

The International Computer and Information Literacy Study (ICILS)

U.S. ICILS 2018 Technical Report and User's Guide

The International Computer and Information Literacy Study (ICILS): U.S. ICILS 2018 Technical Report and User's Guide

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1. INTRODUCTION

The *U.S. ICILS 2018 Technical Report and User's Guide* provides an overview of the design and implementation of the International Computer and Information Literacy Study (ICILS) 2018 in the United States.

1.1 ICILS 2018 in Brief

The International Computer and Information Literacy Study (ICILS) is a computer-based international assessment of eighth-grade students' capacities to use information communications technologies (ICT) productively for different purposes. First conducted in 2013, ICILS assessed students' computer and information literacy (CIL) with an emphasis on the use of computers as information-seeking, management, and communication tools. Thereafter, increasing international recognition of the importance of students' abilities to recognize and operationalize real-world problems using computational formulations led to the development of the computational thinking (CT) component within ICILS. The second cycle of ICILS, administered in 2018, continued to assess CIL and assessed CT in the newly added optional assessment component. In addition, ICILS 2018 investigated how these abilities relate both to in-school and out-of-school contexts that support learning.

Twenty-one education systems around the world participated in ICILS 2013. The United States participated in ICILS for the first time in 2018, along with 13 other education systems. Among them, nine, including the United States, participated in the optional CT component.

ICILS is sponsored by the International Association for the Evaluation of Educational Achievement (IEA) and is conducted in the United States by the National Center for Education Statistics (NCES) within the U.S. Department of Education.

The ICILS assessment was developed through an international collaborative process, including a review of related concepts in the existing literature and input from the U.S. and international experts in ICT. These experts develop frameworks that define the knowledge and skills to be assessed. The frameworks are designed to address key competencies in CIL and CT and use of digital technologies in learning.

A detailed explanation of ICILS from an international perspective can be found in three reports published by the IEA and available online.

- *IEA International Computer and Information Literacy Study 2018 Assessment Framework* (Fraillon, Ainley, Schulz, Duckworth, and Friedman 2019);
- *Preparing for Life in a Digital World: IEA International Computer and Information Literacy Study 2018 International Report* (Fraillon, Ainley, Schulz, Friedman, and Duckworth 2020a); and
- *IEA International Computer and Information Literacy Study 2018 Technical Report* (Fraillon, Ainley, Schulz, Duckworth, and Friedman 2020b).

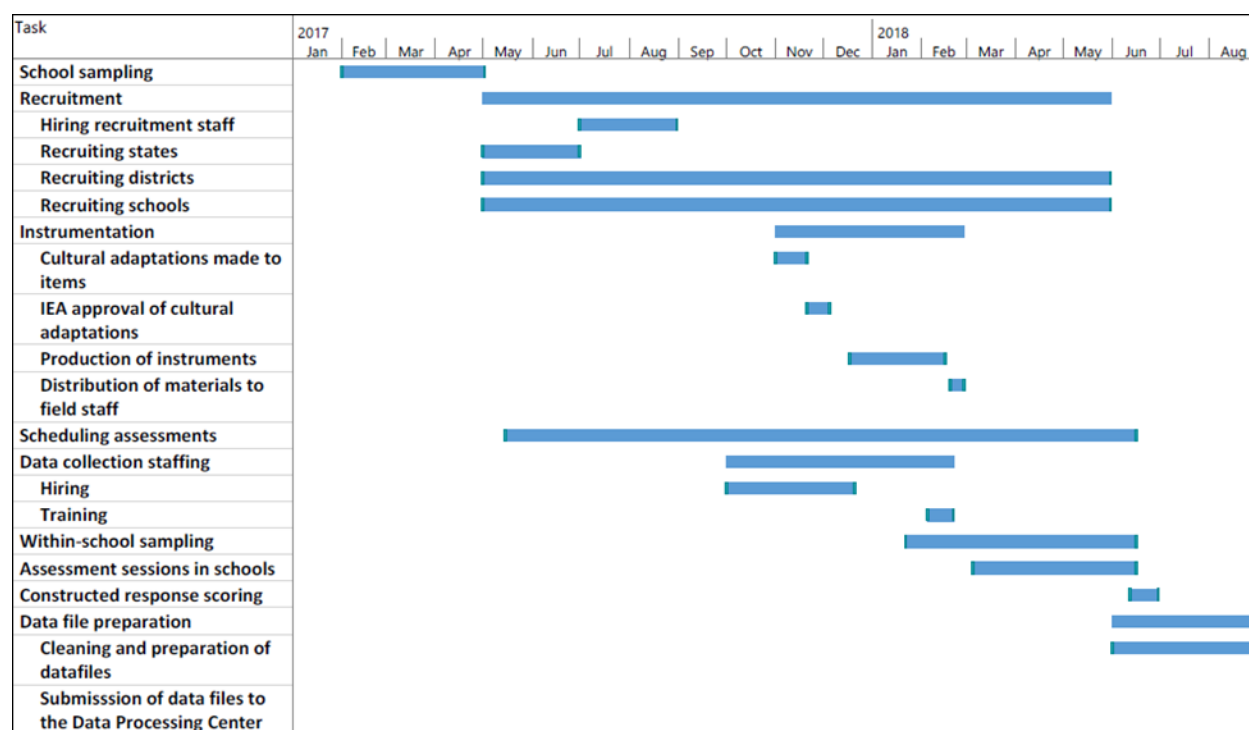
A U.S. national report is available as well. It is titled *U.S. Results from the 2018 International Computer and Information Literacy Study (ICILS) Web Report* (Wang, Perkins, and Tang 2019). This web report provides comparative information about the computer and information literacy of eighth-grade students in

the United States and 13 other education systems that participated in ICILS, and additional details about the achievement of U.S. students that are not available in the international reports. The report is available online at <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2019164>.

1.2 ICILS 2018 U.S. Data Collection Activities and Schedule

Descriptions of the data collection activities and the schedule within the United States provide a foundation to understanding the data. These activities are listed in exhibit 1-1 along with the timing of their implementation. The activities are described in detail in chapter 4 of this report.

Exhibit 1-1. Schedule for ICILS 2018 data collection activities



1.3 Overview of the Design and Administration of ICILS 2018

The basic parameters of the design and administration of ICILS 2018 in the United States are outlined in this section. A more detailed explanation is provided in subsequent chapters of this report. *IEA International Computer and Information Literacy Study 2018 Technical Report* (2020) contains detail on the international design.

Sampling

ICILS is a sample-based assessment, meaning that while only a sample of students take the assessments, they are selected in such a way as to allow the results to be generalizable to a larger target population. The ICILS target population is based on standardized definitions, and the sampling is conducted following standardized and refereed international procedures.

ICILS required participating countries and other education systems to draw probability samples of students who were nearing the end of their eighth year of formal schooling, counting from the first year of the International Standard Classification of Education (ISCED) Level 1 (or primary schooling). (For additional information on ISCED levels, see <http://uis.unesco.org/en/topic/international-standard-classification-education-isced>). In the United States, the sample was drawn to represent the nation at grade 8. The U.S. national sample included both public and private schools, randomly selected and weighted to be representative of the nation at grade 8. (See the section on sampling weights and standard errors in this report for definitions.)

In total, the U.S. national sample in 2018 consisted of 352 schools, 342 of which were determined to be eligible, and 7,864 eighth-grade students. The weighted school response rate for the United States was 67 percent before the use of substitute schools (schools substituted for originally sampled schools that refused to participate) and 77 percent with the inclusion of substitute schools. The weighted student response rate was 91 percent. Student response rates are based on a combined total of students from both sampled and substitute schools.

Assessment Design

ICILS included computer-based student assessments as well as contextual background questionnaires.

The ICILS test is administered on an assessment platform that is designed to provide students with an authentic computer-based assessment experience. Each student completed two CIL modules, a contextual background questionnaire, and two CT modules. Each of the 30-minute CIL modules included a set of questions and tasks that followed a linear narrative structure based on a realistic theme. CIL modules included small discrete questions and a large task that typically took 15 to 20 minutes to complete. The CT component included two 25-minute modules that corresponded to the two strands of the CT construct: conceptualizing problems and operationalizing solutions. Each module included a sequence of related tasks aligned to a unifying theme. All students completed both CT modules, with the order of the two CT modules randomized.

The assessment booklets were constructed such that not all of the students responded to all of the CIL items. This is consistent with other large-scale assessments, such as the National Assessment of Educational Progress (NAEP). To keep the testing burden to a minimum, and to ensure broad subject-matter coverage, ICILS used a rotated block design that included 20 possible CIL module combinations. All students completed both CT modules, with the order of the two CT modules randomized. The CIL and CT modules are described in more detail in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (Fraillon et al. 2020b).

The ICILS student questionnaire included questions relating to students' background characteristics, their experience with and use of ICT to complete a range of different tasks in school and out of school, and their attitudes towards the use of ICT. ICILS also included a 30-minute teacher questionnaire, a 15-

minute ICT coordinator questionnaire, and a 15-minute principal questionnaire. Questionnaires for principals, teachers, and ICT Coordinators were self-administered, primarily using an online survey system. The ICILS questionnaires administered in the United States are available at <https://nces.ed.gov/surveys/icils/questionnaires.asp>.

Test Administration

Test administration for ICILS in the United States started in March and continued into June 2018. The administration was carried out by professional staff trained according to the international guidelines. School personnel were asked only to assist with listings of students, the identification of space for testing in the school, and the specification of any parental consent procedures required. The International Study Center monitored compliance with the standardized procedures.

Scoring

ICILS included both multiple-choice and constructed-response items. A scoring rubric (guide) was provided for every constructed-response item. The National Research Coordinator in each country was responsible for the scoring and the coding of parental occupation data in that country, following established guidelines.

Scaling

Total scores for CIL and CT were estimated using an item response theory model. Equating procedures were used to place CIL scores from the 2013 and 2018 assessments on the same scale. For equating purposes, all 2013 item parameters were reestimated concurrently during the ICILS joint calibration process. More detailed information can be found in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (2020).

Plausible Values

To keep student burden to a minimum, ICILS purposefully administered a limited number of assessment items to each student—too few to produce accurate individual content-related scale scores for each student. The number of assessment items administered to each student, however, is sufficient to produce accurate *group* content-related scale scores for subgroups of the population. These scores are transformed during the scaling process into plausible values to characterize students participating in the assessment, given their background characteristics. Plausible values are imputed values and not test scores for individuals in the usual sense. If used individually, they provide biased estimates of the proficiencies of individual students. However, when grouped as intended, plausible values provide unbiased estimates of population characteristics (e.g., means and variances for groups).

Plausible values represent what the performance of an individual on the entire assessment might have been, had it been observed. They are estimated as random draws (usually five) from an empirically derived distribution of score values based on the student's observed responses to assessment items and on

background variables. Each random draw from the distribution is considered a representative value from the distribution of potential scale scores for all students in the sample who have similar background characteristics and similar patterns of item responses. Differences between plausible values drawn for a single individual quantify the degree of error (the width of the spread) in the underlying distribution of possible scale scores that could have caused the observed performances.

More detailed information can be found in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (2020).

Weighting

Responses from the groups of students were assigned sampling weights to adjust for the complex sample design that resulted in students having an unequal, but known, probability of selection. Additionally, an adjustment for school and student nonresponse was built into the weighting. More detailed information can be found in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (2020). In analyses of the ICILS data, it is necessary to use sampling weights to obtain accurate population estimates.

1.4 Reporting ICILS Results

Achievement results from ICILS are reported on the CIL and CT achievement scales. The CIL achievement scale was established for ICILS 2013 with a midpoint (average) of 500 and with 100 scale points as one standard deviation of achievement across the ICILS 2013 countries. The use of CIL trend modules allowed data collected in ICILS 2018 to be equated with data from the previous cycle and reported on the existing CIL proficiency scale. CIL achievement is described using four levels of increasing sophistication (level 1, level 2, level 3, level 4), with each level spanning 85 scale points. The CT achievement scale was established for ICILS 2018 with a midpoint (average) of 500 and with 100 scale points as one standard deviation of achievement across the ICILS 2018 countries that participated in the CT assessment. The CT scale is described according to three regions of achievement (lower region, middle region, upper region). These regions are designed to describe the increase in complexity of CT knowledge, skills, and understandings from low to high achievement to understand learning progress.

1.5 U.S. International and National Data Files

Three versions of the U.S. national data are available as follows:

- The **ICILS U.S. international data files** that are available as part of the international database released by the International Study Center. The ICILS international data files are available in two versions: a public-use version and a restricted-use version. The public-use ICILS data files can be downloaded from <https://www.iea.nl/data-tools/repository/icils>. A number of variables are not included in the public-use version in order to minimize the risk of disclosing confidential information. These variables include information about students' year and month of birth, testing date, as well as school enrollment (see exhibit 5-1 in chapter 5 of this technical report for a complete list of variables removed from the international public-use data files). The restricted-

use version of the ICILS international data files are available by request through the IEA Study Data Repository (<https://www.iea.nl/data-tools/repository/icils>). A description of the restricted variables removed from the public-use data files are presented in chapter 4 of the *IEA International Computer and Information Literacy Study 2018 User Guide for the International Database* (Mikheeva and Meyer 2019). These data files conform to the international specifications common to the data files from all countries. However, they do not include the U.S. specific adaptations made to a few questions in the questionnaires or the additional questions added to the school and student questionnaires, such as the question on race/ethnicity added to the student questionnaire.

- The **ICILS national public-use data files** are available through the National Center for Education Statistics. The ICILS U.S. national dataset can be downloaded from <https://nces.ed.gov/surveys/icils/>. These U.S. data files include the U.S. specific adaptations made to questionnaire items and additional questions added to the school and student questionnaires.
- The **ICILS national restricted-use data files** are available through the National Center for Education Statistics. Access to these microdata files may be obtained by completing a restricted-use license agreement with NCES. The restricted-use data files are provided only on CD-ROM or DVD-ROM. These data files contain supplemental link files that link ICILS school ID numbers to the school ID numbers as they appear in the publicly available Common Core of Data (CCD) or the Private School Universe Survey (PSS). In addition, race/ethnicity is provided with all available categories and free or reduced-price lunch is provided as a continuous variable. Because these data can reveal the identities of participating schools, the restricted-use data files are only made available to those who obtain a NCES restricted-use data license. Directions on how to obtain the license can be found at <http://nces.ed.gov/pubsearch/licenses.asp>.

Researchers do not need to process the U.S. ICILS microdata (public-use or restricted-use) in order to explore and analyze the data. The ICILS data, including U.S. national variables (race/ethnicity, free lunch) can be analyzed using the NCES International Data Explorer (IDE). The IDE provides for trend analysis when applicable as well as comparisons among all participating ICILS countries. The IDE generates user-defined reports that include options for tables, gap analysis, regression analysis, and significance testing. The IDE can be accessed at <http://nces.ed.gov/surveys/international/ide/>.

The most comprehensive explanation of the ICILS international data, and hence of the U.S. international data file, is provided in the various ICILS 2018 publications produced by the International Association for the Evaluation of Educational Achievement (IEA), particularly the *IEA International Computer and Information Literacy Study 2018 User Guide for the International Database* (Mikheeva and Meyer 2019). This publication provides detailed descriptions of the content and format of the data in the ICILS 2018 international data files and should be seen as the primary reference. The *U.S. ICILS 2018 Technical Report and User's Guide* draws heavily on the international user's guide for much of its data file-related content. This content is supplemented with detail on those aspects of the ICILS data that were unique to the United States.

2. SAMPLING SCHOOLS

2.1 2018 ICILS Sample Design

The sample design for the eighth-grade school sample was developed to retain most of the properties of the previous IEA U.S. school samples, and to follow international requirements as given in chapter 6 of *IEA International Computer and Information Literacy Study 2018 Technical Report* (Fraillon et al. 2020b). The U.S. sample followed a two-stage sampling process with the first stage a sample of schools and the second stage a sample of students within the schools.

There was no oversampling of any subgroup from the total school population in 2018. The overlap with the 2018 National Assessment of Educational Progress (NAEP) school samples was minimized for the 2018 ICILS. The process took place when the 2018 NAEP samples were selected because the ICILS sample was selected before the NAEP samples due to ICILS scheduling constraints. Minimizing overlap reduces the burden on schools by minimizing the number of schools selected for both samples.

The student population for the 2018 ICILS is the set of all eighth-grade students in the United States in both public and private schools. The ICILS school sample consists of 352 schools containing an eighth-grade student. The schools were selected with probability proportionate to the school's estimated grade enrollment of eighth-grade students from the 2018 NAEP school frame. A minimum of 30 eighth-grade students were selected within each school in an equal probability sample (unless there were fewer than the minimum, in which all eighth-grade students were taken with certainty). The overall sample design was intended to approximate a self-weighting sample of students as much as possible in accordance with the international guidelines, with each eighth-grade student in the United States having an approximately equal probability of being selected. See sections 2.4.2 and 4.2 for more details.

2.2 School Sampling Frames

The U.S. school sampling frame for eighth grade was developed from two national databases in the National Center for Education Statistics (1) public schools in the Common Core of Data ([CCD] <http://nces.ed.gov/ccd/>) and (2) private schools in the Private School Survey ([PSS] <https://nces.ed.gov/surveys/pss/>). These sources provide full coverage of all eighth-grade students in the education system in the United States. The ICILS school frames were constructed using the 2015–16 CCD and PSS, the most current data at the time of the frame construction.

The data preparation of the school frames from CCD and PSS benefited from procedures developed for the National Assessment of Educational Progress (NAEP), a large educational survey in the United States. The school frames used the NAEP 2018 school frame as an input data source.

Eligible schools in the school frames included schools operating in the 50 states and the District of Columbia, Department of Defense (DoD) domestic schools, and Bureau of Indian Education (BIE) schools. Schools in Puerto Rico and U.S. territories, DoD schools overseas, adult education institutions with no eighth-grade students, and noneducation institutions (e.g., home schools and correspondence schools) were ineligible for the study.

Any school having an eighth grade was included on the ICILS eighth-grade school sampling frame. Table 2-1 presents frame tabulations of the number of schools by the school grade span (lowest to highest grade level of the school).

Table 2-1. Number and percentage of students and schools included in the U.S. ICILS eighth-grade school sampling frame, by grade span: 2018

Grade span	Students	Percent	Schools	Percent
Total	4,022,771	100	48,276	100
Grades 1 to 8	481,984	12.0	15,144	31.4
Grades 6 to 8	2,137,543	53.1	10,249	21.2
Grades 1 to 12	152,505	3.8	6,271	13.0
Grades 7 to 12	135,218	3.4	3,035	6.3
Grades 7 to 8	643,139	16.0	2,553	5.3
Other	472,382	11.7	11,024	22.8

NOTE: Detail may not sum to totals because of rounding. The “other” grade spans includes all additional grade spans.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

2.3 Stratification

The sample design was a stratified systematic sample within each stratum, with sampling probabilities proportional to size (PPS). Stratification was used for sample efficiency and consistency with previous designs. Twelve explicit strata were formed by the following variables, shown in alphabetical order:

- census region—Northeast, Midwest, South, and West;
- poverty level¹—for public schools, “high” poverty is defined as having 50 percent or more of the students eligible for participation in the free or reduced-price lunch program (FRPL),² and “low” poverty is defined as having less than 50 percent eligible; and
- school type—school is either under public control (operated by publicly elected or appointed officials) or private control (operated by privately elected or appointed officials and derives its major source of funds from private sources).

Within each stratum for all three samples, the frame was implicitly stratified by the following three categorical stratification variables:

- locale—urban-centric locale code (i.e., city, suburb, town, rural);

¹ The sample frame did not contain a direct measure of poverty. No free or reduced-price lunch program (FRPL) data were available for private schools; thus all private schools are treated as low-poverty schools.

² FRPL refers to the same program that is sometimes called the National School Lunch Program (NSLP). ICILS has traditionally used the name FRPL and that will be used in this report hereinafter.

- race/ethnicity status—student population in the school is “15 percent or above” or “below 15 percent” Black, Hispanic, Asian, Hawaiian/Pacific Islander, American Indian and Alaska Native students, and students of Two or more races;³ and
- estimated grade enrollment.

The following tables show the total number and percentage of eighth-grade students and schools in the ICILS 2018 eighth-grade school frame by census region (table 2-2), poverty level (table 2-3), school type (table 2-4) and by poverty level, school type, and region (table 2-5).

Table 2-2. Number and percentage of students and schools included in the U.S. ICILS eighth-grade school sampling frame, by region: 2018

Region	Students	Percent	Schools	Percent
Total	4,022,771	100	48,276	100
Northeast	656,567	16.3	9,276	19.2
Midwest	859,126	21.4	12,622	26.1
South	1,541,675	38.3	15,652	32.4
West	965,403	24.0	10,726	22.2

NOTE: Detail may not sum to totals because of rounding. Region of country is based on Census Bureau definitions.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table 2-3. Number and percentage of students and schools included in the U.S. ICILS eighth-grade school sampling frame, by poverty level: 2018

Poverty level	Students	Percent	Schools	Percent
Total	4,022,771	100	48,276	100
High	1,741,481	43.3	14,292	29.6
Low	2,281,290	56.7	33,984	70.4

NOTE: For public schools, “high” poverty is defined as having 50 percent or more of the students eligible for participation in the free or reduced-price lunch program (FRPL), and “low” poverty is defined as having less than 50 percent eligible. Because no FRPL data were available for private schools, all private schools are categorized as “low.”

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table 2-4. Number and percentage of students and schools included in the U.S. ICILS eighth-grade school sampling frame, by school type: 2018

School type	Students	Percent	Schools	Percent
Total	4,022,771	100	48,276	100
Private	330,594	8.2	19,640	40.7
Public	3,692,177	91.8	28,636	59.3

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

³ Black includes African American and Hispanic includes Latino. Racial categories exclude Hispanic origin.

Table 2-5. Number and percentage of students and schools included in the U.S. ICILS eighth-grade school sampling frame, by region, poverty level, and school type: 2018

Region	Poverty level	School type	Students	Percent	Schools	Percent
Total			4,022,771	100	48,276	100
Northeast	High	Public	193,072	4.8	1,774	3.7
Midwest	High	Public	288,181	7.2	3,289	6.8
South	High	Public	782,538	19.5	5,489	11.4
West	High	Public	477,690	11.9	3,740	7.7
Northeast	Low	Private	76,690	1.9	4,736	9.8
Midwest	Low	Private	79,944	2.0	4,826	10.0
South	Low	Private	111,499	2.8	6,378	13.2
West	Low	Private	62,461	1.6	3,700	7.7
Northeast	Low	Public	386,805	9.6	2,766	5.7
Midwest	Low	Public	491,001	12.2	4,507	9.3
South	Low	Public	647,638	16.1	3,785	7.8
West	Low	Public	425,252	10.6	3,286	6.8

NOTE: Detail may not sum to totals because of rounding. Region of country is based on Census Bureau definitions. For public schools, “high” poverty is defined as having 50 percent or more of the students eligible for participation in the free or reduced-price lunch program (FRPL), and “low” poverty is defined as having less than 50 percent eligible. Because no FRPL data were available for private schools, all private schools are categorized as “low.”

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

2.4 National School Samples

2.4.1 Measure of Size

The goal for the ICILS sample was to attain a self-weighting student sample. To achieve this, schools’ probability of selection was related to their measure of size (MOS), which is proportional to its share of the target population, that is, the eighth-grade enrollment. This method also reduces the chance of selection for smaller schools. This improves cost efficiency by increasing the number of students per school. However, students in schools with enrollments of only a few students would have very large weights if selected. To minimize the impact of these small schools on variances and estimates, the minimum MOS was set to 5.

The following is a summary of the steps for assigning measures of size to the schools on the ICILS frames.

First, determine the estimated target population size for the school. This is the estimated eighth-grade enrollment from the school frame. If the grade enrollment was not available, it was calculated by dividing the school’s total enrollment by the number of grades in the school.

Second, the MOS according to the estimated grade enrollment is 5 if the grade enrollment is less than or equal to 5, and is equal to the grade enrollment otherwise.

2.4.2 School Sample

The U.S. national sample used a two-stage design—a stratified systematic sample of schools with sampling probabilities proportional to size (PPS) and then students within sampled schools. The school selection probability was configured such that all eighth-grade students in the United States would have approximately equal probability of being selected in the samples, i.e., a self-weighting sample. Note that in large schools, a smaller proportion of the students is selected, but this lower rate of selecting students in large schools is offset by a larger probability of selection of large schools, as schools are selected with probability proportional to size. A sample of 352 schools was drawn from the eighth-grade frame. A systematic sample was selected independently in each of the 12 explicit strata (defined in section 2.3) where the MOS is the estimated number of students in eighth grade. Tabulations for the frame and sample by explicit strata are given in section 2.5.

Within each explicit stratum, the frames were implicitly stratified by two categorical stratification variables. The order of the stratification is not given because of confidentiality concerns. The frame was sorted in alternating (serpentine) sort order according to these school characteristics, implicitly stratifying the frame. The last sort within the implicit stratification was by grade enrollment (MOS) in descending order. Alternating the “sort order” sorts a frame from lowest to highest value with respect to the first sort variable, then within each level of the first sort variable, the second sort variable alternates its sort order, from lowest to highest for the first level of the first sort variable, then from highest to lowest for the second level of the first sort variable, then again from lowest to highest for the third level of the first sort variable, and so on. Each of the variables will alternate the sort order within each level of the preceding sort variable. This means that schools adjacent on the list are not substantially different or at most different by one sorting characteristic. For example, if the 4 levels of locale were coded as 1, 2, 3, and 4, then the serpentine sort would follow the pattern of “1, 2, 3, 4, 4, 3, 2, 1, 1, ...” within a stratum.

2.4.3 Substitute Schools

Although efforts were made to secure the participation of all schools selected, it was anticipated at the time of sampling that not all schools would choose to participate. Therefore, as each school was selected for a sample, the two neighboring schools in the sampling frame were designated as substitute schools. The first school following the sample school was the first substitute, and the first school preceding it was the second substitute. If an original school refused to participate, the first substitute was then contacted. If that school also refused to participate, the second substitute was then contacted.

There were several constraints on the assignment of substitutes. One sampled school was not allowed to be a substitute for another, and a given school could not be assigned to be a substitute for more than one sampled school. Furthermore, substitutes were required to be in the explicit stratum as the sampled school. If the sampled school was the first or last school in the stratum, then the second school following or preceding the sampled school was identified as the substitute. If the first substitute school did not have the same implicit stratification values as the sampled school, the first and second substitute were switched. With international consent, the substitute school assignment also avoided the NAEP sample schools whenever possible within the above rules. Under these rules, it was possible to identify two substitutes for each sampled school.

2.4.4 Selecting Students

The final stage of selection was of students within schools. Within each sampled school that agreed to participate in ICILS, all eighth-grade students in the school were listed on the student listing form. Student lists were gathered from participating schools electronically using an adaptation of a secure E-Filing process. E-Filing was successfully used in the Trends in International Mathematics and Science Study (TIMSS) 2015 and provides advantageous features such as efficiency and data quality checks. Schools accessed the E-Filing system through the MyICILS.com website. Once the list of students was received from a school, it was formatted for importing into WinW3S, the international sampling and data management software.

Schools were asked to list all eighth-grade students and whether the student was learning disabled or classified as having limited English proficiency. Even though ICILS does provide accommodations, students were excluded from the subsequent student sampling if the student was learning disabled. A minimum of 30 eighth-grade students were selected within each school in an equal probability sample (unless there were fewer than 30 eighth-grade students, in which all eighth-grade students were taken with certainty).

2.4.5 Selecting Teachers

Within each sampled school that agreed to participate in ICILS, all eighth-grade teachers in the school were listed on the teacher listing form. Teacher lists were gathered from participating schools electronically using an adaptation of a secure E-Filing process. Schools again accessed the E-Filing system through the MyICILS.com website. Once the list of teachers was received from a school, it was formatted for importing into WinW3S. A minimum of 20 eighth-grade teachers were selected within each school in an equal probability sample (unless there were fewer than 20 teachers, in which all eighth-grade teachers were taken with certainty).

2.5 Tabulations Within Subgroups for Frame and Sample

This section provides an overview of the frame and sample for the explicit strata used in the sample process. The PPS sampling and stratification worked effectively: the sample percentage of schools is close to the MOS percentage of the frame for all the implicit strata. For these explicit strata-defining subgroups, tables 2-6 through 2-9 present the following summary tabulations in these subgroups:

- **Total MOS.** This is the summation of MOS_{ij} over the subgroup. Note that this is larger than the national population student size because the minimum MOS_{ij} is set to 5 for small schools; and
- **Sample size.** This is the final realized sample size of schools in the subgroup for the U.S. ICILS eighth-grade sample.

The following tables provides an overview of the eighth-grade frame and sample distribution by each of the explicit stratification variables. Each table shows the MOS and percentage in the sampling frame (data shown in tables 2-6 through 2-9 and the total number and percentage of schools in the ICILS eighth-grade school sample. By each explicit stratification variable, the tables are census region (table 2-6), poverty level (table 2-7), school type (table 2-8) and by poverty level, school type, and region (table 2-9).

Table 2-6. Number and percentage of students in the sampling frame and number and percentage of schools in the sample, U.S. ICILS eighth grade, by region: 2018

Region	Frame		Sample	
	Measure of size	Percent	Number of schools	Percent
Total	4,034,612	100	352	100
Northeast	658,994	16.3	58	16.5
Midwest	861,958	21.4	75	21.3
South	1,545,289	38.3	134	38.1
West	968,371	24.0	85	24.1

NOTE: Detail may not sum to totals because of rounding. Measure of size is the estimated number of students enrolled in the target grade with a minimum of 5 students per school. Region of country is based on Census Bureau definitions.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table 2-7. Number and percentage of students in the sampling frame and number and percentage of schools in the sample, U.S. ICILS eighth grade, by poverty level: 2018

Poverty level	Frame		Sample	
	Measure of size	Percent	Number of schools	Percent
Total	4,034,612	100	352	100
High	1,743,530	43.2	152	43.2
Low	2,291,082	56.8	200	56.8

NOTE: Measure of size is the estimated number of students enrolled in the target grade with a minimum of 5 students per school. For public schools, "high" poverty is defined as having 50 percent or more of the students eligible for participation in the free or reduced-price lunch program (FRPL), and "low" poverty is defined as having less than 50 percent eligible. Because no FRPL data were available for private schools, all private schools are categorized as "low."

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table 2-8. Number and percentage of students in the sampling frame and number and percentage of schools in the sample, U.S. ICILS eighth grade, by school type: 2018

School type	Frame		Sample	
	Measure of size	Percent	Number of schools	Percent
Total	4,034,612	100	352	100
Private	338,317	8.4	30	8.5
Public	3,696,295	91.6	322	91.5

NOTE: Measure of size is the estimated number of students enrolled in the target grade with a minimum of 5 students per school.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table 2-9. Number and percentage of students in the sampling frame and number and percentage of schools in the sample, U.S. ICILS eighth grade, by region, poverty level, and school type: 2018

Region	Poverty level	School type	Frame		Sample	
			Measure of size	Percent	Number of schools	Percent
Total			4,034,612	100	352	100
Northeast	High	Public	193,181	4.8	17	4.8
Midwest	High	Public	288,828	7.2	25	7.1
South	High	Public	783,066	19.4	68	19.3
West	High	Public	478,455	11.9	42	11.9
Northeast	Low	Private	78,792	2.0	7	2.0
Midwest	Low	Private	81,558	2.0	7	2.0
South	Low	Private	114,025	2.8	10	2.8
West	Low	Private	63,942	1.6	6	1.7
Northeast	Low	Public	387,021	9.6	34	9.7
Midwest	Low	Public	491,572	12.2	43	12.2
South	Low	Public	648,198	16.1	56	15.9
West	Low	Public	425,974	10.6	37	10.5

NOTE: Detail may not sum to totals because of rounding. Measure of size is the estimated number of students enrolled in the target grade with a minimum of 5 students per school. Region of country is based on Census Bureau definitions. For public schools, “high” poverty is defined as having 50 percent or more of the students eligible for participation in the free or reduced-price lunch program (FRPL), and “low” poverty is defined as having less than 50 percent eligible. Because no FRPL data were available for private schools, all private schools are categorized as “low.”

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

3. PARTICIPATION RATES AND NONRESPONSE BIAS

To minimize the potential for response biases, IEA developed participation or response rate standards that apply to all participating education systems and govern whether or not data are included in the ICILS 2018 international datasets and the way in which aggregate statistics are presented in the international reports. These standards were set using composites of participation rates at the school, classroom, and student levels, and were calculated both with and without the inclusion of substitute schools (for an explanation of substitute schools, see section 2.4.3) that were selected to replace schools refusing to participate.

The standards take the following three forms, distinguished primarily by whether or not meeting the school participation rate of 85 percent requires the counting of substitute schools:

Category 1: Met requirements. Participants that meet one of the following three sets of conditions are considered to have fulfilled the IEA requirements:

- (A) Obtain an unweighted school response rate of at least 85 percent without replacement (rounded to nearest whole percent) AND an unweighted student response rate (after rounding) of at least 85 percent;

OR

- (B) A weighted (with baseweight) school response rate of at least 85 percent without replacement (rounded to nearest whole percent) AND a weighted (with baseweight) student response rate (after rounding) of at least 85 percent;

OR

- (C) The product of the (unrounded) weighted (with baseweight) school response rate without replacement and the (unrounded) weighted (with baseweight) student response rate of at least 75 percent (after rounding to the nearest whole percent).

Participants in this category appear in the tables and figures in international reports without annotation, and are ordered by achievement score.

Category 2: Met requirements after substitutes. In the case of participants not meeting the category 1 requirements, but who had an unweighted or weighted school response rate of at least 50 percent without replacement (after rounding to the nearest percent) and had either

- (A) An unweighted school response rate of at least 85 percent with replacement (after rounding to nearest whole percent) AND an unweighted student response rate (after rounding) of at least 85 percent;

OR

- (B) A weighted (with baseweight) school response rate of at least 85 percent with replacement (after rounding to nearest whole percent) AND a weighted (with baseweight) student response rate (after rounding) of at least 85 percent;

OR

- (C) The product of the (unrounded) weighted (with baseweight) school response rate with replacement and the (unrounded) weighted (with baseweight) student response rate of at least 75 percent (after rounding to the nearest whole percent).

Those participants able to satisfy only the category 2 standard are included in the tables and figures but are annotated to indicate their response rate status.

Category 3: Unacceptable sampling response rate even when substitute schools are included.

Participants that could provide documentation to show that they complied with ICILS sampling procedures and requirements but did not meet the requirements for category 1 or category 2 were placed in category 3. Participants in this category appeared in a separate section of the achievement tables, below the other participants, in international reports. These countries were presented in alphabetical order.

3.1 ICILS Participation Rates of U.S. Schools, Students, and Teachers

The raw numbers on which the various participation rates are based, along with the participation rates themselves, are shown in table 3-1 and 3-2 for the ICILS national sample by participation status of students and teachers, respectively

To explain how to interpret these participation rates, subsections 3.1.1 through 3.1.3 describe a complete interpretation of the numbers.

Table 3-1. Number of U.S. schools and students and participation rates, by participation status of students in ICILS: 2018

Participation status	Number	Participation rates	
		Unweighted	Weighted
Schools			
Sampled	352	†	†
Excluded and ineligible	10	†	†
Eligible	342	†	†
Participating	231 ¹	68	67
Substitutes	32 ²	†	†
Participating (all schools)	263	77	77
Students in participating schools			
Sampled	7,745	†	†
Excluded and ineligible	270	†	†
Eligible	7,475	†	†
Left school permanently	117	†	†
Absent	568 ³	†	†
Assessed	6,790	91	91

† Not applicable.

¹ Does not include two schools that were not considered participating due to student participation rates under 50 percent.

² Does not include one school that was not considered participating due to student participation rate under 50 percent.

³ Includes 140 students whose parents denied permission to participate and 18 students with failing equipment before start of assessment.

NOTE: NCES standards (Standard 1-3-8) indicate that participation rates should be calculated without including substitute schools since substitute schools do not have an independent probability of selection (National Center for Education Statistics 2012).

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table 3-2. Number of U.S. schools and teachers and participation rates, by participation status of teachers in ICILS: 2018

Participation status	Number	Participation rates	
		Unweighted	Weighted
Schools			
Sampled	352	†	†
Excluded and ineligible	10	†	†
Eligible	342	†	†
Participating	226 ¹	66	62
Substitutes	33	†	†
Participating (all schools)	259	76	72
Teachers in participating schools			
Sampled	3,761	†	†
Out of scope	127 ²	†	†
Eligible	3,634	†	†
Questionnaire not returned	416	†	†
Questionnaire completed	3,218	89	89

† Not applicable.

¹ Does not include 7 schools that are not considered participating due to teacher participation rates under 50 percent.

² Includes 50 and 77 teachers that left school permanently and temporarily, respectively.

NOTE: NCES standards (Standard 1-3-8) indicate that participation rates should be calculated without including substitute schools since substitute schools do not have an independent probability of selection (National Center for Education Statistics 2012).

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

3.1.1 Interpreting School Participation Rates

The school sample consisted of 352 schools and was designed to yield a representative school sample for ICILS. Ten excluded or ineligible schools were identified on the basis that they served special student populations or had closed or altered their grade makeup since the sampling frame was developed. This left 342 eligible schools.

The school participation rates based on student participation are given in table 3-1. Of the 342 eligible schools, two schools that agreed to participate had student participation rates of less than 50 percent and were treated as not participating per international requirements. This resulted in 231 schools that agreed to participate based on student participation in each school. The school participation rate before substitution was 68 percent (unweighted). The analogous weighted school participation rate was 67 percent.

In addition to the 231 participating schools from the original sample, 32 substitute schools also participated for a total of 263 participating schools in the United States. One additional substitute school that agreed to participate had a student participation rate of less than 50 percent and was regarded as not participating. This gave a weighted (and unweighted) school participation rate after substitution of 77 percent.

Additionally, the corresponding school participation rates based on teacher participation are given in table 3-2. Of the 342 eligible schools, seven schools that agreed to participate had teacher participation rates of less than 50 percent and were regarded as not participating. This resulted in 226 that agreed to

participate based on teacher participation in each school. The school participation rate before substitution was 66 percent (unweighted). The analogous weighted school participation rate was 62 percent.

In addition to the 226 participating schools from the original sample, 33 substitute schools also participated for a total of 259 participating schools in the United States. This gave a weighted school participation rate after substitution of 76 percent. The analogous weighted school participation rate was 72 percent.

3.1.2 Interpreting Student Participation Rates

A total of 7,745 eighth-grade students were sampled. At the outset, 267 of these were excluded because of functional or intellectual disabilities or because they were non-native-language-speakers, and three were ineligible as not part of the sample. As a consequence, 7,475 students were considered eligible to take the assessment. In the months between the listing of students and the time of the assessment, 117 students were classified as having left school permanently, as they were no longer in the school at the time of the assessment. On the day of the assessment some 568 students were absent, leaving 6,790 students who completed an ICILS 2018 assessment booklet. Participation rates were calculated on the number of eligible students (7,475). Since 6,790 of the 7,475 eligible students were assessed, the weighted (and unweighted) student participation rate was 91 percent.

3.1.3 Interpreting Teacher Participation Rates

A total of 3,761 teachers were sampled. At the outset, 127 of these were out of scope because they had left the school either permanently or temporarily. As a consequence, 3,634 teachers were considered eligible to answer the questionnaire of which 3,218 teachers returned an ICILS 2018 questionnaire. Participation rates were calculated on the number of eligible teachers (3,634). Since 3,218 of the 3,634 eligible teachers completed questionnaires, the weighted (and unweighted) student participation rate was 89 percent.

3.1.4 Combined Participation Rates

The combined school- and student-weighted participation rate standard of 75 percent used by ICILS in situations in which it was necessary to recruit substitute schools was not met in ICILS 2018. The weighted product of the school and student participation rates for ICILS was 70 percent (also unweighted). The weighted product of the school and teacher participation rates for ICILS was 67 percent (65 percent unweighted). However, the application of international guidelines means that U.S. statistics describing students and teachers in ICILS appear in a separate section of tables in the international report to indicate that participation rates were not met even after substitute schools were included.

3.2 Participation Rates for All Countries

For comparable school and student participation rates in other nations in ICILS, see tables 7.1-7.5 in *IEA International Computer and Information Literacy Study 2018 Technical Report* Fraillon et al. 2020b).

3.3 Exclusions

The nationally defined target population is described in chapter 6 of *IEA International Computer and Information Literacy Study 2018 Technical Report* (Fraillon et al. 2020b). All schools and students excluded from this population are referred to as the “excluded population.” Exclusions could occur at the school level, with entire schools being excluded, or within schools, with specific students or entire classrooms excluded.

3.3.1 School Exclusions

Countries could exclude schools that

- were geographically inaccessible;
- were of extremely small size;
- offered a curriculum or school structure radically different from the mainstream educational system; or
- provided instruction only to students in the excluded categories defined under “within-school exclusions,” such as schools for the blind.

3.3.2 Within-School Exclusions

Countries were asked to adapt the following international within-school exclusion rules to define excluded students:

Students with intellectual disabilities. Students who, in the professional opinion of the school principal or other qualified staff members, were considered to be intellectually disabled or who had been tested psychologically as such. This included students who were emotionally or mentally unable to follow even the general instructions of the test. Students were not excluded solely because of poor academic performance or normal disciplinary problems. It should be noted that students with dyslexia, or other such learning disabilities, were accommodated in the test situation if possible, rather than excluded.

Students with functional disabilities. Students who were permanently physically disabled in such a way that they could not perform in the ICILS testing situation. Functionally disabled students who were able to respond were included in the testing.

Non-native-language speakers. Students who were unable to read or speak the language(s) of the test and were unable to overcome the language barrier of the test. Typically, a student who had received less than 1 year of instruction in the language(s) of the test was excluded.

3.3.3 Exclusions in the U.S. National Samples

As noted earlier, schools were given the opportunity to exclude students—essentially, students with functional or intellectual disabilities, or non-native-language speaking students in the United States who had been mainstreamed. Nevertheless, students with disabilities and/or English language learners were allowed access to many accommodations that they received on their state assessments.

These procedures resulted in a (weighted) student exclusion rate of 5.0 percent based on within-school exclusions. IEA standards define this degree of coverage of the national target population (95 percent for ICILS) as acceptable.

3.4 Nonresponse Bias Analysis

The National Center for Education Statistics (NCES) standards for surveys stipulate that a nonresponse bias analysis is required at any stage of data collection with a weighted unit response rate of less than 85 percent (without substitution). Because the U.S. ICILS 2018 weighted school response rate is below 85 percent, NCES required an investigation into the potential magnitude of nonresponse bias at the school level in the U.S. sample, which is the focus of this section.

A bias analysis was conducted in the United States to address potential problems in the data owing to school nonresponse for ICILS 2018. The purpose of the analysis was to examine whether the participation status of schools was related to various characteristics and thus introduced the potential for bias in the results. The results suggested that there is some potential for nonresponse bias in the U.S. sample (prior to substitution) based on the characteristics studied. It also suggested that, while there was some evidence that the use of substitute schools reduced the potential for bias, it did not reduce it substantially. However, after the application of school nonresponse adjustments, there was little evidence of resulting potential bias in the final sample.

The full text of the nonresponse bias analysis conducted for ICILS can be found in appendix F.

4. SURVEY OPERATIONS

This chapter describes data collection and related activities for ICILS 2018 in the United States. These activities included recruitment of schools for the national sample, sampling of students within schools, development of the instruments, field operations undertaken to administer the assessment, postassessment activities associated with scoring and data entry, and several activities associated with the preparation of the data to meet international standards.

4.1 Recruiting Districts and Schools

The established protocol for seeking the participation of schools in studies such as ICILS, where participation is voluntary, is to (1) notify state education authorities that they have districts and schools selected for the assessment, (2) inform authorities at the district level that schools within their districts are being sampled, and obtain approval as needed, and (3) contact the sampled schools. For public schools in most states, steps 2 and 3 were conducted by NAEP State Coordinators in each state education agency. Participation may be refused at any of these levels, so several considerations were important in this context, specifically the need to establish the value of participation; establish the timing of the assessment window in conjunction with mandatory federal, state, and local assessments; and address concerns about the burden on schools. Public schools in states in which the state education agency did not participate in recruitment and all private schools (including nonreligious, affiliated private schools) were contacted directly by Westat. In the case of Catholic schools, the diocese was informed, approval was sought and obtained when needed, and schools were then contacted by Westat.

4.1.1 Timing of Recruitment Activities

Assessment dates needed to be established early in the school year in which the assessment was to take place or, better still, toward the end of the previous school year. In total, the recruitment phase for ICILS 2018 extended from May 2017 through June 2018, as indicated in exhibit 1-1 in chapter 1. States were contacted in early May 2017. Following this, contact with districts began in late May 2017 and continued through the fall. Schools were contacted beginning in June 2017 and activities continued through May 2018.

4.1.2 The Impact of the Sampling Design on Recruitment Activities

The sampling design played an important role in the design of recruitment activities. For ICILS, 352 schools were sampled in the first instance, along with 352 first substitutes and 352 second substitutes, for a total of 1,056 schools. In gaining the cooperation of schools, at each grade level the sampled schools were approached in the first instance. Operationally this meant first informing the districts in which these schools are located and then approaching the schools themselves. If a sampled school refused to participate, the district of the first substitute school was approached and the district/school permission procedure began anew. If the first substitute school refused as well, then the district of the second substitute school was approached, and then the second substitute school.

4.1.3 Contacting States and Districts

The Chief State School Officer and State Assessment Director in each of the 50 states and Washington, DC, were contacted beginning in May 2017. Each person received an ICILS package that included an NCES cover letter, instructions on how to obtain the sampled schools in the state, a brochure describing the study, a timeline of activities, and a sheet of frequently asked questions. A copy of the letter sent to states is provided as exhibit A-1 in appendix A. Several items of ICILS information materials (exhibits B-1 through B-3 in appendix B) were included with the letter.

Similar packages were supplied to NAEP State Coordinators. NCES and Westat held a series of webinars to explain ICILS, to describe the processes used to report participation, and to answer questions about the study. In many cases, NAEP State Coordinators created personalized contact letters for districts and schools. Westat tracked cooperation status on an ongoing basis through a secure automated reporting system used by NAEP State Coordinators and produced weekly participation reports.

After informing the states, similar packages of recruitment materials were sent to the superintendent and the test coordinator of each district by the NAEP State Coordinator (or diocese by Westat staff) containing sampled schools. A copy of the letter sent to districts is provided as exhibit A-2 in appendix A. Several items of ICILS information materials (exhibits B-1 through B-3 in appendix B) and a list of sampled schools were included with the letter.

During this time, if a sampled school in a cooperating district refused to participate and was judged a firm refusal, a similar district package was sent out to the district of the first substitute school linked to the sampled school. A parallel procedure was adopted with the second substitute district and school in those cases where a first substitute school refused to participate.

Follow-Up Contact

In each case, NAEP State Coordinators or Westat field staff were available to discuss the study and answer questions with district contacts.

Special security requirements. As a matter of course, each ICILS field staff member had a current FBI clearance and fingerprints on file. In addition, all field staff had an Electronic Questionnaire for Investigations Processing (e-QIP) clearance which is a secure website managed by the United States Office of Personnel Management (OPM) that is designed to automate the common security questionnaires used to process federal background investigations. These requirements satisfied school security requirements.

4.1.4 Contacting Schools

After district approval was secured, schools were contacted with an initial school information packet. Private schools and some parochial schools not linked with a diocese were contacted directly. Each school information package was sent by the NAEP State Coordinator or Westat on a flow basis governed by the receipt of district approval. A copy of the notification letter included in the school package is shown as exhibit A-4 in appendix A. Copies of ICILS information materials (exhibits B-1 through B-3 in appendix B) were included with the letter.

Follow-Up Contact

After a few days, for private schools, each school was contacted by a Westat field staff member to discuss the school's participation in ICILS. NAEP State Coordinators continued to follow-up with public schools when necessary, and Westat field staff conducted follow-up with some public schools at state or NAEP State Recruiter request.

Nomination of school coordinator. School principals were asked to identify an individual within the school who would act as the ICILS school coordinator for their school. Principals, deputy principals, teachers, test coordinators, technology coordinators, or guidance counselors took on this role. School coordinator responsibilities were as follows:

- Work with Westat to finalize an assessment date.
- Prepare an electronic list of all students in grade 8.
- Identify excluded students.
- Prepare an electronic list of all teachers and identifying the information communications technologies (ICT) coordinator.
- Liaise with staff, students, and parents as necessary.
- Arrange for space and for the release of students from classes on assessment day.
- Ensure completion and return of the school and teacher questionnaires.
- Hold secure, until the end of the school year, the confidential files that linked student names with IDs and then destroying them.

4.1.5 Informational Materials and Gifts

Given that most of the initial contact with states, districts, and schools was by mail, particular attention was paid to developing materials that would promote the value of participation and assure all concerned that the burden on schools would be minimal. These materials included the following:

- ICILS brochures, a tri-fold describing ICILS, its history, and its importance for the United States (exhibit B-1 in appendix B);
- ICILS Frequently Asked Questions sheets (exhibit B-2 in appendix B);
- Summary of School Activities listing broad timeframes and activities occurring within them (exhibit B-3 in appendix B); and
- MyICILS List Submission guidance (exhibits B-4 and B-5 in appendix B).

After the assessment, schools and school coordinators were paid incentives of \$200 and \$100, respectively. Some categories of hard-to-recruit schools received an increased incentive of \$800. Teachers and ICT coordinators who completed the questionnaire received a \$20 electronic gift card. Students each received a string backpack with a globe image.

Some additional documents were used to maintain contact with schools throughout the year and to inform school coordinators of coming ICILS activities. A MyICILS website that shared information about school coordinator responsibilities and other information in preparation for assessment day was launched in late 2017. Drafts of parent notification letters were available to all schools, and parent approval letter, forms, and fact sheets were supplied to those schools indicating that parent approval was required. Examples of the parent approval materials are provided in exhibits A-5 through A-11 in appendix A. The parent notification/approval process is discussed further below.

4.1.6 Gaining Cooperation Recruiters

Private schools were recruited by three experienced Westat recruiters known as “gaining cooperation recruiters” (GCRs), who were experienced with recruiting schools from previous rounds of similar studies (NAEP, PISA, TIMSS, and PIRLS), and a GCR operations manager.

GCR operations manager responsibilities. The operations manager engaged in the recruiting phase of the study had the following responsibilities:

- Coordinate recruitment activities of the GCRs within their assignment.
- Hold weekly telephone meetings with the GCRs to monitor progress on gaining-cooperation activities and to troubleshoot recruitment strategies.
- Monitor and maintain the Field Management System, ensuring that the disposition codes provided by GCRs gave an accurate portrayal of participation status.
- Act as troubleshooters to handle special issues that arose during the recruiting process.

GCR responsibilities. The primary responsibility of the three GCRs was person-to-person interaction with the schools along with some more administrative tasks, as follows:

- Make telephone contact to sampled schools, and in some cases, their diocese, within their assignment to obtain permission to conduct ICILS.
- Send refusal conversion letters and following up by phone and e-mail when necessary and requested by a field manager.
- Complete an electronic record of calls (EROCC) of each contact within the MyICILS School Control System.
- Maintain the most current disposition codes within the MyICILS School Control System.
- Meet weekly with the operations manager by conference call to discuss progress.

4.1.7 Monitoring the Recruiting Progress

Progress in recruiting districts and schools was monitored by Westat through the MyICILS School Control System. MyICILS is a secure password-protected website, with access restricted to NAEP State Coordinators, GCRs and other designed Westat field staff, and Westat home office staff. GCRs were required to and NAEP State Coordinators were encouraged to update the MyICILS School Control System for each contact made with districts or schools using an electronic record of calls that included updating the disposition code for the district/school in question. The disposition codes in the MyICILS School Control System indicated whether the school was pending, refusing, or cooperating. Using these status codes, the Westat home office tracked the progress of recruitment and generated weekly reports. These weekly reports enabled the operations of recruitment (and eventually assessments) to be closely monitored.

Difficulties in Gaining Cooperation

The principal reasons given by both districts and schools for refusing to participate included, in approximate order of occurrence, the following:

- conflict with mandatory federal, state, and/or local assessments whose outcomes had direct implications for districts, schools, teachers and students;
- the related matter of the burden that additional testing placed on students at the cost of instructional time;
- concerns about too much testing and parents opting out of assessments; and
- the limited return on the school's investment of time because they would not receive much usable information on the school, and none on particular students.

In cases where if none of the schools (original, first substitute, and second substitute) agree to participate, these schools are indicated as final refusal in the MyICILS system with reasons documents.

4.2 Sampling Within Schools

Students were selected in an equal probability sample of grade 8 students in participating schools. For the ICILS 2018 teacher questionnaire, teachers of grade 8 students were selected in an equal probability sample. Detailed descriptions of sampling designs and methods are covered in chapter 2.

These procedures are standardized internationally and embodied in software made available to each country. The software was developed by the International Association for the Evaluation of Educational Achievement (IEA) Data Processing Center and is known as IEA Windows Within School Sampling Software, or WinW3S (IEA Data Processing Center 2014). The WinW3S system provides for forms generation, data entry, class sampling, student sampling, student-teacher linkages, the random assignment of assessment booklets to students, the production of various survey tracking forms, and the printing of labels for test instruments and questionnaires.

Westat home office staff attended a WinW3S training session led by IEA. Based on prior administrations of other studies, Westat developed an E-File system to integrate the data collection with the WinW3S sampling system. This eliminated the hard-copy collection of class and student data and the requisite resulting data entry and cumbersome back and forth with schools. The staff assigned to process the electronic data collection reviewed the incoming data, clarified any issues or inconsistencies with the schools (via school coordinators), properly formatted and imported the data into the WinW3S, and executed the sampling procedures within the WinW3S system. The staff responsible for the sampling processing also generated the materials (all of the forms and labels) needed by field staff and schools for the ICILS assessment. All Westat staff handling personal identifiable information (PII) signed nondisclosure affidavits, and all PII were kept secure on Westat secure servers.

4.2.1 Obtaining Electronic Student and Teacher Lists From Schools

In preparation for the ICILS 2018 assessment period, Westat coordinated with school staff to set up secure, password-protected file transfer protocols between schools and Westat. The E-File system incorporated seamless automated electronic receipting and data tracking.

Student Lists

For the student sample, two versions of the student list submission Excel template (with variations in the number of columns used for student names and dates of birth) with requested data elements was transmitted to the school coordinator. The submitted list was used to create a list of the eligible students, some attributes of each student, and the names of their homeroom class. Exhibits 4-1 and 4-2 show the format of these templates.

Exhibit 4-1. ICILS Student List Submission Template—Version 1 (student name, date of birth in single columns)

	A	B	C	D	E	F
	Student Name (list only the 8th-grade students in this 8th-grade class)	Class Name (Name of homeroom class student is in. If your school does not have homeroom, please use English/Language Arts class. The class name must be a class that is mutually exclusive and exhaustive, i.e. each 8th grader belongs to one and only one of these classes)	Sex	DOB	Student with a Disability status (1=Yes, student has disability and/or IEP 2=No, student does not have disability or IEP)	English Language Learner status (1=Yes, student is ELL 2=No, student is formerly ELL 3=No, student is not ELL)
1						
2						
3						

SOURCE: National Center for Education Statistics (NCES), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit 4-2. ICILS Student List Submission Template—Version 2—Preferred (student name and date of birth in multiple columns)

	A	B	C	D	E	F	G	H	I
	Student First Name (list only the 8th-grade students in this 8th-grade class)	Student Middle Name	Student Last Name	Class Name (Name of homeroom class student is in. If your school does not have homeroom, please use English/Language Arts class. The class name must be a class that is mutually exclusive and exhaustive, i.e. each 8th grader belongs to one and only one of these classes)	Sex	Month of Birth	Year of Birth	Student with a Disability status (1=Yes, student has disability and/or IEP 2=No, student does not have disability or IEP)	English Language Learner status (1=Yes, student is ELL 2=No, student is formerly ELL 3=No, student is not ELL)
1									
2									

SOURCE: National Center for Education Statistics (NCES), International Computer and Information Literacy Study (ICILS), 2018.

The templates provided to the schools allowed for some flexibility in how the schools provided the data. For example, if the school information system stored students' month and year of birth (MOB and YOB) in a single field or in multiple fields, Westat provided alternative templates for them to use. Westat wanted to minimize the burden for schools in providing the requisite data.

After uploading files, schools were asked to match the values in their files to the ICILS codes for all columns except student name and class name. After this mapping was complete, users were presented with a summary table and asked to verify the correctness of the data in the summary table. School coordinators were asked to resubmit their E-File and/or contact Westat’s ICILS help desk in the case of incorrect data. Exhibit 4-3 provides a sample screenshot of this verification screen.

Exhibit 4-3. Verify Your Student E-File Sample screenshot

Verify Your Student E-File

The table below summarizes the information you have provided on your student list (Student E-File). Please review this summary and verify that the information is correct. Total Enrollment at the bottom of the table should match the number of students in your E-File, and the total number of students currently enrolled in grade 8.

Record whether the information is correct or incorrect by selecting the appropriate button at the bottom of the page. Then click the Submit button. If you select INCORRECT, you will need to correct your E-File and resubmit it.

	Number	Percentage
Date of Birth		
DMY	8	100%
Sex		
Male	5	62.5%
Female	3	37.5%
Student with a Disability		
Yes, IEP	2	25%
No, not SD	6	75%
English Language Learner		
Yes, ELL	3	37.5%
No, not ELL	5	62.5%
Total Enrollment:	8	

- ☒ Information is **CORRECT** and **CURRENT**.
☐ Information is **INCORRECT**.

Often schools could provide the data requested in an automated way by pulling the data directly from their school information systems. By eliminating much of the manual entry by schools and providing flexibility even when manual entry was necessary, the quality and speed of obtaining data from schools was enhanced. That allowed list submission and sampling to take place closer to the time of assessment, which provided for a more stable sample of classes and students in these classes than if samples were provided earlier in the school year.

Student List Descriptions

School coordinators were provided with the following data element definitions and descriptions:

- **Student Name.** List only the eighth-grade students in this eighth-grade class. The preferred format is First Name, Middle Name (or Initial), and Last Name in separate columns. However, ICILS will accept student names in one column.
- **Class Name.** Name of homeroom class student is in. If your school does not have homerooms, please use English/Language Arts class. The class name must be a class that is mutually exclusive and exhaustive, i.e., each eighth-grader belongs to one and only one of these classes.
- **Sex.** Codes (numeric or text) for Male/Female.
- **Date of Birth.** The preferred format is Month of Birth and Year of Birth in separate columns. However, ICILS will accept Date of Birth in one column.
- **Student with a Disability (SD) Status.** School-defined codes for
Yes, student has disability and/or IEP; and
No, student does not have disability or IEP.
- **English Language Learner (ELL) Status.** School-defined codes for
Yes, student is ELL;
No, student is formerly ELL; and
No, student is not ELL.

Teacher Lists

Westat used a similar process to collect lists of teachers for the teacher questionnaire sample. Schools were asked to submit a complete and current list of all eighth-grade teachers. As indicated in the instructions, the teacher list should include all teachers who teach a class considered to be a part of the eighth-grade curriculum to eighth-grade students regardless of the subject or the number of hours taught since the beginning of the school year. This would include the teachers of elective courses such as band, visual arts, or gym if electives are part of the eighth-grade curriculum.

As with student list submission, Westat provided schools with multiple templates to allow them flexibility in completing the templates. Exhibits 4-4 and 4-5 present the teacher list templates.

Exhibit 4-4. ICILS Teacher List Submission Template—Version 1 (teacher name in one column)

	A	B	C	D
	Teacher Full Name (Do not include teachers who teach 8th-graders in a class for 7th or 9th-grade. Do not include non-staff teachers who teach (non-compulsory) subjects that are not part of the curriculum. If electives (such as Band, Visual Arts, or Gym) are part of the 8th-grade curriculum, please include teachers who teach these classes too)	Sex	Subject (1=Language Arts; 2=Social Studies; 3=Mathematics & Sciences; 4=Other; 9=Missing)	Teacher Email (work email)
1				
2				
3				

SOURCE: National Center for Education Statistics (NCES), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit 4-5. ICILS Teacher List Submission Template—Version 2—Preferred (teacher name in multiple columns)

	A	B	C	D	E	F
	Teacher First Name (Do not include teachers who teach 8th-graders in a class for 7th or 9th-grade. Do not include non-staff teachers who teach (non-compulsory) subjects that are not part of the curriculum. If electives (such as Band, Visual Arts, or Gym) are part of the 8th-grade curriculum, please include teachers who teach these classes too)	Teacher Middle Name	Teacher Last Name	Sex	Subject (1=Language Arts; 2=Social Studies; 3=Mathematics & Sciences; 4=Other; 9=Missing)	Teacher Email (work email)
1						
2						
3						
4						

SOURCE: National Center for Education Statistics (NCES), International Computer and Information Literacy Study (ICILS), 2018.

4.3 Instruments for ICILS

All ICILS instruments were developed by the IEA as a collaborative effort involving representatives from every country participating in the study. ICILS instruments include a student assessment and context questionnaires.

The ICILS 2018 assessment was a computer-based student test consisting questions in tasks set in authentic contexts design to measure students' computer and information literacy (CIL) and computational thinking (CT). All ICILS 2018 countries administered the CIL components, while a subset of participating countries also opted to administer the test of computational thinking components. The CIL included five modules, three of which were trend modules from ICILS 2013, and the CT included two modules. Example CIL and CT tasks are presented in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (2020).

The questionnaires included a student questionnaire, a teacher questionnaire, an ICT coordinator questionnaire, and a principal questionnaire. The ICILS student questionnaires were administered with the student assessment platform, after the CIL blocks and (for participating countries) before the CT blocks. The principal questionnaires were designed as an online instrument to be completed by the school principal. Teacher and ICT coordinator questionnaires were also developed as online instruments.

The U.S. versions of all four ICILS questionnaires are provided in appendix D of this report and are available on the NCES website <https://nces.ed.gov/surveys/icils/questionnaires.asp>.

4.3.1 The ICILS Assessment

The following summarizes the rationale for and development of the ICILS 2018 assessment. Complete detail is provided in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (2020).

Assessment Frameworks

The test development effort began with the development of the ICILS 2018 frameworks that define the CIL and CT constructs as well as the contextual frameworks. The ICILS 2013 framework was updated to reflect the evolving breadth of conceptualizations of competencies associated with the use of digital technologies. The International Study Center (ISC) at the Australian Council for Educational Research ACER worked in collaboration with national research coordinators (NRCs) and other research partners in updating the ICILS framework. The complete assessment framework for ICILS 2018 is available at https://research.acer.edu.au/ict_literacy/14/.

Strands and Aspects

The ICILS assessment framework describes CIL and CT in terms of strands (i.e., overarching conceptual categories) and aspects (i.e., specific content category within a strand). The CIL and CT strands and aspects are detailed in exhibit 4-6.

Exhibit 4-6. Constructs, strands, aspects in ICILS 2018

Computer and information literacy (CIL) refers to an individual’s ability to use computers to investigate, create, and communicate in order to participate effectively at home, at school, in the workplace, and in the community.			
Strand 1 Understanding computer use	Strand 2 Gathering information	Strand 3 Producing information	Strand 4 Digital communication
<i>Aspect 1.1</i> Foundations of computer use <i>Aspect 1.2</i> Computer use conventions	<i>Aspect 2.1</i> Accessing and evaluating information <i>Aspect 2.2</i> Managing information	<i>Aspect 3.1</i> Transforming information <i>Aspect 3.2</i> Creating information	<i>Aspect 4.1</i> Sharing information <i>Aspect 4.2</i> Using information responsibly and safely
Computational thinking (CT) refers to an individual’s ability to recognize aspects of real-world problems, which are appropriate for computational formulation and to evaluate and develop algorithmic solutions to those problems so that the solutions could be operationalized with a computer.			
Strand 1 Conceptualizing problems		Strand 2 Operationalizing solutions	
<i>Aspect 1.1</i> Knowing about and understanding digital systems <i>Aspect 1.2</i> Formulating and analyzing problems <i>Aspect 1.3</i> Collecting and representing relevant data		<i>Aspect 2.1</i> Planning and evaluating solutions <i>Aspect 2.2</i> Developing algorithms, programs, and interfaces	

SOURCE: International Association for the Evaluation of Educational Achievement (IEA) International Computer and Information Literacy Study (ICILS), 2018 assessment framework.

Item Development

The ICILS followed the same test development process for both the CIL and CT items. Each ICILS task or item comprises stimulus materials given to the students, questions or instructions given to the students, the specified behavior of the assessment platform in response to students’ actions, and the scoring logic as specified in scoring guides for human scoring or in the scoring program. The test development and review process encompassed all of these constituent parts of the ICILS tasks or items. This process included sequential stages, as shown in exhibit 4-7, with some items reviewed and revised multiple times within a stage due to the iterative and collaborative nature of the process.

Exhibit 4-7. ICILS 2018 test development and review process timeline

Year	Month	Group	Activity
2015	February	ICILS International Study Center	Establishment of CIL test specifications and preliminary CT test specifications
2015	March	First meeting of national research coordinators	Reflections on ICILS 2013 test of CIL Review of proposed test development process and test specifications Test development workshop
2015	March	ICILS International Study Center	Drafting, review, and refinement of test modules
2015	December	National research coordinators	Web-based review of test module storyboards (1)
2016	January	ICILS International Study Center	Revision of test module storyboards
2016	February	Second meeting of national research coordinators	Review of draft test modules
2016	March	ICILS International Study Center	Revision of draft test modules following second meeting of national research coordinators and pilot-testing of selected module content
2016	April	National research coordinators	Web-based review of test module storyboards (2)
2016	May	ICILS International Study Center IEA	Revision of test modules and development of content in online test delivery system
2016	September	Third meeting of national research coordinators	Review of modules proposed for inclusion in field trial test and confirmation of test design
2016	October	ICILS International Study Center	Finalization of field trial test modules
2016	November	ICILS field trial scoring trainers	Review of field trial scoring guides for constructed-response items and large tasks (as part of scoring training)
2016	December	ICILS International Study Center	Revision of field trial scoring guides for constructed-response items and large tasks
2017	July	ICILS International Study Center RM Results	Migration of test content to online delivery system
2017	August	ICILS International Study Center	Analysis of field trial item data and recommendations for modules/items to be included in main survey test (field trial analysis report)
2017	September	Fourth meeting of national research coordinators	Review of field trial analysis report and recommendations for test design and modules/items proposed for inclusion in main survey
2017	December	ICILS main survey scoring trainers	Review of main survey scoring guides for constructed- response items and large tasks (as part of scoring training)
2018	January	ICILS International Study Center	Finalization of main survey scoring guides for constructed- response items and large tasks

SOURCE: International Association for the Evaluation of Educational Achievement (IEA) International Computer and Information Literacy Study (ICILS), 2018 Technical Report (2020).

Three ICILS 2013 CIL assessment modules were kept confidential and were included in ICILS 2018 assessments to measure trends. Four new modules (two CIL modules and two CT modules) were created for ICILS 2018. To create new items, the ICILS International Study Center worked in collaboration with national research coordinators and other subject-matter experts. Results from the field test were used to evaluate item difficulty, how well items discriminated between high- and low-performing students, the effectiveness of distracters in multiple-choice items, scoring suitability and reliability for constructed-response items, and evidence of bias toward or against individual countries. All CIL and CT modules used in ICILS 2018 are described in exhibit 4-8.

Exhibit 4-8. ICILS 2018 modules and descriptions

Construct	Module	Description
CIL	Band competition (trend)	Students plan a website, edit an image, and use a simple website builder to create a webpage with information about a school band competition.
	Breathing (trend)	Students manage files and evaluate and collect information to create a presentation to explain the process of breathing to eight- or nine-year-old students.
	School trip (trend)	Students help plan a school trip using online database tools and select and adapt information to produce an information sheet about the trip for their peers. The information sheet includes a map created using an online mapping tool.
	Board games (new)	Students use a school-based social network for direct messaging and group posting to encourage peers to join a board games interest group.
	Recycling (new)	Students access and evaluate information from a video sharing website to identify a suitable information source relating to waste reduction, reuse, and recycling. Students take research notes from the video and use their notes as the basis for designing an infographic to raise awareness about waste reduction, reuse, and recycling.
CT	Automated bus (new)	Students conceptualize problems and engage in programmable decision making by complete a series of planning tasks for a driverless bus, including route planning and braking at safe distances to avoid collisions, for a driverless bus. Tasks include visual representations such as path diagrams, flow charts, and decision trees to represent real-world scenarios
	Farm drone (new)	Students operationalize solutions by using a visual coding system to program an automated drone to complete a range of farming tasks such as planting seeds and watering crops.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA) International Computer and Information Literacy Study (ICILS), 2018 Technical Report (2020).

Each module included three broad categories of tasks: information-based response tasks, skills tasks, and authoring tasks. Information-based response tasks are intended to capture evidence of students' knowledge and understanding with item types including multiple choice, short constructed response, and drag-and-drop. Skills tasks involve interactive simulations of generic software or applications to complete an action. CIL skills tasks are characterized as linear skills tasks that require students to execute one or more commands in a given sequence and nonlinear skills tasks that require students to execute a function with more than one sub-command without a single given sequence. CT skills tasks are characterized as nonlinear systems transfer tasks that require students to make connections between a visual representation of an algorithmic sequence and the textual description of the steps of the sequence; simulation tasks in which students work with a simulation tool, and visual coding tasks that either require students to construct an algorithm or debug an existing algorithm. Authoring tasks, which only appear in the CIL

modules, require students to create or modify information products using computer software applications. The authoring tasks were generally the large task within a CIL module and involved multiple scoring criteria.

The number of new and trend items for ICILS is shown in tables 4.1 (CIL) and 4.2 (CT). The five CIL modules included 22 information-based response tasks, 18 skills tasks, and 41 criterion in the authoring tasks, for a total of 81 items. The two CT modules included two information-based response tasks and 15 skills tasks, for a total of 17 items.

Table 4-1. CIL item counts by type

Module	Items by task format						Total
	Information-based response tasks			Skills tasks		Authoring tasks	
	Multiple choice	Constructed response	Drag and drop	Linear skills	Nonlinear skills	Large task criterion	
Total	7	13	2	11	7	41	81
Band competition	1	2	2	2	3	7	17
Breathing	0	2	0	3	0	10	15
School trip	1	0	0	4	1	7	13
Board games	2	4	0	1	1	5	13
Recycling	3	5	0	1	2	12	23

SOURCE: International Association for the Evaluation of Educational Achievement (IEA) International Computer and Information Literacy Study (ICILS), 2018 Technical Report (2020).

Table 4-2. CT item counts by type

Module	Items by task format						Total
	Information-based response tasks		Skills tasks				
	Multiple choice	Constructed response	Nonlinear systems transfer	Simulation	Algorithm construction	Algorithm debugging	
Total	1	3	5	2	6	2	19
Automated bus	1	1	4	2	0	0	8
Farm drone	0	2	1	0	6	2	11

SOURCE: International Association for the Evaluation of Educational Achievement (IEA) International Computer and Information Literacy Study (ICILS), 2018 Technical Report (2020).

Context Questionnaires

ICILS 2018 included self-administered questionnaires for principals, teachers, and students. Student questionnaires were delivered within the student assessment platform while principal, teacher, and ICT coordinator questionnaires were delivered through the IEA's Online Survey System. Paper versions of the principal, teacher, and ICT coordinator questionnaires were also available, if requested.

Questionnaire development included three phases. In phase 1, the field test materials were developed with content guided by the assessment frameworks and the process including multiple rounds of consultations and reviews by NRCs. Phase 2 included the field testing of these materials and the analysis of field test data. Phase 3 focused on the selection of items for the main survey, informed by the review of field test results.

The questionnaires requested information to help provide a context for the performance scores. The student questionnaire included items focusing on such topics as students' home and learning contexts; students' use of and familiarity with ICT; and students' thoughts about using and learning about ICT. The teacher questionnaire gathered information about school and classroom contexts for ICT, use of ICT for teaching and learning, teacher views on the pedagogical use of ICT, and teachers' confidence in using computers. The principal and ICT coordinator questionnaires were designed to gather information about the school context, the use of ICT in teaching and learning, and the schools' ICT resources and policies.

U.S. Adaptations to the Assessment Items and Questionnaires

Source versions of all instruments (assessment booklets, questionnaires, and manuals) were prepared by the IEA in English and translated by the participating countries into the primary language or languages of instruction in each country. In addition, it was sometimes necessary to adapt the instruments to better fit language usage, even in countries that use English as the primary language of instruction. Other adaptations to fit national education characteristics were sometimes required as well. All adaptations were reviewed and approved by the IEA to ensure they did not change the substance or intent of the question or answer choices.

U.S. Adaptations to the Assessment Items

As in other international studies, the U.S. adaptations to the international instruments were minimal and designed to make the assessment more readable to U.S. students without changing the essence of the assessment item. For example, individual, location, and organization names were provided (for example, Sarah, Market St., Andromeda Middle School), and some changes to the text of instructions were also made to better mirror the administration procedures in the United States.

U.S. Adaptations to the Student, School, Teacher, ICT Coordinator Questionnaires

Adaptations made to the school, teacher, and student questionnaires were of the following five main types:

- changes to general instructions made in the interests of enhancing clarity;
- changes designed to make question text more readable to U.S. students, similar to those made to the assessment items as described above;
- changes to response alternatives where the international response set did not adequately reflect the U.S. context;

- additional questionnaire items included to address particular issues of national interest; and
- changes to ensure some questions were kept in trend with previous assessments.

A detailed list of changes made to the questionnaires is provided in appendix E. Both the original text from the international version of the questionnaire and the changed text from the U.S. version are shown. Text that has been changed in the U.S. version is underlined in that version. Both international and U.S. questionnaire item numbers, or other location indicators, are provided in each instance. Where appropriate, a crosswalk between the U.S. and international versions of the set of response categories of items is provided in the “Comments” column.

Translation and Verification of Instruments

Each country prepared translations of the instruments according to translation guidelines established by the IEA. As the international versions of the instruments are produced in English, the United States did not need to engage in the full-fledged translation required of many nations. However, the adaptations made to the U.S. instruments required verification by the IEA to ensure their suitability.

Layout Verification

Upon receiving IEA approval of the adaptations, electronic files were sent to the International Study Center for layout verifications. Adaptations were made to the online survey instruments using software provided by IEA Hamburg. A set of output files was produced for each questionnaire, and the output files were uploaded to a secure server and verified by IEA Hamburg. Quality control procedures for this process included a review of each adaptation made to the questionnaires and item blocks as well as a full review of the assembled questionnaires.

Preparing the Student Assessment Platform

Following the approval of layout verification, the International Study Center provided a draft assessment platform for review and testing. The review of the draft player platform included a review of each adaptation made to the item blocks and the student questionnaire and a review of the software’s functionality. Following an iterative process of review and revision, the instruments were tested in their delivery environment on Microsoft SurfacePro tablets with each student tablet connection via a secure intranet connection to a server tablet. The testing process included software testers working independently, adult testers in a group environment, and students in a simulated classroom environment.

Online Questionnaires

Once verified by IEA Hamburg, each questionnaire for school and teachers was loaded to a secure NCES server and thoroughly tested by NCES and Westat to ensure that responses were being captured correctly and that the instruments were functioning properly.

4.4 Field Operations

The activities discussed here refer to those associated with the administration of the assessments in participating schools. In the United States, the administration of the assessments was carried out by professional staff trained according to the international guidelines. School personnel were asked only to assist with listings of students, the identification of school space for the assessment, and the specification of parental consent procedures needed for sampled students.

Field operations centered on three main tasks: recruiting and training of field staff, scheduling the assessments, and administration of the assessments within the schools.

Field staff consisted of test administrators and assistant administrators. Test administrators managed the assessments in the schools, while assistant administrators assisted in the assessment administration. All had previous experience with other educational assessments in schools, and all had FBI clearance based on fingerprint and background checks, as well as e-QIP security clearances. Test administrators and assistant administrators also signed a statement of nondisclosure indicating that they would maintain confidentiality of all survey materials and of the data collected.

The total complement of field staff consisted of two field managers, 25 test administrators, and 50 assistant administrators. Field staff conducted assessments for the TIMSS 2019 Field Test in addition to the ICILS 2018 Main Study, with the two studies sharing overlapping assessment windows. The field managers reported directly to the operations director based at Westat's home office and met weekly to discuss progress and any problematic issues arising in the field. Test administrators reported to a field manager who coordinated and monitored their work and, in turn, the test administrators coordinated and supervised the work of the assistant administrators.

4.4.1 Responsibilities of Field Managers, Test Administrators, and Assistant Administrators

Field managers involved in the data collection phase had responsibility for the following tasks:

- Provide input to the data collection in-person training.
- Track the test administrators' receipt of assessment equipment and materials.
- Coordinate data collection activities undertaken by their assigned test administrators.
- Hold weekly one-on-one telephone meetings with their test administrators to monitor progress and to troubleshoot any problems arising.
- Ensure that their test administrators followed ICILS procedures and guidelines.
- Report progress and problems in weekly conference calls with Westat home office staff and other field managers.

Test administrators had responsibility for the following tasks:

- Attend data collection in-person training.
- Receive and secure assessment equipment and materials.
- Train assistant administrators.
- Work with the school coordinator to notify parents and students of the assessment, and obtain permission of parents, if this was required by the school.
- Make arrangements with the school for the assessment sessions.
- Prepare and assign assessment materials for students.
- Monitor online completion of the school and teacher questionnaires and collect questionnaires completed in hard-copy, as applicable.
- Conduct the assessment according to ICILS specified procedures.
- Complete the Test Administration Form, Student Tracking Form, Teacher Tracking Form, and Student Response Rate Form.
- Determine if a makeup session was needed.
- Securing, pack, and ship all hard-copy forms and school folders to Westat's home office.
- Record the status of the assessment in the MyICILS School Control System.
- Report progress to their field manager on a regular basis.

Assistant administrators had responsibility for the following tasks:

- Attend the in-person training conducted by their test administrator.
- Administer the assessment according to ICILS specified procedures.
- Assisting with the completion of the Test Administration Form, Student Tracking Form, Teacher Tracking Form, and Student Response Rate Form.
- Consult regularly with their test administrator.

4.4.2 Training

A 3-day, in-person training for test administrators was held on February 14-16, 2018. The attendees received the Test Administrator and Assessment Administrator manual at the training session. The agenda for this training session is provided as exhibit C-1 in appendix C. This training session integrated training on ICILS and TIMSS data collection procedures. ICILS and TIMSS were very similar in terms of general procedures but differed in preassessment, assessment day, and postassessment procedures. Differences between the studies were referenced at specific times when a unique training point needed to be made.

The first day of training focused on the responsibilities of a test administrator, data collection materials, conducting the preassessment call, entering preassessment call information into the study's School Control System, and preparing equipment and materials for the assessment. In addition, accommodations allowed on ICILS were discussed. At the closing session, on the first day, test administrators met with their field managers to review assignments and schedules. The second day included discussion about the procedures to be followed in setting up for and conducting the assessments, as well as privacy and security of test equipment and materials. The third day dealt with what to do once the assessment was completed, such as uploading data, packing and shipping the assessment materials to Westat and Pearson Educational Measurement, and following administrative procedures.

Field staff were assigned computers to take with them for the duration of data collection. Printers for use with the laptops were issued and sent to each test administrator after training. Test administrators were also provided with an official ICILS 2018 photo ID badge to wear while representing ICILS in the schools.

Training for assistant administrators was conducted as a separate exercise by their respective test administrators. Approximately 8 hours was allocated for this training. Training materials consisted of a Test Administrator and Assessment Administrator Manual, session scripts, and a subset of material from the test administrator training on assessment day tasks.

4.4.3 Scheduling Assessments

The approximately 352 schools sampled for ICILS 2018 were dispersed across the country, although with concentrations in the more populous states and cities. Scheduling assessment dates for these schools required the optimization of school preferences for a particular date with the assessment date preferences of nearby schools and the location of field staff in an effort to keep travel and related expenses to a minimum. The basic approach that was adopted involved the geographic mapping of schools and assignment of a preliminary date, along with the location of field staff. This formed the foundation for discussions with schools, and the assignment of schools to field staff. In essence, geographical clusters of schools were assigned assessment dates clustered in time insofar as this was possible.

Obtaining Assessment Dates From Schools

Prior to recruitment of schools, Westat staff collected date information, including dates associated with state testing, holidays, and breaks for states and some large districts. This information was used to set a tentative date for each school.

Mapping Schools

In a second step, a geographic map of sampled schools was developed based on the addresses of the schools. The map allowed the ready identification of obvious clusters of schools in large metropolitan areas and also allowed for identification of less concentrated clusters in broader geographical areas as well as isolated schools. To establish optimal regions for assessment administrators, geographic clusters

of schools were defined in an iterative process that took into account the location of field staff and their caseload. A total of 24 regions of varying size were identified in this way.

Assigning Tentative Assessment Dates

The provisional assessment dates were then mapped to the schools in each cluster and represented in the MyICILS School Control System. Within clusters, assessment dates were balanced against the location of schools in relation to one another. With some minor modifications to regions, schools in relatively close proximity were assigned to provisional assessment weeks. This process identified smaller clusters of schools that could be assessed within a week without undue travel and related expenses. For the most part, assessments were scheduled Tuesday through Thursday, leaving Monday and Friday as travel days.

Negotiating Final Assessment Dates

Once tentative dates were established, GCRs and NAEP State Coordinators contacted schools to confirm the assessment date and/or negotiate a final assessment date. For the most part, schools accepted the dates proposed. When this was not possible, the ICILS scheduler requested preferred dates from the school and used the work area spreadsheet and a work area map to negotiate an alternative assessment date that would minimize staff travel. Final assessment dates and times were then confirmed by e-mail with the school coordinator.

4.4.4 Assignment of Schools to Test Administrators

For the most part, field staff were assigned a region based on their location. Balancing these and several other demands resulted in some variation in the caseload of test administrators. During the course of the assessments, which ran from end of March 2018 through to early June 2018, some reassignments of schools and/or work areas were necessary.

Troubleshooting

Two of the test administrators and four assistant administrators were recruited as regional troubleshooters who would be available to cover last-minute changes in assessment dates, staff illnesses, and the like. Each of these staff also had their own assignments, essentially schools or makeup sessions that did not easily fit into an identified region or assessment date window.

4.4.5 Recruiting Parents and Students

During recruitment and scheduling contacts with schools, field staff asked about district and/or school requirements for notifying parents about their child's participation in ICILS. School requirements fell into the following three main categories:

- **Notification.** The school would simply send parents a notification of the child's participation in ICILS along with some informational material;
- **Passive consent.** The school was required to ask parents for permission for the child to participate but permission would be assumed unless there was a formal objection; and
- **Active consent.** The school was required to ask parents for permission for the child to participate and the child could not participate until the parents provided formal approval.

Almost all schools opted for parental notification.

To assist schools in this task, the school coordinator was provided with one of three draft letters to parents in electronic format (i.e., Microsoft Word), with the three draft letters corresponding to the three forms of parent permission. These letters could be edited as appropriate and sent out on school stationery. Consent forms to accompany the passive and active consent letters were also provided along with an information sheet with responses to frequently asked questions about ICILS. English and Spanish versions of each of these documents were made available to the schools. Copies of these materials are provided as exhibits A-5 through A-11 in appendix A.

4.4.6 Organizing the Assessment Session at the School

Approximately 3 weeks prior to each school's assessment date, the test administrator called the assigned school coordinator. Using a Preassessment Call Log/ROC, test administrators were instructed to verify previously obtained information on items such as the school's address, principal's name, assessment date, session location, requirements for entering the school, and parking arrangements as well as the status of the within-school sampling forms for the school. The information obtained was maintained within the school folder and updated as a basic reference. The Preassessment Call Log/ROC is provided as exhibit C-2 in appendix C.

On assessment day each test administrator, accompanied by two assistant administrators, arrived at the school with all of the equipment and materials needed for the assessment. Needed equipment and materials included the session script, Microsoft SurfacePro tablets configured for the assessment, USB drives for back-up data transmission, school folder and school-specific forms, student incentive gifts, certificates of community service, and observer session agreements. Upon arrival, the test administrator met with the school coordinator to make any updates to the Student Tracking Form that would affect the preparation of student materials (for example, the withdrawal of listed students from the school or class or changes in parent consent).

Test administrators arrived at the school about an hour before the scheduled assessment to set up equipment and take care of other arrangements for the assessment. Upon arriving in the assessment

location, test administrators confirmed that the location had sufficient space and desks/tables for the number of students in the session and identified power sources. The test administrator and assistant administrators then set up the student tablets, distributed student login cards that provided credentials for students to log in to their assigned booklet, set up the server tablet, and connected all student tablets to the server tablet.

Administering the Assessment

Assessments were administered by reading verbatim from a standardized script according to the instructions in the ICILS Administrator Manuals. A copy of the session script is provided as Exhibit C-3 in appendix C. The script began with a brief introduction to the study. The students were instructed to log in to the ICILS assessment platform and complete the first part of the tutorial. Test administrators then asked students if they had any questions, read the general instructions, and asked students to complete two practice questions. Test administrators again asked students if they had any questions before reading the instructions for part 1. Following this, the students were instructed to begin part 1 of the CIL portion of the assessment. After the allotted 30 minutes, a short break was provided. After the break, the instructions for part 2 were read and students were instructed to begin part 2 of the CIL portion of the assessment. After the allotted 30 minutes for this part of the assessment, another short break was provided. Following the break, the student questionnaire was administered. After the allotted 25 minutes, students were given a longer break before moving on to the CT assessment modules. Students were given 25 minutes for each of the two CT modules, again, with a short break between part 1 and part 2. While students completed each section of the assessment, the test administrator answered any questions students had and ensured that the allotted timing for the section was followed as specified by the assessment procedures and guidelines.

Postassessment Activities

Following the assessment, test administrators collected student login cards. The students received their gift and community service certificate, and were dismissed. After students had left, the test administrator and assistant administrators exited the testing software on the student tablets, shut down the machines, and securely packed all equipment in the Pelican cases. The test administrator recorded participation codes and calculated the student response rate. The test administrators made copies of the Student Tracking Form and the Session Report Form, placing the original documents in the ICILS Storage Envelope to be kept at the school, along with the student login cards. To maintain the security of student names, the test administrator removed and destroyed the column of student names from the copies of the Student Tracking Form and placed the de-identified Student Tracking Form and Session Report Form in the school folder. The session materials were sealed and shipped to Westat home office. Test administrators uploaded all assessment data from the server machines before the end of the day of the assessment, generally after arriving at their home or hotel. Individual tablets were checked to make sure all assessment data had been transferred during the assessment session and no data are on the student tablets. Within 24 hours of completing the assessment, test administrators updated the School Control System with assessment status and other information related to the assessment session.

4.5 Scoring the Assessment

In the United States, the scoring of the ICILS 2018 assessment items was the responsibility of Pearson. The ICILS 2018 assessment items included both multiple-choice and constructed-response items. A scoring rubric (guide) was provided by the IEA for each constructed-response item. The rubrics were reviewed by national research coordinators of all participating education systems and other experts as part of the field test of items, and feedback was provided to IEA.

4.5.1 Scoring and Scoring Reliability

The national research coordinator in each participating education system was responsible for the scoring of data for their education system, following established guidelines. The national research coordinator and additional staff from each education system attended scoring training sessions held by the International Study Center. The training sessions focused on the scoring rubrics employed in ICILS 2018. Participants in these training sessions were provided with practice in scoring example items over several days.

Scoring commenced on June 12, 2018 and was completed as scheduled on June 29. A total of 14 scorers participated over the course of the scoring events. All scorers and leaders were experienced scorers, with all but one having prior TIMSS and/or NAEP scoring experience.

Scorers were trained using prescored item samples provided by the ICILS International Study Center in the “SONET” training platform.

Scoring teams consisting of three to seven scorers trained on the same item with all student responses for that item before moving on to the next item. In the case of the larger tasks, the scoring team was trained on all discrete items within the task. After the practice scoring, the team scored each student response sequentially. Trainers made an effort to provide additional examples to entire teams, when appropriate, and to coach any scorers requiring additional individual assistance. Each team of scorers was monitored by a leader who reviewed consensus and attended to items with lower agreement. Calibration activities varied by item and group. More information on scoring the ICILS items can be found in the ICILS 2018 International Technical Report at https://www.iea.nl/sites/default/files/2020-05/ICILS%202018%20Technical%20Report-FINAL_0.pdf.

4.5.2 Scoring System

The national research coordinator from each participating education system was responsible for their education system’s data entry. In the United States, Westat was contracted to collect data for ICILS 2018 and uploaded the data to the IEA. Student-constructed responses for human scoring were loaded into a custom scoring system developed for ICILS.

Scorers logged in to the scoring system via a web browser. The scoring system presented student responses to scorers, captured the scores submitted, and compiled basic statistics for monitoring scoring progress and reliability.

4.6 Data Preparation

Data collected for the ICILS 2018 main study were imported into data files according to a common international format, as specified in the IEA Data Management Expert—ICILS 2018 MS data entry software. The software facilitated the data verification, correction, and validation by providing various internal data consistency checks.

The data files in this format were sent to the IEA Hamburg (formerly known as the IEA Data Processing Center), where they were subjected to an extensive series of data cleaning and consistency checks. The overriding concern of these checks was to ensure that all information in the database conformed to the internationally defined data structure, national adaptations to questionnaires are reflected appropriately in the codebooks and documentation, and all variables used for the international comparisons were comparable and valid across participating countries.

4.6.1 International Data Cleaning Procedures

The IEA Hamburg is responsible for checking the data files from each country, applying international standard data cleaning rules to verify and validate the accuracy and consistency of the data and documenting electronically any deviations from the international file structure and approved national adaptations. Queries arising during the data cleaning process are addressed to national centers, and the process was repeated as necessary to ensure all data are consistent and comparable within and between participating countries.

Following the international data cleaning process, the countries are provided national univariate and reliability statistics along with data almanacs containing international univariate and item statistics. These materials allow countries to examine their data with those of other participating nations and education systems. Once any problems arising from this examination are resolved, sampling weights and student proficiency scores are added to the file.

Detailed information on the entire data entry and cleaning process can be found online in the *IEA International Computer and Information Literacy Study 2018 Technical Report*:
https://www.iea.nl/sites/default/files/2020-05/ICILS%202018%20Technical%20Report-FINAL_0.pdf.

4.6.2 Data Confidentiality Safeguards

While the National Center for Education Statistics (NCES) and data contractors routinely pledge confidentiality to respondents, concerns about the potential for disclosure of information about individual survey respondents have recently increased, particularly with software and online services available to individuals that could facilitate respondent identification. Data confidentiality laws have been enacted since the Privacy Act of 1974 to further ensure the protection of personally identifiable information. The Education Sciences Reform Act of 2002 explicitly requires that NCES protect the confidentiality of all data collected from respondents in NCES-sponsored surveys. More specifically, NCES Standard 4-2, *Maintaining Confidentiality*, provides the guidelines for limiting the risk of data disclosure for data released by NCES (Seastrom 2002). Data disclosure occurs when an individual respondent has been identified with the survey item responses and other external data sources. The procedures used to reduce

the risk of data disclosure for ICILS 2018, in accordance with the guidelines specified in NCES Standard 4-2, are described below.

All students, teachers, and schools participating in ICILS 2018 do so with the assurance that their identities would not be disclosed. All employees handling the data have signed affidavits of data confidentiality. The names of schools, students, and teachers are removed by the field staff from the TIMSS questionnaires and assessment booklets and are either physically cut or blacked out on the corresponding TIMSS forms. Computer-generated school, student, and teacher IDs replace school, student, and teacher names. Furthermore, hard-copy questionnaires and assessment booklets are sealed by security stickers to ensure that neither school nor project field staff can access the questionnaire responses provided by the respondents.

Additionally, the following NCES disclosure statement appears on the login page for ICILS 2018 and the front cover of the printed questionnaires (the phrase “*search existing data resources, gather the data needed*” is not included on the student questionnaire):

The National Center for Education Statistics (NCES), within the U.S. Department of Education, conducts ICILS in the United States as authorized by the Education Sciences Reform Act of 2002 (20 U.S.C. §9543). All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this voluntary information collection is 1850-0929. The time required to complete this information collection is estimated to average [XX] minutes per [respondent type], including the time to review instructions [, search existing data resources, gather the data needed,] and complete and review the information collection. If you have any comments or concerns regarding the accuracy of the time estimate(s), suggestions for improving the form, or questions about the status of your individual submission of this form, write directly to: International Computer and Information Literacy Study (ICILS), National Center for Education Statistics, PCP, 550 12th St., SW, 4th floor, Washington, DC 20202. OMB No. 1850-0929, approval expires 12/30/2020.

After the ICILS 2018 data are collected, procedures are implemented to ensure the confidentiality of the school, student, and teacher responses. The Institute of Education Sciences (IES) requires that survey data cannot be transmitted to foreign entities prior to ensuring the confidentiality of the data and approval by the IES Disclosure Review Board. The ICILS 2018 disclosure analyses focused on the two Disclosure Review Board-required components for securing the confidentiality of the ICILS 2018 data. These components include the following:

- The identification and masking of potential disclosure-risk ICILS 2018 schools by comparing the study variables with publicly available school files, using probabilistic matching and deterministic swapping on school-level data.
- The implementation of an additional measure of uncertainty of school, student, and teacher identification with the random swapping of data elements within the school, student, and teacher files.

The confidentiality analyses are designed to provide reasonable assurance that the ICILS 2018 U.S. public-use data files will not allow identification of individual schools, students, or teachers when compared to publicly available data collections. No publicly available data collections identify either students or teachers by name, but two data collections identify schools by name.

The NCES regularly publishes the Common Core of Data (CCD), a detailed public school listing, and the Private School Survey (PSS), a detailed private school listing. Merging of the restricted-use files with the CCD/PSS data may reveal the identities of the participating schools. However, the confidentiality procedures included perturbing student- and teacher-level data thus providing a reasonable degree of assurance that teachers and students participated in the ICILS 2018 schools remain unidentifiable. It should be noted that the ICILS 2018 data do not contain any information of a personal or sensitive nature.

Because the variables in the ICILS 2018 data files are obtained from responses to the school questionnaire, which often vary from the CCD and PSS data, exact profile matches are unlikely. Even then, one would not know with certainty whether any of the matched schools are the actual ICILS 2018 schools or whether the match had simply arisen by chance. Nevertheless, school matching analyses were undertaken using probabilistic matching algorithms approved by the IES Disclosure Review Board for use in the data disclosure analyses. These algorithms identify schools whose school questionnaire responses provided some potential for identification. To provide further protection, elements of the data from schools identified as “disclosure risks” in this way are perturbed using the procedures approved by the IES Disclosure Review Board. After perturbation, the data are subjected to another round of analysis analyses to ensure that the potential for identification no longer existed.

An additional measure is taken to reduce further the risk of disclosure of an individual respondent. This random data swapping measure is an IES Disclosure Review Board requirement that reduces disclosure risk by modifying microdata. In random data swapping, a probability sample of records is paired with other records on the file using selected characteristics, and then some identifying variables are swapped between the pairs of records (Kaufman, Seastrom, and Roey 2005). The sampling rate and variables for ICILS 2018 swapping are designed to protect the confidentiality of the data without affecting the usability of the dataset. All questionnaire data (school, information communications technologies [ICT] coordinator, teacher, and student) are involved in the swapping. This method is an effective way of keeping as much valuable data as possible while protecting respondent identity. Swapping preserves the univariate frequencies, means, and variances, although it may slightly affect multivariate relationships. Pre- and postswapping percentage distributions (unweighted and weighted) and correlations are reviewed to ensure data quality was maintained.

Confidentiality analyses are conducted before the U.S. data files are submitted to the IEA Hamburg for data cleaning and review, and prior to the score scaling and estimation of sampling weights. Because of increasing security concerns from the international community, an additional data confidentiality measure is implemented by the IEA Hamburg for CILS 2018. School IDs are scrambled for each education system’s participating schools as a security measurement for de-identification. This procedure puts an additional safeguard in place that makes it difficult to trace collected information back to the source. Because of the hierarchical ID naming convention employed by IEA Hamburg, the scrambling of the school IDs also affected the teacher and student IDs, thus making these IDs scrambled as well.

4.6.3 The ICILS 2018 Student Proficiencies

The assessment items of ICILS 2018 measure students' ability to use computers to collect and manage information, to produce and exchange information (referred to as computer and information literacy [CIL]), and to formulate solutions to problems as that these solutions could be operationalized with the computer (referred to as computational thinking [CT]).

Detailed information on the scaling procedures, CIL and CT estimates, and the development of proficiency levels for CIL are described in the IEA International Computer and Information Literacy Study 2018 Technical Report: https://www.iea.nl/sites/default/files/2020-05/ICILS%202018%20Technical%20Report-FINAL_0.pdf.

4.6.4 The ICILS 2018 Sampling Weights

The study sample design for ICILS 2018 is considered a complex design because it involves multistage sampling, stratification, and cluster sampling. The samplings of schools, students, and teachers for the United States are verified by IEA during the sampling process. Detailed information on the sampling design, requirements, and implementation can be found online in the IEA International Computer and Information Literacy Study 2018 Technical Report: https://www.iea.nl/sites/default/files/2020-05/ICILS%202018%20Technical%20Report-FINAL_0.pdf.

Sampling weights should be used in all ICILS analyses. A detailed description of this process is provided in the IEA International Computer and Information Literacy Study 2018 User Guide for the International Database: https://www.iea.nl/sites/default/files/2020-03/ICILS2018_IDB_User_Guide.pdf.

5. ICILS 2018 DATA FOR THE UNITED STATES

The International Association for the Evaluation of Educational Achievement (IEA) in cooperation with the Australian Council for Educational Research (ACER) releases the ICILS 2018 international databases that contain student achievement data as well as school, information communications technologies (ICT) coordinator, teacher, and student questionnaire data for each participating country. The following list includes the types of data available from the international databases:

- school dataset with school principal and ICT coordinator background questionnaire responses;
- teacher dataset with teacher background questionnaire responses;
- student dataset includes student background questionnaire responses, achievement item responses, and scale scores for the ICILS 2018 assessment; and
- national context survey data with information relating to the structure of education, accessibility of ICT, and the role of ICT in curriculum.

These databases provide comparable data across education systems on detailed measures of student achievement for the ICILS 2018 participating education systems; information on educational practices and student outcomes; and linking variables between student achievement and background information from school principals, ICT coordinators, teachers, and students, and national context of ICT in education.

The international datasets are available in two versions: A public-use version and a restricted-use version. The public-use datasets are available as SAS export files or SPSS “.sav” files through the IEA Data Repository for the ICILS (<https://www.iea.nl/data-tools/repository/icils>). The restricted-use datasets are available by request by contacting the IEA Data Repository to obtain permission and access to the restricted-use version of the ICILS 2018 international database (<https://www.iea.nl/node/3071>).

Discussions of the public- and restricted-use datasets can be found in the *IEA International Computer and Information Literacy Study 2018 Technical Report* (Frailon, Ainley, Schulz, Friedman, and Duckworth 2020) and the *IEA International Computer and Information Literacy Study 2018 User Guide for the International Database* (Mikheeva and Meyer 2019). These two documentations are the more comprehensive and detailed information for the ICILS 2018 data and should represent as the primary references.

The U.S. international data files, which are part of the ICILS 2018 international databases, do not include the U.S. specific adaptations made to the school, teacher, and student questionnaires, such as the question on race/ethnicity added to the student questionnaire. NCES releases the U.S. specific data variables separately from the international databases mentioned above. This chapter focuses on the contents of the NCES-released data files.

5.1 ICILS 2018 U.S. Specific Data Files Released by NCES

For the U.S. specific data files, NCES releases the data in two versions:

- Public-use data files: These data are available by download from <https://nces.ed.gov/surveys/icils/>. The data files are in ASCII format and are named as indicated in exhibit 5-1. Researchers can download the SAS and SPSS codes for reading these data files from the NCES website.
- Restricted-use data files: Researchers can only obtain these data by completing a restricted-use license agreement with NCES. The restricted-use data files are provided only on CD-ROM or DVD-ROM. These datasets contain the supplemental link files that link ICILS 2018 school identification numbers to the school identification numbers as they appear in the publicly available Common Core of Data (CCD) or the Private School Universe Survey (PSS). In addition, the student race/ethnicity variable is provided with all available categories and the percentage of students eligible for free or reduced-price lunch in the school is provided as a continuous variable. Because these data can reveal the identities of participating schools, the restricted-use data files are only made available to those who obtain a NCES restricted-use data license. Researchers can find the directions on how to obtain the license at <https://nces.ed.gov/pubsearch/licenses.asp>. Exhibit 5-2 lists the restricted-use data files released by NCES.

Exhibit 5-1. U.S. ICILS 2018 data files released by NCES, public-use version

Contents	File name
School national variables	ICILS2018_School
Teacher national variables	ICILS2018_Teacher
Student national derived variables	ICILS2018_Student

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

Exhibit 5-2. U.S. ICILS 2018 data files released by NCES, restricted-use version

Contents	File name
Restricted-use school variables	ICILS2018_School_RUF
Restricted-use student variables	ICILS2018_Student_RUF

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

5.2 U.S. Specific Variables

There are two types of U.S. specific variables: (1) those with data from a source other than a questionnaire, and (2) those with data collected through questionnaires from national questions added to the international version of the questionnaires.

5.2.1 ICILS 2018 U.S. Questionnaires

Before describing the two types of the U.S. specific questionnaires, it is important to note that the U.S. questionnaires differ from the ICILS 2018 international questionnaires in several ways:

- Minor language/expression adaptations were made to some of the instructions on the school principal, ICT coordinator, teacher, and student questionnaires.
- For a few questionnaire items, response categories were adapted but in a way that allowed mapping to the international response categories in the U.S. international data files.
- Several U.S. specific variables without international counterparts were added to the school, teacher, and student questionnaires.

The ICILS 2018 U.S. versions of the school principal, ICT coordinator, teacher, and student questionnaires can be downloaded from the NCES website at <https://nces.ed.gov/surveys/icils/questionnaires.asp>.

5.2.2 Variables With Data From Sources Other Than a Questionnaire

Data collected from school records covered the following information:

1. Whether a school was public or private. Information for this variable is derived from the Common Core of Data (CCD). Although information about the public or private school is available in the international dataset of the school questionnaire, there may be missing responses for the variable if the school principal did not provide a response. The derived variable for public or private school provides a binary indicator for identifying schools as either public or private regardless if the school principal provided a response on the school questionnaire. The public or private school indicator variable is included in the public-use school data file.
2. The categorical variable of the poverty level in school as measured by the percentage of students eligible for free or reduced-price lunch. Information for this variable is derived from the CCD. Although information about the poverty level in school is available in the school questionnaire as a continuous response, the derived variable for the percentage of students eligible for free or reduced-price lunch provides a collapsed categorical indicator for identifying schools in five categories for poverty level.

5.2.3 Variables With Data Collected Through Questionnaires

There are several U.S. specific items that were added to the school, teacher, and student questionnaires.

For the **school questionnaire**, two questions were added:

1. The percentage of students in the school eligible for free or reduced-price lunch; and
2. The percentage of students in the school who are English language learners.

The percentage of students in the school eligible for free or reduced-price lunch is used as a school measure of poverty level, and it is obtained from school principals' responses to the school questionnaire. The question asked the school principal to report, as of approximately October 2017, the percentage of students at the school eligible to receive free or reduced-price lunch through the National School Lunch Program (NSLP). This continuous variable is provided in the restricted-use school data file. For the public-use school data file, information from the Common Core Data (CCD) is used to derive a new variable with five categories: (1) less than 10 percent, (2) 10 to 24.9 percent, (3) 25 to 49.9 percent, (4) 50 to 74.9 percent, and (5) 75 percent or more. Because the continuous form of the variable came from the principals' responses while the categorical form of the variable is derived from CCD, the data from the former form may not match the data from the latter form. For example, if data from the school questionnaire is unavailable, information from the CCD is recorded in the public-use school file, but recorded as "missing" in the restricted-use school file. The effect of this replacement on the confidentiality of the data was examined as part of the confidentiality analyses described earlier in chapter 4, section 4.6.2.

The percentage of students in the school who are English language learners is obtained from school principals' responses to the school questionnaire. School principals are asked to report the percentage of currently enrolled students who have been identified as limited-English proficient (LEP)/English language learners (ELL) at the school. This variable is provided in the public-use school data file.

For the **teacher questionnaire**, one question was added that asked teachers to indicate the year they started teaching. This variable is provided in the public-use teacher data file.

For the **student questionnaire**, a two-part question was added that asked students to identify their race/ethnicity. Students are asked first whether they were Hispanic or Latino.⁴ Students are then asked whether they are members of the following five racial groups: (1) White; (2) Black or African American; (3) Asian; (4) American Indian or Alaska Native; or (5) Native Hawaiian or other Pacific Islander. Multiple responses to the second of these questions are allowed. A composite variable with six categories is constructed in which results are shown separately for (1) White, Not Hispanic; (2) Black, Not Hispanic; (3) Hispanic; (4) Asian; and (5) Two or more races. The sixth category is labeled as "Other" and consisted of the small number of students indicating that they are American Indian or Alaska Native, and Native Hawaiian or other Pacific Islander. For the public-use student data file, the race/ethnicity is provided as a composite variable. For the restricted-use student data file, the race/ethnicity variable is provided with all categories.

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⁴ For ICILS 2018 MS data collection, the proportion of students who did not respond to the first part of the question to identify whether they were Hispanic or Latino was much greater in comparison to other international education studies. The nonresponse for the Hispanic or Latino question is coded as missing value and the composite race/ethnicity variable is coded to the category if the student provided response(s) to the second part of the race/ethnicity question. If the student did not provide a response, the value for the composite variable of race/ethnicity for that student is coded as missing.

5.3 ICILS 2018 U.S. Public-Use Data Files

Two variables of country identification (numeric and alpha codes) and the school identification variable included in the public-use school, teacher, and student data files. These identification variables are specific to the ICILS 2018 and can be used to merge with ICILS 2018 data files.

5.3.1 Public-Use School Data File

Besides the country and the school identification variables, the public-use school data file contains two derived variables and one U.S. specific school questionnaire variable. The two derived variables are the categorical variable of the percentage of students in the school eligible for free or reduced-price lunch and the public/private school indicator. The percentage of the currently enrolled students identified as LEP/ELL at the school is the U.S. specific school questionnaire variable included in the public-use school data file. Researchers can merge the public-use school data file with the student and teacher data files by using the country and school identification variables.

5.3.2 Public-Use Teacher Data File

Similar to the public-use school data file, the public-use teacher data file includes the country and the school identification variables as well as the teacher identification variable. The U.S. specific teacher questionnaire variable that asked the teachers to indicate the year they started teaching is also included in the public-use teacher data file. Researchers can merge the public-use teacher data file with the school and student data files by using the country and school identification variables.

5.3.3 Public-Use Student Data File

The public-use student data file also includes the country and the school identification variables as well as the student identification variable and a composite variable for student race/ethnicity. The categories for the student race/ethnicity composite variable are: (1) White, Not Hispanic; (2) Black, Not Hispanic; (3) Hispanic; (4) Asian; (5) Two or more races; and (6) Other. Researchers can merge the public-use student data file with the school and teacher data files by using the country and school identification variables.

5.4 ICILS 2018 U.S. Restricted-Use Data Files

As indicated in previous section, there is a restricted-use school data file and a restricted-use student data file containing data that may reveal the identities of participating ICILS 2018 schools. The restricted-use school and student data files include two variables of country identification (numeric and alpha codes) and the school identification variable. These identification variables are specific to the ICILS 2018 and researchers can use these variables to merge with ICILS 2018 data files.

5.4.1 Restricted-Use School Data File

Similar to the public-use school data file, the restricted-use school data file includes the country and the school identification variables as well as the school identification variable. Besides these ICILS study-related identification variables, the restricted-use school data file also includes the school identification numbers as they appear in the publicly available Common Core of Data (CCD) or the Private School Universe Survey (PSS). The school principals' responses to the school questionnaire on the percentage of students at the school eligible to receive free or reduced-price lunch through the National School Lunch Program (NSLP) is also included as a continuous variable. Researchers may merge the restricted-use school data file with the public-use school, teacher, and student data files by using the country and school identification variables.

5.4.2 Restricted-Use Student Data File

The restricted-use student data file also includes the country and the school identification variables as well as the student identification variable and a variable with seven categories for student race/ethnicity. The categories for the student race/ethnicity variable are: (1) White, Not Hispanic; (2) Black, Not Hispanic; (3) Hispanic; (4) Asian; (5) Native Hawaiian/Pacific Islander; (6) American Indian/Alaskan Native; and (7) Two or more races. Researchers may merge the restricted-use student data file with the public-use school, teacher, and student data files by using the country and school identification variables.

5.5 ICILS 2018 Supplemental Documents and Codebook Files

There are several supplemental documents accompanying each data file released by NCES. As mentioned previously, each data file is in the ASCII format and researchers can use the SAS or SPSS codes provided with the data files to read in the data. Quick guides and README files containing information about the data files are included separately for public- and restricted-use data files. Each data file also has an accompanying codebook in the html format. Illustrative merging codes are included separately for public- and restricted-use data files for merging the U.S. international and national data files, merging the U.S. specific public- and restricted-use data files, and merging the school-, teacher-, and student-level data files.

Researchers can download the files for public-use data from <https://nces.ed.gov/surveys/icils/>. The codebook files for restricted-use data will require users to complete a restricted-use license agreement with NCES. Researchers can find the directions on how to obtain the license at <https://nces.ed.gov/pubsearch/licenses.asp>.

5.6 Merging ICILS 2018 Data Files

In preparing the ICILS 2018 data for analysis, it may be necessary to merge two (or more) of the U.S. specific public- and restricted-use data files named in exhibits 5-1 and 5-2 with the U.S. international databases released by the IEA and ACER. Examples of data file merging provided in the following sections are illustrative SAS and SPSS codes. Users of SAS or SPSS software may adapt the illustrative codes for various merges.

5.6.1 Merging Public- and Restricted-Use School Data Files

The following illustrative SPSS and SAS codes can be adapted to merge public- and restricted-use school data files.

Exhibit 5-3. Illustrative SPSS and SAS codes for merging public- and restricted-use school data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\ICILS2018_School.SAV'. sort cases by IDSCHOOL. save outfile = "C:\ICILS2018\Data\SCHOOL_PUF.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_School_RUF.SAV'. sort cases by IDSCHOOL. save outfile = "C:\ICILS2018\Data\SCHOOL_RUF.SAV". match files / file = "C:\ICILS2018\Data\SCHOOL_RUF.SAV" / table = "C:\ICILS2018\Data\SCHOOL_PUF.SAV" / by IDSCHOOL. save outfile = 'C:\ICILS2018\Data\MERGE1.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data SCHOOL_PUF; set ICILS18.ICILS2018_School; proc sort data = SCHOOL_PUF; by IDSCHOOL; data SCHOOL_RUF; set ICILS18.ICILS2018_School_RUF; proc sort data = SCHOOL_RUF; by IDSCHOOL; data ICILS18.MERGE1; merge SCHOOL_PUF SCHOOL_RUF; by IDSCHOOL; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

5.6.2 Merging Public- and Restricted-Use Student Data Files

The following illustrative SPSS and SAS codes can be adapted to merge public- and restricted-use student data files.

Exhibit 5-4. Illustrative SPSS and SAS codes for merging public- and restricted-use student data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\ICILS2018_Student.SAV'. sort cases by IDSTUD. save outfile = "C:\ICILS2018\Data\STUDENT_PUF.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_Student_RUF.SAV'. sort cases by IDSTUD. save outfile = "C:\ICILS2018\Data\STUDENT_RUF.SAV". match files / file = "C:\ICILS2018\Data\STUDENT_RUF.SAV" / table = "C:\ICILS2018\Data\STUDENT_PUF.SAV" / by IDSTUD. save outfile = 'C:\ICILS2018\Data\MERGE2.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data STUDENT_PUF; set ICILS18.ICILS2018_Student; proc sort data = STUDENT_PUF; by IDSTUD; data STUDENT_RUF; set ICILS18.ICILS2018_Student_RUF; proc sort data = STUDENT_RUF; by IDSTUD; data ICILS18.MERGE2; merge STUDENT_PUF STUDENT_RUF; by IDSTUD; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

5.6.3 Merging Public-Use School and Teacher Data Files

The following illustrative SPSS and SAS codes can be adapted to merge public-use school and teacher data files.

Exhibit 5-5. Illustrative SPSS and SAS codes for merging public-use school and teacher data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\ICILS2018_School.SAV'. sort cases by IDSCHOOL. save outfile = "C:\ICILS2018\Data\SCHOOL.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_Teacher.SAV'. sort cases by IDSCHOOL IDTEACH. save outfile = "C:\ICILS2018\Data\TEACHER.SAV". match files / file = "C:\ICILS2018\Data\TEACHER.SAV" / table = "C:\ICILS2018\Data\SCHOOL.SAV" / by IDSCHOOL. save outfile = 'C:\ICILS2018\Data\MERGE3.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data SCHOOL; set ICILS18.ICILS2018_School; proc sort data = SCHOOL; by IDSCHOOL; data TEACHER; set ICILS18.ICILS2018_Teacher; proc sort data = TEACHER; by IDSCHOOL IDTEACH; data ICILS18.MERGE3; merge SCHOOL TEACHER; by IDSCHOOL; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

5.6.4 Merging Public-Use School and Student Data Files

The following illustrative SPSS and SAS codes can be adapted to merge public-use school and student data files.

Exhibit 5-6. Illustrative SPSS and SAS codes for merging public-use school and student data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\ICILS2018_School.SAV'. sort cases by IDSCHOOL. save outfile = "C:\ICILS2018\Data\SCHOOL.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_Student.SAV'. sort cases by IDSCHOOL IDSTUD. save outfile = "C:\ICILS2018\Data\STUDENT.SAV". match files / file = "C:\ICILS2018\Data\STUDENT.SAV" / table = "C:\ICILS2018\Data\SCHOOL.SAV" / by IDSCHOOL. save outfile = 'C:\ICILS2018\Data\MERGE4.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data SCHOOL; set ICILS18.ICILS2018_School; proc sort data = SCHOOL; by IDSCHOOL; data STUDENT; set ICILS18.ICILS2018_Student; proc sort data = STUDENT; by IDSCHOOL IDSTUD; data ICILS18.MERGE4; merge SCHOOL STUDENT; by IDSCHOOL; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

5.6.5 Merging International and National Data Files

For detailed information on the international data files, users should refer to the *IEA International Computer and Information Literacy Study 2018 User Guide for the International Database* (Mikheeva and Meyer 2019). This documentation provides comprehensive descriptions and discussions on the data file names, format, structure, and response code values. As mentioned earlier, the public-use version of the U.S. international data files is available through the IEA Data Repository for the ICILS (<https://www.iea.nl/data-tools/repository/icils>). The restricted-use datasets are available by request through contacting the IEA Data Repository to obtain permission and access to the restricted-use version of the ICILS 2018 international database (<https://www.iea.nl/node/3071>).

The following illustrative SPSS and SAS codes can be adapted to merge U.S. international and national school data files. The file name **BCGUSAI2** is the U.S. international school data file, which contains both the school principal and ICT coordinator questionnaire data. The CNTRY variable in the U.S. international database has a string length of 9 characters. The CNTRY variable for the NCES U.S. supplemental database has a string length of 3 characters. The user will need to make sure the string length for variable CNTRY is the same between the national and international files for merging.

Exhibit 5-7. Illustrative SPSS and SAS codes for merging U.S. international and national school data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\BCGUSAI2.SAV'. sort cases by IDSCHOOL. save outfile = "C:\ICILS2018\Data\SCHOOL1.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_School.SAV'. sort cases by IDSCHOOL. save outfile = "C:\ICILS2018\Data\SCHOOL2.SAV". match files / file = "C:\ICILS2018\Data\SCHOOL2.SAV" / table = "C:\ICILS2018\Data\SCHOOL1.SAV" / by IDSCHOOL. save outfile = 'C:\ICILS2018\Data\MERGE_SCHOOL.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data SCHOOL1; set ICILS18.BCGUSAI2; proc sort data = SCHOOL1; by IDSCHOOL; data SCHOOL2; set ICILS18.ICILS2018_School; proc sort data = SCHOOL2; by IDSCHOOL; data ICILS2018.MERGE_SCHOOL; merge SCHOOL1 SCHOOL2; by IDSCHOOL; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

The following illustrative SPSS and SAS codes can be adapted to merge U.S. international and national school data files. The file name **BTGUSAI2** is the U.S. international teacher data file that includes the teacher questionnaire data. The CNTRY variable in the U.S. international database has a string length of 9 characters. The CNTRY variable for the NCES U.S. supplemental database has a string length of 3 characters. The user will need to make sure the string length for variable CNTRY is the same between the national and international files for merging.

Exhibit 5-8. Illustrative SPSS and SAS codes for merging U.S. international and national teacher data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\BTGUSAI2.SAV'. sort cases by IDTEACH. save outfile = "C:\ICILS2018\Data\TEACHER1.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_Teacher.SAV'. sort cases by IDTEACH. save outfile = "C:\ICILS2018\Data\TEACHER2.SAV". match files / file = "C:\ICILS2018\Data\TEACHER2.SAV" / table = "C:\ICILS2018\Data\TEACHER1.SAV" / by IDTEACH. save outfile = 'C:\ICILS2018\Data\MERGE_TEACHER.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data TEACHER1; set ICILS18.BTGUSAI2; proc sort data = TEACHER1; by IDTEACH; data TEACHER2; set ICILS18.ICILS2018_Teacher; proc sort data = TEACHER2; by IDTEACH; data ICILS18.MERGE_TEACHER; merge TEACHER1 TEACHER2; by IDTEACH; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

The following illustrative SPSS and SAS codes can be adapted to merge U.S. international and national school data files. The file name **BSGUSAI2** is the U.S. international student data file, which includes the student achievement and questionnaire data. The CNTRY variable in the U.S. international database has a string length of 9 characters. The CNTRY variable for the NCES U.S. supplemental database has a string length of 3 characters. The user will need to make sure the string length for variable CNTRY is the same between the national and international files for merging.

Exhibit 5-9. Illustrative SPSS and SAS codes for merging U.S. international and national student data files

Illustrative SPSS code	Illustrative SAS code
<pre>get file = 'C:\ICILS2018\Data\BSGUSAI2.SAV'. sort cases by IDSTUD. save outfile = "C:\ICILS2018\Data\STUDENT1.SAV". get file = 'C:\ICILS2018\Data\ICILS2018_Student.SAV'. sort cases by IDSTUD. save outfile = "C:\ICILS2018\Data\STUDENT2.SAV". match files / file = "C:\ICILS2018\Data\STUDENT2.SAV" / table = "C:\ICILS2018\Data\STUDENT1.SAV" / by IDSTUD. save outfile = 'C:\ICILS2018\Data\MERGE_STUDENT.SAV'.</pre>	<pre>libname ICILS18 "C:\ICILS2018\Data"; data STUDENT1; set ICILS18.BSGUSAI2; proc sort data = STUDENT1; by IDSTUD; data STUDENT2; set ICILS18.ICILS2018_Student; proc sort data = STUDENT2; by IDSTUD; data ICILS18.MERGE_STUDENT; merge STUDENT1 STUDENT2; by IDSTUD; run;</pre>

SOURCE: U.S. Department of Education, National Center for Education Statistics, International Computer and Information Literacy Study (ICILS), 2018.

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Appendix A

ICILS 2018 Recruitment Materials

APPENDIX A. ICILS 2018 RECRUITMENT MATERIALS

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Exhibit A-1. ICILS 2018 State Letter



UNITED STATES DEPARTMENT OF EDUCATION
INSTITUTE OF EDUCATION SCIENCES
NATIONAL CENTER FOR EDUCATION STATISTICS

[Date]

[Title] [Name First] [Name Last]
[Department]
[State Agency Name]
[Address 1]
[City], [State] [Zip code]

Dear [Title] [Name Last]:

The United States is participating in an important international study in 2018: the International Computer and Information Literacy Study (ICILS). ICILS provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. Results from ICILS are used by researchers and policymakers to chart national progress against international standards and other countries around the world, informing national discussions about international competitiveness.

ICILS is described in more detail in the enclosed materials. In the United States, ICILS is conducted by the National Center for Education Statistics (NCES), part of the U.S. Department of Education. The U.S. Office of Management and Budget has approved the data collection under OMB# 1850-0929. Study findings will not identify participating districts, schools, students, or individual staff. Please see the enclosed FAQ for information about data confidentiality.

Some schools in your state have been randomly selected to participate in ICILS in spring 2018. NCES is in contact with your state assessment director and NAEP State Coordinator to keep them informed about ICILS and how it fits in with other NCES data collections, and to facilitate recruitment of sampled schools. While participation in this study is voluntary, your support of school participation in your state is invaluable so that the United States has a representative sample of schools across the country.

Exhibit A-1. ICILS 2018 State Letter—Continued

If you have questions about the study, please do not hesitate to call Dr. Chris Averett at Westat at (240) 314-2492 or send an e-mail to ICILS@westat.com. Westat is under contract to NCES to collect the ICILS data. You may also get more information about this study by contacting Lydia Malley at NCES at (202) 245-7266 or Lydia.malley@ed.gov, or by visiting the ICILS website at <https://nces.ed.gov/surveys/icils>.

Thank you for your time and support of this important international study.

Sincerely,

Peggy G. Carr, Ph.D.
Acting Commissioner
National Center for Education Statistics

cc: [State assessment director]
[NAEP State Coordinator]

Enclosures

NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). All of the information provided by your schools, staff, and students may only be used for statistical purposes and may not be disclosed or used in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

Exhibit A-2. ICILS 2018 District Letter

**Early May ICILS 2018 Notification Letter From
CHIEF STATE SCHOOL OFFICER TO DISTRICT SUPERINTENDENT**
Red text inside of brackets should be customized before mail merge;
highlighted text inside of brackets represents mail merge fields

Dear [District Superintendent name]:

I am writing to notify you that [number] schools in your district have been randomly selected to participate in an important international study in 2018: the International Computer and Information Literacy Study (ICILS). ICILS provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. Results from ICILS are used by researchers and policymakers to chart national progress against international standards and other countries around the world, informing national discussions about international competitiveness.

Selected schools are notified in advance so that principals can place the assessment date on their calendars and incorporate ICILS into the planned school program. I am writing to ask your district to support the participation of those selected schools. Participating schools will receive \$200, and each school's ICILS school coordinator (the school staff person designated to work with ICILS staff) will receive \$100 as a thank you for his or her time and effort. A school administrator and selected teachers will each be asked to complete a questionnaire. Teachers will receive \$20 as a thank you for completing the questionnaire. Each student who participates will receive a small gift as a token of appreciation.

ICILS is described in more detail in the enclosed materials. In the United States, ICILS is conducted by the National Center for Education Statistics (NCES), part of the U.S. Department of Education, and the data are being collected by Westat. The U.S. Office of Management and Budget has approved the data collection under OMB# 1850-0929. For information on the confidentiality of the data collected, please see the enclosed FAQ. While participation in this study is voluntary, your support of school participation in your district is invaluable so that the United States has a representative sample of schools across the country. The schools will be contacted soon with more information about the assessment.

The list of selected schools in your district is attached, along with schools selected for NAEP 2018. Please include the ICILS assessment window (March to May 2018) on your district test calendar. [Name], our NAEP State Coordinator, will contact your staff with additional information.

If you have questions about the study, please do not hesitate to contact [Name of NSC], or the toll-free ICILS information hotline at 1-855-445-5604 or send an e-mail to ICILS@westat.com. You may also get more information about this study by contacting Lydia Malley at NCES at (202) 245-7266 or Lydia.malley@ed.gov, or by visiting the ICILS website at <https://nces.ed.gov/surveys/icils>.

Exhibit A-2. ICILS 2018 District Letter—Continued

I know that I can count on you to help accomplish our goal of 100 percent participation. Thank you for your time and support of this important international study.

[Name of Chief State School Officer]

Enclosures

CC: [State Testing Director]

[District Test Coordinator]

[NAEP State Coordinator]

NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). All of the information provided by your schools, staff, and students may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

Exhibit A-3. ICILS 2018 Save the Date Letter

**ICILS 2018 Save-the-Date Letter From
NAEP STATE COORDINATOR TO SCHOOL PRINCIPAL – For All Sampled Schools**

Red text inside of brackets should be customized before mail merge;

highlighted text inside of brackets represents mail merge fields

ICILS is coming to your school on [assessment date]. Save the date!

Dear Principal:

[In May], I notified you that your school was selected to participate in an important international study in 2018: the International Computer and Information Literacy Study (ICILS). This letter has the scheduled assessment date for your school.

Your school's grade 8 students will take the assessment for about 3 hours on [assessment date]. Please place the assessment date on your 2017–2018 school calendar. Approximately 30 eighth-graders will be selected to participate in the digitally-based assessment on supplied tablets. ICILS representatives will provide significant support to your school, bring all necessary equipment and materials, and administer the assessment.

If you have questions or a conflict with the scheduled assessment date, please contact me at [telephone number] or [e-mail address] by [date]. I will send you more information about preparing for the assessment [at the beginning of the school year].

ICILS provides a common measure of student achievement in computer and information literacy for international comparisons and is used to inform education policies and practices. Schools, teachers and students have an important role in ensuring that ICILS provides accurate results. Our goal is 100 percent participation in this important assessment, and we know that we can count on you to help us reach it.

Sincerely,

NAEP State Coordinator

CC: District Test Coordinator

NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). All of the information provided by your staff and students may only be used for statistical purposes and may not be disclosed or used in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

Exhibit A-4. ICILS 2018 School Notification Letter

May ICILS 2018 Notification Letter From NAEP State Coordinator to School Principal

Red text inside of brackets should be customized before mail merge;
highlighted text inside of brackets represents mail merge fields

Dear [Principal name],

[School name] has been randomly selected to represent schools across the United States by participating in an important international study in 2018: the International Computer and Information Literacy Study (ICILS). ICILS provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. First administered internationally in 2013, ICILS was developed as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age.

NCES recognizes the burden of assessments on schools and works to reduce that burden as much as possible both in terms of time and resources. ICILS will sample 30 eighth-graders from your school to participate in the study and select 20 eighth-grade teachers to complete a questionnaire. A school administrator also will be asked to complete a questionnaire. As a token of appreciation for participating in ICILS, your school will receive \$200. Students who take ICILS will receive a small gift to thank them for their participation. Your school's ICILS school coordinator (the school staff person designated to work with ICILS staff) will receive \$100 as a thank-you for his or her time and effort. Selected teachers will receive \$20 for completing the questionnaire.

ICILS is described in more detail in the enclosed materials. In the United States, ICILS is conducted by the National Center for Education Statistics (NCES), part of the U.S. Department of Education. The U.S. Office of Management and Budget has approved the data collection under OMB# 1850-0929. Study findings will not identify participating districts, schools, students, or individual staff. For information on the confidentiality of the data collected, please see the enclosed FAQ. While participation in ICILS is voluntary, your school's participation is invaluable in ensuring that the United States has a representative sample of schools across the country.

The assessment window is March 5 to May 25, 2018. Within the next few weeks I will send you an assessment date. Should there be a conflict on this date, an ICILS representative will work with you to identify an alternative time. Please put this date on your 2017-2018 school calendar. At the beginning of the school year, I will send you detailed information about the assessment and will ask you to identify a school coordinator. Westat is under contract to NCES to collect the ICILS data. ICILS representatives will provide significant support to schools and bring all necessary materials, including tablets and all equipment, and administer the assessment.

If you have questions, please do not hesitate to contact me or call the toll-free ICILS information hotline at 1-855-445-5604, or send an e-mail to ICILS@westat.com. You may also get more information about this study by contacting Lydia Malley at NCES at 1-202-245-7266 or lydia.malley@ed.gov, or by visiting the ICILS website at <https://nces.ed.gov/surveys/icils>.

Exhibit A-4. ICILS 2018 School Notification Letter—Continued

Your participation in ICILS 2018 is very important to its success. Our chief state school officer, [name], and your district superintendent, [name], support ICILS and look forward to your school's participation. Thank you for your time and for supporting this important international study.

[Name of State Coordinator]

NAEP State Coordinator

Enclosures

CC: [District Test Coordinator]

NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). All of the information provided by your staff and students may only be used for statistical purposes and may not be disclosed or used in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

Exhibit A-5. ICILS 2018 Parent Notification Letter

SCHOOL LETTERHEAD

Please modify parts in yellow highlight before sending out to parents.

Dear Parent or Guardian,

This letter is to inform you about an important international study of student learning being conducted in our school this spring. The International Computer and Information Literacy Study (ICILS) provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. The United States will participate for the first time in the spring of 2018.

Our school has accepted an invitation from the National Center for Education Statistics (NCES), part of the U.S. Department of Education, to participate in the ICILS main study. Thirty of our 8th grade students will take part. The enclosed summary sheet provides some background information about ICILS, explains what is involved for each student selected to participate in the study, and gives a contact phone number and e-mail address where you can find answers to any questions you might have.

To have an accurate picture of U.S. 8th graders' computer and information literacy, it is important that each student selected takes part in the study. In addition to answering computer and information literacy questions, students will be asked to complete a brief questionnaire about themselves. Although participation in this study is entirely voluntary, I urge you to support this effort by encouraging your child to take part. Previous experience suggests that students actually enjoy taking part, and participating students will receive a small gift, which we think they will like.

All of the information collected is safeguarded, as required by law. NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Under that law, the data provided by schools, staff, and students may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Students and schools are never identified in any reports. All reported statistics refer to the United States as a whole.

Thank you for taking the time to learn about this important study.

Sincerely,

[School official]

Enclosures:

Facts for Parents about the ICILS Main Study

Exhibit A-6. ICILS 2018 Parent Notification Letter—Spanish

SCHOOL LETTERHEAD

Please modify parts in yellow highlight before sending out to parents.

Estimado padre/madre o tutor,

Por medio de la presente queremos informarle acerca de un importante estudio internacional que se realizará en nuestra escuela esta primavera acerca del aprendizaje de los estudiantes. El Estudio Internacional de Alfabetización Computacional y Manejo de Información (ICILS, por sus siglas en inglés) brinda la oportunidad única de comparar los conocimientos básicos de informática y medios de información, así como el acceso y uso de tecnología de los estudiantes de 8° grado en Estados Unidos con las habilidades de los estudiantes en otros países del mundo. El ICILS se creó internacionalmente como respuesta al uso creciente de tecnologías de la información y la comunicación (TIC) en la sociedad moderna y la necesidad de los ciudadanos de desarrollar las habilidades relevantes con el fin de poder participar efectivamente en la era digital. El ICILS se administró primero a nivel internacional en el 2013, en 21 sistemas educativos, y se volverá a administrar en el 2018. Estados Unidos participará por primera vez en la primavera de 2018.

Nuestra escuela ha aceptado una invitación del Centro Nacional de Estadísticas de la Educación (NCES, por sus siglas en inglés), parte del Departamento de Educación de Estados Unidos, para participar en el estudio piloto del ICILS. En nuestra escuela participarán treinta alumnos de 8° grado. El resumen adjunto ofrece información de trasfondo de ICILS, explica lo que implica la participación en el estudio para cada estudiante seleccionado e incluye un número de teléfono y un correo electrónico de contacto donde usted podrá encontrar respuestas a cualquier pregunta que tenga.

Para tener una imagen precisa de los conocimientos básicos de informática y medios de información de lo que los estudiantes de 8° grado en Estados Unidos, es importante que cada estudiante seleccionado participe en el estudio. Además de contestar las preguntas sobre conocimientos básicos de informática y medios de información, a los estudiantes se les pedirá que contesten un cuestionario corto acerca de ellos mismos. A pesar de que la participación en este estudio es completamente voluntaria, quisiéramos pedirle que apoye esta iniciativa animando a su hijo a participar. Las experiencias anteriores sugieren que los estudiantes disfrutaron de la participación. Además, los estudiantes que participen recibirán un pequeño regalo que creemos les gustará.

Toda la información que se reúna está protegida, como lo exige la ley. NCES está autorizado a realizar este estudio de acuerdo con la Ley de reforma de ciencias de la educación de 2002 (ESRA, 2002, Código de Estados Unidos, Título 20, Sección 9543). Según esa ley, la información proporcionada por las escuelas, el personal y los estudiantes únicamente se puede usar con fines estadísticos y no se puede dar a conocer ni usar de alguna manera que pueda identificar a los participantes para ningún otro fin, excepto cuando lo exige la ley (Código de Estados Unidos, Título 20, Sección 9573 y Título 6, Sección 151). En los informes nunca se identifica ni a los estudiantes ni a las escuelas. Todas las estadísticas publicadas se refieren a Estados Unidos en conjunto.

Gracias por tomarse el tiempo de informarse acerca de este importante estudio.

Atentamente,

[School Official]

Se adjuntan los siguientes documentos:

Información para los padres acerca del estudio piloto del ICILS

Exhibit A-7. ICILS 2018 Implicit Consent Letter

SCHOOL LETTERHEAD

Dear Parent or Guardian,

This letter is to inform you about an important international study of student learning being conducted in our school this spring. The International Computer and Information Literacy Study (ICILS) provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. The United States will participate for the first time in the spring of 2018.

Our school has accepted an invitation from the National Center for Education Statistics (NCES), part of the U.S. Department of Education, to participate in the ICILS main study. Thirty of our 8th grade students will take part. The enclosed summary sheet provides some background information about ICILS, explains what is involved for each student selected to participate in the study, and gives a contact phone number and e-mail address where you can find answers to any questions you might have.

To have an accurate picture of U.S. 8th graders' computer and information literacy, it is important that each student selected takes part in the study. In addition to answering computer and information literacy questions, students will be asked to complete a brief questionnaire about themselves. Although participation in this study is entirely voluntary, I urge you to support this effort by encouraging your child to take part. Previous experience suggests that students actually enjoy taking part, and participating students will receive a small gift, which we think they will like.

All of the information collected is safeguarded, as required by law. NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Under that law, the data provided by schools, staff, and students may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Students and schools are never identified in any reports. All reported statistics refer to the United States as a whole.

If you have any objection to your child joining in the ICILS activities, please let us know by completing the attached consent form and returning it to the school.

Thank you for taking the time to learn about this important study.

Sincerely,

[School Official]

Enclosures:

Facts for Parents about the ICILS Main Study

Parent/Guardian Consent Form

Exhibit A-8. ICILS 2018 Implicit Consent Form

International Computer and Information Literacy Study (ICILS)

Main Study

Parent/Guardian Consent Form

Your child has been asked to participate in an international study of student learning called the International Computer and Information Literacy Study (ICILS). Each student who participates will receive a small gift.

The student assessment will be administered by a team of researchers from Westat, on behalf of the National Center for Education Statistics (NCES).

If you grant permission for your child to participate in the 2018 ICILS, you do not need to return this form.

If you do not consent to your child's participation in the 2018 ICILS, please return this form to your child's school as soon as possible.

I do not grant permission for my child, _____, to participate in the International Computer and Information Literacy Main Study.

_____
(Signature of parent or guardian)

Date of signature: ____/____/____

PLEASE PRINT:

Student name: _____

School name: _____

FOR OFFICE USE ONLY:

Student ID: _____

Exhibit A-9. ICILS 2018 Explicit Consent Letter

SCHOOL LETTERHEAD

Dear Parent or Guardian,

This letter is to inform you about an important international study of student learning being conducted in our school this spring. The International Computer and Information Literacy Study (ICILS) provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. The United States will participate for the first time in the spring of 2018.

Our school has accepted an invitation from the National Center for Education Statistics (NCES), part of the U.S. Department of Education, to participate in the ICILS main study. Thirty of our 8th grade students will take part. The enclosed summary sheet provides some background information about ICILS, explains what is involved for each student selected to participate in the study, and gives a contact phone number and e-mail address where you can find answers to any questions you might have.

To have an accurate picture of U.S. 8th graders' computer and information literacy, it is important that each student selected takes part in the study. In addition to answering computer and information literacy questions, students will be asked to complete a brief questionnaire about themselves. Although participation in this study is entirely voluntary, I urge you to support this effort by encouraging your child to take part. Previous experience suggests that students actually enjoy taking part, and participating students will receive a small gift, which we think they will like.

All of the information collected is safeguarded, as required by law. NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Under that law, the data provided by schools, staff, and students may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Students and schools are never identified in any reports. All reported statistics refer to the United States as a whole.

Before we can allow your child to join in the ICILS activities, we must have your written consent. Please let us know by completing the attached form and returning it to the school.

Thank you for taking the time to learn about this important study and to consider your child's participation in it.

Sincerely,

[School Official]

Enclosures:

Facts for Parents about the ICILS Main Study
Parent/Guardian Consent Form

Exhibit A-10. ICILS 2018 Explicit Consent Form

International Computer and Information Literacy Study (ICILS)

Main Study

Parent/Guardian Consent Form

Your child has been asked to participate in an international study of student learning called the International Computer and Information Literacy Study (ICILS). Each student who participates will receive a small gift.

The student assessment will be administered by a team of researchers from Westat, on behalf of the National Center for Education Statistics (NCES).

☐ Yes I grant permission for my child to participate in the 2018 ICILS.

☐ No, I do not grant permission for my child to participate in the 2018 ICILS.

(Signature of parent or guardian)

Date of signature: ____/____/____

PLEASE PRINT:

Student name: _____

School name: _____

FOR OFFICE USE ONLY:

Student ID: _____

Exhibit A-11. ICILS 2018 Facts for Parents

Facts for Parents About ICILS

Between March and May of this year, your child's school will be one of about 300 nationwide taking part in the 2018 International Computer and Information Literacy Study (ICILS). The schools were selected randomly to represent the nation's schools with eighth-grade students. Within each school, eighth-grade students were selected randomly to represent the nation's eighth-graders, and your child was among those students selected to take part in ICILS.

What is ICILS?

The International Computer and Information Literacy Study (ICILS) is an international assessment that measures student computer and information literacy. ICILS provides a unique opportunity to compare U.S. eighth-grade students' computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. Along with more than 15 other nations, the U.S. will take part in the 2018 ICILS cycle. The National Center for Education Statistics (NCES) within the U.S. Department of Education conducts ICILS in the United States.

What is involved?

ICILS staff will visit the school and administer the study. The main assessment will take approximately 3 hours and include a questionnaire that asks students about themselves and their educational experiences.



What are the benefits?

The nation as a whole benefits from ICILS by having a greater understanding of how the computer and information literacy knowledge and skills of U.S. eighth-graders compare with eighth-graders from other countries. Schools that participate in ICILS will receive \$200, and each student who participates will receive a small gift.

Who administers ICILS?

The entire assessment is administered by trained staff from Westat, a research organization under contract to the U.S. Department of Education's National Center for Education Statistics (NCES).

All of the information collected is safeguarded, as required by law. NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Under that law, the data provided by schools, staff, and students may be used only for statistical purposes and may not be disclosed or used in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Students and schools are never identified in any reports. All reported statistics refer to the United States as a whole.

Where can I find out more about ICILS?

More information about ICILS is available at the ICILS website at <https://nces.ed.gov/surveys/icils>. If you wish to contact an ICILS staff member directly, please feel free to call the ICILS U.S. home office at 1-855-445-5604 or email us at icils@westat.com.



Exhibit A-11. ICILS 2018 Facts for Parents—Continued

Facts for Parents About ICILS 2018

Between March and May of this year, your child’s school will be one of about 300 nationwide taking part in the 2018 International Computer and Information Literacy Study (ICILS). The schools were selected randomly to represent the nation’s schools with eighth-grade students. Within each school, eighth-grade students were selected randomly to represent the nation’s eighth-graders, and your child was among those students selected to take part in ICILS.

What is ICILS?

The International Computer and Information Literacy Study (ICILS) is an international assessment that measures student computer and information literacy. ICILS provides a unique opportunity to compare U.S. eighth-grade students’ computer and information literacy skills and access to and use of technology with that of their peers in countries around the world. ICILS was developed internationally as a response to the increasing use of information and communication technology in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. Along with more than 15 other nations, the U.S. will take part in the 2018 ICILS cycle. The National Center for Education Statistics (NCES) within the U.S. Department of Education conducts ICILS in the United States.

What is involved?

ICILS staff will visit the school and administer the study. The main assessment will take approximately 3 hours and include a questionnaire that asks students about themselves and their educational experiences.

What are the benefits?

The nation as a whole benefits from ICILS by having a greater understanding of how the computer and information literacy knowledge and skills of U.S. eighth-graders compare with eighth-graders from other countries. Schools that participate in ICILS will receive \$200, and each student who participates will receive a small gift.

Who administers ICILS?

The entire assessment is administered by trained staff from Westat, a research organization under contract to the U.S. Department of Education’s National Center for Education Statistics (NCES).

All of the information collected is safeguarded, as required by law. NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Under that law, the data provided by schools, staff, and students may be used only for statistical purposes and may not be disclosed or used in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Students and schools are never identified in any reports. All reported statistics refer to the United States as a whole.

Where can I find out more about ICILS?

More information about ICILS is available at the ICILS website at <https://nces.ed.gov/surveys/icils>. If you wish to contact an ICILS staff member directly, please feel free to call the ICILS U.S. home office at 1-855-445-5604 or e-mail us at icils@westat.com.

OMB # 1850-0929 (Expires 12/30/2020)
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Appendix B

ICILS 2018 Informational Materials

APPENDIX B. ICILS 2018 INFORMATIONAL MATERIALS

Exhibit B-1. ICILS 2018 Brochure..... B-2

Exhibit B-2. ICILS 2018 FAQ..... B-6

Exhibit B-3. ICILS 2018 Summary of School Activities B-10

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List B-14

Exhibit B-5. ICILS 2018 Instructions for Submitting Teacher List..... B-20

Exhibit B-1. ICILS 2018 Brochure



Participating countries and other education systems in ICILS 2018

- Canada (Alberta)
- Chile
- Denmark
- Finland
- France
- Germany
- Italy
- Kazakhstan
- Korea
- Luxembourg
- Portugal
- Russian Federation (Moscow)
- Uruguay
- United States



NCES is authorized to conduct ICILS under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Information collected will help the U.S. Department of Education's ongoing efforts to benchmark student achievement in the United States. Participation is voluntary. All of the information you provide may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). The U.S. Office of Management and Budget has approved the data collection under OMB# 1850-0929 (Expires 8/31/2019). Individual responses will be combined with those from other participants to produce summary statistics and reports.



49318.0517



International Computer and Information Literacy Study

2018

Exhibit B-1. ICILS 2018 Brochure—Continued



What is ICILS?

The International Computer and Information Literacy Study (ICILS) is an international assessment designed to measure computer and information literacy skills at the eighth grade, student experience with technology, as well as school and teacher policies, resources and practices related to the use of technology in the classroom. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. The United States will participate for the first time in spring 2018. In 2018, ICILS will involve students from about 15 countries.

ICILS is sponsored by the International Association for the Evaluation of Educational Achievement (IEA) and conducted in the United States by the National Center for Education Statistics (NCES), the U.S. Department of Education.

Why is ICILS important?

ICILS provides a unique opportunity to compare U.S. student skills and experience using technology with that of their peers in other nations, and to provide data on factors that may be associated with student computer and information literacy skills. The results inform national discussions about education, computer and information literacy, as well as international competitiveness.

ICILS provides valuable benchmark information on how U.S. students compare to students around the world, allows educators and policymakers to examine other education systems for practices that could be applied in the United States, and contributes to ongoing discussions of ways to improve the quality of education of all students.

Key findings from ICILS 2013

Findings from ICILS 2013 were published by the IEA in **Preparing for Life in a Digital Age: The IEA International Computer and Information Literacy Study International Report¹** in 2014.

Please go to this webpage to view an IEA infographic:
www.iea.nl/fileadmin/user_upload/Studies/ICILS_2013/ICILS_2013_infographic.pdf

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¹www.iea.nl/fileadmin/user_upload/Publications/Electronic_versions/ICILS_2013_International_Report.pdf

What type of assessment is ICILS?

ICILS is a computer-based assessment that contains a mix of interactive computer tasks. The assessment is developed through an international collaborative process involving input from the United States, other participating countries, and international experts in computer and information literacy and measurement. In a final step, the assessment is endorsed as suitable by all participating countries. The assessment contains small discrete tasks that take less than a minute to complete, and large interactive tasks that take 15–30 minutes. These tasks ask students to create an informational product such as a poster, presentation, or web page using digital tools such as a website builder or online database. Examples of released ICILS items are available at <http://www.iea.nl/icils-past-cycles>.

For more information, please go to:
nces.ed.gov/surveys/icils

Exhibit B-1. ICILS 2018 Brochure—Continued

Back Panel

International Computer and Information Literacy Study 2018

Participating countries and other education systems in ICILS 2018

Canada (Alberta)
Chile
Denmark
Finland
France
Germany
Italy
Kazakhstan
Korea
Luxembourg
Portugal
Russian Federation (Moscow)
Uruguay
United States

NCES Logo

NCES is authorized to conduct ICILS under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). Information collected will help the U.S. Department of Education's ongoing efforts to benchmark student achievement in the United States. Participation is voluntary. All of the information you provide may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). The U.S. Office of Management and Budget has approved the data collection under OMB# 1850-0929 (Expires 8/31/2019). Individual responses will be combined with those from other participants to produce summary statistics and reports.

49318.0517

Exhibit B-1. ICILS 2018 Brochure—Continued

Inside Panels

What is ICILS?

The International Computer and Information Literacy Study (ICILS) is an international assessment designed to measure computer and information literacy skills at the eighth grade, student experience with technology, as well as school and teacher policies, resources and practices related to the use of technology in the classroom. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems and will be administered again in 2018. The United States will participate for the first time in spring 2018. In 2018, ICILS will involve students from about 15 countries.

ICILS is sponsored by the International Association for the Evaluation of Educational Achievement (IEA) and conducted in the United States by the National Center for Education Statistics (NCES), the U.S. Department of Education.

Why is ICILS important?

ICILS provides a unique opportunity to compare U.S. student skills and experience using technology with that of their peers in other nations, and to provide data on factors that may be associated with student computer and information literacy skills. The results inform national discussions about education, computer and information literacy, as well as international competitiveness.

ICILS provides valuable benchmark information on how U.S. students compare to students around the world, allows educators and policymakers to examine other education systems for practices that could be applied in the United States, and contributes to ongoing discussions of ways to improve the quality of education of all students.

What type of assessment is ICILS?

ICILS is a computer-based assessment that contains a mix of interactive computer tasks. The assessment is developed through an international collaborative process involving input from the United States, other participating countries, and international experts in computer and information literacy and measurement. In a final step, the assessment is endorsed as suitable by all participating countries. The assessment contains small discrete tasks that take less than a minute to complete, and large interactive tasks that take 15–30 minutes. These tasks ask students to create an informational product such as a poster, presentation, or web page using digital tools such as a website builder or online database. Examples of released ICILS items are available at <http://www.iea.nl/icils-past-cycles>.

Key findings from ICILS 2013

Findings from ICILS 2013 were published by the IEA in *Preparing for Life in a Digital Age: The IEA International Computer and Information Literacy Study International Report*¹ in 2014.

Please go to this webpage to view an IEA infographic:

www.iea.nl/fileadmin/user_upload/Studies/ICILS_2013/ICILS_2013_infographic.pdf

¹www.iea.nl/fileadmin/user_upload/Publications/Electronic_versions/ICILS_2013_International_Report.pdf

Exhibit B-2. ICILS 2018 FAQ

Frequently Asked Questions



What is ICILS?

The International Computer and Information Literacy Study (ICILS) is an international assessment and research project designed to measure trends in computer and information literacy at the eighth-grade level as well as school and teacher practices related to instruction. ICILS provides a unique opportunity to compare U.S. student skills and experience using technology with that of their peers in other nations, and to provide data on factors that may influence student computer and information literacy skills. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems. ICILS 2018, the second study in the series, will involve students from about 15 countries. The United States will participate for the first time in spring 2018.

Why was my school selected for participation?

Schools of varying demographics and locations were randomly selected so that the U.S. sample is representative of the overall U.S. school population. The random selection process is important for ensuring that a country's sample accurately reflects its schools and, therefore, can be compared fairly with samples of schools from other countries.

Why should my school and students participate?

ICILS informs national discussions about student skills, education policy, and international competitiveness. It is important for selected schools to participate because they represent similar U.S. schools across the country. When students participate and give their best effort, ICILS gets the most accurate measure possible of student achievement in the U.S. to compare with other countries.

Will all our eighth-grade students be asked to participate?

No. Only up to 30 randomly selected students will be asked to participate.

Who conducts the ICILS assessment?

The entire assessment process will be carried out by trained staff from Westat, a research organization under contract with the National Center for Education Statistics (NCES) in the U.S. Department of Education. NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543) and approval of the U.S. Office of Management and Budget under OMB# 1850-0929 (Expires 8/31/2019).

How are the teacher and school questionnaires administered?

The teacher and school questionnaires are administered online from a secure website. Teacher questionnaires take about 30 minutes to complete and ask teachers questions about school and classroom contexts for information and communication technology learning, use of information and communication technology for teaching and learning, and teacher views on and confidence in using computers. There are two school questionnaires: a 15-minute principal questionnaire and a 15-minute information and computer technology (ICT) coordinator questionnaire. If there is no ICT coordinator, then the principal or principal designee completes the ICT questionnaire.

faq

Exhibit B-2. ICILS 2018 FAQ—Continued

Do teachers need to help administer the assessment?

No, Westat ICILS staff will visit the school on the day of the assessment, bringing with them all the materials and equipment required. These field staff will administer the assessments to students.

When will the assessment be conducted?

The assessment will be conducted between March and May, 2018. Each school will be notified of its scheduled assessment date in summer/fall 2017. Westat ICILS staff will work with schools to identify an alternate date should there be a conflict on that date.

Where will the assessment be conducted?

The assessment will be conducted in the schools that are selected to participate.

How long does the assessment take?

The assessment will take approximately 3 hours, including time for directions.

What will happen with the collected data?

The data from the assessment will be used to evaluate how the knowledge and skills of U.S. students compare to those of their peers in other participating countries. All of the information you provide may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Reports of the findings from the assessment will not identify participating districts, schools, students, or individual staff. Individual responses will be combined with those of other participants to produce summary statistics and reports.

Are schools required by federal law to participate?

No. School participation is voluntary. However, we hope you will participate in this study so that students like those in your school are accurately and fairly represented.

What are the benefits?

The nation as a whole benefits from ICILS by having a greater understanding of how computer and information literacy knowledge and skills of U.S. eighth-graders compare with eighth-graders from other countries. To thank participating schools and individuals for their time and effort, we offer tokens of appreciation: schools that participate in ICILS will receive \$200 and the school coordinator (staff person designated to assist with the study) will receive \$100. Teachers who complete a survey will receive \$20, and each student who participates will receive a small gift.

Where can I find more information about ICILS?

Visit the ICILS website at <http://nces.ed.gov/surveys/icils>.

For questions about ICILS 2018, contact the ICILS information hotline at 1-855-445-5604 or by email at icils@westat.com



Exhibit B-2. ICILS 2018 FAQ—Continued

What is ICILS?

The International Computer and Information Literacy Study (ICILS) is an international assessment and research project designed to measure trends in computer and information literacy at the eighth-grade level as well as school and teacher practices related to instruction. ICILS provides a unique opportunity to compare U.S. student skills and experience using technology with that of their peers in other nations, and to provide data on factors that may influence student computer and information literacy skills. ICILS was developed internationally as a response to the increasing use of information and communication technology (ICT) in modern society and the need for citizens to develop relevant skills in order to participate effectively in the digital age. ICILS was first administered internationally in 2013 in 21 education systems. ICILS 2018, the second study in the series, will involve students from about 15 countries. The United States will participate for the first time in spring 2018.

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How are the teacher and school questionnaires administered?

The teacher and school questionnaires are administered online from a secure website. Teacher questionnaires take about 30 minutes to complete and ask teachers questions about school and classroom contexts for information and communication technology learning, use of information and communication technology for teaching and learning, and teacher views on and confidence in using computers. There are two school questionnaires: a 15-minute principal questionnaire and a 15-minute information and computer technology (ICT) coordinator questionnaire. If there is no ICT coordinator, then the principal or principal designee completes the ICT questionnaire.

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Exhibit B-2. ICILS 2018 FAQ—Continued

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When will the assessment be conducted?

The assessment will be conducted between March and May, 2018. Each school will be notified of its scheduled assessment date in summer/fall 2017. Westat ICILS staff will work with schools to identify an alternate date should there be a conflict on that date.

Where will the assessment be conducted?

The assessment will be conducted in the schools that are selected to participate.

How long does the assessment take?

The assessment will take approximately 3 hours, including time for directions.

What will happen with the collected data?

The data from the assessment will be used to evaluate how the knowledge and skills of U.S. students compare to those of their peers in other participating countries. All of the information you provide may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Reports of the findings from the assessment will not identify participating districts, schools, students, or individual staff. Individual responses will be combined with those of other participants to produce summary statistics and reports.

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U.S. Department of Education Logo

IEA Logo

IES Logo

OMB# 1850-0929 (Expires 8/31/2019)

Exhibit B-3. ICILS 2018 Summary of School Activities

The graphic features a red background with a large white hand icon pointing upwards. The hand contains the IEA logo and the IES logo. To the left of the hand is a circular inset showing a smiling boy with a tablet. To the right is a circular inset showing students at computers. The top right corner has the ICILS USA logo. The bottom right corner has the text 'International Computer and Information Literacy Study' and '2018'. The bottom left corner has small text: 'OMB# 1850-0529 (Expires 8/31/2019)'.

DEPARTMENT OF EDUCATION
UNITED STATES OF AMERICA

For additional information,
go to nces.ed.gov/surveys/icils

ICILS^{USA}

IEA

ies NATIONAL CENTER FOR
EDUCATION STATISTICS

International
Computer and
Information
Literacy Study

2018

OMB# 1850-0529
(Expires 8/31/2019)

49338 0517

Exhibit B-3. ICILS 2018 Summary of School Activities—Continued

SUMMARY OF SCHOOL ACTIVITIES: ICILS 2018				
	Fall 2017	January-March 2018 Prior to Assessment Day	March-May 2018 Assessment Day	Benefits
Principal	Designate a school coordinator	- Complete a brief online school questionnaire on the characteristics of the school, its enrollment, resources, policies, and learning environment - Share the importance of participation in the study with school staff	- Support assessment day activities - Encourage students to participate and do their best on the assessment	- Represent other similar U.S. schools - Receive a \$200 check for the school
School coordinator	Confirm an assessment date convenient for your school	- Arrange the day and location for the ICILS assessment - Confirm dates and location with Westat ICILS staff - Provide teacher lists and student lists through the online MyICILS portal - Notify selected teachers, selected students, and students' parents of the study and benefit of participating - Work with Westat ICILS staff to identify students with special needs - Coordinate the principal's completion of the school questionnaire - Coordinate the teachers' completion of the teacher questionnaires - Coordinate the ICT coordinator's completion of the ICT questionnaire - Collect parental consent forms where required and submit to Westat ICILS staff	- Confirm space is appropriate for the assessment - Ensure all sampled students attend the assessment session - Meet with Westat ICILS staff and provide feedback about the assessment process - Collect completed school, ICT coordinator, and teacher questionnaires (if not completed online) and give to Westat ICILS staff	Receive a \$100 check
Selected teachers		Complete online teacher questionnaire		- Represent U.S. teachers in the international study results - Receive \$20
ICT coordinator		Complete online ICT coordinator questionnaire		
Selected students			Attend the assessment session, complete the assessment and student questionnaire	- Represent the United States in the international study - Receive a small thank-you gift
Westat ICILS staff	- Work with the school to set an assessment date - Help school coordinator with assessment details and logistics - Protect school and student confidentiality	- Call the school coordinator to discuss assessment day location and student participation - Select student sample and notify school of selected students	- Administer assessment from start to finish - Furnish all the assessment equipment and materials, including tablets, keyboards and mice - Meet with the school coordinator to debrief at the end of the assessment - Maintain security of all materials	Ensure quality and uniformity of data collected across the United States

Exhibit B-3. ICILS 2018 Summary of School Activities—Continued

Summary of School Activities: ICILS 2018 Main Study				
	Fall 2017	January-March 2018 Prior to Assessment Day	March-May 2018 Assessment Day	Benefits
Principal	Designate a school coordinator	- Complete a brief online school questionnaire on the characteristics of the school, its enrollment, resources, policies, and learning environment - Share the importance of participation in the study with school staff	- Support assessment day activities - Encourage students to participate and do their best on the assessment	- Represent other similar U.S. schools - Receive a \$200 check for the school
School coordinator	Confirm an assessment date convenient for your school	- Arrange the day and location for the ICILS assessment - Confirm dates and location with Westat ICILS staff - Provide teacher lists and student lists through the online MyICILS portal - Notify selected teachers, selected students, and students' parents of the study and benefit of participating - Work with Westat ICILS staff to identify students with special needs - Coordinate the principal's completion of the school questionnaire - Coordinate the teacher's completion of the teacher questionnaire - Collect parental consent forms where required and submit to Westat ICILS staff	- Confirm space is appropriate for the assessment - Ensure all sampled students attend the assessment session - Meet with Westat ICILS staff and provide feedback about the assessment process - Collect complete school, ICT coordinator, and teacher questionnaires (if not completed online) and give to Westat ICILS staff	Receive a \$100 check
Selected Teachers		Complete online teacher questionnaire		- Represent U.S. teachers in the international study results - Receive \$20

Exhibit B-3. ICILS 2018 Summary of School Activities—Continued

Summary of School Activities: ICILS 2018 Main Study				
	Fall 2017	January-March 2018 Prior to Assessment Day	March-May 2018 Assessment Day	Benefits
Selected Students			• Attend the assessment session, complete the assessment and student questionnaire	• Represent the United States in the international study • Receive a small thank-you gift
Westat ICILS staff	• Work with the school to set an assessment date • Help school coordinator with assessment details and logistics • Protect school and student confidentiality	• Call the school coordinator to discuss assessment day location and student participation • Select student sample and notify school of selected students	• Administer assessment from start to finish • Furnish all the assessment equipment and materials, including tablets, keyboards and mice • Meet with the school coordinator to debrief at the end of the assessment • Maintain security of all materials	• Ensure quality and uniformity of data collected across the United States

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List

ICILS needs a complete and current list of **all students in grade 8** in order to draw a random sample of students to participate in the assessment. Your student data electronic file (E-File) must be submitted as a Microsoft Excel file.

You may use one of the **ICILS Excel Templates** (located in **Documents** on [MyICILS Website] and described below) or you may provide an Excel file with the same information. If you cannot submit your student data with this information in an Excel file, please call or e-mail the ICILS Help Desk at ICILS@westat.com or 1-855-445-5604.

Step 1 – Compile Data in an Excel File

Prepare an Excel file with the following data elements for all students in **grade 8**.

Data Element	Description
Student Name	The preferred format is First Name, Middle Name (or Initial), and Last Name in separate columns. However, TIMSS will accept student names in one column.
Class Name	Name of homeroom class student is in. If your school does not have homeroom, please use English/Language Arts class. The class name must be a class that is mutually exclusive and exhaustive, i.e., each 8 th grader belongs to one and only one of these classes.
Sex	Codes (numeric or text) for Male/Female
Date of Birth	The preferred format is Month of Birth and Year of Birth in separate columns. However, TIMSS will accept Date of Birth in one column.
Student with a Disability (SD) Status	School-defined codes for: 1=Yes, student has disability and/or IEP 2=No, student does not have disability or IEP
English Language Learner (ELL) Status	School-defined codes for: 1=Yes, student is ELL 2=No, student is formerly ELL 3=No, student is not ELL

You may use one of the templates provided or create your own Excel file with these data for each student. It is preferred that you include column headers as the first row in your E-File, as in these templates. However, E-Files without column headers will be accepted.

Template 1 has student name in one column, and date of birth in one column.

C	D	E	F	G
Student Name	Sex	Date of Birth	Student with a Disability Status	English Language Learner Status

Template 2 has student name in three separate columns, and month of birth and year of birth in two separate columns.

C	D	E	F	G	H	I	J
Student First Name	Student Middle Name or Initial	Student Last Name	Sex	Month of Birth	Year of Birth	Student with a Disability Status	English Language Learner Status

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List—Continued

Tips for ensuring the E-File process goes smoothly:

- Use the template or provide column headers if you are using your own file. Student information should begin on the second row. There should be no empty rows within the student data.
- Be sure to give your file a unique, descriptive name. Within Excel, click on *File*, then *Save As*, and give your file a name such as “Your School Name ICILS 2018 Grade 8 Students.xls.”
- The first row of data in your file will be read as the column header unless you indicate otherwise on the **Submit Student List** webpage. Each succeeding row will be considered a student record.
- There should be only one worksheet with data in the Excel file. If there are other worksheets, they must not contain any data.
- Do not provide any other student information.

Step 2 – Upload Your Excel File

Once your file is prepared and checked for accuracy and completeness, login to www.MyICILS.com and select “Submit Student List” from the left-hand menu.

Filename Filesize Uploaded Uploaded By

Once you have submitted an E-File, the file's information will appear under these headings, as shown in the box below

Does your student data file contain [column headers](#): Yes ▾ The e-Filing system needs to know if the first row of the file contains headings

New file: TIMSS Gr 8 test efile one col.xlsx You can type in the file name or use "Browse" to find the file on your computer

[Click here to go to the next step](#)

Click **browse** to look for your completed file and then click **upload**. It is recommended you use an excel file with column headers in them.

Step 3 – Identify Your Columns

We need to know what information is in each column of your student data file (E-File). If you provided column headers in your E-File (preferred), they are displayed in **Column Heading Is** in the table. If you did not provide column headers, **Column Heading Is** will contain numbers for each column in your submitted E-File. Click on the down arrows in **Your Column Contains** to select descriptions for each column header. If there is no appropriate description in the drop-down list, please select N/A. *(If you do not see this screen below, please click on the link with your file name on the submit student list page to access this screen).*

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List—Continued

Column Heading Is	Your Column Contains
Student First Name (list only the 8th-grade students in this 8th	Student Name: First ▼
Student Middle Name	Student Name: Middle ▼
Student Last Name	Student Name: Last ▼
Class Name (Name of homeroom class student is in# If your school	Class ▼
Sex	Sex ▼
Month of Birth	Birth Date: Month of Birth ▼
Year of Birth	Birth Date: Year of Birth ▼
Student with a Disability status __ (1=Yes, student has disabilit	Students with a Disability Status ▼
English Language Learner status_ (1=Yes, student is ELL__2=No, st	English Language Learner Status ▼

Select *Next* after all columns have been identified.

Step 4 – Match Your Values to ICILS Codes

ICILS also needs to know the values for some of the columns in your E-File. The tables contain the following information for each column:

- Your Values: The values in your E-File
- Codes: Click on the down arrow and select the ICILS Code that best matches Your Values
- Number: The number of students in your E-File with that value
- Percentage: The percentage in your E-File with that value

Before proceeding to each next page, make sure the uploaded data agrees with the data you entered into the Excel spreadsheet. If there is an error in your data file, exit the site, correct the problem in your Excel file, and upload a new file again.

- Update **Birth** Codes by selecting the appropriate code for each of your excel file values. *If you included DOB in only one column, you will see this screenshot below. If not and you had MOB and YOB in separate columns, please go to next the screenshot showing gender codes.* (ICILS prefers just MOB and YOB only though in separate columns).

You can use the “Update all codes” drop-down field to update every value in the table.

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List—Continued

Date of Birth - Column 1 of 4

Update All Codes:

Your Values	Codes	Number	Percentage
10/1/1999 12:00:00 AM	Select Code ▼	1	12.5%
11/2/2000 12:00:00 AM	Select Code ▼	1	12.5%
4/21/2000 12:00:00 AM	Select Code ▼	1	12.5%
4/21/2003 12:00:00 AM	Select Code ▼	1	12.5%
4/21/3000 12:00:00 AM	Select Code ▼	1	12.5%

b. Update **Gender** Codes by selecting the appropriate code for each of your excel file values. In the example below, this example school uses a value of “1” for Females and “2” for “Males.” Select the codes that is applicable for your own school.

If there is an error in your data file, exit E-File, correct the problem in your Excel file, and upload the file again.

Sex - Column 2 of 4

Your Values	Codes	Number	Percentage
1	Female ▼	3	37.5%
2	Male ▼	5	62.5%

c. Update the **Student with a Disability** Codes. In the example below, this example school uses a value of “1” for “No, not SD” and “2” for “Yes, IEP.” Select the codes that is applicable for your own school.

If there is an error in your data file, exit E-File, correct the problem in your Excel file, and upload the file again.

Student with a Disability - Column 3 of 4

Your Values	Codes	Number	Percentage
1	No, not SD ▼	6	75%
2	Yes, IEP ▼	2	25%

d. Update the English Language Learner Codes. In the example below, this example school uses a value of “1” for “Yes, ELL,” “2” for “No, Formerly ELL, and “3” for “No, not ELL.”

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List—Continued

English Language Learner - Column 4 of 4

Your Values	Codes	Number	Percentage
1	Yes, ELL ▼	1	16.67%
2	No, Formerly ELL (and monitored for AYP reporting) ▼	1	16.67%
3	No, not ELL ▼	4	66.67%

[Previous](#) [Next](#)

If there is an error in your data file, exit the site, correct the problem in your Excel file, and upload a new file again.

Step 5 – Verify Your E-File

The table in this section summarizes the information you have provided on your student list (E-File). Please review this summary and verify that the information is correct. *Total Enrollment* at the bottom of the table should match the number of students in your E-File, and the total number of students currently enrolled in grade 8.

Exhibit B-4. ICILS 2018 Instructions for Submitting Student List—Continued

Verify Your Student E-File

The table below summarizes the information you have provided on your student list (Student E-File). The bottom of the table should match the number of students in your E-File, and the total number of

Record whether the information is correct or incorrect by selecting the appropriate button at the bottom of the page. If you select INCORRECT, you will need to correct your E-File and resubmit it.

	Number	Percentage
Date of Birth		
DMY	8	100%
Sex		
Male	5	62.5%
Female	3	37.5%
Student with a Disability		
Yes, IEP	2	25%
No, not SD	6	75%
English Language Learner		
Yes, ELL	3	37.5%
No, not ELL	5	62.5%
Total Enrollment:	8	

- ☒ Information is **CORRECT and CURRENT**.
☐ Information is **INCORRECT**.

[Previous](#) [Submit](#)

Record whether the information is correct or incorrect by selecting the appropriate button at the bottom of the page. Then click the *Submit* button. If you select INCORRECT, you will need to correct your E-File and resubmit it.

After submitting Your information as Correct, you can also see your column mappings again by clicking your file name link on the Submit Student List main page (example shown below).

Filename	Filesize	Uploaded
ICILS 2018 Student List Template 1.xlsx	11887	1/23/2018 10:34:46 AM

Does your student data file contain [column headers](#): [Yes](#) ▼

New file: [Choose File](#) No file chosen

[Upload](#)

Once you have finished submitting student lists, please submit **Teacher Lists** by going to the “Submit Teacher List.” After submitting both **Student** and **Teacher** lists, we will send you an e-mail within 5-10 business days of selected students and teachers. You do not have to go to the **Prepare for Assessment** Section in www.mycils.com until after you receive that e-mail. **If you need assistance, please contact the ICILS Help Desk at ICILS@westat.com or 1-855-445-5604.**

Exhibit B-5. ICILS 2018 Instructions for Submitting Teacher List

ICILS 2018 Main Study Instructions for Submitting the Teacher List

In addition to a student list, ICILS needs a complete and current list of **all your school's eighth-grade teachers** in order to select a random sample to complete the teacher questionnaire. This list should include all teachers that are teaching regular school subjects (in the eighth-grade curriculum) to eighth-grade students (regardless of the subject or the number of hours taught) during the ICILS testing period and since the beginning of the school year. This list should include all teachers who teach a class considered to be a part of the 8th-grade curriculum. If electives (such as Band, Visual Arts, or Gym) are part of the 8th-grade curriculum, please include teachers who teach these classes too).

Step 1 – Compile Data in an Excel File

Prepare an Excel file with the following data elements for all Grade 8 Teachers.

1. Teacher Name
2. Sex (Codes numeric or text for Male/Female)
3. Subject Taught (Use Main Subject Codes for subject the teacher teaches: 1=Language Arts; 2=Social studies; 3=Mathematics & Sciences; 4=Other; 9=Missing)
4. Teacher E-mail Address (work e-mail)

Your electronic teacher data file (E-File) must be submitted as a Microsoft Excel file. You may use one of the templates provided (located under the **Documents** tab on the navigation menu on www.mycils.com) or create your own Excel file with these data for each teacher.

It is preferred that you include column headers as the first row in your E-File, as shown in these templates. However, E-Files without column headers will be accepted. If you cannot submit your teacher data with this information in an Excel file, please call or e-mail the ICILS Help Desk at ICILS@westat.com or call 1-(855)-445-5604.

Template 1 has the teacher name in one column.

	A	B	C	D
	Teacher Full Name (Do not include teachers who teach 8th-graders in a class for 7th or 9th-grade. Do not include non-staff teachers who teach (non-compulsory) subjects that are not part of the curriculum. If electives (such as Band, Visual Arts, or Gym) are part of the 8th-grade curriculum, please include teachers who teach these classes too)	Sex	Subject (1=Language Arts; 2=Social Studies; 3=Mathematics & Sciences; 4=Other; 9=Missing)	Teacher Email (work email)
1				
2				
3				

Exhibit B-5. ICILS 2018 Instructions for Submitting Teacher List—Continued

Template 2 has the teacher name in three separate columns.

	A	B	C	D	E	F
	Teacher First Name (Do not include teachers who teach 8th-graders in a class for 7th or 8th-grade. Do not include non-staff teachers who teach (non-compulsory) subjects that are not part of the curriculum. If electives (such as Band, Visual Arts, or Gym) are part of the 8th-grade curriculum, please include teachers who teach these classes too.)	Teacher Middle Name	Teacher Last Name	Sex	Subject (1=Language Arts; 2=Social Studies; 3=Mathematics & Sciences; 4=Other; 9=Missing)	Teacher Email (work email)
1						
2						
3						
4						

Additional tips:

- Use the most current enrollment information.
- Include all teachers in the list who teach eighth-grade students in an eighth-grade class, regardless of the subject or number of hours taught, and even if they also teach students in other grades.
- Print a list of the teachers you included for your future reference using the *Print* button.
- Do not provide any other teacher information.

Step 2 – Upload Your Excel File

Once your file is prepared and checked for accuracy and completeness, login to www.mycils.com and select **Submit Teacher List** from the navigation menu on the left. Username format is last name and first letter of first name.

For example, Britney Johnson's username would be johnsonb

Below is a screenshot you will see on the Submit Teacher List page that outline all data needed.

[Home](#)
[What You Need To Do](#)
[Provide School Information](#)
[Submit Student List](#)
[Submit Teacher List](#)
[Prepare for Assessment](#)
[What You Need To Know](#)
[Documents](#)
[Important Websites](#)
[Contact Us](#)

Submit Teacher List

ICILS needs a complete and current list of **all teachers who teach at least one grade 8 class** or 8th grade student in order to draw a random sample of teacher to participate in the teacher online questionnaire. Your teacher data electronic file (Teacher E-File) must be submitted as a Microsoft Excel file.

You may use the ICILS Teacher E-File Excel Template or you may provide an Excel file with the same information. Include the following information for each student:

- Teacher Name: The preferred format is First Name, Middle Name (or Initial), and Last Name in separate columns. However, ICILS will accept teacher names in one column.
- Sex: Codes for Male/Female.
- Main Subject the Teacher Teaches: 1=Language Arts; 2=Social Studies; 3=Mathematics & Sciences; 4=Other; 9=Missing.
- Teacher Email (work email)

It is preferred that you include column headers as the first row in your Teacher E-File (see templates for examples in [Documents](#)). However, E-Files without column headers will be accepted. If you cannot submit your teacher data with this information in an Excel file, please call or email the ICILS Help Desk at ICILS@westat.com or 1-855-445-5604.

Filename	Filesize	Uploaded	Uploaded By
Does your teacher data file contain <u>column headers</u> : Yes ▼			
New file: Choose File No file chosen			
Upload			

Click **browse** to look for your completed file and then click **upload**. It is recommended you use an excel file with column headers in them.

Exhibit B-5. ICILS 2018 Instructions for Submitting Teacher List—Continued

Filename	Filesize	Uploaded	Uploaded By

Does your teacher data file contain [column headers](#): Yes ▼

New file: R:\ and ICILS 2018 Template eFiles\Alaa\ICILS Teacher ListA Browse...

Upload

Step 3 – Identify Your Columns

We need to know what information is in each column of your teacher data file (E-File). If you provided column headers in your E-File (preferred), they are displayed in the **Column Heading Is** part of the table. If you did not provide column headers, **Column Heading Is** will contain numbers for each column in your submitted E-File. Click on the down arrows in **Your Column Contains** to select descriptions for each column header. If there is no appropriate description in the drop-down list, please select N/A. *(If you do not see this screen below, please click on the link with your file name on the submit teacher list page to access this screen).*

Select *Next* after all columns have been identified.

Column Heading Is	Your Column Contains
Teacher Full Name	Teacher Name ▼
Sex	Sex ▼
Subject	Subject ▼
Teacher Email (work email)	Teacher Email ▼

Previous Next

Step 4 – Match Your Values to ICILS Codes

ICILS also needs to know the values for some of the columns in your E-File. The tables contain the following information for each column:

- Your Values: The values in your E-File
- ICILS Codes: Click on the down arrow and select the ICILS Code that best matches Your Values
- Number: The number of teachers in your E-File with that value
- Percentage: The percentage in your E-File with that value

Exhibit B-5. ICILS 2018 Instructions for Submitting Teacher List—Continued

Sex - Column 1 of 1

Your Values	ICILS Codes	Number	Percentage
1	Male ▾	4	50%
2	Select Code N/A Male Female	4	50%

Step 5 – Verify Your E-File

The table in this section summarizes the information you have provided on your teacher list (E-File). Please review this summary and verify that the information is correct. *Total Enrollment* at the bottom of the table should match the number of teachers in your E-File, and the total number of teachers currently teaching in grade 8.

Record whether the information is correct or incorrect by selecting the appropriate button at the bottom of the page. Then click the *Submit* button. If you select INCORRECT, you will need to correct your E-File and resubmit it.

If you need assistance, e-mail ICILS@westat.com
or call 1-(855)-445-5604.

After submitting both **Student** and **Teacher** lists, we will send you an e-mail within 5-10 business days of selected students and teachers. You do not have to go to the **Prepare for Assessment** Section in www.mycils.com until after you receive that e-mail.

Appendix C

ICILS 2018 Field Staff Training Materials

APPENDIX C. ICILS 2018 FIELD STAFF TRAINING MATERIALS

Exhibit C-1. ICILS 2018 Test Administrator Training Agenda	C-2
Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC	C-5
Exhibit C-3. ICILS 2018 Session Script	C-11

Exhibit C-1. ICILS 2018 Test Administrator Training Agenda

Day 1: February 14, 2018 - 9:00 AM – 5:00 PM		
Session #1: Welcome to TIMSS	9:00– 9:30	• Introductions • Introduction to TIMSS and ICILS • Overview ▪ Purpose and goals ▪ Samples: classes • TA role and responsibilities
Session #2: Organizing Your Assignment and Materials	9:30– 10:15	• Checking school assignment materials • Assignment log and calendar • SCS calendar and reports • School folder • Materials from Westat and Pearson • Equipment
10:15 – 10:30 Morning Break		
Session #3: Conducting the Preassessment Call	10:30– 11:00	• Preassessment Call demo
Session #4: Exercise #1: Preassessment Call Role Play Part A	11:00– 12:00	• Role play 1
12:00 – 1:00 Lunch		
Session #4: Exercise #1: Preassessment Call Role Play Part B	1:00– 2:00	• Role play 2
Session #5: Updating Information after the Preassessment Call	2:00– 2:30	• Recording information in the school folder • Updating the SCS (demo)
Session #6: Exercise #2 – Enter Information Collected in Role Plays 1 and 2	2:30– 3:00	• Enter information in the SCS from role plays
3:00–3:15 AFTERNOON BREAK		
Session #7: Preparing Equipment and Materials for the Assessment	3:15– 3:45	• Charging the tablets • Gathering materials for the assessment
Session #8: Meet with Field Manager	3:45– 5:00	• Review school assignments • Logistics

Exhibit C-1. ICILS 2018 Test Administrator Training Agenda—Continued

Day 2: February 15, 2018 - 9:00 AM – 5:00 PM		
Session #9: Privacy and Security	9:00– 9:15	• Review equipment and materials security procedures
Session #10: Setting up for TIMSS	9:15– 10:00	• Prepare for the assessment • Set up equipment for TIMSS - demo
10:00 – 10:15 Morning Break		
Session #11: Exercise #3: Setting up the equipment for TIMSS	10:15– 11:00	• Set up equipment for TIMSS assessment
Session #12: Conducting the TIMSS Assessment	11:00– 12:00	• Review session script and timing • Preview assessment • Troubleshooting
12:00 – 1:00 Lunch		
Session #13: Setting up for ICILS	1:00– 1:30	• Prepare for the assessment • Set up the equipment for ICILS - demo
Session #14: Exercise: 4: Setting up the equipment for ICILS	1:30– 2:00	• Set up equipment for ICILS assessment
2:00 – 2:15 Afternoon Break		
Session #15: Conducting the ICILS Assessment	2:15– 5:00	• Review session script and timing • Trainees preview assessment • Troubleshooting
Day 3: February 16, 2018 - 9:00 AM – 5:00 PM		
Review of Procedures for administering ICILS and TIMSS	9:00– 9:30	• Review of procedures • Questions and Answers
Session #16: Concluding the Assessment	9:30– 10:00	• Record participation codes • Pack TIMSS student questionnaires • Clean up room • Participation codes
Session #17: Exercise 5: Recording participation codes	10:00– 10:30	• Record participation codes for training school

Exhibit C-1. ICILS 2018 Test Administrator Training Agenda—Continued

10:30 – 10:45 Morning Break		
Session #18: Uploading ICILS Data	10:45–11:15	• Uploading ICILS data - demo
Session #19: Exercise 6: Uploading ICILS Data	11:15–11:45	• Practice uploading ICILS data
11:45 – 12:45 Lunch		
Session #20: Uploading TIMSS Data	12:45–1:15	• Uploading TIMSS data - demo
Session #21: Exercise 7: Uploading TIMSS Data	1:15–1:45	• Practice uploading TIMSS data
Session #22: Updating the SCS After the Assessment	1:45–2:15	• Entering status and assessment detail into the SCS
Session #23: Exercise 8: Enter Information Postassessment	2:15–2:45	• Assessment completion in SCS
Session #24: AA Training	2:45–3:15	• Review AA training materials, exercises, and training content
3:15 – 3:30 Afternoon Break		
Session #25: Administrative Procedures	3:30–4:00	• Managing AAs • Weekly calls • FedEx accounts
Session #26: Training Wrap-up	4:00–4:30	• Complete DCIUFs and Oath of Office • Prepare FedEx boxes
Session #27: Meet with Field Manager	4:30–5:00	• Review assignment and schedules • Discuss weekly report calls

Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC

TIMSS and ICILS Preassessment Call Log/ROC

School Name and ID: _____

School Coordinator: _____

School Coordinator E-mail: _____

School Phone Number: _____

Date of Assessment: _____

Before contacting the school coordinator confirm that classes at the school have been sampled. Schools that have submitted class lists will have the Student Tracking Form in the folder. As classes are selected in the school, Westat will send the forms to you.

Student Tracking Form(s) are in the folder

Whenever possible begin contacting the school coordinator at least two weeks prior to the assessment.

Hello, this is _____ (your name) representing the *[Trends in International Mathematics and Science Study, or TIMSS/International Computer and Information Literacy Study, or ICILS]*. You were contacted by the Westat home office earlier this year to complete the sampling of the students who will be participating in *[TIMSS/ICILS]*. I am calling to confirm the student information, assessment logistics, discuss accommodations, and to answer any questions you may have.

---

1. ____ Review the **Student Tracking Form (STF)** with the school coordinator.

Talking points:

- Confirm demographic information data for each sampled student
- Record exclusions and accommodations as needed

If student IDs (rather than student names) were used on the Student Tracking Form, remind the SC that their copy of the Student Tracking Form (which includes students names) should be readily available when you arrive at the school.

Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC—Continued

2. _____ Discuss plans for notify the selected students of the assessment. Because there are breaks between assessment sections, everyone moves from section to section at the same time. Anyone who finishes a section early will need something quiet, like a book, to keep themselves occupied. When students are notified of the assessment, it will be helpful to include a note about bringing a book.

3. _____ Review parent notification procedures and receipt of consent forms if applicable. If consent is needed in the school, discuss with the SC what can be done to obtain consent.

You must collect a dated copy of the letter sent to the parents on assessment day.

4. _____ Confirm assessment day plans.

Assessment day: _____

Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC—Continued

- Confirm time, and location of the sessions. Verify whether the assessment room(s) are on the first floor, or elevator-accessible. The assessment team needs to have access to the assessment location at least one hour before the students arrive to set up the equipment and get the room ready for the students. The room must have tables or desk space for the assessment team to set up the assessment tablets.

Session Number	Time	Location	Administrator TA/AA

5. ____ Ask for directions to the school, if you need them.
6. ____ Discuss the equipment and materials you will be bringing to the school. Ask about the best location to park in relation to the assessment room, as well as the availability of loading docks, school-provided carts, or anything else that will help your team get the equipment to the assessment location.

Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC—Continued

7. ____ Ask where you should report when you arrive at the school and tell the School Coordinator that you will be arriving at least one hour before the scheduled assessment time to get your materials ready.

8. ____ Make arrangements for the SC, school principal, or classroom teacher to be available in each session to introduce you to the class.

9. ____ Review the handling of emergencies, problem situations, bathroom breaks and procedures for dismissing students at the end of the session.

10. ____ If grade 8, ask the school coordinator if the school would like Certificates of Community Service for distribution to grade 8 students.

Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC—Continued

11. _____ **For ICILS**, review the **Teacher Tracking Form** and **Questionnaire Participation Status Report**.

- Confirm teacher names and subjects on the Teacher Tracking Form
- If the status report indicates any questionnaires are outstanding, ask the school coordinator to follow-up with the school principal, technology coordinator, and/or teachers who have not completed the electronic questionnaire.

*If hard-copy questionnaires were sent to the school, let the school coordinator know that you will need to collect the completed questionnaires on assessment day.
If hard-copy questions are requested during the call send an e-mail to Pearson to request questionnaires.*

12. _____ Discuss school and school coordinator incentives.

School will receive a \$200 check for participating in the assessment.

Who should the school honorarium check be made out to? CONFIRM SPELLING OF THE NAME (SCHOOL, PRINCIPAL, ETC).

School Coordinator will receive a \$100 check for participating in the assessment.

For school coordinator honorarium, confirm the spelling of the name.

Thank the school coordinator.

Exhibit C-2. ICILS 2018 Preassessment Call Log/ROC—Continued

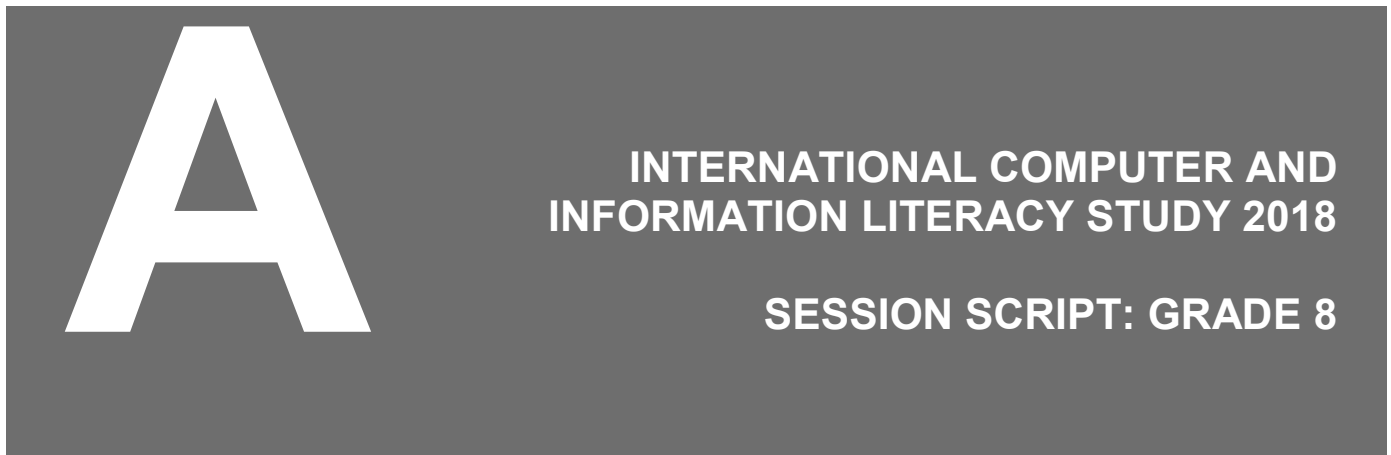
TIMSS and ICILS Preassessment Call Log/ROC

RECORD EACH CALL

Record of Contacts:

Person you spoke to	Date	Time	Outcome

Exhibit C-3. ICILS 2018 Session Script



Administering the Grade 8 ICILS Main Study Assessment

The instructions marked with the  symbol and printed in **bold** in the administration script must be read aloud to the students word for word to ensure that the testing sessions are conducted in the same way in all countries. Although you should become familiar with these instructions before the actual testing, do not attempt to memorize them. Read these instructions exactly as they are written. Comments that are not in bold are not to be read aloud. They are instructions for you only.

To begin the testing session:

- Make sure that the Session Group ID is recorded at the top of the Test Administration Form.
- Make sure each student has a login card and mouse.
- Have a drawstring backpack for display.
- Make sure that students are seated quietly, with nothing on their desks.
- Record the current time in cell (7a) of the Test Administration Form.
- Begin reading the administration script.

Exhibit C-3. ICILS 2018 Session Script—Continued

Introduction



Good morning/afternoon, everyone! My name is (YOUR NAME). This school has been chosen to take part in an important international project to help us understand what students know about, understand about and are able to do with computers. Different countries from all over the world are taking part in this study. You will be completing a series of tasks using the tablets. While I talk to you about today's test, I would like you all to be quiet, stay at your desks, and listen carefully.

EXCEPT IN INDIANA AND APPLICABLE SCHOOLS NOTED IN THE SCS: say:



At the conclusion of this session I will give each of you an ICILS drawstring backpack (SHOW BACKPACK) for your participation and trying your best in this important study.



If you still have any schoolbooks or other materials—for example, a ruler—on your desk, please put them away. All electronic devices, such as cell phones, calculators, tablets, portable computers, and photo or video cameras, must be turned off and stored away for the duration of the test administration.



On your keyboard there is a Student Login Card with a label with your name on it.

Hold up sample login card.



Now, look at the information on the label on the login card. If the card does not have your name on it, please raise your hand.

Assist students with incorrect login cards.

Collect all login cards meant for absent students.



Now, place the login card to the left of your tablet. Make sure that you can still see it.



I will explain how you log in and use the tablet. You can use the keyboard and mouse for this test. The touchscreen will not work. If you cannot get your tablet to work correctly, raise your hand for help.

Exhibit C-3. ICILS 2018 Session Script—Continued



On the tablet in front of you, each of you should see a login screen. Raise your hand if you need help.

Assist students with login screen.



On the screen there is a line for “Student ID” where you will enter the student ID from the label on the login card. It is an eight-digit number. Click on the line and enter your student ID now.

Help students locate the student ID on the login card.



When you finish entering your student ID, click on the “Password” line with the mouse.

Assist students as necessary.



Here you will enter the password that is printed on the login card. It is a five-digit number. Enter it now.

Help students locate the password on the login card.



Select Log In.



Firstly we are going to work through a tutorial together. The tutorial will help you get used to the types of questions you will answer and tasks you will complete. As we are going to work through the tutorial together you must only click on functions or buttons on the tablet when I tell you to do so.



Are there any questions?

Answer any questions or points of clarification.

Conducting the Tutorial

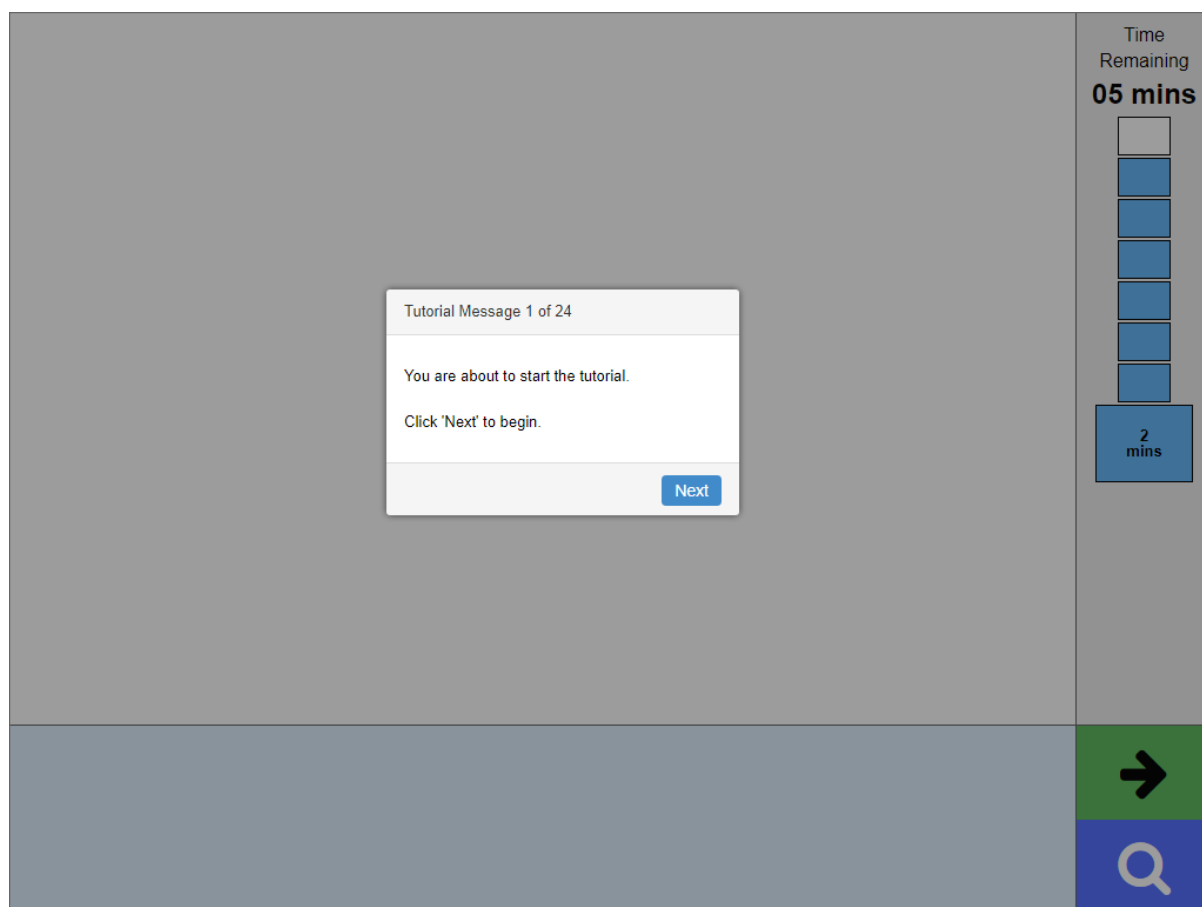


On the welcome screen enter the number 1112 and select ‘Start’ to begin the tutorial.

Confirm that the students are looking at the introductory screen to the tutorial.

Exhibit C-3. ICILS 2018 Session Script—Continued

Figure C-1: Tutorial Introductory Screen

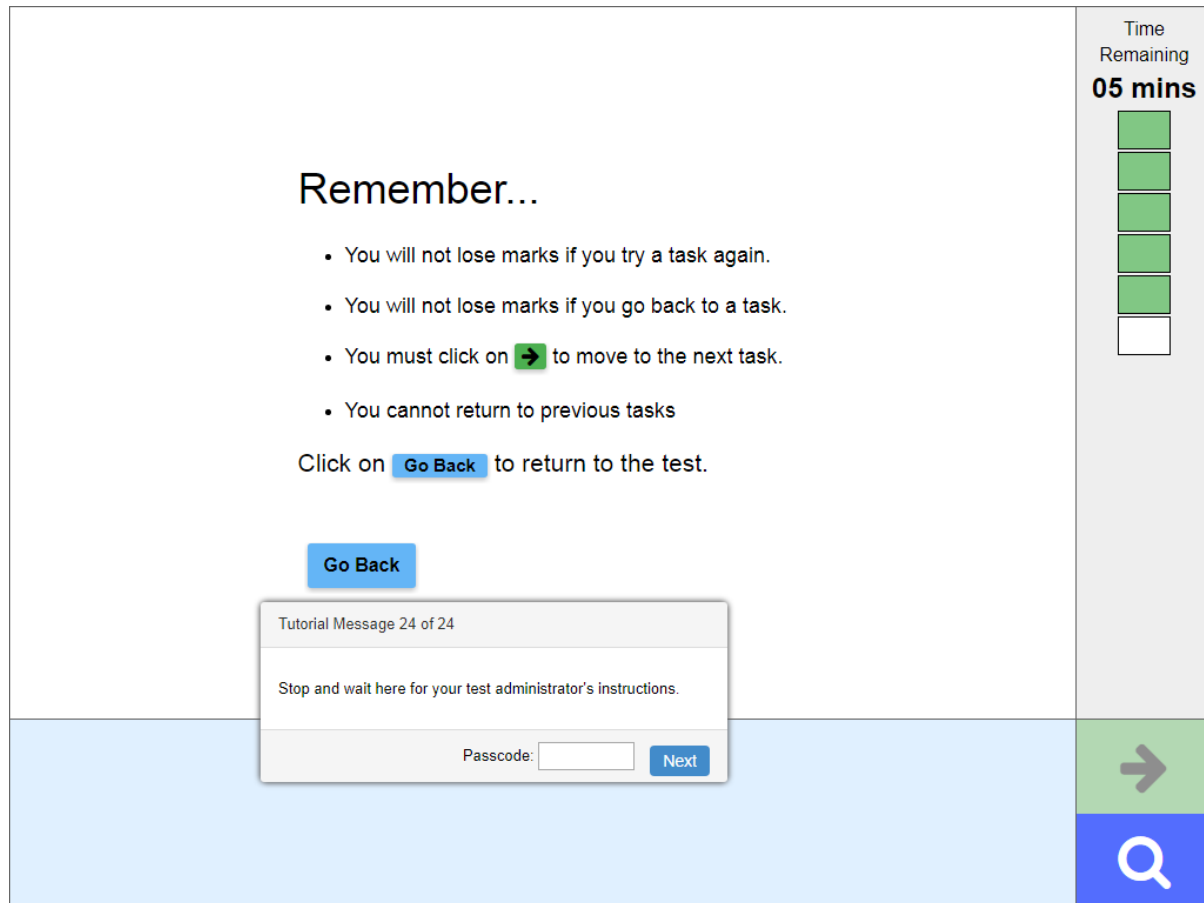


 **You will complete the first part of the tutorial on your own. Raise your hand if you have questions at any time during the tutorial. Now, you may select “Next” and start working on the tutorial.**

While students are completing the tutorial you can help them to complete questions as required.

When the students reach the Tutorial Information Screen (shown on the following page) they will not be able to progress without assistance. Wait until all students reach this screen.

Figure C-2: Tutorial Information Screen



 Are there any questions?

Answer any questions.

 Please listen carefully while I explain this screen.

 In every part of the assessment, this Help screen will show some useful information. Let's take a minute to review the information here in the tutorial.

 After you complete some tasks you will see the message “An action has been recorded.” You will be able to select the “Try again’ button if you want to change your answer. If you choose to try a task again, your previous answer will be replaced by your next answer.

Exhibit C-3. ICILS 2018 Session Script—Continued

-  **After you try again you will see a screen instructing you to move to the next question. You have already seen this screen in the tutorial.**
-  **You won't lose points if you try a task again.**
-  **After you complete some tasks you must click on the arrow to progress. You will then see a screen allowing you to 'Go back.' For these tasks your work will always be saved and you can click on the 'Go back' button as many times as you need.**
-  **You won't lose points if you go back to a task.**
-  **At the bottom right of the screen you will see a green arrow. When you click on the arrow you will move to the next task even if you have not finished or attempted the task.**
-  **You must click on the arrow to move to the next task.**
-  **You cannot return to previous tasks.**
-  **Try to complete each task before you click on the arrow. Once you have confirmed your answer, you will not be able to go back.**
-  **Do you have any questions?**

Answer any questions.

-  **Before we finish the tutorial, you need to complete the last two practice questions. You are allowed to ask me for help with these final two practice questions.**
-  **Once you have finished, I will give you the password to begin the test.**
-  **To complete the last two practice questions, enter the passcode '0000' into your screen. You may begin now.**

The students will then be able to complete the two practice questions that have them edit the document (increasing the size of the selected text and resizing the image of the painting).

When the students have completed the tutorial, they will see the screen allowing them to go to the first CIL assessment module. Entering the password will enable them to begin the first assessment module.

This is the final opportunity you have to give students information about how to complete the test.

Exhibit C-3. ICILS 2018 Session Script—Continued

Check that all students have understood the information in the tutorial and are ready to begin the test. Answer any points of clarification.

Confirm that the students are looking at the following module progression screen.

Figure C-3: Module Progression Screen



We are now ready to begin the assessment tasks. You will have no more than 30 minutes to complete all the tasks in this module. After you have finished this module you will complete one other module and a questionnaire. After the questionnaire you will begin part 2 of the test and complete two more modules. Each of you will probably complete different modules.

Exhibit C-3. ICILS 2018 Session Script—Continued

-  In most modules you will need to complete a large task at the end. The program will play a demonstration video to explain each of these tasks to you when you reach it. Pay careful attention to what the demonstration videos show you about the software features available in each large task. In each module you should take more time with these large tasks than with other tasks.
-  In some of the tasks you need to use internet websites. The websites you will use are not connected to the real internet: they only work within your computer. They are all safe for you to use.
-  Remember that your computer screen will display the total number of tasks you will need to complete in each module, the number of tasks you have completed and the amount of time you have left to complete them. Use these to help you plan your time as you work.
-  You do not need to rush through the tasks. The modules have been planned so that you have plenty of time to complete all the tasks.
-  Remember also that once you have completed a task you cannot go back. There is no advantage in finishing quickly so you can look over your work. It is better to take the time to complete each task carefully.
-  If you have any problems during the test please raise your hand and I will come and help you. I cannot tell you the answers to the test questions but I can help you to understand the test questions and explain what you need to do. I can also help you with technical issues.
-  Do you have any questions before you begin?

Answer any questions or points of clarification.

Write the time in section 7b of the Test Administration Form.

Conducting the first CIL assessment module

-  You will have 30 minutes to complete the first module.
-  When you see this screen with an hourglass again, it means you are finished with the first module. You can read quietly until everyone is finished. You may not take out a cell phone or any electronic device.

Exhibit C-3. ICILS 2018 Session Script—Continued

 **To begin, enter the password 1214.**

 **Begin the assessment by clicking on the arrow.**

Write the time in section 8a of the Test Administration Form.

When students have completed the first CIL assessment module they will see the module progression screen again. Students who finish early should be told to wait quietly (and read or complete another quiet activity) until everyone has finished.

Students who finish a module early **must not be allowed** to use the testing tablet while they are waiting.

After 30 minutes, say:

 **Please stop.**

Write the time in section 8b of the Test Administration Form.

Encourage the students to stand up, stretch and move around (as appropriate).

Students can take a 5 minute break. The break time is convenient if any students need to use the bathroom.

After the break make sure that all students are seated again at their allocated tablets.

Conducting the second CIL assessment module

 **You will have 30 minutes to complete the next module.**

 **Enter the password 2411.**

 **Click ‘Continue’ to begin.**

Write the time in section 9a of the Test Administration Form.

When students have completed the second CIL assessment module they will see the module progression screen again. Students who finish early should be told to wait quietly (and read or complete another quiet activity) until everyone has finished.

Students who finish a module early **must not be allowed** to use the testing tablet while they are waiting.

Exhibit C-3. ICILS 2018 Session Script—Continued

After 30 minutes, say:



Please stop.

Write the time in section 9b of the Test Administration Form.

Instruct the students to take a short break. (*NOTE:* In states, districts, or schools where the questionnaire is not allowed, continue with the longer break before the first CT module on page 11.)

Encourage the students to stand up, stretch and move around (as appropriate).

After the break make sure that all students are again seated at their allocated tablets.

OMIT THE FOLLOWING SECTION IN COLORADO, NEW HAMPSHIRE AND SCHOOLS THAT DO NOT ALLOW THE QUESTIONNAIRES AS NOTED IN THE SCS. CONTINUE WITH THE FIRST CT MODULE ON PAGE

Conducting the questionnaire

The students will now complete the Student Background Questionnaire.

In column 7 in the Student Tracking Form, you must record whether a student participated in the administration of the Student Questionnaire.

After the Student Tracking Form has been completed, write the time in section 10a of the Test Administration Form and say the following to the students:



You will now complete a questionnaire about you, your family and your computer use.



Please read each question carefully and answer as accurately as you can.



There are no right or wrong answers in this questionnaire. You may skip any question you do not want to answer.



Your answers should be the ones that are right for you. The questions should be easy to answer. However, if you need any help answering them then raise your hand. I can discuss these questions with you and help you to answer them if you need me to.

Exhibit C-3. ICILS 2018 Session Script—Continued

-  There are questions that ask you about the main job that your parents/[guardians] have. Please answer these questions carefully by providing a job title and then a description of what your parents/[guardians] do in their job.
-  Unlike the test you have just completed, you can return to questions you have previously answered throughout the questionnaire. There is a forwards arrow on the bottom right of the screen. When you click on this arrow you will move to the next question. There is also a backward arrow which allows you to return to the previous item.
-  The taskbar shows your progress through the questionnaire. The bars on the taskbar are blue before you have opened the question, the tasks turn white while you are working on the question and turn green when you have completed or visited the question.
-  You will have 25 minutes to complete this section.
-  Enter the password 1445 and click ‘Continue’ to begin.
After 25 minutes, say:
-  Please stop.

After completing the questionnaire, students should be given a sufficient break of at least 15 minutes and ideally no more than 45 minutes. Encourage the students to stand up, stretch and move around (as appropriate). The break time is convenient if any students need to use the bathroom.

After the break make sure that all students are seated again at their allocated tablets.

Note

Please make sure that students continue the ICILS instruments using the same tablet without being logged out of the session. If the student is logged out, assist them to log back in.

Conducting the first CT assessment module

-  We are now ready to begin your last two assessment modules. You will have 25 minutes to complete all the tasks in this first module. After you have finished this module you will complete one other module. You will all complete the same modules, but you may receive them in a different order from one another.

Exhibit C-3. ICILS 2018 Session Script—Continued

-  **The procedure for completing these modules is the same as those that you completed earlier today.**
-  **If you have any problems during the test please raise your hand and I will come and help you. Again I cannot tell you the answers to the test questions but I can help you to understand the test questions and explain what you need to do.**
-  **Do you have any questions before you begin?**

Answer any questions or points of clarification.

-  **You will have 25 minutes to complete the module.**
-  **Enter password 4445 and click the arrow to begin.**

Write the time in section 11a of the Test Administration Form.

When students have completed the first CT assessment module they will see the module progression screen again. Students who finish early should be told to wait quietly (and read or complete another quiet activity) until everyone has finished.

Students who finish a module early **must not be allowed** to use the testing tablet while they are waiting.

After 25 minutes, say:

-  **Please stop.**

Write the time in section 11b of the Test Administration Form.

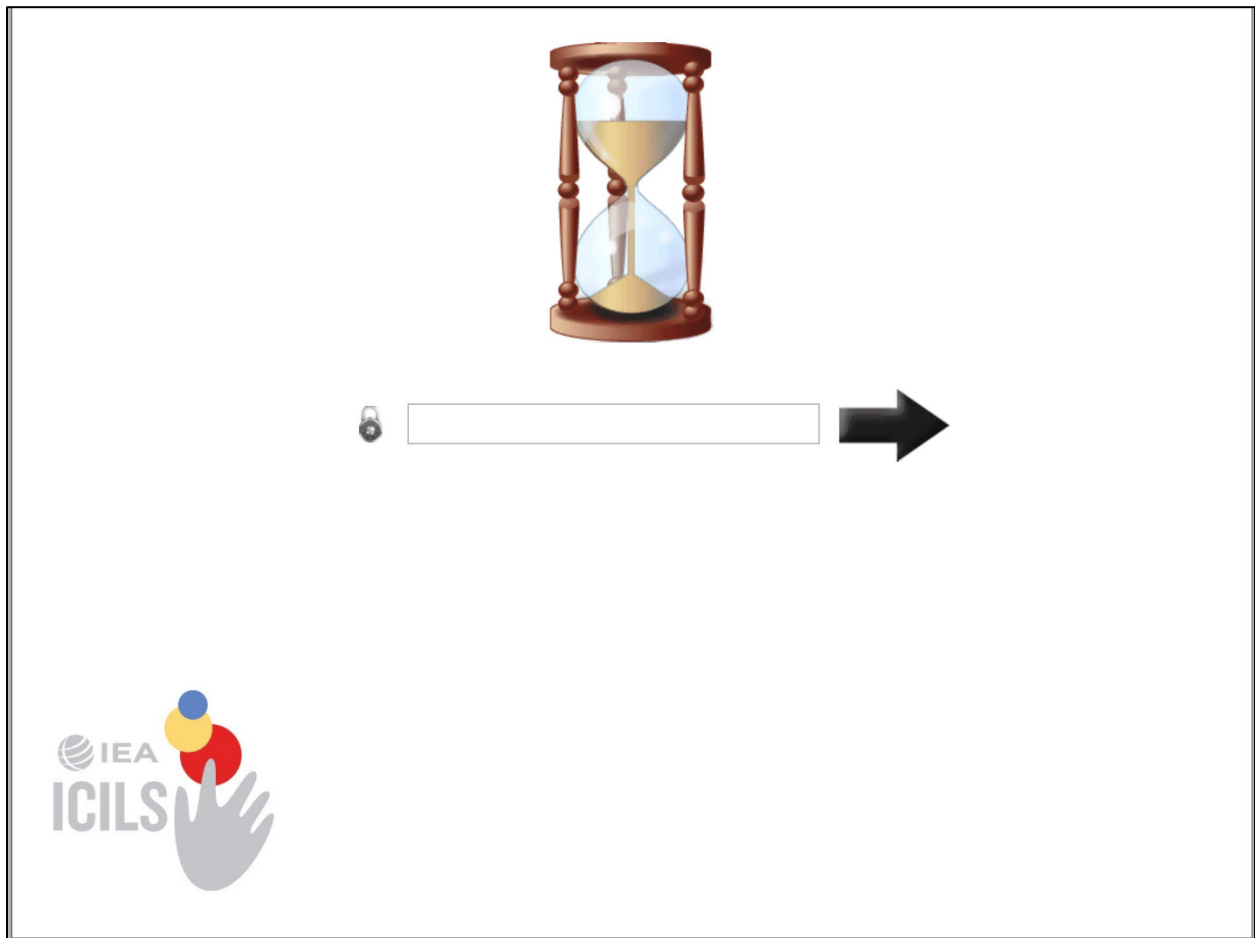
Conducting the second CT assessment module

-  **We are ready for the last module**
-  **Enter password 5151 and click ‘Continue’ to begin.**

Write the time in section 12a of the Test Administration Form.

When students have completed the second CT assessment module they will see the module exit screen shown below.

Figure C-4: Module Exit Screen



Students who finish early should be told to wait quietly (and read or complete another quiet activity) until everyone has finished. Students who finish a module early **must not be allowed** to use the testing tablet while they are waiting.

After 25 minutes, say:

-  **Please stop.**
-  **Place your login cards on the corner of your work space.**
-  **Do not turn off your devices. Thank you very much for participating in this study. Your work will help us to learn more about our students and schools. Please stay seated.**

Exhibit C-3. ICILS 2018 Session Script—Continued

Collect the student login cards and place them in the red storage envelope.

Write the time in section 12b of the Test Administration Form.

If the state or district allows, give an ICILS drawstring backpack to each students as a thank you for their participation.

If the school approved, distribute the Certificates of Community Service to the students.

You may now dismiss the students. Make sure the mice are attached to the tablets as students leave the room.

Thank you again for your help in conducting this important international study.

Dismiss student according to school policy.

To close the testing software:

1. Press Alt + F4.
2. When a message appears asking for the admin password, press Esc.

To shut down the tablets:

1. Press Ctrl + Alt + Delete.
2. Select the Power icon in the lower right corner of the screen.
3. Select Shut down.

Appendix D

ICILS 2018 Questionnaires

APPENDIX D. ICILS 2018 QUESTIONNAIRES

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IEA International Computer and Information Literacy Study

ICT Coordinator Questionnaire for the 2018 Main Study

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According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this voluntary information collection is 1850-0929. The time required to complete this information collection is estimated to average 15 minutes per ICT coordinator, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments or concerns regarding the accuracy of the time estimate(s), suggestions for improving the form, or questions about the status of your individual submission of this form, write directly to: International Computer and Information Literacy Study (ICILS), National Center for Education Statistics, Potomac Center Plaza (PCP), 550 12th St., SW, 4th floor, Washington, DC 20202.

OMB No. 1850-0929, Approval Expires 12/31/2020.



Introduction to the Questionnaire for ICT Coordinators

Your school has agreed to participate in the 2018 Main Study for the International Computer and Information Literacy Study (ICILS). ICILS is an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). The purpose of ICILS is to examine across different countries the extent to which young people in eighth grade have developed computer and information literacy, which is defined as the ability to use Information and Communication Technology (ICT) to investigate, create, and communicate with others at home, school, the workplace, and in society.

In this questionnaire, ICT can refer to:

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

This questionnaire is concerned with ICT in schools and in particular the ICT resources (including computers) as well as pedagogical practices that use ICT. The questionnaire is addressed to ICT coordinators who are asked to provide information about their schools. It is important that the person responding knows about the ICT facilities in your school and about practices regarding their use. The questionnaire should be completed by the person with designated responsibility for ICT in the school. If there is no person with designated responsibility for ICT in the school, the questionnaire should be completed by the principal or assistant principal. Since your school has been selected as part of a nationwide sample, your responses are very important in helping to evaluate the questions as relevant to describing eighth-grade education in the United States. If you do not have the information to answer particular questions, then please consult other persons in your school. In this questionnaire, you will find questions about your position as ICT coordinator, ICT resources in your school, and support for ICT use in your school.

Since ICILS is an international study and all countries are using the same questionnaire, you may find that some of the questions seem unusual or are not entirely relevant to you or schools in the United States. Nevertheless, it is important that you do your best to answer all the questions as accurately as you can so comparisons can be made across countries in the study.

It is estimated that you will need about 15 minutes to complete the questionnaire. **We appreciate the time and effort this takes and thank you for your cooperation and contribution.**

The National Center for Education Statistics (NCES) is authorized to collect information from this questionnaire by the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). You do not have to provide the information requested. However, the information you provide will help the U.S. Department of Education's ongoing efforts to understand better how the educational system in the United States compares to that in other countries. There are no penalties should you choose not to participate in this study. All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Your responses will be combined with those from other participants to produce summary statistics and reports.

Thank You.

About Your Position

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

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

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

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

(Please mark only one choice)

- ☐₁ Yes, I formally serve as coordinator.
- ☐₂ Yes, I informally serve as coordinator.
- ☐₃ I am not the ICT coordinator, but I am answering as the school principal or his/her designee.

Q2 Which of the following teaching duties do you have?

(Please mark one choice in each row)

	<i>Yes</i>	<i>No</i>
a) I teach ICT courses to students.	☐ ₁	☐ ₂
b) I teach other subjects (not related to learning about ICT) to students.	☐ ₁	☐ ₂
c) I do <u>not</u> have any teaching duties for students.	☐ ₁	☐ ₂
d) I teach ICT courses to, or conduct workshops for, teachers and other school staff.	☐ ₁	☐ ₂

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

(Please mark only one choice)

- ☐₁ Never, we do not use ICT
- ☐₂ Fewer than 5 years
- ☐₃ At least 5 but fewer than 10 years
- ☐₄ 10 years or more

	ICT Resources

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

	<i>Available to teachers <u>and</u> students</i>	<i>Available only to teachers</i>	<i>Available only to students</i>	<i>Not available</i>
a) Digital learning resources that can be accessed offline	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Digital learning resources that can <u>only</u> be used online	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Access to the Internet through the school network	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Access to an education site or network maintained by education authorities	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Email accounts for school-related use	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q5 Please indicate the availability of each of the following software resources at your school.*(Please mark one choice in each row)*

	<i>Available to teachers and students</i>	<i>Available only to teachers</i>	<i>Available only to students</i>	<i>Not available</i>
a) Practice programs or apps where teachers decide which questions are asked of students (e.g., Quizlet, Kahoot)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Single user digital learning games (e.g., Languages Online)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Multi-user digital learning games with graphics and inquiry tasks (e.g., Quest Atlantis)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Word-processor software (e.g., Microsoft Word)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Presentation software (e.g., Microsoft PowerPoint)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Video and photo software for capture and editing (e.g., Windows Movie Maker, iMovie, Adobe Photoshop)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Concept mapping software (e.g., Inspiration, Webspiration)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Data logging and monitoring tools (e.g., Logger Pro) that capture real-world data digitally for analysis (e.g., speed, temperature)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) Simulations and modelling software (e.g., NetLogo)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
j) A learning management system (e.g., Blackboard, Edmodo, Moodle)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
k) Graphing or drawing software	☐ ₁	☐ ₂	☐ ₃	☐ ₄
l) e-portfolios (e.g., VoiceThread)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
m) Digital contents linked with textbooks	☐ ₁	☐ ₂	☐ ₃	☐ ₄
n) Social media (e.g., Facebook, Twitter)	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q6 Please indicate the availability of the following technology facilities in eighth grade.*(Please mark one choice in each row)*

	<i>Available to teachers and students</i>	<i>Available only to teachers</i>	<i>Available only to students</i>	<i>Not available</i>
a) Remote access to a school network	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Space on a school network to store files	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) A school intranet with applications and workspaces	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Internet-based applications for collaborative work (e.g., Google Docs, OneNote, Padlet)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) A 3D printer	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Robots or robotic devices	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Access to a wireless LAN (Wi-Fi)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) A learning management system (e.g., Blackboard, Edmodo, Moodle)	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q7 A) In your school, approximately how many of the following types of (school-provided) ICT devices are available?

(Please record a whole number. Record 0 (zero), if none.)
For this question please:

- Count terminals (if they have a keyboard and a screen) as computers
- Exclude computers that are not in use (e.g., in storage)
- Exclude computers that are only used as servers

	All devices in the school	Devices available for student use
a) Desktop computers	____ ____ ____ ____	____ ____ ____ ____
b) Laptops/notebooks.....	____ ____ ____ ____	____ ____ ____ ____
c) Tablet devices	____ ____ ____ ____	____ ____ ____ ____

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

(Please record a whole number. Record 0 (zero), if none.)

%

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

(Please record a whole number. Record 0 (zero), if none.)

Smart boards/interactive white boards

Q8 Does your school or school district provide teachers with their own portable digital device?

(Please mark only one choice)

- ☐₁ Yes, for every teacher
- ☐₂ Yes, but not for all teachers
- ☐₃ No

Q9 Approximately what percentage of students in eighth grade have access to portable computers (laptops, netbooks or tablet devices) at school?*(Please mark one choice in each row)*

	0 to 25%	26 to 50%	51 to 75%	76 to 100%
a) Students are provided with portable computers by their school for use at school only	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Students are provided with portable computers by their school for use at home <u>and</u> at school	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Students bring portable computers which they own to use at school	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q10 Where are school ICT devices for teaching and learning in eighth grade located?*(Please mark one choice in each row)*

	Yes	No
a) In most (80% or more) classrooms	☐ ₁	☐ ₂
b) In computer laboratories	☐ ₁	☐ ₂
c) As class sets of computers that can be moved between classrooms	☐ ₁	☐ ₂
d) In the library	☐ ₁	☐ ₂
e) In other places accessible to students (e.g., cafeteria, auditorium, study area)	☐ ₁	☐ ₂
f) Students bring the devices to class	☐ ₁	☐ ₂

	ICT Support

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

	<i>Yes</i>	<i>No</i>
a) Yourself	☐ ₁	☐ ₂
b) A network administrator in the school (other than yourself)	☐ ₁	☐ ₂
c) ICT technical staff (other than yourself) at the school	☐ ₁	☐ ₂
d) Administrators or school staff (other than yourself)	☐ ₁	☐ ₂
e) Teachers (other than yourself)	☐ ₁	☐ ₂
f) Staff from the relevant education authority responsible for the school	☐ ₁	☐ ₂
g) Personnel from external companies contracted to provide maintenance	☐ ₁	☐ ₂
h) Students from the school	☐ ₁	☐ ₂

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

	<i>Yes</i>	<i>No</i>
a) Yourself	☐ ₁	☐ ₂
b) ICT technical staff (other than yourself) at the school	☐ ₁	☐ ₂
c) Administrators or school staff (other than yourself)	☐ ₁	☐ ₂
d) Librarians, library staff, or information specialists (other than yourself)	☐ ₁	☐ ₂
e) Teachers (other than yourself)	☐ ₁	☐ ₂
f) Staff from the relevant education authority responsible for the school	☐ ₁	☐ ₂

Q13 To what extent is the use of ICT in teaching and learning at your school hindered by each of the following obstacles?*(Please mark one choice in each row)*

	<i>A lot</i>	<i>To some extent</i>	<i>Very little</i>	<i>Not at all</i>
a) Too few computers with an Internet connection	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Insufficient Internet bandwidth or speed	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Not enough computers for instruction	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Lack of sufficiently powerful computers	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Problems in maintaining ICT equipment	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Not enough computer software	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Insufficient ICT skills among teachers	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Insufficient time for teachers to prepare lessons	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) Insufficient effective professional learning resources for teachers	☐ ₁	☐ ₂	☐ ₃	☐ ₄
j) Lack of an effective online learning support platform	☐ ₁	☐ ₂	☐ ₃	☐ ₄
k) Insufficient incentives for teachers to integrate ICT use in their teaching	☐ ₁	☐ ₂	☐ ₃	☐ ₄
l) Restricted access to useful Internet resources	☐ ₁	☐ ₂	☐ ₃	☐ ₄
m) Insufficient technical ICT support	☐ ₁	☐ ₂	☐ ₃	☐ ₄
n) Insufficient pedagogical support for the use of ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q14 Is Computing, Computer science, Information technology, Informatics, or a similar topic taught as a standalone subject in eighth grade at your school?

- ☐₁ Yes - Please continue with question 15
- ☐₂ No - Please go to the end of the questionnaire

Q15 In the teaching of Computing, Computer science, Information technology, Informatics, or a similar subject in eighth grade at your school, how much emphasis is given to the following tasks?*(Please mark one choice in each row)*

	<i>Strong emphasis</i>	<i>Some emphasis</i>	<i>Little emphasis</i>	<i>No emphasis</i>
a) Developing algorithms (e.g., instructions for a program like Scratch)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Writing computer programs	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Evaluating computer programs	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Developing applications	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Refining computer code to improve efficiency	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Debugging computer code	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Developing simulations	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Testing solutions to problems using simulations	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) Creating visual displays of processes (e.g., flow charts, decision trees)	☐ ₁	☐ ₂	☐ ₃	☐ ₄

THANK YOU FOR YOUR TIME AND EFFORT IN COMPLETING THE QUESTIONNAIRE



IEA International Computer and Information Literacy Study

Principal Questionnaire for the 2018 Main Study

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OMB No. 1850-0929, Approval Expires 12/31/2020.



Introduction to the School Principal Questionnaire

Your school has agreed to participate in the 2018 Main Study for the International Computer and Information Literacy Study (ICILS). ICILS is an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). The purpose of ICILS is to examine across different countries the extent to which young people in eighth grade have developed computer and information literacy, which is defined as the ability to use Information and Communication Technology (ICT) to investigate, create, and communicate with others at home, school, the workplace, and in society.

In this questionnaire, ICT can refer to:

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

This questionnaire is addressed to school principals who are asked to provide information about their schools. Since your school has been selected as part of a nationwide sample, your responses are very important in helping to evaluate the questions as relevant to describing eighth-grade education in the United States. Some of the questions may require that you look up school records, so you may wish to arrange for the assistance of another staff member to help provide this information.

In this questionnaire, you will find questions about you and your use of ICT, characteristics of your school, the application of ICT in teaching and learning at your school, and aspects of the management of ICT in your school. Since ICILS is an international study and all countries are using the same questionnaire, you may find that some of the questions seem unusual or are not entirely relevant to you or schools in the United States. Nevertheless, it is important that you do your best to answer all the questions so comparisons can be made across countries in the study. Please answer the questions with reference to your school as a whole. For some of the questions you are asked to answer referring only to eighth-grade students.

Please look at the instructions given in each of the questions.

It is estimated that you will need about 15 minutes to complete the questionnaire. **We appreciate the time and effort this takes and thank you for your cooperation and contribution.**

The National Center for Education Statistics (NCES) is authorized to collect information from this questionnaire by the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). You do not have to provide the information requested. However, the information you provide will help the U.S. Department of Education's ongoing efforts to understand better how the educational system in the United States compares to that in other countries. There are no penalties should you choose not to participate in this study. All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Your responses will be combined with those from other participants to produce summary statistics and reports.

Thank You.

	About You and Your Use of ICT

Q1 Are you female or male?☐₁ Female☐₂ Male**Q2 How often do you use ICT for the following activities?***(Please mark one choice in each row)*

	<i>Never</i>	<i>Less than once a month</i>	<i>At least once a month but not every week</i>	<i>At least once a week but not every day</i>	<i>Every day</i>
a) Searching for information on the Internet or a network maintained by education authorities for its schools	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
b) Providing information about an educational issue through a website	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
c) Looking up records in a database (e.g., in a student information system)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
d) Maintaining, organizing and analyzing data (e.g., with a spreadsheet or database)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
e) Preparing presentations	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
f) Communicating with teachers in your school	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
g) Communicating with education authorities	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
h) Communicating with principals and senior staff in other schools	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
i) Communicating with parents	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
j) Working with a learning management system (e.g., Blackboard, Edmodo, Moodle)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
k) Using social media to communicate with the wider community about school-related activities	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
l) Managing staff (e.g., scheduling, professional development)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
m) Preparing the curriculum	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
n) School financial management	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅

	<i>Your School</i>

Q3 What is the total number of boys and girls in the entire school as of October 1, 2017?

(Please record a whole number. Record 0 (zero), if none.)

Total number of girls

Total number of boys

Q4 What is the total number of boys and girls in eighth grade as of October 1, 2017?

(Please record a whole number. Record 0 (zero), if none.)

Total number of girls

Total number of boys

Q5 Around the 1st of October 2017, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program?

(Please record a whole number. Record 0 (zero), if none.)

Percentage of students

Q6 Of the students currently enrolled in your school, what percentage has been identified as limited-English proficient (LEP)/English language learners (ELL)?

(Please record a whole number. Record 0 (zero), if none.)

(Percentage of students)

Q7 A) What is the lowest (youngest) grade that is taught at your school?*(Please mark only one choice)*

- ☐₁ Preschool
- ☐₂ Kindergarten
- ☐₃ First grade
- ☐₄ Second grade
- ☐₅ Third grade
- ☐₆ Fourth grade
- ☐₇ Fifth grade
- ☐₈ Sixth grade
- ☐₉ Seventh grade
- ☐₁₀ Eighth grade

B) What is the highest (oldest) grade that is taught at your school?*(Please mark only one choice)*

- ☐₁ Eighth grade
- ☐₂ Ninth grade
- ☐₃ Tenth grade
- ☐₄ Eleventh grade
- ☐₅ Twelfth grade

Q8 What are the total numbers of full-time and part-time teachers in your school?

A full-time teacher is employed on a regular basis as a teacher for at least 90% of full-time hours for the full school year.

All other teachers should be considered part-time.

(Please record a whole number. Record 0 (zero), if none.)

- a)   Total number of full-time teachers
- b)   Total number of part-time teachers

Q9 Which of the following best describes where your school is located?*(Please mark only one choice)*

- ☐₁ In a community with fewer than 3,000 people
- ☐₂ In a town with at least 3,000 but less than 15,000 people
- ☐₃ In a town with at least 15,000 but less than 100,000 people
- ☐₄ In a city with at least 100,000 but less than 1,000,000 people
- ☐₅ In a city with 1,000,000 or more people

Q10 A) Is this school a public or a private school?*(Please mark only one choice)*

- ☐₁ A public school

(This is a school managed directly or indirectly by a public education authority, government agency, or governing board, appointed by government or elected by public franchise.)

- ☐₂ A private school

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

B) Approximately what percentage of students in your school have the following backgrounds?*(Please mark one choice in each row)*

	<i>0 to 10%</i>	<i>11 to 25%</i>	<i>26 to 50%</i>	<i>More than 50%</i>
a) Come from economically affluent homes	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Come from economically disadvantaged homes	☐ ₁	☐ ₂	☐ ₃	☐ ₄

	<i>ICT and Teaching in Your School</i>

Q11 How important is each of the following outcomes of education in your school?*(Please mark one choice in each row)*

	<i>Very important</i>	<i>Quite important</i>	<i>Somewhat important</i>	<i>Not important</i>
a) The development of students' basic computer skills (e.g., Internet use, email, word processing, presentation software)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) The development of students' skills in using ICT for collaboration with others	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) The use of ICT for facilitating students' responsibility for their own learning	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) The use of ICT to augment and improve students' learning	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) The development of students' understanding and skills relating to safe and appropriate use of ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) The development of students' proficiency in accessing and using information with ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) The development of students' ability to write apps or programs	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q12 Are there procedures in place to monitor whether teachers at this school use ICT to achieve the following learning outcomes?*(Please select **all** that apply for **each** row)*

	<i>Yes, by reviewing lesson plans</i>	<i>Yes, through teacher self- evaluation</i>	<i>Yes, through observing class- rooms</i>	<i>Yes, by other means</i>	<i>No, this is not moni- tored</i>
a) The development of students' basic computer skills (e.g., Internet use, email, word processing, presentation software)	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁
b) The development of students' skills in using ICT for collaboration with others	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁
c) The use of ICT for facilitating students' responsibility for their own learning	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁
d) The use of ICT to augment and improve students' learning	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁
e) The development of students' understanding and skills relating to safe and appropriate use of ICT ...	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁
f) The development of students' proficiency in accessing and using information with ICT	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁
g) The development of students' ability to write apps or programs	☐ ₁	☐ ₁	☐ ₁	☐ ₁	☐ ₁

Q13 Are teachers in your school expected to acquire knowledge and skills in each of the following activities?*(Please mark one choice in each row)*

	<i>Expected and required</i>	<i>Expected but not required</i>	<i>Not expected</i>
a) Integrating Web-based learning in their instructional practice	☐ ₁	☐ ₂	☐ ₃
b) Using ICT-based forms of student assessment	☐ ₁	☐ ₂	☐ ₃
c) Using ICT for monitoring student progress	☐ ₁	☐ ₂	☐ ₃
d) Collaborating with other teachers via ICT	☐ ₁	☐ ₂	☐ ₃
e) Communicating with parents via ICT	☐ ₁	☐ ₂	☐ ₃
f) Communicating with students via ICT	☐ ₁	☐ ₂	☐ ₃
g) Integrating ICT into teaching and learning	☐ ₁	☐ ₂	☐ ₃
h) Using subject-specific digital learning resources (e.g., tutorials, simulation)	☐ ₁	☐ ₂	☐ ₃
i) Using e-portfolios for assessment	☐ ₁	☐ ₂	☐ ₃
j) Using ICT to develop authentic (real-life) assignments for students ..	☐ ₁	☐ ₂	☐ ₃
k) Assessing students' computer and information literacy	☐ ₁	☐ ₂	☐ ₃

	Management of ICT in Your School

Q14 Who has the main responsibility for making decisions about each of the following aspects of ICT in this school?*(Please mark one choice in each row)*

		<i>School district or relevant education authority</i>	<i>School boards/ councils</i>	<i>School principal or deputy</i>	<i>Heads of department</i>	<i>ICT coordinator</i>	<i>Information specialist or librarian</i>	<i>Individual teachers</i>	<i>No one</i>
a) The procurement of ICT equipment	☐	☐	☐	☐	☐	☐	☐	☐	☐
b) The choice of non-digital learning materials	☐	☐	☐	☐	☐	☐	☐	☐	☐
c) The choice of digital learning materials	☐	☐	☐	☐	☐	☐	☐	☐	☐
d) The selection of a learning management system	☐	☐	☐	☐	☐	☐	☐	☐	☐
e) The maintenance of ICT equipment	☐	☐	☐	☐	☐	☐	☐	☐	☐
f) Decisions about whether ICT is used in teaching	☐	☐	☐	☐	☐	☐	☐	☐	☐
g) The implementation of ICT-based approaches in teaching	☐	☐	☐	☐	☐	☐	☐	☐	☐
h) The implementation of ICT-based approaches in administration....	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q14 (Cont.) Who has the main responsibility for making decisions about each of the following aspects of ICT in this school?*(Please mark one choice in each row)*

	<i>School district or relevant education authority</i>	<i>School boards/ councils</i>	<i>School principal or deputy</i>	<i>Heads of department</i>	<i>ICT coordinator</i>	<i>Information specialist or librarian</i>	<i>Individual teachers</i>	<i>No one</i>
i) The use of ICT-based approaches to assessment ...	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆	☐ ₇	☐ ₈
j) The assessment of students' computer and information literacy	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆	☐ ₇	☐ ₈
k) The implementation of a computer and information literacy curriculum at the school	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆	☐ ₇	☐ ₈
l) The development of ICT-related teacher competencies	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆	☐ ₇	☐ ₈

Q15 Does your school or school system have policies with regard to the following aspects of ICT use?*(Please mark one choice in each row)*

	<i>Yes</i>	<i>No</i>
a) The provision of security measures to prevent unauthorized system access or entry	☐ ₁	☐ ₂
b) Restrictions on the number of hours students are allowed to sit at a computer	☐ ₁	☐ ₂
c) Student access to school computers outside class hours (but during school hours)	☐ ₁	☐ ₂
d) Student access to school computers outside school hours	☐ ₁	☐ ₂
e) The fulfilment of intellectual property rights (e.g., software copyrights)	☐ ₁	☐ ₂
f) Prohibitions of access to inappropriate material (e.g., pornography, violence)	☐ ₁	☐ ₂
g) Student use of non-school related games on school computers	☐ ₁	☐ ₂
h) The provision of access to school computers and/or the Internet for the local community (parents and/or others)	☐ ₁	☐ ₂
i) Support for students with special needs or specific learning difficulties	☐ ₁	☐ ₂
j) Unacceptable behaviours towards other students (e.g., cyberbullying)	☐ ₁	☐ ₂
k) The provision of laptop computers and/or other mobile learning devices for student use at school and at home	☐ ₁	☐ ₂
l) Student use of their own ICT at school	☐ ₁	☐ ₂

Q16 Throughout the current school year, how many teachers in this school participate in the following forms of professional development about ICT for teaching and learning?*(Please mark one choice in each row)*

	<i>None or hardly any</i>	<i>Some of them</i>	<i>Most of them</i>	<i>All or nearly all</i>
a) Courses on the use of ICT in teaching provided by the school or the school system	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Training by another teacher who has attended a course on ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Discussions about the use of ICT in education as a regular item during meetings of the teaching staff	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Observations of colleagues using ICT in their teaching	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Group discussions of teachers about their use of ICT in teaching	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Participation in professional learning programs delivered online.....	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Participation in courses on ICT conducted by an external agency or expert	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Participation in a community of practice concerned with ICT in teaching	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q17 At your school, what priority is given to the following ways of facilitating the use of ICT in teaching and learning?*(Please mark one choice in each row)*

	<i>High priority</i>	<i>Medium priority</i>	<i>Low priority</i>	<i>Not a priority</i>
a) Increasing the number of computers per student in the school	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Increasing the number of computers connected to the Internet	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Increasing the bandwidth of Internet access for the computers connected to the Internet	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Increasing the range of digital learning resources available for teaching and learning	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Establishing or enhancing an online learning support platform	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Supporting participation in professional development on pedagogical use of ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Increasing the availability of qualified technical personnel to support the use of ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Providing teachers with incentives to integrate ICT use in their teaching	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) Providing more time for teachers to prepare lessons in which ICT is used	☐ ₁	☐ ₂	☐ ₃	☐ ₄
j) Increasing the professional learning resources for teachers in the use of ICT	☐ ₁	☐ ₂	☐ ₃	☐ ₄

THANK YOU FOR YOUR TIME AND EFFORT IN COMPLETING THIS QUESTIONNAIRE

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IEA International Computer and Information Literacy Study

Teacher Questionnaire for the 2018 Main Study

The National Center for Education Statistics (NCES), within the U.S. Department of Education, conducts ICILS in the United States as authorized by the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this voluntary information collection is 1850-0929. The time required to complete this information collection is estimated to average 30 minutes per teacher, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments or concerns regarding the accuracy of the time estimate(s), suggestions for improving the form, or questions about the status of your individual submission of this form, write directly to: International Computer and Information Literacy Study (ICILS), National Center for Education Statistics, Potomac Center Plaza (PCP), 550 12th St., SW, 4th floor, Washington, DC 20202.

OMB No. 1850-0929, Approval Expires 12/31/2020.



Introduction to the Questionnaire for Teachers

Your school has agreed to participate in the 2018 Main Study for the International Computer and Information Literacy Study (ICILS). ICILS is an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). The purpose of ICILS is to examine across different countries the extent to which young people in eighth grade have developed computer and information literacy, which is defined as the ability to use Information and Communication Technology (ICT) to investigate, create, and communicate with others at home, school, the workplace, and in society in order to improve teaching and learning worldwide.

In this questionnaire, ICT can refer to:

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

This questionnaire is addressed to teachers who are asked to provide information about ICT in their schools, its use in teaching and learning, and students' development of Computer and Information Literacy (CIL). Since your school has been selected as part of a nationwide sample, your responses are very important in helping to evaluate the questions as relevant to describing eighth-grade education in the United States.

In this questionnaire, you will find questions about your background and familiarity with ICT, your use of ICT in teaching a reference eighth-grade class, the use of ICT in the school, and learning to use ICT in teaching. Some questions focus on a nominated "reference" class. This is the first eighth-grade class that you teach for a regular subject (e.g., other than home room or assembly) on or after the Tuesday following the last weekend before you first accessed this questionnaire. You may, of course, teach the class at other times during the week as well. If you did not teach an eighth-grade class on that Tuesday, please use the eighth-grade class that you taught on the first day after that Tuesday.

Since ICILS is an international study and all countries are using the same questionnaire, you may find that some of the questions seem unusual or are not entirely relevant to you or schools in the United States. Nevertheless, it is important that you do your best to answer all the questions as accurately as you can so comparisons can be made across countries in the study.

It is estimated that you will need about 30 minutes to complete the questionnaire. **We appreciate the time and effort this takes and thank you for your cooperation and contribution.**

The National Center for Education Statistics (NCES) is authorized to collect information from this questionnaire by the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). You do not have to provide the information requested. However, the information you provide will help the U.S. Department of Education's ongoing efforts to understand better how the educational system in the United States compares to that in other countries. There are no penalties should you choose not to participate in this study. All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Your responses will be combined with those from other participants to produce summary statistics and reports.

Thank you.

	<i>About You</i>

Q1 Are you a female or male?☐₁ Female☐₂ Male**Q2 How old are you?***(Please mark only one choice)*☐₁ Less than 25☐₂ 25–29☐₃ 30–39☐₄ 40–49☐₅ 50–59☐₆ 60 or over**Q3 What year did you start teaching?***(Please write in a year)*

Q4 What are the main subjects that you teach in this school in the current school year?

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

☐₁ English Language Arts☐₁ Spanish, or other foreign language☐₁ Mathematics☐₁ Sciences (e.g., general science and/or physics, chemistry, biology, geology, earth sciences, technical science)☐₁ Human sciences/Humanities/Social studies (e.g., history, geography, civics, law, economics)☐₁ Creative arts (e.g., visual arts, music, dance, drama)☐₁ Information technology, Computer science, or a similar subject☐₁ Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades)☐₁ Other (e.g., moral education/ethics, physical education, personal and social development)

Q5 In the current school year, at how many schools do you teach eighth-grade students?

(Please mark only one choice)

- ☐₁ Only in this school
- ☐₂ In this and another school
- ☐₃ In this and in two other schools
- ☐₄ In this and in three or more other schools

	<i>Your Use of ICT</i>

Q6 Approximately how long have you been using ICT for *teaching* purposes?*(Please mark only one choice in each row)*

	<i>Never</i>	<i>Less than two years</i>	<i>Between two and five years</i>	<i>More than five years</i>
a) During lessons	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Preparing lessons	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q7 How often do you use ICT in these settings?*(Please mark one choice in each row)*

	<i>Never</i>	<i>Less than once a month</i>	<i>At least once a month but not every week</i>	<i>At least once a week but not every day</i>	<i>Every day</i>
a) At school when teaching	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
b) At school for other work-related purposes	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
c) Outside of school for work-related purposes	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
d) Outside of school for non-work-related purposes	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅

Q8 How well can you do these tasks using ICT?*(Please mark one choice in each row)*

	<i>I know how to do this</i>	<i>I haven't done this but I could find out how</i>	<i>I do not think I could do this</i>
a) Find useful teaching resources on the Internet	☐ ₁	☐ ₂	☐ ₃
b) Contribute to a discussion forum/user group on the Internet (e.g., a wiki or blog)	☐ ₁	☐ ₂	☐ ₃
c) Produce presentations (e.g., Microsoft PowerPoint or a similar program) with simple animation functions	☐ ₁	☐ ₂	☐ ₃
d) Use the Internet for online purchases and payments	☐ ₁	☐ ₂	☐ ₃
e) Prepare lessons that involve the use of ICT by students	☐ ₁	☐ ₂	☐ ₃
f) Use a spreadsheet program (e.g., Microsoft Excel) for keeping records or analyzing data	☐ ₁	☐ ₂	☐ ₃
g) Assess student learning	☐ ₁	☐ ₂	☐ ₃
h) Collaborate with others using shared resources (e.g., Google Docs, OneNote, Padlet)	☐ ₁	☐ ₂	☐ ₃
i) Use a learning management system (e.g., Blackboard, Edmodo, Moodle)	☐ ₁	☐ ₂	☐ ₃

	<i>Your Use of ICT in Teaching</i>

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

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

Q9 Which of the following best describes the subject for this reference class?

(Please mark only one choice)

- ☐₁ English Language Arts
- ☐₂ Spanish, or other foreign language
- ☐₃ Mathematics
- ☐₄ Sciences (e.g., general science and/or physics, chemistry, biology, geology, earth sciences, technical science)
- ☐₅ Human sciences/Humanities/Social studies (e.g., history, geography, civics, law, economics)
- ☐₆ Creative arts (e.g., visual arts, music, dance, drama)
- ☐₇ Information technology, Computer science, or a similar subject
- ☐₈ Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades)
- ☐₉ Other (e.g., moral education/ethics, physical education, personal and social development)

Q10 In your teaching of the reference class in this school year, how much emphasis have you given to developing the following ICT-based capabilities in your students?*(Please mark one choice in each row)*

	<i>Strong emphasis</i>	<i>Some emphasis</i>	<i>Little emphasis</i>	<i>No emphasis</i>
a) Accessing information efficiently	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Displaying information for a given audience/purpose	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Evaluating the credibility of digital information	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Sharing digital information with others	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Using computer software to construct digital work products (e.g., presentations, documents, images, and diagrams)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Providing digital feedback on the work of others (such as classmates)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Exploring a range of digital resources when searching for information	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Providing references for digital information sources	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) Understanding the consequences of making information publicly available online	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q11 How often do students in your reference class use ICT for the following activities?*(Please mark one choice in each row)*

	<i>They do not engage in this activity</i>	<i>They never use ICT in this activity</i>	<i>They some- times use ICT in this activity</i>	<i>They often use ICT in this activity</i>	<i>They always use ICT in this activity</i>
a) Working on extended projects (i.e., lasting over a week)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
b) Working on short assignments (i.e., within one week)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
c) Explaining and discussing ideas with other students	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
d) Submitting completed work for assessment	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
e) Working individually on learning materials at their own pace	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
f) Undertaking open-ended investigations or field work	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
g) Reflecting on their learning experiences (e.g., by using a learning log)	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
h) Communicating with other students on projects	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
i) Planning a sequence of learning activities for themselves	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
j) Analyzing data	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
k) Evaluating information resulting from a search	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
l) Collecting data for a project	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
m) Creating visual products or videos	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
n) Sharing products with other students	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅

Q12 How often do you use ICT with the following practices when teaching your reference class?*(Please mark one choice in each row)*

	<i>I do not use this practice with the reference class</i>	<i>I never use ICT with this practice</i>	<i>I sometimes use ICT with this practice</i>	<i>I often use ICT with this practice</i>	<i>I always use ICT with this practice</i>
a) The presentation of information through direct class instruction	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
b) The provision of remedial or enrichment support to individual students or small groups of students	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
c) The support of student-led whole-class discussions and presentations	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
d) The assessment of students' learning through tests	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
e) The provision of feedback to students on their work	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
f) The reinforcement of learning of skills through repetition of examples	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
g) The support of collaboration among students	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
h) The mediation of communication between students and experts or external mentors	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
i) The communication with parents or guardians about students' learning	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅
j) The support of inquiry learning	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅

Q13 How often did you use the following tools in your teaching of the reference class this school year?*(Please mark one choice in each row)*

	<i>Never</i>	<i>In some lessons</i>	<i>In most lessons</i>	<i>In every or almost every lesson</i>
a) Practice programs or apps where you ask students questions (e.g., Quizlet, Kahoot)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Digital learning games	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Word-processor software (e.g., Microsoft Word)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Presentation software (e.g., Microsoft PowerPoint)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Spreadsheets (e.g., Microsoft Excel)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Video and photo software for capture and editing (e.g., Windows Movie Maker, iMovie, Adobe Photoshop)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Concept mapping software (e.g., Inspiration, Webspiration)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Simulations and modelling software (e.g., NetLogo)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) A learning management system (e.g., Blackboard, Edmodo, Moodle)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
j) Communication software (e.g., email, direct messaging, Skype)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
k) Collaborative software (e.g., Google Docs, OneNote, Padlet)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
l) Computer-based information resources (e.g., topic-related websites, wikis, encyclopaedia)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
m) Interactive digital learning resources (e.g., learning objects)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
n) Graphing or drawing software	☐ ₁	☐ ₂	☐ ₃	☐ ₄
o) e-portfolios (e.g., VoiceThread)	☐ ₁	☐ ₂	☐ ₃	☐ ₄
p) Digital contents linked with textbooks	☐ ₁	☐ ₂	☐ ₃	☐ ₄
q) Social media (e.g., Facebook, Twitter)	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q14 In your teaching of the reference class this school year, how much emphasis have you given to teaching the following skills?*(Please mark one choice in each row)*

	<i>Strong emphasis</i>	<i>Some emphasis</i>	<i>Little emphasis</i>	<i>No emphasis</i>
a) Displaying information in different ways	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) Breaking a complex process into smaller parts	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) Understanding diagrams that describe or show real-world problems	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) Planning tasks by setting out the steps needed to complete them	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) Using tools to make diagrams that help solve problems	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) Using simulations to help understand or solve real-world problems	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) Making flow diagrams to show the different parts of a process	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) Recording and evaluating data to understand and solve a problem	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) Using real-world data to review and revise solutions to problems	☐ ₁	☐ ₂	☐ ₃	☐ ₄

	<i>In Your School</i>

Q15 To what extent do you agree or disagree with the following statements about the use of ICT in teaching at your school?*(Please mark one choice in each row)*

	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
a) ICT is considered a priority for use in teaching.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) My school has sufficient ICT equipment (e.g., computers).	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) The computer equipment in my school is up-to-date.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) My school has access to sufficient digital learning resources (e.g., learning software or apps).	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) My school has good connectivity (e.g., fast speed and stable) to the Internet.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) There is enough time to prepare lessons that incorporate ICT.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) There is sufficient opportunity for me to develop expertise in ICT.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) There is sufficient technical support to maintain ICT resources.	☐ ₁	☐ ₂	☐ ₃	☐ ₄

Q16 To what extent do you agree or disagree with the following statements about your use of ICT in teaching and learning at your school?*(Please mark one choice in each row)*

	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
a) I work together with other teachers on improving the use of ICT in classroom teaching.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) I collaborate with colleagues to develop ICT-based lessons.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) I observe how other teachers use ICT in teaching.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) I discuss with other teachers how to use ICT in teaching topics.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) I share ICT-based resources with other teachers in my school.	☐ ₁	☐ ₂	☐ ₃	☐ ₄

	<i>Learning to Use ICT in Teaching</i>

Q17 Did your initial teacher education include the following elements?*(Please mark one choice in each row)*

	<i>Yes</i>	<i>No</i>
a) Learning how to use ICT	☐ ₁	☐ ₂
b) Learning how to use ICT in teaching	☐ ₁	☐ ₂

Q18 How often have you participated in any of the following professional learning activities in the past two years?*(Please mark one choice in each row)*

	<i>Not at all</i>	<i>Once only</i>	<i>More than once</i>
a) A course on ICT applications (e.g., word processing, presentations, Internet use, spreadsheets, databases)	☐ ₁	☐ ₂	☐ ₃
b) A course or webinar on integrating ICT into teaching and learning ...	☐ ₁	☐ ₂	☐ ₃
c) Training on subject-specific digital teaching and learning resources ..	☐ ₁	☐ ₂	☐ ₃
d) Observations of other teachers using ICT in teaching	☐ ₁	☐ ₂	☐ ₃
e) An ICT-mediated discussion or forum on teaching and learning	☐ ₁	☐ ₂	☐ ₃
f) The sharing of digital teaching and learning resources with others through a collaborative workspace	☐ ₁	☐ ₂	☐ ₃
g) Use of a collaborative workspace to jointly evaluate student work	☐ ₁	☐ ₂	☐ ₃
h) A course on use of ICT for students with special needs or specific learning difficulties	☐ ₁	☐ ₂	☐ ₃
i) A course on how to use ICT to support personalized learning by students	☐ ₁	☐ ₂	☐ ₃

	<i>Approaches to Teaching</i>

Q19 To what extent do you agree or disagree with the following statements about using ICT in teaching and learning at school?*(Please mark one choice in each row)***Using ICT at school ...**

	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>
a) impedes concept formation by students.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
b) helps students develop greater interest in learning.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
c) helps students to work at a level appropriate to their learning needs.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
d) results in students copying material from Internet sources. .	☐ ₁	☐ ₂	☐ ₃	☐ ₄
e) helps students develop problem solving skills.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
f) distracts students from learning.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
g) results in poorer written expression among students.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
h) results in poorer calculation and estimation skills among students.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
i) limits the amount of personal communication among students.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
j) enables students to collaborate more effectively.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
k) helps students develop skills in planning and self-regulation of their work.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
l) improves academic performance of students.	☐ ₁	☐ ₂	☐ ₃	☐ ₄
m) enables students to access better sources of information. ...	☐ ₁	☐ ₂	☐ ₃	☐ ₄

THANK YOU FOR YOUR TIME AND EFFORT IN COMPLETING THE QUESTIONNAIRE



IEA International Computer and Information Literacy Study

Student Questionnaire for the 2018 Main Study

The National Center for Education Statistics (NCES), within the U.S. Department of Education, conducts ICILS in the United States as authorized by the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151).

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this voluntary information collection is 1850-0929. The time required to complete this information collection is estimated to average 30 minutes per student, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments or concerns regarding the accuracy of the time estimate(s), suggestions for improving the form, or questions about the status of your individual submission of this form, write directly to: International Computer and Information Literacy Study (ICILS), National Center for Education Statistics, Potomac Center Plaza (PCP), 550 12th St., SW, 4th floor, Washington, DC 20202.

OMB No. 1850-0929, Approval Expires 12/31/2020.



INTRODUCTION TO THE QUESTIONNAIRE FOR STUDENTS

This questionnaire is about Information and Communication Technology (ICT). In this questionnaire, ICT can refer to:

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

In this questionnaire, you will find questions about:

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

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

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

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

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

The National Center for Education Statistics (NCES) is authorized to collect information from this questionnaire by the Education Sciences Reform Act of 2002 (ESRA 2002, 20 U.S.C. §9543). You do not have to provide the information requested. However, the information you provide will help the U.S. Department of Education's ongoing efforts to understand better how the educational system in the United States compares to that in other countries. There are no penalties should you choose not to participate in this study. All of the information you provide may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). Your responses will be combined with those from other participants to produce summary statistics and reports.

Thank you.

ABOUT YOU

Q1 When were you born?

(Scroll down to answer both parts to this question)

January - December (Month) 

1997 – 2008 (Year) 

Q2 Are you a girl or a boy?

Girl Boy

☐
☐

Q3 Are you Hispanic or Latino?

(Please mark only one choice)

Yes, I am Hispanic or Latino ☐

No, I am not Hispanic or Latino ☐

Q4 Which of the following best describes you?

(Please mark all choices that apply)

White ☐

Black or African American ☐

Asian ☐

American Indian or Alaska Native ☐

Native Hawaiian or other Pacific Islander ☐

Q5 What is the highest level of education you expect to complete?

(Please mark only one choice)

Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD) ☐

Associate's degree (2-year college program) ☐

High school graduate ☐

Some high school ☐

Less than high school ☐

YOUR HOME AND YOUR FAMILY

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

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

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

Q6 In what country were you and your parents born?

*(Please mark only one choice in each **column**)*

	You	Parent or guardian 1	Parent or guardian 2
United States	☐	☐	☐
Another country	☐	☐	☐

Q7 What language do you speak at home most of the time?

(Please mark only one choice)

English	☐
Spanish	☐
Another language	☐

Q8 Does your parent or guardian 1 work in a paid job?

Yes ☐ (**Note:** Student will be directed to Q10a and Q11a)

No ☐ (**Note:** Student will be directed to Q10b and Q11b)

Q9a What is your parent or guardian 1's main job?

(for example, school teacher, cook, sales manager)

(Please write in the job title)

Q10a What does your parent or guardian 1 do in his/her main job?

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

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

Q9b What was your parent or guardian 1's last main job?

(for example, school teacher, cook, sales manager)

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

(Please write in the job title)

Q10b What did your parent or guardian 1 do in his/her last main job?

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

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

Q11 What is the highest level of education completed by your parent or guardian 1?

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

(Please mark only one choice)

Bachelor's degree (4-year college program)
OR Master's degree or professional degree
(MD, DDS, lawyer, minister) OR Doctorate
(Ph.D., or EdD) ☐

Associate's degree (2-year college program) ☐

High school graduate ☐

Some high school ☐

Less than high school ☐

Q12 Does your parent or guardian 2 work in a paid job?

Yes ☐ **(Note:** Student will be directed to Q14a and Q15a)

No ☐ **(Note:** Student will be directed to Q14b and Q15b)

Q13a What is your parent or guardian 2's main job?

(for example, school teacher, cook, sales manager)

(Please write in the job title)

Q14a What does your parent or guardian 2 do in his/her main job?

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

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

Q13b What was your parent or guardian 2's last main job?

(for example, school teacher, cook, sales manager)

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

(Please write in the job title)

Q14b What did your parent or guardian 2 do in his/her last main job?

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

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

Q15 What is the highest level of education completed by your parent or guardian 2?

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

(Please mark only one choice)

Bachelor's degree (4-year college program)
OR Master's degree or professional degree
(MD, DDS, lawyer, minister) OR Doctorate
(Ph.D. or EdD) ☐

Associate's degree (2-year college program) ☐

High school graduate ☐

Some high school ☐

Less than high school ☐

Q16 About how many books are there in your home?*Do not count magazines, newspapers, comic books or your schoolbooks.**(Please mark only one choice)*

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

Q17 How many of the following ICT devices are currently used in your home?*(Please mark one choice in each row)*

		<i>None</i>	<i>One</i>	<i>Two</i>	<i>Three or more</i>
a)	Desktop or laptop computers	☐	☐	☐	☐
b)	Tablet devices or e-readers (e.g., iPad, Surface Pro, Kindle)	☐	☐	☐	☐

YOUR USE OF ICT

Q18 How long have you been using each of the following types of ICT devices?

(Please mark one choice in each row)

	<i>Never or less than one year</i>	<i>At least one year but less than three years</i>	<i>At least three years but less than five years</i>	<i>At least five years but less than seven years</i>	<i>Seven years or more</i>
a) Desktop or laptop computers	☐	☐	☐	☐	☐
b) Tablet devices or e-readers (e.g., iPad, Surface Pro, Kindle)	☐	☐	☐	☐	☐
c) Smartphones except for using text and calling	☐	☐	☐	☐	☐

Q19 Who mainly taught you how to do the following activities?*(Please mark one choice in each row)*

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

Q20   **How often do you use ICT in these places?**

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

(Please mark one choice in each row)

	<i>Never</i>	<i>Less than once a month</i>	<i>At least once a month but not every week</i>	<i>At least once a week but not every day</i>	<i>Every day</i>
a) At school for school-related purposes	☐	☐	☐	☐	☐
b) At school for other purposes	☐	☐	☐	☐	☐
c) Outside of school for school-related purposes	☐	☐	☐	☐	☐
d) Outside of school for other purposes	☐	☐	☐	☐	☐

Q21 How often do you use ICT for each of the following activities?*(Please mark one choice in each row)*

	<i>Never</i>	<i>Less than once a month</i>	<i>At least once a month but not every week</i>	<i>At least once a week but not every day</i>	<i>Every day</i>
a) Write or edit documents	☐	☐	☐	☐	☐
b) Use a spreadsheet to do calculations, store data or plot graphs e.g., using Microsoft Excel)	☐	☐	☐	☐	☐
c) Create a simple “slideshow” presentation (e.g., using Microsoft PowerPoint)	☐	☐	☐	☐	☐
d) Record or edit videos	☐	☐	☐	☐	☐
e) Write computer programs, scripts or apps (e.g., using Scratch, Logo, VBA, Java)	☐	☐	☐	☐	☐
f) Use drawing, painting or graphics software or apps	☐	☐	☐	☐	☐
g) Produce or edit music	☐	☐	☐	☐	☐
h) Build or edit a webpage	☐	☐	☐	☐	☐

Q22 How often do you use ICT to do each of the following communication activities?*(Please mark one choice in each row)*

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

Q23   **How often do you use ICT to do each of the following leisure activities?**

(Please mark one choice in each row)

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

USING ICT FOR SCHOOL

Q24   **How often do you use ICT for the following school-related purposes?**
(Please mark one choice in each row)

	<i>Never</i>	<i>Less than once a month</i>	<i>At least once a month but not every week</i>	<i>At least once a week but not every school day</i>	<i>Every school day</i>
a) Prepare reports or essays	☐	☐	☐	☐	☐
b) Prepare presentations	☐	☐	☐	☐	☐
c) Work online with other students	☐	☐	☐	☐	☐
d) Complete worksheets or exercises	☐	☐	☐	☐	☐
e) Organize your time and work	☐	☐	☐	☐	☐
f) Take tests	☐	☐	☐	☐	☐
g) Use software or applications to learn skills or a subject (e.g., mathematics tutoring software, language learning software)	☐	☐	☐	☐	☐
h) Use the Internet to do research	☐	☐	☐	☐	☐
i) Use coding software to complete assignments (e.g., in Scratch, Logo, VBA, Java)	☐	☐	☐	☐	☐
j) Make video or audio productions	☐	☐	☐	☐	☐

Q25   **At school, how often do you use ICT during lessons in the following subjects or subject areas?**
(Please mark one choice in each row)

	<i>I don't study this subject / these subjects</i>	<i>Never</i>	<i>In some lessons</i>	<i>In most lessons</i>	<i>In every or almost every lesson</i>
a) English Language Arts	☐	☐	☐	☐	☐
b) Spanish or other foreign language	☐	☐	☐	☐	☐
c) Mathematics	☐	☐	☐	☐	☐
d) Sciences (general science and/or physics, chemistry, biology, geology, earth sciences)	☐	☐	☐	☐	☐
e) Human sciences/Humanities /Social studies (e.g., history, geography, civics, law, economics)	☐	☐	☐	☐	☐
f) Creative arts (e.g., visual arts, music, dance, drama)	☐	☐	☐	☐	☐
g) Information technology, computer science or similar subject	☐	☐	☐	☐	☐
h) Practical or vocational (e.g., mechanics and repair, healthcare occupations, construction trades)	☐	☐	☐	☐	☐
i) Other (e.g., moral/ethics, physical education, personal and social development)	☐	☐	☐	☐	☐

Q26 When studying throughout this school year, how often did you use the following tools during class?

(Please mark one choice in each row)

	<i>Never</i>	<i>In some lessons</i>	<i>In most lessons</i>	<i>In every or almost every lesson</i>
a) Tutorial software or practice programs	☐	☐	☐	☐
b) Word-processing software (e.g., Microsoft Word)	☐	☐	☐	☐
c) Presentation software (e.g., Microsoft PowerPoint)	☐	☐	☐	☐
d) Spreadsheets (e.g., Microsoft Excel)	☐	☐	☐	☐
e) Multimedia production tools (e.g., media capture and editing, web production)	☐	☐	☐	☐
f) Concept mapping software (e.g., Inspiration, Webspiration)	☐	☐	☐	☐
g) Tools that capture real-world data (e.g., speed, temperature) digitally for analysis	☐	☐	☐	☐
h) Simulations and modelling software	☐	☐	☐	☐
i) Computer-based information resources (e.g., websites, wikis, encyclopedia)	☐	☐	☐	☐
j) Interactive digital learning resources (e.g., learning games or applications)	☐	☐	☐	☐
k) Graphing or drawing software	☐	☐	☐	☐

Q27 At school, to what extent have you learned how to do the following tasks?*(Please mark one choice in each row)*

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

Q28 At school, have you learned about the importance of the following topics?*(Please mark one choice in each row)*

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

YOUR THOUGHTS ABOUT USING AND LEARNING ABOUT ICT

Q29 How well can you do each of these tasks when using ICT?

(Please mark one choice in each row)

	<i>I know how to do this</i>	<i>I have never done this but I could work out how to do this</i>	<i>I do not think I could do this</i>
a) Edit digital photographs or other graphic images	☐	☐	☐
b) Create a database (e.g., using Microsoft Access)	☐	☐	☐
c) Write or edit text for a school assignment	☐	☐	☐
d) Search for and find relevant information for a school project on the Internet	☐	☐	☐
e) Build or edit a webpage	☐	☐	☐
f) Change the settings on your device to improve the way it operates	☐	☐	☐
g) Create a computer program, macro, or app (e.g., in Scratch, Logo, VBA, Java)	☐	☐	☐
h) Set up a local area network of computers or other ICT	☐	☐	☐
i) Create a multi-media presentation (with sound, pictures, or video)	☐	☐	☐
j) Upload text, images, or video to an online profile	☐	☐	☐
k) Insert an image into a document or message	☐	☐	☐
l) Install a program or app	☐	☐	☐
m) Judge whether you can trust information you find on the Internet	☐	☐	☐

Q30 How much do you agree or disagree with the following statements about ICT?

(Please mark one choice in each row)

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

Q31 When studying during the current school year, to what extent have you been taught how to do the following tasks?

(Please mark one choice in each row)

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

Q32 Do you study computing, computer science, information technology, informatics or similar in the current school year?

Yes ☐

No ☐

THANK YOU FOR YOUR TIME AND EFFORT IN COMPLETING THE QUESTIONNAIRE

Appendix E

Questionnaire Adaptations

APPENDIX E. QUESTIONNAIRE ADAPTATIONS

Exhibit E-1. ICILS 2018 Coordinator Questionnaire Adaptations	E-2
Exhibit E-2. ICILS 2018 Principal Questionnaire Adaptations	E-7
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Exhibit E-1. ICILS 2018 Coordinator Questionnaire Adaptations

International Question Number	International English Version	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
ABOUT YOUR POSITION				
Q3	How many years has your school been using ICT for teaching and/or learning purposes for students in [target grade]? <i>(Please mark only one choice)</i> 1 = Never, we do not use ICT 2 = Fewer than 5 years 3 = At least 5 but fewer than 10 years 4 = 10 years or more	eighth grade	eighth grade	
ICT RESOURCES				
Q5	Please indicate the availability of each of the following software resources at your school. (Please mark one choice in each row) 1 = Available to teachers - same as in STudents 2 = Available only to teachers 3 = Available only to students 4 = Not available			
Q5A	Practice programs or [apps] where teachers decide which questions are asked of students (e.g. [Quizlet, Kahoot], [mathfessor])	app (e.g., Quizlet, Kahoot)	app (e.g., Quizlet, Kahoot)	
Q5B	Single user digital learning games (e.g. [languages online])	(e.g., Languages Online)	(e.g., Languages Online)	
Q5C	Multi-user digital learning games with graphics and inquiry tasks (e.g. [Quest Atlantis])	(e.g., Quest Atlantis)	(e.g., Quest Atlantis)	

Exhibit E-1. ICILS 2018 Coordinator Questionnaire Adaptations—Continued

International Question Number	International English Version	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q5D	Word-processor software (e.g. [Microsoft Word ®])	(e.g., Microsoft Word)	(e.g., Microsoft Word)	
Q5E	Presentation software (e.g. [Microsoft PowerPoint ®])	(e.g., Microsoft PowerPoint)	(e.g., Microsoft PowerPoint)	
Q5F	Video and photo software for capture and editing (e.g. [Windows Movie Maker, iMovie, Adobe Photoshop])	(e.g., Windows Movie Maker, iMovie, Adobe Photoshop)	(e.g., Windows Movie Maker, iMovie, Adobe Photoshop)	
Q5G	Concept mapping software (e.g. [Inspiration ®], [Webspiration ®])	(e.g., Inspiration, Webspiration)	(e.g., Inspiration, Webspiration)	
Q5H	Data logging and monitoring tools (e.g. [Logger Pro]) that capture real-world data digitally for analysis (e.g. speed, temperature)	(e.g., Logger Pro) (e.g., speed, temperature)	(e.g., Logger Pro) (e.g., speed, temperature)	
Q5I	Simulations and modelling software (e.g. [NetLogo])	(e.g., NetLogo)	(e.g., NetLogo)	
Q5J	A learning management system (e.g. [Edmodo], [Blackboard])	(e.g., Blackboard, Edmodo, Moodle)	(e.g., Blackboard, Edmodo, Moodle)	
Q5L	e-portfolios (e.g. [VoiceThread])	(e.g., VoiceThread)	(e.g., VoiceThread)	
Q5N	Social media (e.g. [Facebook, Twitter])	(e.g., Facebook, Twitter)	(e.g., Facebook, Twitter)	

Exhibit E-1. ICILS 2018 Coordinator Questionnaire Adaptations—Continued

International Question Number	International English Version	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q6	Please indicate the availability of the following technology facilities at [target grade]. (Please mark one choice in each row) 1 = Available to teachers - same as in Students 2 = Available only to teachers 3 = Available only to students 4 = Not available	eighth grade	eighth grade	
Q6D	Internet-based applications for collaborative work (e.g. [Google Docs ®])	(e.g., Google Docs, Padlet, OneNote)	(e.g., Google Docs, Padlet, OneNote)	
Q6E	A learning management system (e.g. [WebCT ®], [Moodle])	(e.g., Blackboard, Edmodo, Moodle)	(e.g., Blackboard, Edmodo, Moodle)	
Q7A	In your school, approximately how many of the following types of (school-provided) ICT devices are available? For this question please: • Count terminals (if they have a keyboard and a screen) as computers • Exclude computers that are not in use (e.g. in storage) • Exclude computers that are only used as servers • Record 0 (zero), if none.	(e.g., in storage)	(e.g., in storage)	

Exhibit E-1. ICILS 2018 Coordinator Questionnaire Adaptations—Continued

International Question Number	International English Version	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q8	Does your school or [educational authority] provide teachers with their own portable digital device? (Please mark only one choice) 1 = Yes, for every teacher 2 = Yes, but not for all teachers 3 = No	school district	school district	
Q9	Approximately what percentage of students at the [target grade] have access to portable computers (laptops, netbooks or tablet devices) at school? (Please mark one choice in each row) 1 = 0 to 25% 2 = 26 to 50% 3 = 51 to 75% 4 = 76 to 100%	eighth grade	eighth grade	
Q9A	Students provided with portable computers by their [school] for use at school only	school	school	
Q9B	Students provided with portable computers by their [school] for use at home and at school	school	school	
Q10	Where are school ICT devices for teaching and learning in [target grade] located? (Please mark one choice in each row) 1 = Yes 2 = No	eighth grade	eighth grade	
Q10E	In other places accessible to students (e.g. cafeteria, auditorium, study area)	(e.g., cafeteria, auditorium, study area)	(e.g., cafeteria, auditorium, study area)	

Exhibit E-1. ICILS 2018 Coordinator Questionnaire Adaptations—Continued

International Question Number	International English Version	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
ICT SUPPORT				
Q11	At your school, who provides [routine/day-to-day] technical ICT support? <i>(Please mark one choice in each row)</i> 1 = Yes 2 = No	day-to-day	day-to-day	
Q12	At your school, who provides [routine/day-to-day] pedagogical ICT support for teachers? <i>(Please mark one choice in each row)</i> 1 = Yes 2 = No	day-to-day	day-to-day	
Q14	Is [computing, computer science, information technology, informatics or similar] taught as a standalone subject at the [target grade] in your school? 1 = Yes (Please continue with questions 15) 2 = No (Please go to the end of the questionnaire)	computing, computer science, information technology, informatics or similar eighth grade	computing, computer science, information technology, informatics or similar eighth grade	
Q15	In the teaching of [computing, computer science, information technology, informatics or similar] at the [target grade] in your school, how much emphasis is given to the following tasks? <i>(Please mark one choice in each row)</i> 1 = Strong emphasis 2 = Some emphasis 3 = Little emphasis 4 = No emphasis	computing, computer science, information technology, informatics, or a similar subject similar	computing, computer science, information technology, informatics, or a similar subject similar	
Q15A	Develop algorithms (e.g. instructions for a program like [Scratch])	(e.g., instructions for a program like Scratch)	(e.g., instructions for a program like Scratch)	

Exhibit E-2. ICILS 2018 Principal Questionnaire Adaptations

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
ABOUT YOU AND YOUR USE OF ICT					
Q2	How often do you use ICT for the following activities? <i>(Please mark one choice in each row)</i> 1 = Never 2 = Less than once a month 3 = At least once a month but not every week 4 = At least once a week but not every day 5 = Every day	Q2			
Q2C	Look up records in a database (e.g. in a student information system)	Q2C	e.g.,	e.g.,	
Q2D	Maintain, organise and analyse data (e.g. with a spreadsheet or database)	Q2D	e.g.,	e.g.,	
Q2J	Work with a learning management system (e.g. [Moodle])	Q2J	e.g., Blackboard, Edmodo, Moodle	e.g., Blackboard, Edmodo, Moodle	
Q2L	Management of staff (e.g. scheduling, professional development)	Q2L	e.g.,	e.g.,	
YOUR SCHOOL					
Q3	What is the total number of boys and girls in the entire school? <i>Record 0 (zero), if none.</i>	Q3	<i>(Please record a whole number. Record 0 (zero), if none.)</i>	<i>(Please record a whole number. Record 0 (zero), if none.)</i>	
Q4	What is the total number of boys and girls in [target grade]? <i>Record 0 (zero), if none.</i>	Q4	eighth-grade <i>(Please record a whole number. Record 0 (zero), if none.)</i>	eighth-grade <i>(Please record a whole number. Record 0 (zero), if none.)</i>	
		Q5	Around the 1st of October 2017, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program? <i>(Please record a whole number. Record 0 (zero), if none.)</i> _____ (Percentage of students)	Around the 1st of October 2017, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program? <i>(Please record a whole number. Record 0 (zero), if none.)</i> _____ (Percentage of students)	

Exhibit E-2. ICILS 2018 Principal Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
		Q6	Of the students currently enrolled in your school, what percentage has been identified as limited-English proficient (LEP)/English language learners (ELL)? <i>(Please record a whole number. Record 0 (zero), if none.)</i> _____ (Percentage of students)	Of the students currently enrolled in your school, what percentage has been identified as limited-English proficient (LEP)/English language learners (ELL)? <i>(Please record a whole number. Record 0 (zero), if none.)</i> _____ (Percentage of students)	
Q5A	What is the lowest (youngest) grade that is taught at your school? <i>(Please mark only once choice)</i> 1=[National Adaptation 1] 2=[National Adaptation 2] 3=[National Adaptation 3] 4=[National Adaptation 4] 5=[National Adaptation 5] 6=[National Adaptation 6] 7=[National Adaptation 7] 8=[National Adaptation 8]	Q7A	1=Preschool 2=Kindergarten 3=First grade 4=Second grade 5=Third grade 6=Fourth grade 7=Fifth grade 8=Sixth grade 9=Seventh grade 10=Eighth grade	1=Preschool 2=Kindergarten 3=First grade 4=Second grade 5=Third grade 6=Fourth grade 7=Fifth grade 8=Sixth grade 9=Seventh grade 10=Eighth grade	Natl > Intl 1 > 1 2 > 1 3 > 1 4 > 2 5 > 3 6 > 4 7 > 5 8 > 6 9 > 7 10 > 8
Q5B	What is the highest (oldest) grade that is taught at your school? <i>(Please mark only once choice)</i> 1=[National Adaptation 9] 2=[National Adaptation 10] 3=[National Adaptation 11] 4=[National Adaptation 12] 5=[National Adaptation 13] 6=[National Adaptation 14]	Q7B	1=Eighth grade 2=Ninth grade 3=Tenth grade 4=Eleventh grade 5=Twelfth grade	1=Eighth grade 2=Ninth grade 3=Tenth grade 4=Eleventh grade 5=Twelfth grade	Natl > Intl 1 > 1 2 > 2 3 > 3 4 > 4 5 > 5
Q6	What are the total numbers of full-time and part-time teachers in your school? A full-time teacher is employed on a regular basis as a teacher for at least 90% of full-time hours for the full school year. All other teachers should be considered part-time. <i>Record 0 (zero), if none.</i>	Q8	<i>(Please record a whole number. Record 0 (zero), if none.)</i>	<i>(Please record a whole number. Record 0 (zero), if none.)</i>	

Exhibit E-2. ICILS 2018 Principal Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
8A	Is this school a public or a private school? <i>(Please mark only one choice)</i> 1 = A public school (This is a school managed directly or indirectly by a public education authority, government agency, or governing board, appointed by government or elected by public franchise.) 2 = A private school (This is a school managed directly or indirectly by a non-government organisation; for example, a church, trade union, business, or other private institution.)	Q10A	Is this school a public or a private school? (Please mark only one choice) 1 = A public school (This is a school managed directly or indirectly by a public education authority, government agency, or governing board, appointed by government or elected by public franchise.) 2 = A private school (This is a school managed directly or indirectly by a non-government organisation; for example, a church, trade union, business, or other private institution.)	Is this school a public or a private school? (Please mark only one choice) 1 = A public school (This is a school managed directly or indirectly by a public education authority, government agency, or governing board, appointed by government or elected by public franchise.) 2 = A private school (This is a school managed directly or indirectly by a non-government organisation; for example, a church, trade union, business, or other private institution.)	
Q11	How often do you use ICT in the following practices when teaching your reference class? (Please mark one choice for each row) 1 = I do not use this practice with the reference class 2 = I never use ICT with this practice 3 = I sometimes use ICT with this practice 4 = I often use ICT with this practice 5 = I always use ICT with this practice				
Q9A	The development of students' basic computer skills (e.g. internet use, email, word processing, presentation software)	Q11A	e.g., Internet	e.g., Internet	
Q9G	The development of students' ability to write [apps] or programs	Q11G	apps	apps	
Q10	Are there procedures in place to monitor whether teachers at this school use ICT to achieve the following learning outcomes? <i>(Please select all that apply for each row)</i> 1 = Yes, by reviewing lesson plans 2 = Yes, through teacher self-evaluation 3 = Yes, through observing classrooms 4 = Yes, by other means 5 = No, this is not monitored	Q12			

Exhibit E-2. ICILS 2018 Principal Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q10A	The development of students' basic computer skills (e.g. internet use, email, word processing, presentation software)	Q12A	e.g., Internet	e.g., Internet	
Q10G	The development of students' ability to write [apps] or programs	Q12G	apps	apps	
Q11	Are teachers in your school expected to acquire knowledge and skills in each of the following activities? (Please mark one choice in each row) 1 = Expected and required 2 = Expected but not required 3 = Not expected	Q13			
Q11H	Use subject-specific digital learning resources (e.g. tutorials, simulation)	Q13H	e.g.,	e.g.,	
Q11K	Assess students' [computer and information literacy]	Q13K	computer and information literacy	computer and information literacy	
Q12	Who has the main responsibility for making decisions about each of the following aspects of ICT in this school? (Please mark one choice in each row) 1 = [Ministry, department or local/district authority] 2 = School boards/councils 3 = School principal or deputy 4 = [Heads of department] 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	Q14	1 = School district or relevant education authority 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	1 = School district or relevant education authority 2 = School boards/councils 3 = School principal or deputy 4 = Heads of department 5 = ICT coordinator 6 = Information specialist or librarian 7 = Individual teachers 8 = No one	
Q12J	The assessment of students' [computer and information literacy]	Q14J	computer and information literacy	computer and information literacy	
Q12K	The implementation of a [computer and information literacy] curriculum at the school	Q14K	computer and information literacy	computer and information literacy	
Q13	Does your school or school system have policies with regard to the following aspects of ICT use? (Please mark one choice in each row) 1 = Yes 2 = No	Q15			

Exhibit E-2. ICILS 2018 Principal Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q13E	Student access to school computers outside school hours The fulfillment of intellectual property rights (e.g. software copyrights)	Q15E	e.g., fulfillment	e.g., fulfillment	
Q13F	Prohibitions of access to inappropriate material (e.g. pornography, violence)	Q15F	e.g.,	e.g.,	
Q13I	Support for [students with special needs or specific learning difficulties]	Q15I	students with special needs or specific learning difficulties	students with special needs or specific learning difficulties	
Q13J	Unacceptable behaviours towards other students (e.g. [Cyberbullying])	Q15J	Cyberbullying	Cyberbullying	
Q14	Throughout the current school year, how many teachers in this school participate in the following forms of professional development about ICT for teaching and learning? <i>(Please mark one choice in each row)</i> 1 = None or hardly any 2 = Some of them 3 = Most of them 4 = All or nearly all	Q16			
Q14H	Participation in a [community of practice] concerned with ICT in teaching	Q16H	community of practice	community of practice	

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
ABOUT YOU					
		Q3	What year did you start teaching? <u> </u> <i>(Please write in a year)</i>	What year did you start teaching? <u> </u> <i>(Please write in a year)</i>	This is a U.S. question used in TIMSS 2015 and other national studies.
Q3	What are the main subjects that you teach in this school in the current school year? <i>(Please indicate the subjects that you teach in this school (indicate only those that individually account for at least [four lessons] each week in this school). The exact name of one or more of your subjects may not appear in the list for each category. If it does not, please mark the category you think best fits the subject.)</i>	Q4	four classes or two classes if block scheduling is used	four classes or two classes if block scheduling is used	
Q3A	[Language arts: test language]	Q4A	English Language Arts	English Language Arts	
Q3B	[Language arts: foreign and other national languages]	Q4B	Spanish, or other foreign language	Spanish, or other foreign language	
Q3C	Mathematics [Add any appropriate national examples]	Q4C	Mathematics	Mathematics	

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
Q3E	Human sciences/Humanities (history, geography, civic and citizenship education, law, economics etc.)	Q4E	Human sciences /Humanities / Social studies (e.g., history, geography, civics, law, economics)	Human sciences /Humanities / Social studies (e.g., history, geography, civics, law, economics)	To be consistent, using “e.g.,” instead of “etc.”
Q3F	Creative arts (visual arts, music, dance, drama etc.)	Q4F	Creative arts (e.g., visual arts, music, dance, drama)	Creative arts (e.g., visual arts, music, dance, drama)	To be consistent, using “e.g.,” instead of “etc.”
Q3G	[Information technology, computer studies or similar]	Q4G	Information technology, computer science, or similar subject	Information technology, computer science, or similar subject	We are wondering if “computer science” should be added to match the last question in the SQ?
Q3H	Practical and vocational subjects [Add any appropriate national examples]	Q4H	Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades)	Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades)	
Q3I	Other (e.g. [moral/ethics, physical education, home economics, personal and social development])	Q4I	(e.g., moral/ethics, physical education, personal and social development)	(e.g., moral/ethics, physical education, personal and social development)	Added comma after “e.g.”
Q4	In the current school year, at how many schools do you teach [target grade] students? (Please mark only one choice) 1 = Only in this school 2 = In this and another school 3 = In this and in two other schools 4 = In this and in three or more other schools	Q5	eighth-grade	eighth-grade	

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
YOUR USE OF ICT					
Q7	How well can you do these tasks using ICT? (Please mark one choice in each row) 1 = I know how to do this 2 = I haven't done this but I could find out how 3 = I do not think I could do this	Q8			
Q7C	Produce presentations (e.g. [PowerPoint® or a similar program]), with simple animation functions	Q8C	(e.g., Microsoft PowerPoint or a similar program)	(e.g., Microsoft PowerPoint or a similar program)	Copyright symbol not required. Capital first letter suffices. Added comma after "e.g."
Q7F	Using a spreadsheet program (e.g. [Microsoft Excel ®]) for keeping records or analyzing data	Q8F	(e.g., Microsoft Excel)	(e.g., Microsoft Excel)	Copyright symbol not required. Capital first letter suffices. Added comma after "e.g."
Q7H	Collaborate with others using shared resources such as [Google Docs®], [Padlet]	Q8H	Collaborate with others using shared resources (e.g., Google Docs, Padlet, OneNote)	Collaborate with others using shared resources (e.g., Google Docs, Padlet, OneNote)	Copyright symbol not required. Capital first letter suffices. Deleted "such as" and inserted "e.g.,"
Q7I	Use a learning management system (e.g. [Moodle], [Blackboard], [Edmodo])	Q8I	(e.g., Blackboard, Edmodo, Moodle)	(e.g., Blackboard, Edmodo, Moodle)	Copyright symbol not required. Capital first letter suffices. Added comma after "e.g."

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
YOUR USE OF ICT IN TEACHING					
Q8	Which of the following best describes the subject for this reference class? <i>(Please mark only one choice)</i> 1 = [Language arts: Test language] 2 = [Language arts: Foreign and other national languages] 3 = Mathematics [Add any appropriate national examples] 4 = Sciences (general science and/or physics, chemistry, biology, geology, earth sciences) 5 = Human sciences/Humanities/Social Studies (history, geography, civics, law, economics etc.) 6 = Creative arts (visual arts, music, dance, drama etc.) 7 = [Information technology, computer studies or similar] 8 = Practical and vocational subjects [Add any appropriate national examples] 9 = Other (e.g. [moral/ethics, physical education, home economics, personal and social development])	Q9	1 = English Language Arts 2 = Spanish, or other foreign language 3 = Mathematics 4 = Sciences (e.g., general science and/or physics, chemistry, biology, geology, earth sciences, technical science) 5 = Human sciences/Humanities/Social studies (e.g., history, geography, civics, law, economics) 6 = Creative arts (e.g., visual arts, music, dance, drama) 7 = Information technology, computer science or similar subject 8 = Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades) 9 = Other (e.g., moral/ethics, physical education, personal and social development)	1 = English Language Arts 2 = Spanish, or other foreign language 3 = Mathematics 4 = Sciences (e.g., general science and/or physics, chemistry, biology, geology, earth sciences, technical science) 5 = Human sciences/Humanities/Social studies (e.g., history, geography, civics, law, economics) 6 = Creative arts (e.g., visual arts, music, dance, drama) 7 = Information technology, computer science or similar subject 8 = Practical and vocational subjects (e.g., mechanics and repair, healthcare occupations, construction trades) 9 = Other (e.g., moral/ethics, physical education, personal and social development)	Also changed “etc.” to “e.g.” to be consistent. Removed “home economics”
Q9	In your teaching the reference class in this school year, how much emphasis have you given to developing the following ICTbased capabilities in your students? <i>(Please mark one choice in each row)</i> 1 = Strong emphasis 2 = Some emphasis 3 = Little emphasis 4 = No emphasis	Q10			
Q9E	To use computer software to construct digital work products (e.g. presentations, documents, images and diagrams)	Q10E	(e.g., presentations, documents, images and diagrams)	(e.g., presentations, documents, images and diagrams)	Added comma after “e.g.”

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
Q10	How often do <u>students</u> in your reference class use ICT for the following activities? <i>(Please mark one choice in each row)</i> 1 = They do not engage in this activity 2 = They never use ICT in this activity 3 = They sometimes use ICT in this activity 4 = They often use ICT in this activity 5 = They always use ICT in this activity	Q11			
Q10G	Reflect on their learning experiences (e.g. by using a learning log)	Q11G	(e.g., by using a learning log)	(e.g., by using a learning log)	Added comma after "e.g."
Q11	How often do you use ICT in the following practices when teaching your reference class? <i>(Please mark one choice for each row)</i> 1 = I do not use this practice with the reference class 2 = I never use ICT with this practice 3 = I sometimes use OCT with this practice 4 = I often use ICT with this practice 5 = I always use ICT with this practice	Q12			
Q11I	The communication with parents or [guardians] about students' learning	Q12I	guardians	guardians	
Q12	How often did you use the following tools in your teaching of the reference class this school year? <i>(Please mark one choice in each row)</i> 1 = Never 2 = In some lessons 3 = In most lessons 4 = In every or almost lessons	Q13			
Q12A	Practice programs or apps where you ask students questions (e.g. [Quizlet, Kahoot, mathfessor])	Q13A	(e.g., Quizlet, Kahoot)	(e.g., Quizlet, Kahoot)	Added comma after "e.g."
Q12C	Word-processor software (e.g. [Microsoft Word ®])	Q13C	(e.g., Microsoft Word)	(e.g., Microsoft Word)	Copyright symbol not required. Capital first letter suffices. Added comma after "e.g."
Q12D	Presentation software (e.g. [Microsoft PowerPoint ®])	Q13D	(e.g., Microsoft PowerPoint)	(e.g., Microsoft PowerPoint)	Copyright symbol not required. Capital first letter suffices. Added comma after "e.g."

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
Q12E	Spreadsheets (e.g. [Microsoft Excel ®])	Q13E	(e.g., Microsoft Excel)	(e.g., Microsoft Excel)	Copyright symbol not required. Capital first letter suffices. Added comma after “e.g.”
Q12F	Video and photo software for capture and editing (e.g. [Windows Movie Maker, iMovie, Adobe Photoshop])	Q13F	(e.g., Windows Movie Maker, iMovie, Adobe Photoshop)	(e.g., Windows Movie Maker, iMovie, Adobe Photoshop)	Added comma after “e.g.”
Q12G	Concept mapping software (e.g. [Inspiration ®], [Webspiration ®])	Q13G	(e.g., Inspiration, Webspiration)	(e.g., Inspiration, Webspiration)	Copyright symbol not required. Capital first letter suffices. Added comma after “e.g.”
Q12H	Simulations and modelling software (e.g. [NetLogo])	Q13H	(e.g., NetLogo)	(e.g., NetLogo)	Added comma after “e.g.”
Q12I	A learning management system (e.g. [Edmodo], [Blackboard])	Q13I	(e.g., Blackboard, Edmodo, Moodle)	(e.g., Blackboard, Edmodo, Moodle)	Added comma after “e.g.”
Q12J	Communication software (e.g. email, direct messaging, Skype)	Q13J	(e.g., email, direct messaging, Skype)	(e.g., email, direct messaging, Skype)	Added comma after “e.g.”
Q12K	Collaborative software (e.g. [Google Docs ®], [Onenote], [Padlet])	Q13K	(e.g., Google Docs, Onenote, Padlet)	(e.g., Google Docs, Onenote, Padlet)	Copyright symbol not required. Capital first letter suffices.
Q12L	Computer-based information resources (e.g. topic-related websites, wikis, encyclopaedia)	Q13L	(e.g., topic-related websites, wikis, encyclopaedia)	(e.g., topic-related websites, wikis, encyclopaedia)	Added comma after “e.g.”
Q12M	Interactive digital learning resources (e.g. learning objects)	Q13M	(e.g., learning objects)	(e.g., learning objects)	Added comma after “e.g.”
Q12O	e-portfolios (e.g. [VoiceThread])	Q13O	(e.g., VoiceThread)	(e.g., VoiceThread)	Added comma after “e.g.”
Q12Q	Social media (e.g. [Facebook, Twitter])	Q13Q	(e.g., Facebook, Twitter)	(e.g., Facebook, Twitter)	Added comma after “e.g.”
IN YOUR SCHOOL					
Q14	To what extent do you agree or disagree with the following statements about using ICT in teaching at your school? (Please mark one choice in each row) 1 = Strongly agree 2 = Agree 3 = Disagree 4 = Strongly disagree	Q15			
Q14B	My school has sufficient ICT equipment (e.g. computers).	Q15B	(e.g., computers)	(e.g., computers)	Added comma after “e.g.”

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language		National Adaptation in English	Justification for proposed changes
Q14D	My school has access to sufficient digital learning resources (e.g. learning software or [apps]).	Q15D	(e.g., learning software or apps).		(e.g., learning software or apps).	Added comma after “e.g.”
Q14E	My school has good connectivity (e.g. fast speed speed - same as in STable) to the Internet.	Q15E	(e.g., fast speed and stable)		(e.g., fast speed and stable)	Typo in column 2. Added comma after “e.g.”
LEARNING TO USE ICT IN TEACHING						
Q16	Did your [initial teacher education] include the following elements? <i>(Please mark one choice in each row)</i> 1 = Yes 2 = No	Q17	bachelor's degree	bachelor's degree		
Q17	Have you participated in any of the following professional development activities in the past two years? <i>(Please mark one choice in each row)</i> 1 = Yes 2 = No	Q18			This item stem and categories in the ICILS 18 MS Teacher Questionnaire says: How often have you participated in any of the following professional Activities in the past two years 1=Not at all 2=Once only 3=More than once Column 2 has different text.	
Q17H	A course on use of ICT for [students with special needs or specific learning difficulties]	Q18H	students with special needs or specific learning difficulties	students with special needs or specific learning difficulties		
APPROACHES TO TEACHING						
Q18	To what extent do you agree or disagree with the following practices and principles in relation to the use of ICT in teaching and learning? <i>(Please mark one choice in each row)</i> Using ICT at school ... 1 = Strongly agree 2 = Agree 3 = Disagree 4 = Strongly disagree	Q19				
Q18A	Impedes concept formation by students.	Q19A	impedes concept formation by students.	impedes concept formation by students.	Lower cased dimension like in FT.	

Exhibit E-3. ICILS 2018 Teacher Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Justification for proposed changes
Q18B	Helps students develop greater interest in learning.	Q19B	helps students develop greater interest in learning.	helps students develop greater interest in learning.	Lower cased dimension like in FT.
Q18C	Helps students to work at a level appropriate to their learning needs.	Q19C	helps students to work at a level appropriate to their learning needs.	helps students to work at a level appropriate to their learning needs.	Lower cased dimension like in FT.
Q18D	Results in students copying material from Internet sources.	Q19D	results in students copying material from Internet sources.	results in students copying material from Internet sources.	Lower cased dimension like in FT.
Q18E	Helps students develop problem solving skills.	Q19E	helps students develop problem solving skills.	helps students develop problem solving skills.	Lower cased dimension like in FT.
Q18F	Distracts students from learning.	Q19F	distracts students from learning.	distracts students from learning.	Lower cased dimension like in FT.
Q18G	Results in poorer written expression among students.	Q19G	results in poorer written expression among students.	results in poorer written expression among students.	Lower cased dimension like in FT.
Q18H	Results in poorer calculation and estimation skills among students.	Q19H	results in poorer calculation and estimation skills among students.	results in poorer calculation and estimation skills among students.	Lower cased dimension like in FT.
Q18I	Limits the amount of personal communication among students.	Q19I	limits the amount of personal communication among students.	limits the amount of personal communication among students.	Lower cased dimension like in FT.
Q18J	Enables students to collaborate more effectively.	Q19J	enables students to collaborate more effectively.	enables students to collaborate more effectively.	Lower cased dimension like in FT.
Q18K	Helps students develop skills in planning and self-regulation of their work.	Q19K	helps students develop skills in planning and self-regulation of their work.	helps students develop skills in planning and self-regulation of their work.	Lower cased dimension like in FT.
Q18L	Improves academic performance of students.	Q19L	improves academic performance of students.	improves academic performance of students.	Lower cased dimension like in FT.
Q18M	Enables students to access better sources of information.	Q19M	enables students to access better sources of information.	enables students to access better sources of information.	Lower cased dimension like in FT.

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
ABOUT YOU					
Q1	When were you born?		<i>(Scroll down to answer both parts to this question)</i>	<i>(Scroll down to answer both parts to this question)</i>	
		Q3	Are you Hispanic or Latino? <i>(Please mark only one choice)</i>	Are you Hispanic or Latino? <i>(Please mark only one choice)</i>	
		Q3A	Yes, I am Hispanic or Latino	Yes, I am Hispanic or Latino	
		Q3B	No, I am not Hispanic or Latino	No, I am not Hispanic or Latino	
		Q4	Which of the following best describes you? <i>(Please mark all choices that apply)</i>	Which of the following best describes you? <i>(Please mark all choices that apply)</i>	
		Q4A	White	White	
		Q4B	Black or African American	Black or African American	
		Q4C	Asian	Asian	
		Q4D	American Indian or Alaska Native	American Indian or Alaska Native	
		Q4E	Native Hawaiian or other Pacific Islander	Native Hawaiian or other Pacific Islander	
Q3	What is the highest level of education you expect to complete? <i>(Please mark only one choice)</i>	Q5	What is the highest level of education you expect to complete? <i>(Please mark only one choice)</i>	What is the highest level of education you expect to complete? <i>(Please mark only one choice)</i>	
	1 = [ISCED level 6, 7 or 8]		1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD)	1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D. or EdD)	
	2 = [ISCED level 4 or 5]		2 = Associate's degree (2-year college program)	2 = Associate's degree (2-year college program)	
	3 = [ISCED level 3]		3 = High school graduate	3 = High school graduate	
	4 = [ISCED level 2]		4 = Some high school	4 = Some high school	
	5 = I do not expect to complete [ISCED level 2]		5 = Less than high school	5 = Less than high school	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
YOUR HOME AND YOUR FAMILY					
Q4	In what country were you and your parents born? <i>(Please mark only one choice in each column)</i> 1 = [Country of test] 2 = [Other country/Group A] 3 = [Other country/Group B] 4 = [Another country]	Q6	1 = USA 2 = Another country	1 = USA 2 = Another country	Nat > Intl 1 > 1 2 > 4
Q4B	[Parent or guardian 1]	Q6B	Parent or guardian 1	Parent or guardian 1	
Q4C	[Parent or guardian 2]	Q6C	Parent or guardian 2	Parent or guardian 2	
Q5	What language do you speak at home most of the time? <i>(Please mark only one choice)</i> 1 = [Language of test] 2 = [Other language 1] 3 = [Other language 2] 4 = [Another language]	Q7	1 = English 2 = Spanish 3 = Another language	1 = English 2 = Spanish 3 = Another language	Natl > Intl 1 > 1 2 > 2 3 > 4
Q6	Does your [parent or guardian 1] work in a paid [job]? 1 = Yes (Note: Student will be directed to Q7a and Q8a) 2 = No (Note: Student will be directed to Q7b and Q8b)	Q8	parent or guardian 1 job	parent or guardian 1 job	
Q7A	What is your [parent or guardian 1]'s main [job]? (for example high school teacher, kitchen-hand, sales manager) <i>(Please write in the [job] title).</i>	Q9A	parent or guardian 1 (for example, school teacher, cook, sales manager) job	parent or guardian 1 (for example, school teacher, cook, sales manager) job	
Q8A	What does your [parent or guardian 1] do in his/her main [job]? (for example teaches high school students, helps the cook prepare meals in a restaurant, manages a sales team) <i>(Please use a sentence to describe the kind of work he/she does in that [job])</i>	Q10A	parent or guardian 1 job (for example, teaches high school students, helps prepare meals in a restaurant, manages a sales team) job	parent or guardian 1 job (for example, teaches high school students, helps prepare meals in a restaurant, manages a sales team) job	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q7B	What was your [parent or guardian 1]'s last main [job]? (for example high school teacher, kitchen-hand, sales manager) <i>(Please tell us her last main [job]. If he/she has never had a paid [job], please write what he/she is currently doing.)</i> <i>(Please write in the [job] title).</i>	Q9B	parent or guardian 1 job job job job	parent or guardian 1 job job job job	
Q8B	What did your [parent or guardian 1] do in his/her last main [job]? (for example taught high school students, helped the cook prepare meals in a restaurant, managed a sales team) <i>(Please use a sentence to describe the kind of work he/she did in that [job] or what he/she is currently doing if he/she never had a paid [job].)</i>	Q10B	parent or guardian 1 job (for example, taught high school students, helped prepare meals in a restaurant, managed a sales team) job job	parent or guardian 1 job (for example, taught high school students, helped prepare meals in a restaurant, managed a sales team) job job	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q9	What is the highest level of education completed by your [parent or guardian 1]? <i>If you are not sure which box to choose, please ask the [test administrator] for help. (Please mark only one choice)</i>	Q11	parent or guardian 1 test administrator	parent or guardian 1 test administrator	
	1 = [ISCED level 6, 7 or 8]		1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D., or EdD)	1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D., or EdD)	
	2 = [ISCED level 4 or 5]		2 = Associate's degree (2-year college program)	2 = Associate's degree (2-year college program)	
	3 = [ISCED level 3]		3 = High school graduate	3 = High school graduate	
	4 = [ISCED level 2]		4 = Some high school	4 = Some high school	
	5 = He/she did not complete [ISCED level 2]		5 = Less than high school	5 = Less than high school	
Q10	Does your [parent or guardian 2] work in a paid [job]? 1 = Yes (Note: Student will be directed to Q11a and Q12a) 2 = No (Note: Student will be directed to Q11b and Q12b)	Q12	Does your [parent or guardian 2] work in a paid [job]? 1 = Yes (Note: Student will be directed to Q11a and Q12a) 2 = No (Note: Student will be directed to Q11b and Q12b)	Does your [parent or guardian 2] work in a paid [job]? 1 = Yes (Note: Student will be directed to Q11a and Q12a) 2 = No (Note: Student will be directed to Q11b and Q12b)	1=1 2=2

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q11A	What is your [parent or guardian 2]'s main [job] ? (for example high school teacher, kitchen-hand, sales manager) <i>(Please write in the [job] title).</i>	Q13A	parent or guardian 2 (for example, school teacher, cook, sales manager) job	parent or guardian 2 (for example, school teacher, cook, sales manager) job	
Q12A	What does your [parent or guardian 2] do in his/her main [job] ? (for example teaches high school students, helps the cook prepare meals in a restaurant, manages a sales team) <i>(Please use a sentence to describe the kind of work he/she does in that [job])</i>	Q14A	parent or guardian 2 job (for example, teaches high school students, helps prepare meals in a restaurant, manages a sales team) job	parent or guardian 2 job (for example, teaches high school students, helps prepare meals in a restaurant, manages a sales team) job	
Q11B	What was your [parent or guardian 2]'s last main [job] ? (for example high school teacher, kitchen-hand, sales manager) <i>(Please tell us his last main [job]. If he/she has never had a paid [job], please write what he/she is currently doing.)</i> <i>(Please write in the [job] title).</i>	Q13B	parent or guardian 2 job job job job	parent or guardian 2 job job job job	
Q12B	What did your [parent or guardian 2] do in his/her last main [job] ? (for example taught high school students, helped the cook prepare meals in a restaurant, managed a sales team) <i>(Please use a sentence to describe the kind of work he/she did in that [job] or what he/she is currently doing if he/she never had a paid [job].)</i>	Q14B	parent or guardian 2 (for example, taught high school students, helped prepare meals in a restaurant, managed a sales team) job job job	parent or guardian 2 (for example, taught high school students, helped prepare meals in a restaurant, managed a sales team) job job job	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q13	What is the highest level of education completed by your [parent or guardian 2]? <i>If you are not sure which box to choose, please ask the [test administrator] for help. (Please mark only one choice)</i>	Q15	parent or guardian 2 test administrator	parent or guardian 2 test administrator	
	1 = [ISCED level 6, 7 or 8]		1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D., or EdD)	1 = Bachelor's degree (4-year college program) OR Master's degree or professional degree (MD, DDS, lawyer, minister) OR Doctorate (Ph.D., or EdD)	
	2 = [ISCED level 4 or 5]		2 = Associate's degree (2-year college program)	2 = Associate's degree (2-year college program)	
	3 = [ISCED level 3]		3 = High school graduate	3 = High school graduate	
	4 = [ISCED level 2]		4 = Some high school	4 = Some high school	
	5 = He/she did not complete [ISCED level 2]		5 = Less than high school	5 = Less than high school	
Q15A	How many of the following ICT devices are currently used in your home? <i>(Please mark one choice in each row)</i>	Q17A			
Q15AA	Desktop or [laptop] computers	Q17AA	laptop	laptop	
Q15AB	Tablet devices or e-readers (e.g. [iPad, Tablet PC, Kindle])	Q17AB	e.g., iPad, Surface Pro, Kindle	e.g., iPad, Surface Pro, Kindle	
Q15B	Do you have an Internet connection at home? <i>(Please mark only one choice)</i> 1 = Yes 2 = No	Q17B	Not administered	Not administered	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
YOUR USE OF ICT					
Q16	How long have you been using each of the following types of ICT devices? <i>(Please mark only one choice in each row)</i> 1 = Never or less than one year 2 = At least one year but less than three years 3 = At least three years but less than five years 4 = At least five years but less than seven years 5 = Seven years or more	Q18			
Q16A	Desktop or [laptop] computers	Q18A	laptop	laptop	
Q16B	Tablet devices or e-readers (e.g. [iPad, Tablet PC, Kindle])	Q18B	e.g., iPad, Surface Pro, Kindle	e.g., iPad, Surface Pro, Kindle	
Q16C	[Smartphones] except for using text and calling	Q18C	Smartphones	Smartphones	
Q18	How often do you use ICT in these places? Please do not count the use of [smartphones] when making phone calls or writing text messages. <i>(Please mark one choice in each row)</i> 1 = Never 2 = Less than once a month 3 = At least once a month but not every week 4 = At least once a week but not every day 5 = Every day	Q20	smartphones	smartphones	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q19	How often do you use ICT for each of the following activities? <i>(Please mark one choice in each row)</i> 1 = Never 2 = Less than once a month 3 = At least once a month but not every week 4 = At least once a week but not every day 5 = Every day	Q21			
Q19B	Use a spreadsheet to do calculations, store data or plot graphs (e.g. using [Microsoft Excel @])	Q21B	Microsoft Excel e.g.,	Microsoft Excel e.g.,	
Q19C	Create a simple “slideshow” presentation (e.g. using [Microsoft PowerPoint @])	Q21C	Microsoft PowerPoint e.g.,	Microsoft PowerPoint e.g.,	
Q19E	Write computer programs, scripts or apps (e.g. using [Logo, LUA, or Scratch])	Q21E	Scratch, Logo, VBA, Java e.g.,	Scratch, Logo, VBA, Java e.g.,	
Q19F	Use drawing, painting or graphics software or [apps]	Q21F	apps	apps	
Q19H	Build or edit a webpage	Q21H			
Q20	How often do you use ICT to do each of the following communication activities? <i>(Please mark one choice in each row)</i> 1 = Never 2 = Less than once a month 3 = At least once a month but not every week 4 = At least once a week but not every day 5 = Every day	Q22			
Q20B	Communicate with friends, family, or other people using instant messaging, voice or video chat (e.g. [Skype, WhatsApp, Viber])	Q22B	Skype, FaceTime, WhatsApp, Viber e.g.,	Skype, FaceTime, WhatsApp, Viber e.g.,	
Q20E	Ask questions on forums or [Q&A, question and answer] websites	Q22E	Q&A, question and answer	Q&A, question and answer	
Q20F	Answer other peoples' questions on forums or [Q&A, question and answer] websites	Q22F	Q&A, question and answer	Q&A, question and answer	
Q20G	Write posts for your own blog (e.g. [WordPress, Tumblr, Blogger])	Q22G	e.g., WordPress, Tumblr, Blogger	e.g., WordPress, Tumblr, Blogger	
Q20H	Post images or video in social networks or online communities (e.g. [Facebook, Instagram or YouTube])	Q22H	e.g., Facebook, Instagram or YouTube	e.g., Facebook, Instagram or YouTube	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
USING ICT FOR SCHOOL					
Q22	How often do you use ICT for the following school-related purposes? <i>(Please mark one choice in each row)</i> 1 = Never 2 = Less than once a month 3 = At least once a month but not every week 4 = At least once a week but not every school day 5 = Every school day	Q24			
Q22D	Complete [worksheets] or exercises	Q24D	worksheets	worksheets	
Q22G	Use software or applications to learn skills or a subject (e.g. mathematics tutoring software, language learning software)	Q24G	e.g.,	e.g.,	
Q22I	Use coding software to complete assignments (e.g. [Scratch])	Q24I	Scratch, Logo, VBA, Java e.g.,	Scratch, Logo, VBA, Java e.g.,	
Q23	At school, how often do you use ICT during lessons in the following subjects or subject areas? <i>(Please mark one choice in each row)</i> 1 = I don't study this subject/these subjects 2 = Never 3 = In some lessons 4 = In most lessons 5 = In every or almost every lesson	Q25	5 = In every or almost every lesson	5 = In every or almost every lesson	
Q23A	[Language arts: test language]	Q25A	English Language Arts	English Language Arts	
Q23B	[Language arts: foreign or other national languages]	Q25B	Spanish or other foreign language	Spanish or other foreign language	
Q23E	Human sciences /Humanities / Social studies (history, geography, civics, law, economics, etc.)	Q25E	Human sciences /Humanities / Social studies (e.g., history, geography, civics, law, economics)	Human sciences /Humanities / Social studies (e.g., history, geography, civics, law, economics)	
Q23F	Creative arts ([visual] arts, music, dance, drama, etc.)	Q25F	Creative arts [e.g., visual arts, music, dance, drama]	Creative arts [e.g., visual arts, music, dance, drama]	
Q23G	[Information technology, computer studies or similar]	Q25G	Information technology, computer science or similar subject	Information technology, computer science or similar subject	
Q23H	Practical or vocational [Add any appropriate national examples]	Q25H	(e.g., mechanics and repair, healthcare occupations, construction trades)	(e.g., mechanics and repair, healthcare occupations, construction trades)	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q23I	Other (e.g. [moral/ethics, physical education, personal and social development])	Q25I	Other (e.g., moral/ethics, physical education, personal and social development)	Other (e.g., moral/ethics, physical education, personal and social development)	
Q24	When studying throughout this school year, how often did you use the following tools during class? <i>(Please mark one choice in each row)</i> 1 = Never 2 = In some lessons 3 = In most lessons 4 = In every or almost every lesson	Q26			
Q24A	Tutorial software or [practice programs]	Q26A	practice programs	practice programs	
Q24B	Word-processing software (e.g. [Microsoft Word ®])	Q26B	Microsoft Word	Microsoft Word	
Q24C	Presentation software (e.g. [Microsoft PowerPoint ®])	Q26C	Microsoft PowerPoint	Microsoft PowerPoint	
Q24D	Spreadsheets (e.g. [Microsoft Excel®])	Q26D	Microsoft Excel	Microsoft Excel	
Q24F	Concept mapping software (e.g. [Inspiration ®], [Webspiration ®])	Q26F	e.g., Inspiration, Webspiration	e.g., Inspiration, Webspiration	
Q24G	Tools that capture real-world data (e.g. speed, temperature) digitally for analysis	Q26G	e.g.,	e.g.,	
Q24I	Computer-based information resources (e.g. websites, wikis, encyclopaedia)	Q26I	Computer-based information resources (e.g., websites, wikis, encyclopedia)	Computer-based information resources (e.g., websites, wikis, encyclopedia)	
Q24J	Interactive digital learning resources (e.g. learning games or applications)	Q26J	e.g.,	e.g.,	
Q26	At school, have you learned about the importance of the following topics? <i>(Please mark one choice in each row)</i> 1 = Yes 2 = No	Q28			
Q26A	To change passwords regularly (e.g. network account, email, social media)	Q28A	e.g.,	e.g.,	

Exhibit E-4. ICILS 2018 Student Questionnaire Adaptations—Continued

International Question Number	International English Version	National Question Number	National Adaptation in Testing Language	National Adaptation in English	Recoding Instructions
Q27	How well can you do each of these tasks when using ICT? <i>(Please mark one choice in each row)</i> 1 = I know how to do this 2 = I have never done this but I could work out how to do this 3 = I do not think I could do this	Q29			
Q27B	Create a database (e.g. using [Microsoft Access ®])	Q29B	e.g., Microsoft Access	e.g., Microsoft Access	
Q27G	Create a computer program, macro, or [app] (e.g. in [Basic, Visual Basic])	Q29G	e.g., app Scratch, Logo, VBA, Java	e.g., app Scratch, Logo, VBA, Java	
Q27L	Install a program or [app]	Q29L	app	app	
Q28	How much do you agree or disagree with the following statements about ICT? <i>(Please mark one choice in each row)</i> 1 = Strongly agree 2 = Agree 3 = Disagree 4 = Strongly disagree	Q30			
Q28I	I would like to study subjects related to ICT after [secondary school]	Q30I	high school	high school	
Q30	Do you study [computing, computer science, information technology, informatics or similar] in the current school year? 1 = Yes 2 = No	Q32	computing, computer science, information technology, informatics or similar	computing, computer science, information technology, informatics or similar	

Appendix F

U.S. ICILS 2018 Nonresponse Bias Analysis Final Report



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U.S. ICILS 2018 Nonresponse Bias Analysis

Final Report

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1. INTRODUCTION

The International Computer and Information Literacy Study (ICILS) is a computer-based international assessment of eighth-grade students' computer and information literacy skills. ICILS was first administered internationally in 2013 in 21 education systems and was administered again in 2018. The United States participated for the first time in the 2018 administration. The student population sampled in ICILS is defined as all students in each country or other education system who were enrolled in the grade that represents eight years of schooling, counting from the first year of ISCED Level 1, provided that the mean age at the time of testing is at least 13.5 years. In most participating nations, including the United States, this corresponds to all eighth-graders.

The U.S. ICILS study, supported by the National Center for Education Statistics (NCES), used a two-stage stratified sampling design. The first stage used a systematic probability-proportionate-to-size technique to select schools where size is the estimated grade 8 enrollment of the school. Although efforts were made to secure the participation of all schools selected in the first stage, it was anticipated that not all schools would choose to participate. Therefore, as each school was selected in the sample, the two neighboring schools in the sorted sampling frame (immediately following and preceding the selected school) were designated as the first and second substitute schools, respectively. The sampling frame was sorted first by explicit strata and secondarily by implicit strata, so the replacement schools were within the same strata as the original school. If the sampled school refused to participate, the first substitute was then contacted. If that school also refused to participate, the second substitute was then contacted.

The second stage of sampling consisted of selecting students within sampled schools. A minimum of 30 students were selected across classes. If fewer than 30 students were found in a school, they were all included in the survey. Also, if the number of eligible students was greater than 30, but less or equal to 32, all students were selected in order to prevent the situation that a small number of students are the only ones not being surveyed. The ICILS 2018 national data collection was fielded in March, April, and May 2018.

Additionally, a minimum of 20 teachers were selected. If fewer than 20 teachers were found in a school, they were all included in the survey. Also, if the number of eligible teachers was greater than 20, but less or equal to 22, all teachers were selected in order to prevent the situation that a small number of teachers are the only ones not being surveyed.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

There were 352 schools in the original sample. Of these 352 sampled schools, 342 were determined to be eligible¹ (the eligible original school sample) containing at least one eighth-grade student. International ICILS standards stipulated that schools with a student participation rate of less than 50 percent were regarded as nonrespondents, so two original sample schools and one replacement school with less than 50 percent of students participating were treated as nonrespondents in this report. This resulted in 231 participating schools (the participating original sample) for an initial weighted response rate of 67.4 percent. An additional 32 substitute schools participated for a total of 263 participating schools after replacement (the participating final sample). The weighted school response rate increased to 77.1 percent. The school participation rates for the U.S. sample are summarized in table F-1. The weighted student response rate was 91.0 percent within responding schools. The weighted teacher response rate was 89.4 percent.

Table F-1. Selected characteristics for the nonresponse bias analysis of the U.S. ICILS final school sample: 2018

Sample	Schools in original sample	Eligible schools in sample	Number of participating schools		Percent (weighted)	
			Before replacement	After replacement	School participation rate before replacement	School participation rate after replacement
United States	352	342	231	263	67.4	77.1

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

NCES standards for assessment surveys stipulate that a nonresponse bias analysis is required at any stage of data collection reporting a weighted unit response rate less than 85 percent. Since the U.S. ICILS weighted school response rate is below 85 percent, NCES requires an investigation into the potential magnitude of nonresponse bias at the school level in the U.S. sample. Since the U.S. ICILS 2018 weighted student and teacher response rates are above 85 percent, a nonresponse bias analysis at the student and teacher levels are not required.

¹ Of the 352 original schools selected for the sample, there were 8 ineligible and 2 excluded schools.

2. METHODOLOGY

To measure the potential nonresponse bias at the school level, the characteristics of participating schools were compared to those of the total eligible sample of schools. This was conducted in a way so that the tests of statistical significance that were applied account for the fact that the participating schools are a subset of the eligible schools, and not a distinct group.

The general approach taken involves an analysis in three parts as described below.

1. Analysis of the participating original sample: The distribution of the participating original school sample (N = 231) was compared with that of the total eligible original school sample (N = 342). The participating original sample is the sample before substitution. In each sample, schools were weighted by their school base weights and enrollment of grade 8 students, referred to as a size-adjusted weight, excluding any nonresponse adjustment factor. The size-adjusted weight modifies the PPS weight so that schools with relatively small number of students (and large school base weights) won't influence the results more than schools with relatively large number of students (and small school base weights). The base weight for each original school is the reciprocal of its selection probability. Size adjustment is used because the nonresponse bias concerns relate to the representation of the student population. For example, this reduces the distortion that private school rates could have on the overall rate.
2. Analysis of the participating final school sample with substitutes: The distribution of the participating final school sample (N = 263), which includes 32 participating substitutes that were used as replacements for nonresponding schools from the eligible original sample, was compared to the total eligible final school sample (N = 342). The total eligible final sample includes the participating final sample plus those original nonrespondents that were not replaced by substitutes. Again, schools were weighted by their size-adjusted school base weights for both the eligible sample and the participating schools. The base weight for each substitute school is the reciprocal of its selection probability².
3. Analysis of the nonresponse-adjusted final sample with substitutes: The same sets of schools were compared as in the second analysis, but this time, when analyzing the participating final schools alone, school nonresponse adjustments were applied to the size-adjusted school base weights. The international weighting procedures form nonresponse adjustment classes by the explicit stratification variables. The eligible sample was again weighted by their size-adjusted school base weights.

The first analysis indicates the potential for nonresponse bias that was introduced through school nonresponse. The second analysis suggests the remaining potential for nonresponse bias after the mitigating effects of substitution have been accounted for. The third analysis indicates the potential for bias

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² In most cases the estimated number of grade 8 students for a substitute school is very close to the original, and thus the baseweights are nearly equal. Differences in the eligible percentages shown in the tables between the original sample and the final sample with substitutes are attributable to differences between original and substitute schools in the estimated number of grade 8 students.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

after accounting for the mitigating effects of both substitution and nonresponse weight adjustments. Both the second and third analyses, however, may provide an overly optimistic scenario, resulting from the fact that substitution and nonresponse adjustments may correct somewhat for deficiencies in the characteristics examined here, but there is no guarantee that they are equally as effective for other characteristics and, in particular, for student achievement. Additionally, the international weighting procedures creates nonresponse adjustment cells with only the explicit stratification variables that may or may not be the only contributor to observed bias in the responding sample.

Participating ICILS schools and the total eligible ICILS school sample were compared by as many school sampling frame characteristics as possible that might provide information about the presence of nonresponse bias. Comparing frame characteristics between participating schools and the total eligible school sample is not an ideal measure of nonresponse bias if the characteristics are unrelated or weakly related to more substantive items in the survey; however, often it is the only approach available since ICILS data are not available for nonparticipating schools. While the school-level characteristics used in these analyses are limited to those available in the sampling frame, each of the variables had a demonstrated relationship to achievement in previous student assessments in the U.S.

Frame characteristics for public schools were from the 2015-16 Common Core of Data (CCD) and, for private schools, from the 2015-16 Private School Universe Survey (PSS).

The following categorical variables were available in the sampling frame for all schools:

- School control—indicates whether the school is under public control³ (operated by publicly elected or appointed officials) or private control (operated by privately elected or appointed officials and derives its major source of funds from private sources);
- Locale—urban-centric locale code (i.e., central city, suburb, town, rural);
- Census region—Northeast, Midwest, South, and West (see appendix A for state listing);
- Poverty level⁴—for public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the national free and reduced-price lunch (FRPL) program, and a low poverty school is defined as one in which less than 50 percent are eligible;
- School size—grade 8 enrollment of school (as shown on school samples frame) divided into three equally sized categories (small, medium, and large)⁵.

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³ Includes charter schools.

⁴ The sample frame did not contain a direct measure of poverty. No free or reduced-price lunch (FRPL) program data were available for private schools, thus all private schools are treated as low-poverty schools.

⁵ Small schools had less than or equal to 105 grade 8 students. Medium schools had less than or equal to 365 grade 8 students. Large schools had more than 365 grade 8 students.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

The following continuous variables were available in the sampling frame for all schools:

- Estimated number of grade 8 students enrolled;
- Total number of students; and
- Percentage of students in seven race/ethnicity categories (White, non-Hispanic; Black, non-Hispanic; Hispanic; Asian; American Indian or Alaska Native; Hawaiian/Pacific Islander; and Two or more races).⁶

An additional continuous variable, the percentage of students eligible to participate in the FRPL, was available only for public schools. The poverty level variable mentioned among the categorical variable is the recoded version of this continuous variable.⁷

For categorical variables, the distribution of frame characteristics for participating schools was compared with the distribution for the total eligible school sample. The hypothesis of independence between the characteristic and participation status was tested using a Rao-Scott modified Chi-square statistic at the 5 percent level (Rao and Thomas 2003). For continuous variables, summary means were calculated and the difference between means was tested using a *t* test. The *p*-values for the tests are presented in the tables that follow. The statistical significance of differences between participants and the total eligible sample is identical to that which would result from comparing participants and nonparticipants, since all significance tests account for the fact that the participants are a subset of the full sample. The bias and relative bias are also shown in each table. The bias is calculated as the difference between the respective estimates for the participants and the eligible sample. The relative bias is calculated as the bias divided by the estimate from the total eligible school sample and is a measure of the size of the bias compared to the total eligible school sample (i.e., the unbiased) estimate.

In addition to these tests, logistic regression models were used to provide a multivariate analysis that examined the conditional independence of these school characteristics as predictors of participation. The logistic regression compared frame characteristics for participating schools with nonparticipating schools, which is effectively the same as comparing the participating schools to the eligible sample as in the bivariate analysis.

Multivariate analysis can provide additional insights, over and above those gained through the bivariate analysis. It may be the case that only one or two variables are actually related to participation status. However, if these variables are also related to the other variables examined in the analyses, then

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⁶ Black includes African American, and Hispanic includes Latino. Racial categories exclude Hispanic origin.

⁷ The continuous variable percentage of students eligible to participate in the FRPL is missing for private schools; however, private schools are treated as low poverty for the categorical variable poverty level.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

other variables, which are not related to participation status, will appear as significant in simple bivariate tables. Multivariate analysis, in contrast, examines the conditional relationships with participation after controlling for the other predictor variables—thereby, testing the robustness of the relationships between school characteristics and participation.

Dummy variables were created for each component of the categorical variables so that each component was included separately. The last component of each categorical variable is used as the reference category. The p -value of a dummy variable indicates whether there is a significant difference at the 5 percent level from the effect of the (omitted) reference category. It is not possible to include all the frame characteristics in a single model because the seven race/ethnicity variables are linearly dependent (i.e., they sum up to 100 percent for every school). Therefore, two models were used. In the first model, six race/ethnicities (Black, non-Hispanic; Hispanic; Asian; American Indian or Alaska Native; Hawaiian/Pacific Islander; and Two or more races) were included in the model with “percentage White, non-Hispanic” as the reference category. In addition, an F test was used to determine whether the parameter estimates of these six characteristics were simultaneously equal to zero. In the second model, the summed percentage of the six race/ethnicities (Black, non-Hispanic; Hispanic; Asian; American Indian or Alaska Native; Hawaiian/Pacific Islander; and Two or more races), referred to as the summed race/ethnicity percentage, replaced the six race/ethnicity variables with “percentage White, non-Hispanic” again as the reference category. The second model permits the analysis of differences in the percentages of White, non-Hispanic students, which is not possible in the first model. All other frame characteristics were included in both models.

Because the percentage of students eligible for free or reduced-price lunch was not included in the main logistic regression analysis, a separate analysis with public schools only was conducted. To include free or reduced-price lunch eligibility in a model, public schools were modeled separately using a third model with the summed race/ethnicity percentage and adding the percentage of students eligible for free or reduced-price lunch. Since poverty is derived from the percentage of students eligible for free or reduced-price lunch, an interaction term between the two characteristics was also included in the model.

The multivariate regression analysis cannot be conducted after the school nonresponse adjustments are applied to the weights. The concept of nonresponse-adjusted weights does not apply to the nonresponding units, and, thus, we cannot conduct an analysis that compares respondents with nonrespondents using nonresponse-adjusted weights.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

The bivariate analysis and the logistic regression were both performed using replicate weights to properly account for the complex sample design. The JK2 method was used to create the replicate weights (Westat 2007).

3. PARTICIPATING ORIGINAL SAMPLE

This section presents the nonresponse bias analysis based on the original sample of 342 eligible schools for ICILS. The distribution of the participating original sample was compared to the schools in the total eligible original sample. Size-adjusted school base weights were used for both the eligible sample and the participating schools. The weighted school response rate for ICILS was 67.4 percent, with 231 out of 342 schools participating.

3.1 Categorical Variables

The distribution of participating and eligible schools by the five characteristics is shown in table F-2. The Chi-square statistic for school control, census region, poverty level, and school size are significant and suggests that there is evidence of relationships with participation in the assessment. In particular, public schools were overrepresented among participating schools relative to eligible schools (95.3 percent versus 91.9 percent, respectively), while private schools were underrepresented among participating schools relative to eligible schools (4.7 percent versus 8.1 percent, respectively). Schools in the Northeast were underrepresented among participating schools relative to eligible schools (8.1 percent versus 16.8 percent, respectively), while schools in the South were overrepresented among participating schools (44.7 percent versus 38.2 percent, respectively). Schools in low poverty were underrepresented among participating schools relative to eligible schools (49.3 percent versus 56.4 percent, respectively), while schools in high poverty were overrepresented among participating schools (50.7 percent versus 43.6 percent, respectively). Small sized schools were underrepresented among participating schools relative to eligible schools (28.9 percent versus 33.2 percent, respectively), while medium sized schools were overrepresented among participating schools (36.4 percent versus 33.7 percent, respectively). There are no statistically significant relationships between participation status and any of the other characteristics shown in table F-2. However, the absolute value of the relative bias for schools in rural areas is greater than 10 percent, which indicates potential bias even though no statistically significant relationship was detected.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-2. Percentage distribution of eligible and participating schools in the U.S. ICILS original sample, by selected categorical variables: 2018

School characteristic	Sample schools		Bias	Relative bias	Chi-square <i>p</i> -value
	Eligible (percent) (N = 342)	Participating (percent) (N = 231)			
School control					0.008
Public	91.9	95.3	3.33	0.036	
Private	8.1	4.7	-3.33	-0.414	
Locale					0.329
Central city	30.7	29.0	-1.68	-0.055	
Suburb	40.0	39.0	-1.07	-0.027	
Town	10.8	11.7	0.85	0.078	
Rural	18.5	20.4	1.91	0.103	
Census region					< .001
Northeast	16.8	8.1	-8.66	-0.516	
Midwest	21.4	19.9	-1.47	-0.069	
South	38.2	44.7	6.52	0.171	
West	23.6	27.2	3.62	0.153	
Poverty level					< .001
High	43.6	50.7	7.03	0.161	
Low	56.4	49.3	-7.03	-0.125	
School size					0.044
Small	33.2	28.9	-4.28	-0.129	
Medium	33.7	36.4	2.71	0.080	
Large	33.1	34.7	1.57	0.047	

NOTE: Detail may not sum to totals because of rounding. Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low-poverty schools. Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

3.2 Continuous Variables

Summary means for each continuous variable for participating and eligible schools are shown in tables F-3 and F-4. No data on FRPL eligibility were available for private schools, so private schools are not included in the analysis shown in table F-4.

The *t* test statistic for grade 8 enrollment is significant and suggests that there is evidence of relationships with participation in the assessment. In particular, participating schools had a higher mean grade 8 enrollment than the eligible sample (259.4 versus 245.9, respectively; table F-3) The *t* test statistic for White, non-Hispanic and Hispanic are significant and suggests that there is evidence of relationships

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

with participation in the assessment. In particular, participating schools had a lower mean percentage of White, non-Hispanic students than the eligible sample (48.3 percent versus 51.6 percent, respectively) and a higher mean percentage of Hispanic students than the eligible sample (27.1 percent versus 24.7 percent, respectively). However, the absolute value of the relative bias for Asian is greater than 10 percent, although this is due mostly to the eligible percentage being less than 5.0 percent, as the bias is relatively small. The *t* test statistic for free or reduced-price lunch is significant and suggests that there is evidence of relationships with participation in the assessment. In particular, participating schools had a higher mean percentage than the eligible sample (53.9 percent versus 50.8 percent, respectively; table F-4).

Table F-3. Mean values of various characteristics for eligible and participating schools in the U.S. ICILS original sample: 2018

	Sample schools		Bias	Relative bias	<i>t</i> test <i>p</i> -value
	Eligible (mean) (N = 342)	Participating (mean) (N = 231)			
Enrollment					
Total school	785.1	779.6	-5.53	-0.007	0.782
Grade 8	245.9	259.4	13.42	0.055	0.028
Race/ethnicity percentage					
White, non-Hispanic	51.6	48.3	-3.26	-0.063	0.004
Black, non-Hispanic	13.8	15.2	1.37	0.099	0.084
Hispanic	24.7	27.1	2.48	0.101	0.007
Asian	5.1	4.5	-0.60	-0.118	0.133
American Indian or Alaska Native	1.1	1.1	0.02	0.015	0.945
Hawaiian/Pacific Islander	0.3	0.3	-0.01	-0.018	0.889
Two or more races	3.4	3.4	0.00	0.000	0.999

NOTE: Black includes African American, and Hispanic includes Latino. Racial categories exclude Hispanic origin. Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor. SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-4. Mean percentage of students eligible for free or reduced-price lunch, in eligible and participating public schools in the U.S. ICILS original sample: 2018

Students	Sample schools		Bias	Relative bias	<i>t</i> test <i>p</i> -value
	Eligible (percent) (N = 296)	Participating (percent) (N = 211)			
Percentage of students eligible for free or reduced-price lunch	50.8	53.9	3.03	0.060	0.002

NOTE: Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

3.3 Logistic Regression Model

To examine the joint relationship of various characteristics to school nonresponse, the analysis used a logistic regression model with participation status as the binary dependent variable and frame characteristics as predictor variables. Since public and private schools were modeled together using the variables available for all schools, the percentage of students eligible for free or reduced-price lunch was not included in the main logistic regression analysis.

Standard errors and tests of hypotheses for the full model parameter estimates are presented in table F-5a (with six race/ethnicity variables) and table F-5b (with summed race/ethnicity percentage). Private schools are treated as low poverty for the categorical variable poverty level. Private schools, schools in central cities and suburbs, Northeast region, Midwest region, high poverty, medium sized schools, total school and grade 8 enrollments, Black, non-Hispanic, and Hispanic were significant predictors of school participation in table F-5a. The negative parameter estimates indicate that:

- relative to public schools, private schools were somewhat underrepresented among the participating schools;
- relative to schools in rural areas, schools in central cities were somewhat underrepresented among the participating schools;
- relative to schools in the West region, schools in the Northeast and Midwest regions were somewhat underrepresented among the participating schools;
- total school enrollment in participating schools was smaller than in all eligible schools.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

The positive parameter estimates indicate that:

- relative to schools in rural areas, schools in suburbs were somewhat overrepresented among the participating schools;
- relative to schools in low poverty, schools in high poverty were somewhat overrepresented among the participating schools;
- relative to large sized schools, medium sized schools were somewhat overrepresented among participating schools;
- grade 8 enrollment in participating schools was larger than in all eligible schools;
- the likelihood that a school participated increases as the percentages of Black, non-Hispanic and Hispanic students increases.

The F test statistic to determine whether the race/ethnicity characteristics are simultaneously equal to 0 was 3.9433 with a p -value of 0.0019, which indicates that a significant relationship with participation was detected. Private schools, schools in central cities and suburbs, Northeast region, Midwest region, high poverty, medium sized schools, total school enrollment, and the summed race/ethnicity percentage were significant predictors of school participation in table F-5b. The positive parameter estimate for the summed race/ethnicity indicates that the likelihood that a school participated decreases as the White, non-Hispanic percentage increases.

Because the percentage of students eligible for free or reduced-price lunch was not included in the main logistic regression analysis, a separate analysis with public schools only was conducted. To include free or reduced-price lunch eligibility in a model, public schools were modeled separately using a model with the summed race/ethnicity percentage and adding the percentage of students eligible for free or reduced-price lunch. Since poverty is derived from the percentage of students eligible for free or reduced-price lunch, an interaction term⁸ was also included in the model. Standard errors and tests of hypotheses for the full model parameter estimates are presented in table F-5c. Schools in suburbs, Northeast region, Midwest region, high poverty, medium sized schools, free or reduced-price lunch eligibility, high poverty, high poverty and free or reduced price lunch eligibility interaction term, and total school enrollment were significant predictors of school participation. The positive parameter estimate for free or reduced-price lunch eligibility indicates that the percentage of students eligible for free or reduced-price lunch in participating public schools was higher than in all eligible public schools. The negative coefficient on the interaction term indicates the smaller the percentage of students eligible for free or reduced-priced lunch the less likely public schools above 50 percent poverty will respond relative to public schools below 50

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⁸ The interaction term can be interpreted as indicating whether the marginal effect of a one percentage-point increase in FRPL is diminished or amplified for schools above the 50 percent cut point, relative to those below the cut point.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

percent poverty. The F test statistic to determine whether the sum of the parameter estimates for free or reduced-priced lunch and the interaction term is equal to 0 was 0.001 with a p -value of 0.9759. Together with the significant positive parameter for free or reduced-price lunch eligibility, this indicates that the percentage eligible for free or reduced price lunch was positively associated with participation in low poverty schools, but not in high poverty schools.

Table F-5a. Logistic regression model parameters (with six race/ethnicity variables) using the U.S. ICILS original school sample: 2018

Parameter	Parameter estimate	Standard error	t test for H_0 : parameter = 0	p -value
Intercept	0.649	0.5199	1.2492	0.2155
Private school	-0.567	0.1854	-3.0571	0.0031
Central city	-0.540	0.1239	-4.3586	< 0.0001
Suburb	0.272	0.1156	2.3485	0.0215
Town	-0.161	0.1162	-1.3901	0.1686
Northeast	-2.000	0.1022	-19.5609	< 0.0001
Midwest	-0.750	0.1058	-7.0890	< 0.0001
South	-0.128	0.1062	-1.2036	0.2325
High poverty	0.558	0.0871	6.4050	< 0.0001
Small	0.408	0.3959	1.0302	0.3062
Medium	0.502	0.2207	2.2723	0.0259
Total school enrollment	-0.001	0.0001	-5.8302	< 0.0001
Grade 8 enrollment	0.003	0.0014	2.0045	0.0486
Black, non-Hispanic	0.007	0.0019	3.4915	0.0008
Hispanic	0.004	0.0017	2.5091	0.0143
Asian	-0.006	0.0043	-1.3458	0.1824
American Indian or Alaska Native	-0.022	0.0174	-1.2435	0.2176
Hawaiian/Pacific Islander	-0.021	0.0184	-1.1354	0.2598
Two or more races	0.011	0.0119	0.8882	0.3773

NOTE: Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low poverty schools. Black includes African American, and Hispanic includes Latino. Racial categories exclude Hispanic origin. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-5b. Logistic regression model parameters (with summed race/ethnicity percentage) using the U.S. ICILS original school sample: 2018

Parameter	Parameter estimate	Standard error	<i>t</i> test for H0: parameter = 0	<i>p</i> -value
Intercept	0.519	0.5114	1.0152	0.3133
Private school	-0.580	0.1825	-3.1802	0.0021
Central city	-0.412	0.1332	-3.0973	0.0027
Suburb	0.358	0.1194	2.9960	0.0037
Town	-0.053	0.1191	-0.4409	0.6606
Northeast	-1.961	0.0943	-20.8074	< 0.0001
Midwest	-0.648	0.0969	-6.6866	< 0.0001
South	-0.001	0.0981	-0.0117	0.9907
High poverty	0.589	0.0903	6.5170	< 0.0001
Small	0.379	0.3885	0.9758	0.3323
Medium	0.491	0.2152	2.2800	0.0255
Total school enrollment	-0.001	0.0001	-5.9460	< 0.0001
Grade 8 enrollment	0.003	0.0014	1.9283	0.0576
Summed race/ethnicity percentage	0.003	0.0014	2.2804	0.0254

NOTE: Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low poverty schools. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-5c. Logistic regression model parameters (with summed race/ethnicity percentage) using the U.S. ICILS original public school sample: 2018

Parameter	Parameter estimate	Standard error	<i>t</i> test for H0: parameter = 0	<i>p</i> -value
Intercept	0.311	0.4798	0.6491	0.5182
Central city	-0.147	0.1407	-1.0443	0.2997
Suburb	0.474	0.1228	3.8615	0.0002
Town	0.232	0.1349	1.7205	0.0895
Northeast	-2.069	0.1126	-18.3762	< 0.0001
Midwest	-1.052	0.1054	-9.9856	< 0.0001
South	-0.225	0.1169	-1.9276	0.0577
High poverty	1.038	0.2829	3.6695	0.0005
Small	0.249	0.3521	0.7059	0.4825
Medium	0.404	0.1999	2.0182	0.0471
Free or reduced-price lunch eligibility	0.021	0.0037	5.6453	< 0.0001
High poverty* free or reduced-price lunch eligibility	-0.021	0.0053	-3.9055	0.0002
Total school enrollment	-0.001	0.0001	-6.4666	< 0.0001
Grade 8 enrollment	0.002	0.0013	1.4750	0.1444
Summed race/ethnicity percentage	0.004	0.0019	1.8253	0.0719

NOTE: Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

4. PARTICIPATING FINAL SAMPLE WITH SUBSTITUTES

This section presents the nonresponse bias analysis based on the final sample of 342 eligible schools for the U.S. ICILS sample, including participating substitute schools. The distribution of the participating final sample of schools was compared to the schools in the total eligible final sample. The total eligible final sample includes participating final sample plus those original nonrespondents who were not replaced by substitutes. Size-adjusted school base weights were used for both the eligible sample and the participating schools. Through the use of substitute schools, the weighted school response rate for ICILS was 77.1 percent, with 263 out of 342 schools participating.

4.1 Categorical Variables

The distribution of participating and eligible schools by the five characteristics is shown in table F-6. The Chi-square statistic for school control, census region, poverty level, and school size are significant and suggests that there is evidence of relationships with participation in the assessment. In particular, public schools were overrepresented among participating schools relative to eligible schools (94.4 percent versus 91.9 percent, respectively), while private schools were underrepresented among participating schools relative to eligible schools (5.6 percent versus 8.1 percent, respectively). Schools in the Northeast were underrepresented among participating schools relative to eligible schools (9.4 percent versus 16.8 percent, respectively), while schools in the South were overrepresented among participating schools (43.5 percent versus 38.2 percent, respectively). Schools in low poverty were underrepresented among participating schools relative to eligible schools (51.6 percent versus 56.3 percent, respectively), while schools in high poverty were overrepresented among participating schools (48.4 percent versus 43.7 percent, respectively). Small sized schools were underrepresented among participating schools relative to eligible schools (30.0 percent versus 33.3 percent, respectively), while medium sized schools were overrepresented among participating schools (36.5 percent versus 33.6 percent, respectively). There are no statistically significant relationships between participation status and any of the other characteristics shown in table F-6. However, the absolute value of the relative bias for schools in towns is greater than 10 percent, which indicates potential bias even though no statistically significant relationship was detected.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-6. Percentage distribution of eligible and participating schools in the U.S. ICILS final sample, by selected categorical variables: 2018

School characteristic	Sample schools		Bias	Relative bias	Chi-square <i>p</i> -value
	Eligible (percent) (N = 342)	Participating (percent) (N = 263)			
School control					0.026
Public	91.9	94.4	2.42	0.026	
Private	8.1	5.6	-2.42	-0.301	
Locale					0.112
Central city	30.7	28.1	-2.56	-0.083	
Suburb	40.0	40.7	0.65	0.016	
Town	10.8	12.1	1.32	0.122	
Rural	18.5	19.1	0.59	0.032	
Census region					< .001
Northeast	16.8	9.4	-7.40	-0.440	
Midwest	21.4	20.5	-0.86	-0.040	
South	38.2	43.5	5.31	0.139	
West	23.6	26.6	2.95	0.125	
Poverty level					< .001
High	43.7	48.4	4.71	0.108	
Low	56.3	51.6	-4.71	-0.084	
School size					0.042
Small	33.3	30.0	-3.25	-0.098	
Medium	33.6	36.5	2.85	0.085	
Large	33.1	33.5	0.40	0.012	

NOTE: Detail may not sum to totals because of rounding. Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low poverty schools. Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

4.2 Continuous Variables

Summary means for each continuous variable for participating and eligible schools are shown in tables F-7 and F-8. No data on FRPL eligibility were available for private schools, so private schools are not included in the analysis shown in table F-8.

There were no statistically significant differences between participating and eligible schools with respect to enrollment (table F-7). The *t* test statistic for grade 8 enrollment is significant and suggests that there is evidence of relationships with participation in the assessment. In particular, participating schools had higher mean grade 8 enrollment than the eligible sample (365.3 versus 349.1, respectively;

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

table F-7). The t test statistic for White, non-Hispanic and Hispanic are significant and suggests that there is evidence of relationships with participation in the assessment. In particular, participating schools had a lower mean percentage of White, non-Hispanic students than the eligible sample (47.8 percent versus 50.2 percent, respectively) and a higher mean percentage of Hispanic students than the eligible sample (27.1 percent versus 25.2 percent, respectively). There were no statistically significant differences between participating and eligible schools with respect to race/ethnicity percentage (table F-7). However, the absolute value of the relative bias for Hawaiian/Pacific Islander American Indian or Alaska Native is greater than 10 percent, although this is due mostly to the eligible percentage being less than 5.0 percent, as the bias is relatively small. The t test statistic for free or reduced-price lunch is significant and suggests that there is evidence of relationships with participation in the assessment. In particular, participating schools had a higher mean percentage than the eligible sample (53.2 percent versus 51.5 percent, respectively; table F-8).

Table F-7. Mean values of various characteristics for eligible and participating schools in the U.S. ICILS final sample: 2018

Characteristic	Sample schools		Bias	Relative bias	t test p -value
	Eligible (mean) (N = 342)	Participating (mean) (N = 263)			
Enrollment					
Total school	778.3	772.4	-5.89	-0.008	0.744
Grade 8	245.5	253.7	8.17	0.033	0.109
Race/ethnicity percentage					
White, non-Hispanic	50.2	47.8	-2.48	-0.049	0.003
Black, non-Hispanic	14.6	15.4	0.78	0.053	0.234
Hispanic	25.2	27.1	1.82	0.072	0.004
Asian	5.0	4.6	-0.43	-0.086	0.155
American Indian or Alaska Native	1.2	1.4	0.23	0.190	0.062
Hawaiian/Pacific Islander	0.4	0.3	-0.02	-0.065	0.494
Two or more races	3.4	3.5	0.10	0.030	0.467

NOTE: Black includes African American, and Hispanic includes Latino. Racial categories exclude Hispanic origin. Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor. SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-8. Mean percentage of students eligible for free or reduced-price lunch, in eligible and participating public schools in the U.S. ICILS final sample: 2018

Students	Sample schools		Bias	Relative bias	<i>t</i> test <i>p</i> -value
	Eligible (percent) (N = 296)	Participating (percent) (N = 238)			
Percentage of students eligible for free or reduced-price lunch	51.5	53.2	1.69	0.033	0.014

NOTE: Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Schools were weighted by their size-adjusted school base weights that did not include a nonresponse adjustment factor.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

4.3 Logistic Regression Model

To examine the joint relationship of various characteristics to school nonresponse, the analysis used a logistic regression model with participation status as the binary dependent variable and frame characteristics as predictor variables. Since public and private schools were modeled together using the variables available for all schools, the percentage of students eligible for free or reduced-price lunch was not included in the main logistic regression analysis.

Standard errors and tests of hypotheses for the full model parameter estimates are presented in table F-9a (with six race/ethnicity variables) and table F-9b (with summed race/ethnicity percentage). Private schools, schools in central cities, Northeast region, Midwest region, high poverty, medium sized schools, total school enrollment, percentages of Black, non-Hispanic, Hispanic, American Indian or Alaska Native, Hawaiian/Pacific Islander, and Two or more races were significant predictors of school participation in table F-9a. The negative parameter estimates indicate that:

- relative to public schools, private schools were somewhat underrepresented among the participating schools;
- relative to schools in rural areas, schools in central cities were somewhat underrepresented among the participating schools;
- relative to schools in the West region, schools in the Northeast and Midwest regions were somewhat underrepresented among the participating schools;
- total school enrollment in participating schools was smaller than in all eligible schools; and
- the likelihood that a school participated decreases as the percentage of Hawaiian/Pacific Islander students increases.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

The positive parameter estimates indicate that:

- relative to schools in low poverty, schools in high poverty were somewhat overrepresented among the participating schools;
- relative to large sized schools, medium sized schools were somewhat overrepresented among participating schools; and
- the likelihood that a school participated increases as the percentages of Black, non-Hispanic students, Hispanic students, American Indian or Alaska Native students, and students with Two or more races increase.

The F test statistic to determine whether the race/ethnicity characteristics are simultaneously equal to 0 was 8.5839 with a p -value of < 0.0001 , which indicates that a significant relationship with participation was detected. Private schools, schools in central cities, Northeast region, Midwest region, high poverty, medium sized schools, total school enrollment, and the summed race/ethnicity percentage were significant predictors of school participation in table F-9b. The positive parameter estimate for the summed race/ethnicity indicates that the likelihood that a school participated decreases as the white non-Hispanic percentage increases.

Because the percentage of students eligible for free or reduced-price lunch was not included in the main logistic regression analysis, a separate analysis with public schools only was conducted. To include free or reduced-price lunch eligibility in a model, public schools were modeled separately using a model with the summed race/ethnicity percentage and adding the percentage of students eligible for free or reduced-price lunch. Since poverty is derived from the percentage of students eligible for free or reduced-price lunch, an interaction term was also included in the model. Standard errors and tests of hypotheses for the full model parameter estimates are presented in table F-9c (with public schools only). Schools in central cities, Northeast region, Midwest region, medium sized schools, free or reduced-price lunch eligibility, total school enrollment, and the summed race/ethnicity percentage were significant predictors of school participation. The positive parameter estimate for free or reduced-price lunch eligibility indicates that the percentage of students eligible for free or reduced-price lunch in participating public schools was higher than in all eligible public schools. The F test statistic to determine whether the sum of the parameter estimates for free or reduced-priced lunch and the interaction term is equal to 0 was 0.75 with a p -value of 0.3877. Together with the significant positive parameter for free or reduced-price lunch eligibility, this indicates that the percentage eligible for free or reduced price lunch was positively associated with participation in low poverty schools, but not in high poverty schools.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-9a. Logistic regression model parameters (with six race/ethnicity variables) using the U.S. ICILS final school sample: 2018

Parameter	Parameter estimate	Standard error	<i>t</i> test for H ₀ : parameter = 0	<i>p</i> -value
Intercept	1.155	0.6791	1.7010	0.0931
Private school	-0.762	0.2061	-3.6993	0.0004
Central city	-1.140	0.1645	-6.9302	< 0.0001
Suburb	-0.222	0.1629	-1.3647	0.1764
Town	-0.226	0.1534	-1.4755	0.1443
Northeast	-2.118	0.1150	-18.4220	< 0.0001
Midwest	-0.658	0.1291	-5.1012	< 0.0001
South	0.102	0.1220	0.8369	0.4053
High poverty	0.472	0.0909	5.1919	< 0.0001
Small	0.529	0.5106	1.0364	0.3033
Medium	0.748	0.2848	2.6259	0.0105
Total school enrollment	#	0.0001	-5.7546	< 0.0001
Grade 8 enrollment	0.002	0.0018	1.2242	0.2247
Black, non-Hispanic	0.006	0.0021	2.9516	0.0042
Hispanic	0.011	0.0019	5.7977	< 0.0001
Asian	-0.001	0.0046	-0.1691	0.8662
American Indian or Alaska Native	0.041	0.0118	3.4966	0.0008
Hawaiian/Pacific Islander	-0.069	0.0214	-3.2203	0.0019
Two or more races	0.053	0.0123	4.2740	0.0001

Rounds to zero.

NOTE: Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low poverty schools. Black includes African American, and Hispanic includes Latino. Racial categories exclude Hispanic origin. Schools were weighted by their school base weights that did not include a nonresponse adjustment factor, and by their estimated number of grade 8 students.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-9b. Logistic regression model parameters (with summed race/ethnicity percentage) using the U.S. ICILS final school sample: 2018

Parameter	Parameter estimate	Standard error	<i>t</i> test for H ₀ : parameter = 0	<i>p</i> -value
Intercept	1.558	0.6467	2.409	0.0184
Private school	-0.676	0.2051	-3.2982	0.0015
Central city	-1.138	0.1684	-6.7540	< 0.0001
Suburb	-0.251	0.1659	-1.5112	0.1349
Town	-0.257	0.1550	-1.6576	0.1016
Northeast	-2.318	0.1027	-22.5825	< 0.0001
Midwest	-0.832	0.1162	-7.1649	< 0.0001
South	-0.002	0.1127	-0.0134	0.9894
High poverty	0.468	0.0950	4.9309	< 0.0001
Small	0.455	0.4824	0.9432	0.3486
Medium	0.752	0.2687	2.7996	0.0065
Total school enrollment	#	0.0001	-5.7742	< 0.0001
Grade 8 enrollment	0.002	0.0017	1.0432	0.3002
Summed race/ethnicity percentage	0.007	0.0015	4.767	< 0.0001

Rounds to zero.

NOTE: Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low poverty schools. Schools were weighted by their school base weights that did not include a nonresponse adjustment factor, and by their estimated number of grade 8 students.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-9c. Logistic regression model parameters (with summed race/ethnicity percentage) using the U.S. ICILS final public school sample: 2018

Parameter	Parameter estimate	Standard error	<i>t</i> test for H ₀ : parameter = 0	<i>p</i> -value
Intercept	1.680	0.5975	2.8116	0.0063
Central city	-0.645	0.1854	-3.4805	0.0008
Suburb	0.063	0.1764	0.3573	0.7219
Town	0.344	0.1853	1.8558	0.0674
Northeast	-2.765	0.1345	-20.5604	< 0.0001
Midwest	-1.528	0.1359	-11.2441	< 0.0001
South	-0.014	0.1452	-0.0971	0.9229
High poverty	0.271	0.3810	0.7111	0.4792
Small	0.444	0.4122	1.0769	0.2850
Medium	0.914	0.2434	3.7574	0.0003
Free or reduced-price lunch eligibility	0.010	0.0044	2.1992	0.0309
High poverty* free or reduced-price lunch eligibility	-0.005	0.0070	-0.7165	0.4759
Total school enrollment	-0.001	0.0001	-6.8068	< 0.0001
Grade 8 enrollment	0.001	0.0015	0.5598	0.5773
Summed race/ethnicity percentage	0.005	0.0023	2.2381	0.0282

NOTE: Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL. Schools were weighted by their school base weights that did not include a nonresponse adjustment factor, and by their estimated number of grade 8 students.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

5. NONRESPONSE-ADJUSTED FINAL SAMPLE WITH SUBSTITUTES

This section presents the nonresponse bias analysis based on the final sample of 342 eligible schools for the U.S. ICILS sample. The distribution of the participating final sample, including participating substitute schools, was compared to the schools in the total eligible final sample, just like the previous section. However, in the analyses that follow, size-adjusted school base weights were used for the eligible sample of schools, whereas nonresponse adjustments were applied to the size-adjusted school base weights for the participating schools.

5.1 Categorical Variables

The distribution of participating and eligible schools by the five characteristics is shown in table F-10. There are no statistically significant relationships between participation status and any of the characteristics shown in table F-10. However, the absolute value of the relative bias for schools in central cities and towns is greater than 10 percent, which indicates potential bias even though no statistically significant relationships were detected.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-10. Percentage distribution of eligible and participating schools in the U.S. ICILS nonresponse-adjusted sample, by selected categorical variables: 2018

School characteristic	Sample schools		Bias	Relative bias	Chi-square <i>p</i> -value
	Eligible (percent) (N = 342)	Participating (percent) (N = 263)			
School control					0.999
Public	91.9	91.9	0.00	0.000	
Private	8.1	8.1	0.00	0.000	
Locale					0.114
Central city	30.7	27.5	-3.19	-0.104	
Suburb	40.0	42.6	2.56	0.064	
Town	10.8	11.9	1.08	0.100	
Rural	18.5	18.0	-0.45	-0.024	
Census region					1.000
Northeast	16.8	16.8	0.01	0.000	
Midwest	21.4	21.3	-0.01	0.000	
South	38.2	38.2	0.01	0.000	
West	23.6	23.6	0.00	0.000	
Poverty level					0.994
High	43.7	43.7	0.01	0.000	
Low	56.3	56.3	-0.01	0.000	
School size					0.302
Small	33.3	33.8	0.49	0.015	
Medium	33.6	35.7	2.08	0.062	
Large	33.1	30.5	-2.57	-0.078	

NOTE: Detail may not sum to totals because of rounding. Census region is the state-based region of the country (see technical notes for state listing). For public schools, a high poverty school is defined as one in which 50 percent or more of the students are eligible for participation in the FRPL; all private schools are treated as low poverty schools. Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Participating schools were weighted by their size-adjusted school nonresponse-adjusted weights. The eligible sample was weighted by their size-adjusted school base weights.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

5.2 Continuous Variables

Summary means for each continuous variable for participating and eligible schools are shown in tables F-11 and F-12. No data on FRPL eligibility were available for private schools, so private schools are not included in the analysis shown in table F-12.

There were no statistically significant differences between participating and eligible schools with respect to enrollment or race/ethnicity percentage (table F-11). There was also no statistically significant difference between participating and eligible schools with respect to free or reduced-price lunch (table F-12).

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-11. Mean values of various characteristics for eligible and participating schools in the U.S. ICILS nonresponse-adjusted sample: 2018

Characteristic	Sample schools		Bias	Relative bias	<i>t</i> test <i>p</i> -value
	Eligible (mean) (N = 342)	Participating (mean) (N = 263)			
Enrollment					
Total school	778.3	755.9	-22.34	-0.029	0.255
Grade 8	245.5	241.5	-4.03	-0.016	0.505
Race/ethnicity percentage					
White, non-Hispanic	50.2	49.6	-0.62	-0.012	0.522
Black, non-Hispanic	14.6	14.9	0.31	0.021	0.689
Hispanic	25.2	25.5	0.31	0.012	0.651
Asian	5.0	4.7	-0.23	-0.047	0.533
American Indian or Alaska Native	1.2	1.2	0.05	0.038	0.309
Hawaiian/Pacific Islander	0.4	0.3	-0.04	-0.098	0.224
Two or more races	3.4	3.6	0.23	0.067	0.355

NOTE: Black includes African American, and Hispanic includes Latino. Racial categories exclude Hispanic origin. Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Participating schools were weighted by their size-adjusted school nonresponse-adjusted weights. The eligible sample was weighted by their size-adjusted school base weights.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

Table F-12. Mean percentage of students eligible for free or reduced-price lunch, in eligible and participating public schools in the U.S. ICILS nonresponse-adjusted sample: 2018

Students	Sample schools		Bias	Relative bias	<i>t</i> test <i>p</i> -value
	Eligible (percent) (N = 296)	Participating (percent) (N = 238)			
Percentage of students eligible for free or reduced-price lunch	51.5	51.6	0.14	0.003	0.860

NOTE: Eligible schools have at least one grade 8 student. Participating schools agreed to have their students assessed. The relative bias is calculated as the bias divided by the estimate from the eligible sample. Participating schools were weighted by their size-adjusted school nonresponse-adjusted weights. The eligible sample was weighted by their size-adjusted school base weights.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

6. SUMMARY

Since the U.S. ICILS weighted school response rates are below 85 percent, NCES requires an investigation into the potential magnitude of nonresponse bias at the school level in the U.S. sample. The investigation into nonresponse bias at the school level for the U.S. ICILS effort shows statistically significant relationships between response status and some of the available school characteristics that were examined in the analyses.

For original sample schools, eight variables were found to be statistically significantly related to participation in the bivariate analysis: school control (table F-2), census region (table F-2), poverty level (table F-2), school size (table F-2), grade 8 enrollment (table F-3), percentage of White, non-Hispanic (table F-3), percentage of Hispanic (table F-3), and percentage of free or reduced-price lunch (table F-4). Additionally, the absolute value of the relative bias for schools in rural areas (table F-2), and Asian (table F-3) is greater than 10 percent, which indicates potential bias even though no statistically significant relationship was detected. Although each of these findings indicates some potential for nonresponse bias, when all of these factors were considered simultaneously in a regression analysis, private schools, schools in central cities and suburbs, Northeast region, Midwest region, high poverty, medium sized schools, total school and grade 8 enrollments, Black, non-Hispanic, and Hispanic were significant predictors of school participation (table F-5a). The second model showed that private schools, schools in central cities and suburbs, Northeast region, Midwest region, high poverty, medium sized schools, total school enrollment, and the summed race/ethnicity percentage were significant predictors of participation (table F-5b, with summed race/ethnicity percentage). The third model showed that schools in suburbs, Northeast region, Midwest region, high poverty, medium sized schools, free or reduced-price lunch eligibility, high poverty and free or reduced price lunch eligibility interaction term, and total school enrollment were significant predictors of school participation among public schools only (table F-5c).

For the final sample of schools (with substitutes), seven variables were found to be statistically significantly related to participation in the bivariate analysis: school control (table F-6), census region (table F-6), poverty level (table F-6), school size (table F-6), percentage of White, non-Hispanic (table F-7), percentage of Hispanic (table F-7), and percentage of free or reduced-price lunch (table F-8). Additionally, the absolute value of the relative bias for schools in towns (table F-6) and American Indian or Alaska Native (table F-7) are greater than 10 percent. When all of these factors were considered simultaneously in a regression analysis, private schools, schools in central cities, Northeast region, Midwest region, high poverty, medium sized schools, total school enrollment, Black, non-Hispanic, Hispanic, American Indian or Alaska Native, Hawaiian/Pacific Islander, and Two or more races were significant predictors of

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

participation (table F-9a). The second model showed that private schools, schools in central cities, Northeast region, Midwest region, high poverty, medium sized schools, total school enrollment, and the summed race/ethnicity percentage were significant predictors of participation (table F-9b, with summed race/ethnicity percentage). The third model showed that schools in central cities, Northeast region, Midwest region, medium sized schools, free or reduced-price lunch eligibility, total school enrollment, and the summed race/ethnicity percentage were significant predictors of school participation among public schools only (table F-9c).

For the final sample of schools (with substitutes) with school nonresponse adjustments applied to the weights, no variables were found to be statistically significantly related to participation in the bivariate analysis. However, the absolute value of the relative bias for schools in central cities (table F-10) and schools in towns (table F-10) is greater than 10 percent. The multivariate regression analysis cannot be conducted after the school nonresponse adjustments are applied to the weights. The concept of nonresponse-adjusted weights does not apply to the nonresponding units, and, thus, we cannot conduct an analysis that compares respondents with nonrespondents using nonresponse-adjusted weights. The results of the analyses are summarized in table F-13.

In sum, the investigation into nonresponse bias at the school level in the U.S. ICILS 2018 provides evidence that there is some potential for nonresponse bias in the ICILS participating original sample based on the characteristics studied. It also suggests that, while there is some evidence that the use of substitute schools reduced the potential for bias, it has not reduced it substantially. However after the application of school nonresponse adjustments, there is little evidence of resulting potential bias in the available frame variables and correlated variables in the final sample.

Exhibit F. U.S. ICILS 2018 Nonresponse Bias Analysis Final Report—Continued

Table F-13. Characteristics with p -values less than 0.05 and absolute relative bias greater than 10 percent, U.S. ICILS schools: 2018

Analysis	Characteristics with p -values less than 0.05	Additional characteristics with absolute relative bias greater than 10 percent
Original sample	School control, Census region, poverty level, school size, grade 8 enrollment, White, non-Hispanic, Hispanic, free or reduced-price lunch	Rural, Asian
Regression model a	Private, Central city, Suburb, Northeast, Midwest, High poverty, Medium sized schools, Total school and grade 8 enrollment, Black, non-Hispanic, Hispanic	†
Regression model b	Private, Central city, Suburb, Northeast, Midwest, High poverty, Medium sized schools, Total school enrollment, Summed race/ethnicity percentage	†
Regression model c	Suburb, Northeast, Midwest, High poverty, Medium sized schools, Free or reduced-price lunch eligibility, Interaction term, Total school enrollment	†
Sample with substitutes	School control, Census region, Poverty level, School size, White, non-Hispanic, Hispanic, Free or reduced-price lunch	Town, American Indian or Alaska Native
Regression model a	Private, Central city, Northeast, Midwest, High poverty, Medium sized schools, Total school enrollment, Black, non-Hispanic, Hispanic, American Indian or Alaska Native, Hawaiian/Pacific Islander, Two or more races	†
Regression model b	Private, Central city, Northeast, Midwest, High poverty, Medium sized schools, Total school enrollment, Summed race/ethnicity percentage	†
Regression model c	Central city, Northeast, Midwest, Medium sized schools, Free or reduced-price lunch eligibility, Total school enrollment, Summed race/ethnicity percentage	†
Nonresponse adjusted	None	Central City, Town

† Not applicable.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), 2018.

APPENDIX F REFERENCES

Rao, J.N.K., and Thomas, D.R. (2003). Analysis of Categorical Response Data From Complex Surveys: An Appraisal and Update. In R.L. Chambers and C.J. Skinner (Eds.), *Analysis of Survey Data* (pp. 85–108). West Sussex, England: John Wiley and Sons.

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