercises and tasks, individually or collectively
ST14Q05	I work on something at my own pace

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 28: Items of the scale 'Student centered'

ST14	**In lessons, how often are you engaged in the following (whether using ICT or not)?**
ST14Q06	We work in small groups
ST14Q07	We look up ideas and information
ST14Q08	We investigate and explore issues individually or in small groups and search for information about it
ST14Q09	We try to solve problems
ST14Q10	We explain and discuss our own ideas about important questions of the day with teachers and other students
ST14Q11	Students help each other to better understand and learn
ST14Q12	We take time to think about how better to learn

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 29: Cronbach Alpha's of the scales 'Teacher centered' and 'Student centered' by country and ISCED level.

	ISCED2		ISCED3A		ISCED3B	
	ST14_TeacherCentered	ST14_StudentCentered	ST14_TeacherCentered	ST14_StudentCentered	ST14_TeacherCentered	ST14_StudentCentered
Austria	0,74	0,86	0,68	0,83	0,73	0,88
Belgium	0,79	0,89	0,70	0,85	0,72	0,87
Bulgaria	0,72	0,89	0,74	0,89	0,80	0,92
Croatia	0,76	0,87	0,77	0,88	0,78	0,89
Cyprus	0,76	0,87	0,79	0,88	0,90	0,93
Czech_Rep	0,77	0,84	0,69	0,84	0,78	0,87
Denmark	0,81	0,89	0,70	0,86	0,79	0,93
Estonia	0,80	0,87	0,76	0,88	0,85	0,92
Finland	0,84	0,92	0,78	0,90	0,84	0,93
France	0,80	0,88	0,80	0,90	0,81	0,91
Greece	0,72	0,84	0,70	0,85	0,79	0,88
Hungary	0,77	0,86	0,71	0,85	0,76	0,88
Ireland	0,81	0,88	0,79	0,88		
Italy	0,75	0,85	0,71	0,83	0,75	0,85
Latvia	0,81	0,89	0,80	0,89	0,79	0,90
Lithuania	0,81	0,90	0,78	0,89	0,82	0,90
Luxembourg	0,79	0,89	0,86	0,94	0,81	0,90
Malta	0,75	0,86	0,71	0,81		
Norway	0,81	0,91	0,77	0,90	0,82	0,91
Poland	0,80	0,90	0,81	0,90	0,84	0,91
Portugal	0,85	0,92	0,81	0,91	0,84	0,93
Romania	0,78	0,88	0,76	0,87	0,78	0,89
Slovakia	0,79	0,87	0,77	0,87	0,79	0,88
Slovenia	0,81	0,90	0,77	0,89	0,85	0,92
Spain	0,77	0,87	0,76	0,86	0,75	0,89
Sweden	0,84	0,91	0,80	0,89	0,83	0,93
Turkey	0,83	0,92	0,83	0,92	0,80	0,91
EU	0,79	0,88	0,77	0,88	0,82	0,91

SKILLS AND COMPETENCE: 4 SCALES

An exploratory factor analysis on the 24 items of question 15 of the student questionnaire (ST15), which asked students about their confidence of ICT skills and competence, resulted in four scales: 'Operational ICT skills', 'Social media skills', 'Internet responsible use' and 'Internet safe use'.

Table 30: Items of the scale 'Operational ICT skills'

ST15	**How confident are you doing the following tasks?**
ST15Q01	Produce text using a word processing programme
ST15Q02	Edit digital photographs or other graphic images
ST15Q03	Edit online text containing Internet links and images
ST15Q04	Create a database
ST15Q05	Edit a questionnaire online
ST15Q06	Email a file to someone/another student or teacher
ST15Q07	File electronic documents in computer folders and subfolders
ST15Q08	Use spreadsheet programmes
ST15Q09	Use a spreadsheet to plot a graph
ST15Q10	Create a presentation with animations
ST15Q11	Create a multimedia presentation (text, graphics, video ...)
ST15Q14	Install software on my computer

Note: Item categories were "Not at all", "A little", "Somewhat" and "A lot"

Table 31: Items of the scale 'Social media skills'

ST15	**How confident are you doing the following tasks?**
ST15Q12	Participate in a discussion forum on the Internet
ST15Q13	Create blogs or web sites and maintain them
ST15Q15	Participate in social networks and use most of their features

Note: Item categories were "Not at all", "A little", "Somewhat" and "A lot"

Table 32: Items of the scale 'Internet responsible use'

ST15	**How confident are you doing the following tasks?**
ST15Q16	Judge the reliability of information found on the Internet
ST15Q17	Identify online sources of reliable information
ST15Q23	Use information found on the internet without plagiarising (e.g. copy/paste in home work)

Note: Item categories were "Not at all", "A little", "Somewhat" and "A lot"

Table 33: Items of the scale 'Internet safe use'

ST15	**How confident are you doing the following tasks?**
ST15Q18	Use the Internet safely to protect yourself against bullying
ST15Q19	Use the Internet safely to protect your privacy
ST15Q20	Use the Internet safely to protect your online reputation
ST15Q21	Use the Internet safely to respect the privacy of others
ST15Q22	Use the Internet safely to respect others' reputation
ST15Q24	Protect yourself against spam and junk mail

Note: Item categories were "Not at all", "A little", "Somewhat" and "A lot"

Table 34: Cronbach Alpha's of the scales 'Operational ICT skills', 'Social media skills', 'Internet responsible use' and 'Internet safe use' by country and ISCED level

	ISCED2				ISCED3A				ISCED3B			
	ST15_TechnicalSkills	ST15_SocialMediaSkills	ST15_InternResponUse	ST15_InternSafeUse	ST15_TechnicalSkills	ST15_SocialMediaSkills	ST15_InternResponUse	ST15_InternSafeUse	ST15_TechnicalSkills	ST15_SocialMediaSkills	ST15_InternResponUse	ST15_InternSafeUse
Austria	0,90	0,76	0,74	0,92	0,89	0,73	0,78	0,92	0,90	0,74	0,78	0,93
Belgium	0,90	0,80	0,75	0,92	0,88	0,76	0,77	0,91	0,90	0,77	0,79	0,93
Bulgaria	0,93	0,82	0,84	0,93	0,92	0,77	0,81	0,93	0,93	0,81	0,84	0,94
Croatia	0,94	0,81	0,82	0,93	0,91	0,76	0,77	0,93	0,94	0,80	0,85	0,94
Cyprus	0,91	0,77	0,73	0,90	0,94	0,82	0,79	0,93	0,97	0,87	0,93	0,93
Czech_Rep	0,91	0,72	0,72	0,91	0,86	0,67	0,58	0,86	0,91	0,72	0,72	0,92
Denmark	0,90	0,74	0,77	0,92	0,86	0,69	0,74	0,91	0,84	0,59	0,66	0,89
Estonia	0,93	0,79	0,83	0,94	0,91	0,75	0,81	0,93	0,90	0,72	0,83	0,96
Finland	0,93	0,83	0,85	0,95	0,90	0,79	0,82	0,94	0,91	0,86	0,89	0,97
France	0,92	0,80	0,81	0,92	0,92	0,79	0,81	0,91	0,93	0,86	0,81	0,93
Greece	0,91	0,78	0,77	0,90	0,91	0,78	0,76	0,91	0,93	0,83	0,81	0,92
Hungary	0,92	0,75	0,83	0,93	0,91	0,70	0,81	0,92	0,92	0,77	0,84	0,93
Ireland	0,92	0,73	0,80	0,93	0,93	0,74	0,83	0,95				
Italy	0,89	0,76	0,72	0,90	0,88	0,72	0,73	0,89	0,89	0,71	0,76	0,90
Latvia	0,92	0,77	0,79	0,91	0,91	0,75	0,76	0,91	0,93	0,74	0,81	0,91
Lithuania	0,92	0,80	0,72	0,92	0,90	0,73	0,68	0,91	0,93	0,83	0,80	0,93
Luxembourg	0,93	0,83	0,83	0,93	0,94	0,90	0,89	0,95	0,93	0,82	0,81	0,93
Malta	0,90	0,76	0,70	0,91	0,90	0,78	0,75	0,91				
Norway	0,93	0,79	0,82	0,93	0,90	0,75	0,85	0,92	0,90	0,74	0,83	0,93
Poland	0,91	0,80	0,78	0,92	0,89	0,79	0,78	0,93	0,92	0,84	0,82	0,94
Portugal	0,92	0,78	0,80	0,93	0,91	0,78	0,82	0,94	0,93	0,78	0,82	0,94
Romania	0,92	0,77	0,78	0,93	0,90	0,73	0,79	0,91	0,92	0,76	0,78	0,92
Slovakia	0,92	0,78	0,79	0,92	0,88	0,68	0,72	0,90	0,91	0,74	0,80	0,92
Slovenia	0,94	0,82	0,82	0,94	0,92	0,78	0,76	0,94	0,95	0,84	0,85	0,95
Spain	0,91	0,76	0,77	0,92	0,90	0,69	0,74	0,90	0,92	0,76	0,78	0,93
Sweden	0,94	0,85	0,86	0,95	0,90	0,74	0,85	0,92	0,94	0,89	0,86	0,96
Turkey	0,93	0,86	0,75	0,93	0,94	0,81	0,79	0,94	0,93	0,76	0,74	0,92
EU	0,92	0,79	0,79	0,93	0,90	0,75	0,78	0,92	0,92	0,79	0,82	0,93

IMPACT: 1 SCALE

An exploratory factor analysis on the 7 items of question 16 of the student questionnaire (ST16), which asked students about the impact of ICT use on learning, resulted in one scale: 'ICT Positive impact'. A similar scale has been constructed from the teacher questionnaires (see later).

Table 35: Items of the scale 'ICT Positive impact'

ST16	**Do you consider using ICT (computers, interactive whiteboards) during lessons has a <u>positive</u> impact on the following?**

ST16Q01	You concentrate more on what you're learning
ST16Q02	You try harder in what you're learning
ST16Q03	You feel more independent in your learning (e.g. go over work again, find out more about things you are interested in)
ST16Q04	You understand more easily what you're learning
ST16Q05	You remember more easily what you've learnt
ST16Q06	ICT enables you to work better with other students on tasks
ST16Q07	ICT improves the atmosphere in class (e.g. students are more engaged, there is less disruption)

Note: Item categories were "Not at all", "A little", "Somewhat" and "A lot"

Table 36: Cronbach Alpha's of the scale 'ICT attitude' by country and ISCED level

	ISCED2 ST16_posimpact	ISCED3A ST16_posimpact	ISCED3B ST16_posimpact
Austria	0,90	0,89	0,90
Belgium	0,91	0,91	0,92
Bulgaria	0,92	0,93	0,94
Croatia	0,92	0,92	0,94
Cyprus	0,90	0,93	0,95
Czech_Rep	0,89	0,88	0,91
Denmark	0,90	0,89	0,84
Estonia	0,91	0,91	0,94
Finland	0,94	0,94	0,96
France	0,91	0,91	0,91
Greece	0,90	0,91	0,93
Hungary	0,90	0,92	0,93
Ireland	0,92	0,92	
Italy	0,88	0,92	0,92
Latvia	0,91	0,92	0,93
Lithuania	0,91	0,91	0,93
Luxembourg	0,94	0,94	0,92
Malta	0,91	0,87	
Norway	0,93	0,92	0,92
Poland	0,91	0,91	0,93
Portugal	0,92	0,90	0,93
Romania	0,91	0,90	0,92
Slovakia	0,91	0,90	0,91
Slovenia	0,94	0,94	0,95
Spain	0,92	0,93	0,92
Sweden	0,93	0,91	0,94
Turkey	0,92	0,96	0,95
EU	0,92	0,91	0,93

ATTITUDES: 1 SCALE

An exploratory factor analysis on the 8 items of question 17 of the student questionnaire (ST17), which asked students about their attitude towards computers, resulted in one scale: 'ICT Attitude'.

Table 37: Items of the scale 'ICT Attitude'

ST17	**Thinking about your experience with computers: to what extent do you agree with the following statements?**
ST17Q01	It is really important to me to work with a computer for learning
ST17Q02	Using a computer for learning is really fun
ST17Q03	I use a computer for learning because I'm very interested in computers
ST17Q04	I lose track of time when I'm learning with the computer
ST17Q05	It's really worth using a computer for learning because it will help me in my future life as an adult
ST17Q06	I use a computer to learn as it will help in the work that I want to do later on
ST17Q07	I learn things using computers that will help me to get a job
ST17Q08	Learning with computer is important for me because I need it for what I want to study later on

Note: Item categories were "Strongly disagree", "Disagree", "Agree" and "Strongly agree"

Table 38: Cronbach Alpha's of the scale 'ICT attitude' by country and ISCED level

	ISCED2 ST17_attitude	ISCED3A ST17_attitude	ISCED3B ST17_attitude
Austria	0,88	0,86	0,89
Belgium	0,89	0,84	0,90
Bulgaria	0,92	0,93	0,94
Croatia	0,91	0,90	0,93
Cyprus	0,87	0,87	0,93
Czech_Rep	0,89	0,82	0,90
Denmark	0,87	0,88	0,86
Estonia	0,87	0,85	0,91
Finland	0,92	0,88	0,91
France	0,86	0,86	0,89
Greece	0,85	0,83	0,88
Hungary	0,90	0,88	0,91
Ireland	0,89	0,89	
Italy	0,84	0,85	0,87
Latvia	0,87	0,83	0,90
Lithuania	0,88	0,87	0,91
Luxembourg	0,93	0,90	0,91
Malta	0,90	0,83	
Norway	0,89	0,90	0,91
Poland	0,86	0,85	0,89
Portugal	0,91	0,88	0,92
Romania	0,88	0,87	0,89
Slovakia	0,90	0,85	0,89
Slovenia	0,90	0,88	0,93
Spain	0,87	0,88	0,89
Sweden	0,92	0,85	0,94
Turkey	0,93	0,94	0,92
EU	0,90	0,87	0,91

SCALES INDICES FROM THE SCHOOL QUESTIONNAIRE

PROFESSIONAL DEVELOPMENT OF TEACHERS: 1 SCALE

An exploratory factor analysis on the 9 items of question 15 of the school questionnaire (SC15), which asked school heads about the ICT professional development that their teachers undertook, resulted in one scale: 'Professional Development'.

Table 39: Items of the scale 'School head attitude'

SC15	**In the past two school years (2009-11), what percentage of your teachers have undertaken professional development in the following?**
SC15Q01	Introductory courses on internet use and general applications (basic word-processing, spreadsheets, presentations, databases, etc.)
SC15Q02	Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment etc.)
SC15Q03	Advanced courses on internet use (creating websites/home page, video conferencing, etc.)
SC15Q04	Equipment-specific training (interactive whiteboard, laptop, etc.)
SC15Q05	Courses on the pedagogical use of ICT in teaching and learning
SC15Q06	Subject-specific training on learning applications (tutorials, simulations, etc.)
SC15Q07	Course on multimedia (using digital video, audio equipment, etc.)
SC15Q08	Participation in peer learning communities or group work with other teachers about the use of ICT for learning and teaching
SC15Q09	Other professional development opportunities related to ICT

Note: Item categories were "None", "25% or fewer", "26-50%" and "More than 50%""

Table 40: Cronbach Alpha's of the scale 'Professional Development' by country and ISCED level

	ISCED1 SC15_ProfDev	ISCED2 SC15_ProfDev	ISCED3A SC15_ProfDev	ISCED3B SC15_ProfDev
Austria	0,74	0,71	0,78	0,78
Belgium	0,89	0,80	0,82	0,79
Bulgaria	0,76	0,85	0,87	0,83
Croatia	0,74	0,68	0,79	0,77
Cyprus	0,86	0,82	0,90	0,96
Czech_Rep	0,78	0,78	0,84	0,77
Denmark	0,88	0,86	0,76	0,84
Estonia	0,79	0,85	0,82	0,47
Finland	0,92	0,81	0,84	0,87
France	0,70	0,77	0,87	0,94
Greece	0,89	0,89	0,85	0,92
Hungary	0,83	0,85	0,85	0,75
Ireland	0,78	0,83	0,87	
Italy	0,87	0,84	0,89	0,79
Latvia	0,78	0,78	0,76	0,91
Lithuania	0,87	0,81	0,89	0,90
Luxembourg	0,60	0,92	0,80	0,72
Malta	0,81	0,80		
Norway	0,85	0,88	0,82	0,92
Poland	0,82	0,75	0,81	0,84
Portugal	0,82	0,76	0,79	0,76
Romania	0,90	0,90	0,85	0,84
Slovakia	0,79	0,82	0,85	0,80
Slovenia	0,66	0,71	0,88	0,52
Spain	0,80	0,85	0,87	0,91
Sweden	0,70	0,79	0,94	0,69
Turkey	0,92	0,81	0,88	0,81
EU	0,84	0,83	0,85	0,85

Note: No Cronbach Alpha could be computed for Malta at ISCED3A because only two school heads participated (there are only three schools at ISCED3A) and they gave exactly the same answers.

OBSTACLES FOR USING ICT: 3 SCALES

Question 17 of the school questionnaire asked school heads about the obstacles to use ICT in teaching and learning. The same question was asked to teachers within the teacher questionnaire (TE20). An exploratory factor analysis on the 20 items has been implemented separately on the school questionnaire and on the teacher questionnaire and resulted in three scales: 'Equipment', 'Pedagogy' and 'Goal', identical for teacher and school heads questionnaires. However, items SC17Q14 (TE20Q14), SC17Q15 (TE20Q15) and SC17Q16 (TE20Q15) have been dropped out of the scales because they didn't loaded on the same factor for both factor analyses.

Table 41: Items of the scale 'Equipment as an obstacle'

SC17	**Is your school capacity to provide ICT teaching and learning affected by a shortage or inadequacy in the following areas?**
SC17Q01	Insufficient number of computers
SC17Q02	Insufficient number of Internet- connected computers
SC17Q03	Insufficient Internet bandwidth or speed
SC17Q04	Insufficient number of interactive whiteboards
SC17Q05	Insufficient number of laptops/notebooks
SC17Q06	School computers out of date and/or needing repair

Note: Item categories were "Not at all", "A little", "Some" and "A lot" (reverse order for scaling purpose)

Table 42: Items of the scale 'Pedagogy as an obstacle'

SC17	**Is your school capacity to provide ICT teaching and learning affected by a shortage or inadequacy in the following areas?**
SC17Q07	Lack of adequate skills of teachers
SC17Q08	Insufficient technical support for teachers
SC17Q09	Insufficient pedagogical support for teachers
SC17Q10	Lack of adequate content/material for teaching
SC17Q11	Lack of content in national language
SC17Q12	Too difficult to integrate ICT use into the curriculum
SC17Q13	Lack of pedagogical models on how to use ICT for learning

Note: Item categories were "Not at all", "A little", "Some" and "A lot" (reverse order for scaling purpose)

Table 43: Items of the scale 'Goal as an obstacle'

SC17	**Is your school capacity to provide ICT teaching and learning affected by a shortage or inadequacy in the following areas?**
SC17Q17	Most parents not in favour of the use of ICT at school
SC17Q18	Most teachers not in favour of the use of ICT at school
SC17Q19	No or unclear benefit to use ICT for teaching
SC17Q20	Using ICT in teaching and learning not being a goal in our school

Note: Item categories were "Not at all", "A little", "Some" and "A lot" (reverse order for scaling purpose)

Table 44: Cronbach Alpha's of the scale 'Equipment', 'Pedagogy' and 'Goal' by country and ISCED level

	ISCED1			ISCED2			ISCED3A			ISCED3B		
	SC17_Equipment	SC17_Pedagogy	SC17_Goal	SC17_Equipment	SC17_Pedagogy	SC17_Goal	SC17_Equipment	SC17_Pedagogy	SC17_Goal	SC17_Equipment	SC17_Pedagogy	SC17_Goal
Austria	0,84	0,78	0,77	0,84	0,84	0,75	0,81	0,92	0,83	0,77	0,89	0,72
Belgium	0,83	0,83	0,80	0,69	0,83	0,75	0,87	0,82	0,77	0,80	0,89	0,66
Bulgaria	0,78	0,86	0,64	0,81	0,83	0,60	0,80	0,83	0,68	0,82	0,83	0,70
Croatia	0,83	0,83	0,69	0,86	0,86	0,69	0,86	0,87	0,76	0,87	0,87	0,74
Cyprus	0,81	0,87	0,72	0,86	0,85	0,60	0,72	0,88	0,70	0,51	0,89	0,64
Czech_Rep	0,83	0,84	0,77	0,88	0,82	0,77	0,76	0,81	0,69	0,82	0,86	0,72
Denmark	0,79	0,78	0,69	0,86	0,71	0,27	0,63	0,88	0,56	0,77	0,75	-0,53
Estonia	0,75	0,80	0,82	0,79	0,73	0,73	0,70	0,79	0,84	0,65	0,78	0,87
Finland	0,74	0,67	0,57	0,72	0,69	0,70	0,61	0,80	0,73	0,56	0,76	0,65
France	0,80	0,86	0,72	0,71	0,83	0,67	0,83	0,83	0,60	0,75	0,83	0,63
Greece	0,84	0,81	0,72	0,81	0,84	0,67	0,85	0,79	0,73	0,62	0,76	0,65
Hungary	0,84	0,79	0,80	0,82	0,85	0,73	0,81	0,79	0,78	0,92	0,84	0,79
Ireland	0,81	0,77	0,83	0,64	0,83	0,71	0,64	0,69	0,80			
Italy	0,78	0,80	0,74	0,79	0,82	0,65	0,78	0,72	0,66	0,84	0,85	0,70
Latvia	0,67	0,83	0,67	0,83	0,80	0,74	0,73	0,68	0,77	0,63	0,77	0,46
Lithuania	0,81	0,85	0,82	0,75	0,83	0,77	0,77	0,80	0,65	0,66	0,84	0,78
Luxembourg	0,76	0,74	0,82	0,68	0,90	0,77	0,51	0,83	0,03	0,92	0,97	0,82
Malta	0,79	0,90	0,43	0,24	0,82	0,28	0,45	0,65	0,50			
Norway	0,85	0,82	0,59	0,84	0,79	0,61	0,46	0,87	0,53	0,29	0,88	0,66
Poland	0,84	0,88	0,79	0,89	0,84	0,88	0,88	0,86	0,84	0,91	0,86	0,82
Portugal	0,89	0,92	0,73	0,87	0,87	0,64	0,79	0,85	0,77	0,81	0,86	0,75
Romania	0,83	0,84	0,73	0,82	0,86	0,75	0,81	0,85	0,77	0,75	0,84	0,75
Slovakia	0,80	0,75	0,76	0,80	0,77	0,66	0,74	0,80	0,82	0,77	0,80	0,77
Slovenia	0,77	0,81	0,43	0,80	0,81	0,54	0,81	0,65	0,82	0,67	0,46	0,72
Spain	0,71	0,78	0,82	0,78	0,82	0,70	0,78	0,79	0,69	0,85	0,77	0,61
Sweden	0,71	0,24	0,69	0,87	0,69	0,48	0,80	0,13	0,65	0,89	0,95	0,47
Turkey	0,92	0,94	0,69	0,87	0,85	0,83	0,67	0,82	0,84	0,66	0,78	0,82
EU	0,83	0,82	0,75	0,81	0,82	0,69	0,82	0,84	0,71	0,82	0,85	0,70

SCHOOL HEAD OPINIONS: 1 SCALE

An exploratory factor analysis on the 8 items out of 10 of question 21 of the school questionnaire (SC21), which asked school heads about their opinions about ICT use for educational purposes, resulted in one scale: 'attitude'. The same scale has been created from the teacher questionnaire (TE24).

Table 45: Items of the scale 'School head attitude'

SC21	**To what extent do you disagree or agree with the following statements about the use of ICT at school?**
	Computers and the internet should be used for:
SC21Q01	Students to do exercises and practise
SC21Q02	Students to retrieve information
SC21Q03	Students to work in a collaborative way
SC21Q04	Students to learn in an autonomous way
	ICT use in teaching and learning positively impacts on:
SC21Q05	Student motivation
SC21Q06	Student achievement
SC21Q07	Students' higher order thinking skills (critical thinking, analysis, problem solving)
SC21Q08	Student's competence in transversal skills (learning to learn, social competences, etc.)

Note: Item categories were "Strongly disagree", "Disagree", "Agree" and "Strongly agree"

Table 46: Cronbach Alpha's of the scale 'School head attitude' by country and ISCED level

	ISCED1 SC21_attitude	ISCED2 SC21_attitude	ISCED3A SC21_attitude	ISCED3B SC21_attitude
Austria	0,93	0,91	0,91	0,88
Belgium	0,80	0,86	0,87	0,89
Bulgaria	0,88	0,89	0,88	0,92
Croatia	0,92	0,89	0,91	0,91
Cyprus	0,91	0,92	0,95	0,93
Czech_Rep	0,91	0,89	0,87	0,89
Denmark	0,86	0,87	0,82	0,94
Estonia	0,86	0,89	0,86	0,74
Finland	0,89	0,86	0,83	0,91
France	0,83	0,88	0,71	0,87
Greece	0,91	0,92	0,83	0,90
Hungary	0,89	0,90	0,90	0,83
Ireland	0,81	0,95	0,94	
Italy	0,81	0,86	0,88	0,80
Latvia	0,86	0,87	0,87	0,89
Lithuania	0,95	0,91	0,95	0,90
Luxembourg	0,74	0,86	0,97	0,85
Malta	0,91	0,80		
Norway	0,89	0,88	0,80	0,91
Poland	0,96	0,95	0,97	0,94
Portugal	0,87	0,86	0,88	0,91
Romania	0,88	0,91	0,87	0,91
Slovakia	0,81	0,88	0,90	0,88
Slovenia	0,83	0,90	0,88	0,83
Spain	0,86	0,81	0,89	0,88
Sweden	0,86	0,91	0,76	0,85
Turkey	0,97	0,68	0,94	0,98
EU	0,88	0,89	0,90	0,88

Note: No Cronbach Alpha could be computed for Malta at ISCED3A because only two school heads participated (there are only three schools at ISCED3A) and they gave exactly the same answers.

SCALES INDICES FROM THE TEACHER QUESTIONNAIRE

PROFESSIONAL DEVELOPMENT: 1 SCALE

An exploratory factor analysis on the 11 items of question 14 of the teacher questionnaire (TE14), which asked teachers about their undertaken professional development, resulted in one scale: 'Professional Development'.

Table 47: Items of the scale 'Professional Development'

TE14	**In the past two school years, have you undertaken professional development in the following areas?**
TE14Q01	Introductory courses on internet use and general applications (basic word-processing, spreadsheets, presentations, databases, etc.)
TE14Q02	Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment etc.)
TE14Q03	Advanced courses on internet use (creating websites/home page, video conferencing, etc.)
TE14Q04	Equipment-specific training (interactive whiteboard, laptop, etc.)
TE14Q05	Courses on the pedagogical use of ICT in teaching and learning
TE14Q06	Subject-specific training on learning applications (tutorials, simulations, etc.)
TE14Q07	Course on multimedia (using digital video, audio equipment, etc.)
TE14Q08	Participate in online communities (e.g. mailing lists, twitter, blogs) for professional discussions with other teachers
TE14Q09	ICT training provided by school staff
TE14Q10	Personal learning about ICT in your own time
TE14Q11	Other professional development opportunities related to ICT

Note: Dichotomous scale (Yes/No) recoded with 'No'=0 and 'Yes'=1

Table 48: Cronbach Alpha's of the scale 'Professional Development' by country and ISCED level

	ISCED1 TE14_ProfDev	ISCED2 TE14_ProfDev	ISCED3A TE14_ProfDev	ISCED3B TE14_ProfDev
Austria	0,74	0,67	0,64	0,72
Belgium	0,72	0,64	0,62	0,63
Bulgaria	0,74	0,78	0,77	0,76
Croatia	0,67	0,74	0,78	0,74
Cyprus	0,68	0,79	0,72	0,89
Czech_Rep	0,72	0,61	0,57	0,68
Denmark	0,60	0,55	0,70	0,53
Estonia	0,67	0,70	0,76	0,66
Finland	0,65	0,67	0,72	0,90
France	0,72	0,66	0,75	0,69
Greece	0,78	0,81	0,83	0,74
Hungary	0,59	0,70	0,72	0,72
Ireland	0,61	0,63	0,72	
Italy	0,80	0,74	0,79	0,80
Latvia	0,69	0,67	0,71	0,49
Lithuania	0,71	0,69	0,73	0,69
Luxembourg	0,58	0,44	0,44	0,58
Malta	0,79	0,77	0,95	
Norway	0,75	0,75	0,60	0,77
Poland	0,67	0,76	0,72	0,77
Portugal	0,66	0,60	0,68	0,74
Romania	0,74	0,80	0,76	0,79
Slovakia	0,75	0,77	0,78	0,75
Slovenia	0,73	0,70	0,69	0,69
Spain	0,76	0,77	0,76	0,73
Sweden	0,80	0,75	0,66	0,60
Turkey	0,84	0,92	0,80	0,80
EU	0,75	0,74	0,76	0,76

ICT ACTIVITIES: 1 SCALE

An exploratory factor analysis on the 11 items of question 18 of the teacher questionnaire (TE18), which asked teachers about the ICT activities they use for teaching, resulted in one scale: 'Teacher Activities'.

Table 49: Items of the scale 'Teacher Activities'

TE18	**How often do you do the following activities with the target class?**
TE18Q01	Browse / search the internet to collect information to prepare lessons
TE18Q02	Browse or search the internet to collect learning material or resources to be used by students during lessons
TE18Q03	Use applications to prepare presentations for lessons
TE18Q04	Create your own digital learning materials for students
TE18Q05	Prepare exercises and tasks for students
TE18Q06	Post home work for students on the school website
TE18Q07	Use ICT to provide feedback and/or assess students' learning
TE18Q08	Evaluate digital learning resources in the subject you teach
TE18Q09	Communicate online with parents
TE18Q10	Download/upload/browse material from the school's website or virtual learning environment / learning platform
TE18Q11	Look for online professional development opportunities

Note: Item categories were "Never or almost never", "Several times a month", "At least once a week" and "Every day of almost every day"

Table 50: Cronbach Alpha's of the scale 'Teacher Activities' by country and ISCED level

	ISCED1 TE18_TeachAct	ISCED2 TE18_TeachAct	ISCED3A TE18_TeachAct	ISCED3B TE18_TeachAct
Austria	0,78	0,83	0,81	0,83
Belgium	0,78	0,81	0,82	0,82
Bulgaria	0,85	0,83	0,87	0,88
Croatia	0,84	0,83	0,84	0,88
Cyprus	0,80	0,84	0,84	0,89
Czech_Rep	0,85	0,80	0,85	0,85
Denmark	0,82	0,73	0,76	0,72
Estonia	0,83	0,82	0,82	0,78
Finland	0,78	0,79	0,83	0,92
France	0,60	0,74	0,77	0,82
Greece	0,85	0,87	0,81	0,84
Hungary	0,73	0,84	0,83	0,82
Ireland	0,77	0,86	0,83	
Italy	0,83	0,86	0,82	0,86
Latvia	0,74	0,80	0,80	0,89
Lithuania	0,80	0,82	0,80	0,75
Luxembourg	0,73	0,70	0,70	0,59
Malta	0,68	0,78	0,84	
Norway	0,83	0,82	0,84	0,89
Poland	0,81	0,79	0,82	0,86
Portugal	0,79	0,80	0,83	0,87
Romania	0,82	0,87	0,85	0,87
Slovakia	0,83	0,83	0,80	0,84
Slovenia	0,78	0,80	0,88	0,88
Spain	0,86	0,84	0,86	0,85
Sweden	0,88	0,75	0,84	0,82
Turkey	0,89	0,87	0,87	0,89
EU	0,79	0,80	0,82	0,84

OBSTACLES FOR USING ICT: 3 SCALES

Alongside the three obstacle scales constructed from the school head questionnaire (SC17), the same three obstacle scales have been constructed from the teacher questionnaire (TE20): 'Equipment', 'Pedagogy' and 'Goal'.

Table 51: Items of the scale 'Equipment as an obstacle'

TE20	**Is your school capacity to provide ICT teaching and learning affected by a shortage or inadequacy in the following areas?**
TE20Q01	Insufficient number of computers
TE20Q02	Insufficient number of Internet- connected computers
TE20Q03	Insufficient Internet bandwidth or speed
TE20Q04	Insufficient number of interactive whiteboards
TE20Q05	Insufficient number of laptops/notebooks
TE20Q06	School computers out of date and/or needing repair

Note: Item categories were "Not at all", "A little", "Some" and "A lot" (reverse order for scaling purpose)

Table 52: Items of the scale 'Pedagogy as an obstacle'

TE20	**Is your school capacity to provide ICT teaching and learning affected by a shortage or inadequacy in the following areas?**
TE20Q07	Lack of adequate skills of teachers
TE20Q08	Insufficient technical support for teachers
TE20Q09	Insufficient pedagogical support for teachers
TE20Q10	Lack of adequate content/material for teaching
TE20Q11	Lack of content in national language
TE20Q12	Too difficult to integrate ICT use into the curriculum
TE20Q13	Lack of pedagogical models on how to use ICT for learning

Note: Item categories were "Not at all", "A little", "Some" and "A lot" (reverse order for scaling purpose)

Table 53: Items of the scale 'Goal as an obstacle'

TE20	**Is your school capacity to provide ICT teaching and learning affected by a shortage or inadequacy in the following areas?**
TE20Q17	Most parents not in favour of the use of ICT at school
TE20Q18	Most teachers not in favour of the use of ICT at school
TE20Q19	No or unclear benefit to use ICT for teaching
TE20Q20	Using ICT in teaching and learning not being a goal in our school

Note: Item categories were "Not at all", "A little", "Some" and "A lot" (reverse order for scaling purpose)

Table 54: Cronbach Alpha's of the scales 'Equipment', 'Pedagogy' and 'Goal' by country and ISCED level

	ISCED1			ISCED2			ISCED3A			ISCED3B		
	TE20_Equipment	TE20_Pedagogy	TE20_Goal	TE20_Equipment	TE20_Pedagogy	TE20_Goal	TE20_Equipment	TE20_Pedagogy	TE20_Goal	TE20_Equipment	TE20_Pedagogy	TE20_Goal
Austria	0,86	0,89	0,74	0,80	0,86	0,81	0,84	0,83	0,80	0,82	0,84	0,84
Belgium	0,88	0,90	0,69	0,83	0,89	0,74	0,87	0,89	0,69	0,89	0,88	0,79
Bulgaria	0,89	0,88	0,74	0,86	0,87	0,77	0,89	0,85	0,76	0,84	0,83	0,73
Croatia	0,86	0,87	0,73	0,89	0,88	0,80	0,84	0,88	0,84	0,89	0,87	0,80
Cyprus	0,83	0,87	0,80	0,83	0,86	0,75	0,89	0,91	0,82	0,89	0,83	0,73
Czech_Rep	0,72	0,80	0,67	0,84	0,83	0,76	0,82	0,84	0,73	0,83	0,88	0,79
Denmark	0,84	0,81	0,78	0,75	0,88	0,58	0,81	0,83	0,69	0,73	0,86	0,32
Estonia	0,80	0,90	0,80	0,82	0,84	0,79	0,85	0,86	0,80	0,87	0,85	0,66
Finland	0,77	0,84	0,80	0,78	0,82	0,78	0,86	0,88	0,71	0,80	0,73	0,84
France	0,83	0,87	0,70	0,79	0,88	0,65	0,83	0,90	0,70	0,75	0,92	0,57
Greece	0,77	0,79	0,80	0,88	0,86	0,69	0,83	0,79	0,79	0,77	0,78	0,87
Hungary	0,86	0,84	0,89	0,86	0,85	0,82	0,87	0,83	0,72	0,88	0,84	0,84
Ireland	0,85	0,89	0,30	0,86	0,89	0,67	0,78	0,90	0,82			
Italy	0,83	0,83	0,71	0,82	0,84	0,71	0,84	0,85	0,75	0,84	0,87	0,74
Latvia	0,86	0,81	0,76	0,87	0,80	0,77	0,86	0,83	0,81	0,83	0,88	0,77
Lithuania	0,79	0,79	0,70	0,80	0,84	0,79	0,81	0,85	0,81	0,82	0,83	0,68
Luxembourg	0,89	0,85	0,82	0,83	0,90	0,63	0,85	0,64	0,74	0,92	0,91	0,63
Malta	0,81	0,89	0,75	0,81	0,81	0,83	0,48	0,58	0,81			
Norway	0,85	0,83	0,78	0,91	0,83	0,57	0,63	0,79	0,58	0,78	0,91	0,71
Poland	0,88	0,87	0,82	0,88	0,87	0,83	0,88	0,86	0,82	0,89	0,88	0,83
Portugal	0,86	0,77	0,70	0,84	0,86	0,70	0,87	0,85	0,74	0,89	0,89	0,84
Romania	0,83	0,87	0,84	0,86	0,89	0,81	0,86	0,87	0,78	0,81	0,90	0,80
Slovakia	0,82	0,86	0,79	0,84	0,81	0,73	0,84	0,83	0,78	0,81	0,83	0,79
Slovenia	0,87	0,80	0,66	0,84	0,82	0,62	0,83	0,86	0,54	0,87	0,69	0,51
Spain	0,84	0,78	0,82	0,87	0,83	0,73	0,88	0,82	0,75	0,85	0,86	0,78
Sweden	0,88	0,83	0,92	0,88	0,80	0,72	0,70	0,64	0,62	0,82	0,88	0,92
Turkey	0,85	0,86	0,77	0,80	0,91	0,84	0,82	0,84	0,91	0,86	0,85	0,84
EU	0,85	0,86	0,80	0,85	0,86	0,77	0,86	0,86	0,77	0,87	0,87	0,78

LEARNING ACTIVITIES IN GENERAL: 2 SCALES

An exploratory factor analysis on the 11 items of question twenty-one of the teacher questionnaire (TE21), which asked teachers about the type of learning activities they use for teaching, resulted in two scales: 'Teacher centered' and 'Student centered'. These two scales are similar to those created from the student questionnaire (ST14) but are not exactly the same. The concepts are identical but the questions are different, from perspective of teachers or students.

Table 55: Items of the scale 'Teacher centered'

TE21	**To what extent do the following aspects of teaching and learning (with or without ICT) feature when teaching the target class?**

TE21Q01	I present, demonstrate and explain to the whole class
TE21Q02	I support and explain things to individual students
TE21Q03	Students work alone at their own pace
TE21Q05	Students work on exercises or tasks individually at the same time
TE21Q07	Students take tests and assessments

Note: Item categories were "None", "A little", "Sometimes" and "A lot" (reverse order for scaling purpose)

Table 56: Items of the scale 'Student centered'

TE21	**To what extent do the following aspects of teaching and learning (with or without ICT) feature when teaching the target class?**

TE21Q04	Students work in groups
TE21Q06	Students give presentations to the whole class
TE21Q08	Students are engaged in enquiry-based activities
TE21Q09	Students discuss ideas with other students and the teacher
TE21Q10	Students reflect on their learning
TE21Q11	Students participate in assessing their work

Note: Item categories were "None", "A little", "Sometimes" and "A lot" (reverse order for scaling purpose)

Table 57: Cronbach Alpha's of the scales 'Teacher centered' and 'Student centered' by country and ISCED level

	ISCED1		ISCED2		ISCED3A		ISCED3B	
	TE21_StudCentered	TE21_TeachCentered	TE21_StudCentered	TE21_TeachCentered	TE21_StudCentered	TE21_TeachCentered	TE21_StudCentered	TE21_TeachCentered
Austria	0,82	0,59	0,83	0,73	0,79	0,66	0,80	0,57
Belgium	0,82	0,57	0,77	0,45	0,81	0,50	0,80	0,67
Bulgaria	0,83	0,68	0,78	0,64	0,80	0,67	0,81	0,60
Croatia	0,86	0,82	0,83	0,77	0,84	0,73	0,82	0,75
Cyprus	0,80	0,75	0,76	0,58	0,78	0,74	0,85	0,48
Czech_Rep	0,72	0,77	0,78	0,73	0,72	0,71	0,73	0,61
Denmark	0,76	0,53	0,79	0,52	0,75	0,59	0,63	0,39
Estonia	0,83	0,45	0,75	0,66	0,80	0,55	0,90	0,80
Finland	0,72	0,67	0,79	0,64	0,79	0,69	0,82	0,76
France	0,76	0,67	0,73	0,58	0,79	0,65	0,78	0,59
Greece	0,78	0,71	0,84	0,70	0,78	0,58	0,76	0,16
Hungary	0,83	0,81	0,77	0,62	0,81	0,69	0,79	0,72
Ireland	0,84	0,61	0,86	0,39	0,82	0,44		
Italy	0,70	0,67	0,78	0,69	0,75	0,67	0,77	0,54
Latvia	0,84	0,62	0,80	0,70	0,83	0,72	0,72	0,65
Lithuania	0,85	0,79	0,80	0,73	0,79	0,74	0,74	0,58
Luxembourg	0,81	0,67	0,84	0,47	0,66	0,57	0,94	0,95
Malta	0,74	0,60	0,76	0,69	0,52	0,42		
Norway	0,76	0,57	0,76	0,49	0,71	0,82	0,79	0,65
Poland	0,82	0,57	0,82	0,66	0,82	0,70	0,83	0,72
Portugal	0,79	0,42	0,68	0,61	0,77	0,63	0,81	0,58
Romania	0,82	0,74	0,78	0,69	0,77	0,64	0,74	0,52
Slovakia	0,77	0,66	0,78	0,67	0,76	0,64	0,75	0,69
Slovenia	0,86	0,77	0,76	0,63	0,79	0,73	0,76	0,46
Spain	0,76	0,75	0,81	0,70	0,78	0,64	0,77	0,63
Sweden	0,94	0,90	0,81	0,76	0,76	0,61	0,86	0,63
Turkey	0,87	0,60	0,88	0,66	0,88	0,76	0,85	0,73
EU	0,81	0,71	0,79	0,65	0,78	0,65	0,82	0,70

SKILLS AND COMPETENCE: 2 SCALES

The question twenty-two of the teacher questionnaire asked teachers about their confidence in ICT activities. Most items were similar to those for students (ST15). A confirmatory factor analysis on 11 out the 20 items of TE22 confirmed two scales created with the student items (ST15): 'Operational Skills' and 'Social media skills'.

Table 58: Items of the scale 'Operational ICT skills'

TE22	**To what extent are you confident in the following?**
TE22Q01	Produce a text using a word processing programme
TE22Q03	Capture and edit digital photos, movies or other graphics
TE22Q04	Edit online text containing Internet links and images
TE22Q05	Create a database
TE22Q06	Edit a questionnaire online
TE22Q07	Email a file to someone, another student or teacher
TE22Q08	Organise computer files in folders and subfolders
TE22Q09	Use spreadsheet
TE22Q10	Use a spreadsheet to plot a graph
TE22Q11	Create a presentation with simple animation functions
TE22Q12	Create a presentation with video or audio clips
TE22Q16	Download and install software on a computer

Note: Item categories were "None", "A little", "Somewhat" and "A lot" (reverse order for scaling purpose)

Table 59: Items of the scale 'Social media skills'

TE22	**How confident are you doing the following tasks?**
TE22Q13	Participate in a discussion forum on the Internet
TE22Q14	Create and maintain blogs or web sites
TE22Q15	Participate in social networks

Note: Item categories were "None", "A little", "Somewhat" and "A lot" (reverse order for scaling purpose)

Table 60: Cronbach Alpha's of the scales 'Operational ICT skills' and 'Social media skills' by country and ISCED level

	ISCED1		ISCED2		ISCED3A		ISCED3B	
	TE22_OperationalSkills	TE22_SocialMediaSkills	TE22_OperationalSkills	TE22_SocialMediaSkills	TE22_OperationalSkills	TE22_SocialMediaSkills	TE22_OperationalSkills	TE22_SocialMediaSkills
Austria	0,90	0,82	0,92	0,86	0,88	0,87	0,86	0,84
Belgium	0,89	0,77	0,90	0,82	0,87	0,83	0,88	0,81
Bulgaria	0,92	0,81	0,92	0,78	0,92	0,77	0,92	0,76
Croatia	0,92	0,78	0,93	0,85	0,93	0,86	0,93	0,88
Cyprus	0,92	0,85	0,93	0,84	0,92	0,86	0,96	0,92
Czech_Rep	0,89	0,78	0,92	0,79	0,91	0,83	0,91	0,82
Denmark	0,91	0,72	0,86	0,79	0,81	0,78	0,94	0,85
Estonia	0,92	0,81	0,92	0,82	0,92	0,85	0,91	0,85
Finland	0,94	0,84	0,91	0,82	0,93	0,83	0,92	0,85
France	0,84	0,68	0,90	0,79	0,91	0,83	0,90	0,77
Greece	0,92	0,88	0,94	0,89	0,93	0,84	0,92	0,83
Hungary	0,93	0,81	0,94	0,81	0,92	0,83	0,94	0,84
Ireland	0,93	0,75	0,94	0,86	0,94	0,85		
Italy	0,92	0,80	0,93	0,85	0,93	0,86	0,93	0,82
Latvia	0,88	0,67	0,88	0,66	0,90	0,70	0,86	0,69
Lithuania	0,91	0,81	0,90	0,77	0,90	0,76	0,91	0,86
Luxembourg	0,90	0,80	0,88	0,74	0,90	0,95	0,92	0,84
Malta	0,93	0,80	0,87	0,82	0,80	0,98		
Norway	0,91	0,82	0,89	0,81	0,90	0,87	0,89	0,86
Poland	0,90	0,79	0,92	0,86	0,93	0,86	0,93	0,86
Portugal	0,84	0,75	0,86	0,79	0,89	0,83	0,88	0,86
Romania	0,94	0,77	0,94	0,81	0,92	0,82	0,93	0,85
Slovakia	0,91	0,76	0,92	0,81	0,93	0,83	0,92	0,83
Slovenia	0,89	0,79	0,88	0,78	0,90	0,86	0,88	0,79
Spain	0,94	0,80	0,94	0,87	0,92	0,84	0,92	0,82
Sweden	0,89	0,88	0,92	0,68	0,84	0,72	0,89	0,85
Turkey	0,94	0,85	0,91	0,76	0,92	0,83	0,94	0,80
EU	0,91	0,80	0,91	0,81	0,91	0,84	0,91	0,83

TEACHER OPINIONS: 1 SCALE

An exploratory factor analysis on the 7 items of question twenty-three of the teacher questionnaire (TE23), which asked teachers about their opinion on ICT use impact on student learning, resulted in one scale: 'Opinion'. This scale is similar those these created from the ST16 of the student questionnaire. The concept behind these scales is identical but from perspective of teachers or students.

Table 61: Items of the scale 'Teacher attitude'

TE23	**Do you consider ICT use during lessons has a <u>positive</u> impact on the following?**
TE23Q01	Students concentrate more on their learning
TE23Q02	Students try harder in what they are learning
TE23Q03	Students feel more autonomous in their learning (they can repeat exercises if needed, explore in more detail topics that they are interested in, etc.)
TE23Q04	Students understand more easily what they learn
TE23Q05	Students remember more easily what they've learnt
TE23Q06	ICT facilitates collaborative work between students
TE23Q07	ICT improves the class climate (students more engaged, less disturbing)

Note: Item categories were "A lot", "Somewhat", A little" and "Not at all" (reverse order for scaling purpose)

Table 62: Cronbach Alpha's of the scale 'Opinion' by country and ISCED level

	ISCED1	ISCED2	ISCED3A	ISCED3B
	TE23_Opinion	TE23_Opinion	TE23_Opinion	TE23_Opinion
Austria	0,88	0,85	0,86	0,85
Belgium	0,91	0,89	0,89	0,91
Bulgaria	0,92	0,92	0,93	0,92
Croatia	0,91	0,93	0,92	0,94
Cyprus	0,93	0,90	0,94	0,72
Czech_Rep	0,84	0,88	0,84	0,86
Denmark	0,74	0,87	0,89	0,84
Estonia	0,85	0,88	0,89	0,92
Finland	0,85	0,83	0,88	0,94
France	0,59	0,82	0,90	0,85
Greece	0,86	0,90	0,88	0,91
Hungary	0,91	0,89	0,89	0,90
Ireland	0,85	0,88	0,87	
Italy	0,87	0,89	0,90	0,88
Latvia	0,89	0,85	0,86	0,85
Lithuania	0,88	0,89	0,90	0,88
Luxembourg	0,84	0,88	0,90	0,78
Malta	0,94	0,94	0,94	
Norway	0,93	0,91	0,87	0,83
Poland	0,86	0,87	0,88	0,90
Portugal	0,88	0,88	0,89	0,93
Romania	0,89	0,90	0,93	0,91
Slovakia	0,85	0,89	0,87	0,86
Slovenia	0,85	0,89	0,91	0,88
Spain	0,87	0,89	0,91	0,90
Sweden	0,90	0,90	0,77	0,88
Turkey	0,93	0,95	0,90	0,95
EU	0,94	0,92	0,91	0,91

ATTITUDE OF TEACHERS: 1 SCALE

The question twenty-four of the teacher questionnaire (TE24) asked teachers about their attitudes towards ICT. The items were similar to those for school heads (SC21). A confirmatory factor analysis on 8 out the 10 items of TE24 confirmed the scale created with the school items (SC21): 'Teacher attitude'.

Table 63: Items of the scale 'Teacher attitude'

TE24	**To what extent do you disagree or agree with the following statements about the use of ICT at school?**

	ICT should be used for students to:
TE24Q01	Do exercises and practise
TE24Q02	Retrieve information
TE24Q03	Work in a collaborative way
TE24Q04	Learn in an autonomous way
	ICT use in teaching and learning positively impacts on students':
TE24Q05	Motivation
TE24Q06	Achievement
TE24Q07	Higher order thinking skills (critical thinking, analysis, problem solving)
TE24Q08	Competence in transversal skills (learning to learn, social competences, etc.)

Note: Item categories were "Strongly disagree", "Disagree", "Agree" and "Strongly agree" (reverse order for scaling purpose)

Table 64: Cronbach Alpha's of the scale 'Teacher Attitude' by country and ISCED level

	ISCED1 TE24_Attitude	ISCED2 TE24_Attitude	ISCED3A TE24_Attitude	ISCED3B TE24_Attitude
Austria	0,87	0,84	0,86	0,83
Belgium	0,79	0,82	0,88	0,85
Bulgaria	0,92	0,93	0,92	0,92
Croatia	0,91	0,89	0,90	0,92
Cyprus	0,88	0,89	0,87	0,96
Czech_Rep	0,81	0,86	0,84	0,88
Denmark	0,74	0,86	0,84	0,77
Estonia	0,85	0,88	0,87	0,86
Finland	0,84	0,78	0,84	0,89
France	0,84	0,81	0,89	0,69
Greece	0,85	0,80	0,78	0,76
Hungary	0,84	0,84	0,85	0,87
Ireland	0,89	0,93	0,90	
Italy	0,87	0,87	0,87	0,89
Latvia	0,89	0,88	0,86	0,86
Lithuania	0,88	0,87	0,89	0,89
Luxembourg	0,82	0,81	0,96	0,89
Malta	0,84	0,90	0,94	
Norway	0,86	0,87	0,86	0,85
Poland	0,90	0,87	0,89	0,89
Portugal	0,88	0,87	0,87	0,89
Romania	0,90	0,90	0,90	0,90
Slovakia	0,85	0,89	0,85	0,88

Slovenia	0,88	0,86	0,86	0,91
Spain	0,91	0,89	0,91	0,90
Sweden	0,89	0,86	0,87	0,76
Turkey	0,95	0,92	0,90	0,93
EU	0,87	0,87	0,89	0,88

Cluster analyses

METHOD

We used the two-step cluster analysis method in SPSS software to identify groups of students, teachers, and schools that are similar to each other on a number of preselected variables. When determining the number of clusters we not only took into account statistical criteria (best fit) but also criteria of interpretability and similarity across the different grades. This means that we looked for a solution that was interpretable and that fitted each grade. Finally, the cluster analyses were performed at each ISCED level separately applying the same number of clusters.

Missing values on the preselected items were imputed when less than half of the items were missing.

In the following paragraphs, we describe the results of the different cluster analyses and the items that were used to identify the clusters.

DIGITALLY SUPPORTIVE SCHOOLS

The following items were used in the cluster analysis 'Digitally supportive schools':

- items tapping strategies for schools to use ICT in teaching and learning (school questionnaire): SC18Q01-SC8Q06 (strategies),
- items tapping incentives that schools use in order increase the use of ICT in teaching and learning (school questionnaire): SC19Q01-SC19Q05,
- items tapping the existence of innovation policy measures in schools (school questionnaire): SC20Q01-SC20Q03,
- items tapping the availability of an ICT coordinator (school questionnaire): SC16Q01,
- items tapping obstacles to use ICT in teaching and learning (school questionnaire): SC17_Equip, SC17_Goal, SC17_Ped,
- items tapping support to teachers in terms of professional development (school questionnaire): SC15_ProfDev,
- items tapping the attitude of principals about the use of ICT for educational purposes: SC21_Attitude

A cluster analysis performed on all the items resulted in only 2 clusters (a polarization). As this is not very interesting in terms of profiling, we decided to perform two cluster analyses separately. The first

cluster analysis included the items tapping school strategies, incentives and innovation policy and the second cluster analysis included the other items. Both cluster analyses resulted in two clusters. A cross-tabulation of those two clusters resulted in the following four cluster profiles:

- cluster 1: strong policy & strong support
- cluster 3: weak policy & strong support
- cluster 2: strong policy & weak support
- cluster 4: weak policy & weak support

In Table 65, we show the descriptive statistics by cluster and by level on the items concerned.

Table 65: Descriptive statistics on the items tapping strategies, incentives, and innovation by cluster and by level

CLUSTER	SC18Q01	SC18Q02	SC18Q03	SC18Q04	SC18Q05	SC18Q06	SC18Q07	SC18Q08	SC19Q01	SC19Q02	SC19Q03	SC19Q04	SC19Q05	SC20Q01	SC20Q02	SC20Q03	SC15_ProfDev	SC16R	SC17_Goal	SC17_Ped	SC17_Equip	SC21_attitude
	Percentage of 'Yes'																Mean					
ISCED1																						
1	76	66	68	80	86	40	68	72	20	6	26	44	40	58	88	62	2,32	2,39	1,33	2,06	2,30	3,29
3	10	8	34	42	52	18	24	32	4	2	2	14	16	18	50	12	1,83	2,00	1,24	2,05	2,14	3,22
2	68	64	62	72	88	40	74	66	16	2	16	38	36	52	80	42	1,86	1,80	1,91	2,84	3,18	3,29
4	10	6	18	28	30	8	34	34	6	2	4	12	16	18	50	16	1,59	1,58	1,91	2,92	3,06	3,18
ISCED2																						
1	98	88	76	82	86	60	66	60	14	4	14	42	46	60	86	56	2,35	2,50	1,39	2,16	2,28	3,43
3	20	4	48	62	70	36	62	48	8	2	18	32	30	38	80	46	2,21	2,29	1,36	2,21	2,25	3,34
2	96	82	72	64	86	50	62	52	12	2	16	44	44	62	86	60	1,98	1,85	1,88	2,65	2,82	3,27
4	16	8	36	46	52	30	48	40	6	0	8	24	20	44	78	30	1,79	1,83	2,01	2,85	2,90	3,17
ISCED3A																						
1	64	60	74	88	86	62	76	72	18	2	26	50	48	72	90	72	2,50	2,09	1,26	2,02	2,19	3,54
3	38	24	28	54	48	24	18	46	4	0	6	16	16	18	66	46	2,38	2,25	1,26	2,05	2,09	3,25
2	56	44	70	68	82	54	82	70	22	4	26	46	52	64	98	66	1,97	2,05	1,94	2,77	2,77	3,27
4	36	18	24	22	30	14	26	24	6	2	8	20	22	26	60	18	1,81	1,81	2,03	2,85	2,72	3,21
ISCED3B																						
1	62	54	80	86	84	58	78	70	28	6	28	58	60	60	94	68	2,41	2,32	1,28	1,84	2,02	3,61
3	34	12	48	44	60	40	38	38	10	2	4	12	18	18	46	22	2,16	2,50	1,29	1,67	1,77	3,61
2	50	40	72	72	78	48	78	64	20	6	28	52	62	52	92	58	1,91	1,93	1,74	2,56	2,57	3,22
4	30	20	26	26	34	28	22	30	6	0	4	12	18	20	48	16	1,79	1,69	1,84	2,68	2,47	3,12

DIGITALLY SUPPORTIVE TEACHERS

The following items were used in the cluster analysis 'Digitally supportive teachers':

- TE07Q01R (teacher use),
- TE09_scale (access to equipment),
- TE14_ProfDev, TE15Q01 (amount of ProfDev),
- TE20_Equip (obstacles), TE20_Ped (obstacles), TE20_Goal (obstacles),
- TE22_skills (confidence), TE22_commun (confidence),
- TE23_opinion
- TE24_attitude

A cluster analysis performed on all the items resulted in the following four cluster profiles:

- Cluster 1: high attitude, confidence, training AND low obstacles, high access
- Cluster 2: high attitude, confidence, training AND high obstacles, low access
- Cluster 3: low attitude, confidence, training AND low obstacles, high access
- Cluster 4: low attitude, confidence, training AND high obstacles, low access

In Table 66, we present the descriptive statistics by cluster and by level on the items concerned.

Table 66: Descriptive statistics by cluster and by level on the items used in the cluster analysis 'Digitally Supportive Teachers'

CLUSTER	TE07Q01R	TE09_scale	TE14_ProfDev	TE15Q01	TE20_Equip	TE20_Ped	TE20_Goal	TE22_SocialMedia Skills	TE22_OperatSkills	TE23_Opinion	TE24_Attitude
						Mean					
ISCED1											
1	5,00	0,72	0,61	4,75	2,44	1,89	1,29	3,29	3,58	3,60	3,62
2	3,79	0,57	0,34	3,79	3,19	2,53	1,75	2,98	3,35	3,30	3,35
3	3,64	0,71	0,35	4,03	2,20	1,94	1,26	1,76	2,61	3,07	3,17
4	2,64	0,49	0,16	3,04	3,26	2,92	1,91	1,67	2,31	3,05	3,16
ISCED2											
1	4,75	0,70	0,63	4,70	2,16	1,73	1,29	3,11	3,51	3,35	3,44
2	4,33	0,62	0,43	4,27	3,18	2,71	1,87	2,88	3,38	3,23	3,37
3	3,35	0,70	0,36	3,98	1,89	1,89	1,42	1,87	2,68	2,55	2,87
4	2,71	0,55	0,18	2,98	3,03	2,76	2,08	1,71	2,35	2,90	3,05
ISCED3A											
1	4,35	0,65	0,36	3,65	1,87	1,72	1,27	2,60	3,25	2,87	3,07
2	4,62	0,62	0,53	4,68	2,89	2,36	1,67	3,00	3,49	3,33	3,50

3	2,68	0,59	0,30	3,63	2,29	2,38	1,80	1,73	2,56	2,35	2,72
4	3,10	0,44	0,16	2,77	3,36	3,03	2,28	2,06	2,63	3,16	3,28
ISCED3B											
1	5,74	0,67	0,45	4,43	1,83	1,66	1,23	3,29	3,65	3,24	3,35
2	5,36	0,62	0,48	4,51	3,09	2,49	1,82	3,09	3,55	3,53	3,58
3	3,89	0,62	0,22	3,18	1,87	1,83	1,26	1,90	2,81	2,90	3,07
4	3,39	0,50	0,23	3,28	3,00	2,85	2,12	2,13	2,79	2,88	3,04

DIGITALLY SUPPORTIVE STUDENTS

The following items were used in the cluster analysis 'Digitally supportive students':

- ST03_AccesHome,
- ST04Q01 (experience at home),
- ST05_Info&Commun (use at home), ST05_Games (use at home), ST05_Fun (use at home),
- ST06_ActSchWork_sc (use at home), ST06_ActSchWork_st (use at home),
- ST11_Equip (access at school),
- ST13_CompUse (use at school),
- ST10Q01 (experience at school)

A cluster analysis performed on all the items resulted in the following three cluster profiles:

- Cluster 1: high use and access at school AND high use and access at home
- Cluster 2: low use and access at school AND high use and access at home
- Cluster 3: low use and access at school AND low use and access at home

In Table 67, we present the descriptive statistics by cluster and by level on the items concerned.

Table 67: Descriptive statistics on the items used in the cluster analysis 'digitally supportive students'

Cluster	ST03_UseHome	ST04Q01	ST05_Inf&Comm	ST05_Games	ST05_Fun	ST06_ActSchWork_st	ST06_ActSchWork_sc	ST10Q01	ST11_Equip	ST13_CompUse
					Mean					
ISCED2										
1	0,88	3,19	2,82	2,66	3,38	2,98	2,11	2,64	2,04	2,20

2	0,85	3,13	2,26	2,03	3,18	2,20	1,34	2,41	1,42	1,42
3	0,72	2,32	1,66	1,41	1,88	1,62	1,20	2,16	1,32	1,35
ISCED3A										
1	0,87	3,64	3,14	2,53	3,55	3,10	2,12	2,99	1,80	2,08
2	0,80	4,00	2,54	1,62	3,09	2,29	1,41	3,04	1,32	1,38
3	0,75	2,63	2,26	1,51	2,81	2,15	1,40	2,35	1,33	1,41
ISCED3B										
1	0,84	3,57	3,12	2,71	3,49	2,81	2,32	2,85	2,05	2,25
2	0,80	3,63	2,55	2,01	3,38	1,96	1,32	2,88	1,40	1,36
3	0,61	2,67	1,93	1,42	2,23	1,74	1,37	2,29	1,40	1,40

DIGITALLY EQUIPPED SCHOOLS

The following items were used in the cluster analysis 'Digitally equipped schools':

- SC07_NbComputers_for100students,
- SC07_NbDigitalReaders_for100students,
- SC07_NbMobiles_for100students,
- SC07_NbInterWhiteboards_for100students,
- SC07_NbDigitalCameras_for100students,
- SC07_NbDataProjectors_for100students,
- SC08Q01 (percentage of operational equipment),
- SC11Q01 (broadband speed: 10 mbps or less *versus* More than 10 mbps)
- SC12Q01 (technology access)
- SC13Q01-SC13Q04 (maintenance),
- SC14Q01-SC14Q04, SC14Q06 and SC14Q11 (connectedness)

A cluster analysis performed on all the items resulted in the following three cluster profiles:

- Cluster 1: High Equipment levels / Fast broadband / High Connectedness
- Cluster 2: Lower Equipment levels / Slow or no broadband / Some Connectedness
- Cluster 3: Low Equipment levels / Slow or no broadband / No Connectedness

In Table 68, we present the descriptive statistics by cluster and by level on the items concerned.

Table 68: Descriptive statistics on the items used in the cluster analysis 'Digitally supportive students'

CLUSTER	SC07_Computers_100stud	SC07_DigitalReader_100stud	SC07_Mobile_100stud	SC07_IntWitheboard_100stud	SC07_DigCamera_100stud	SC07_DataProjector_100stud	SC08Q01_1	SC08Q01_2	SC08Q01_3	SC08Q01_4	SC11Q01R_MoreThan10mbps	SC12Q01_1	SC12Q01_2	SC12Q01_3	SC12Q01_4	SC12Q01_5	SC13Q01	SC13Q02	SC13Q03	SC13Q04	SC14Q01	SC14Q02	SC14Q03	SC14Q04	SC14Q06	SC14Q11
				Mean					%					%					% of 'Yes'					% of 'Yes'		
ISCED1																										
1	24,2	0,0	0,3	1,8	1,1	2,7	2	4	10	84	46	46	16	24	14	2	68	22	64	8	84	84	38	76	60	0
2	8,7	0,0	0,1	0,5	0,3	1,0	4	8	22	66	24	74	14	6	6	0	78	44	4	16	86	58	20	78	22	0
3	11,1	0,0	0,1	0,6	0,3	1,0	6	6	26	62	28	58	26	6	6	6	72	24	30	8	0	0	0	0	0	100
ISCED2																										
1	36,9	0,1	0,4	1,5	0,8	3,3	0	4	14	84	66	42	14	26	16	2	80	18	80	6	98	84	56	86	90	0
2	15,9	0,0	0,2	0,9	0,4	2,0	2	6	16	74	32	70	12	10	6	2	84	46	10	8	94	64	24	84	56	0
3	10,8	0,0	0,1	0,5	0,2	1,2	4	6	16	76	22	76	12	4	6	0	76	44	28	26	0	2	0	0	0	100
ISCED3A																										
1	32,5	0,0	0,6	0,9	0,9	3,5	0	2	20	76	62	36	12	34	18	0	80	28	34	14	98	96	70	90	80	0
2	14,2	0,0	0,1	0,5	0,2	1,9	2	6	14	78	30	74	12	12	2	0	90	36	14	6	94	48	0	88	44	0
3	11,4	0,0	0,2	0,4	0,2	1,2	6	6	22	68	26	60	24	10	6	2	88	36	4	2	0	0	0	0	0	100
ISCED3B																										
1	43,7	0,0	1,2	0,7	1,1	3,8	2	6	10	82	62	40	14	32	14	0	82	38	16	8	98	94	80	92	76	0
2	21,7	0,0	0,3	0,5	0,4	2,1	2	2	16	80	40	68	12	14	6	0	100	22	2	4	96	46	2	94	48	0
3	17,3	0,0	0,7	0,4	0,3	1,5	2	2	20	78	24	66	18	10	4	0	82	34	4	4	0	2	0	0	0	96

Appendices

References

Organisation for Economic Co-operation and Development (OECD). (2009). *PISA 2006 technical report.* Paris : Author.

Carstens, R, & Pelgrum, W. J., (2009). *SITES 2006 Technical Report.* Amsterdam: IEA