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THROUGH: Kathy Axt

FROM: Edith McArthur

SUBJECT: Request for Clearance for the Proposed Fast Response Survey System (FRSS) 92: *Educational Technology in U.S. Public Schools, Fall 2008*

Justification

The National Center for Education Statistics (NCES), U.S. Department of Education proposes to employ the Fast Response Survey System (FRSS) to conduct a survey of educational technology in public elementary and secondary schools. The survey was requested by the Office of Educational Technology (OET) to provide national data on current and emerging educational technology within the nation's public school system. The survey is included in the National Educational Technology Leadership national activities spending plan.

The proposed survey will provide data that can be compared to some of the results from the FRSS survey series *Internet Access in U.S. Public Schools and Classrooms: 1994-2005*, which focused on access to computers and the Internet. For example, these surveys found that in 2005, the ratio of students to instructional computers with Internet access in public schools was 3.8 to 1, a decrease from the 12.1 to 1 ratio in 1998. The proposed survey will also collect information needed to calculate the current ratio of students to instructional computers.

In addition, the new survey will cover a broader range of educational technology topics. It will provide current national statistics on the availability and types of (1) hardware (e.g., computers, hand-held devices, peripherals); (2) network and Internet access (e.g., wireless access); and (3) operating systems. An important issue for technology usage is the ability of the school staff to integrate technology into the curriculum. Therefore the proposed survey will collect information on the support within the school to help staff integrate technology into instruction, as well as the provision of technical support. To obtain information on the climate for educational technology and identify potential barriers within schools, respondents will be asked to report their perceptions about technology issues in their school and district. The number of instructional classrooms will be collected in order to report the average number of computers per classroom. Finally, to update and/or verify information from the sampling frame, the survey will collect information on the percentage of students eligible for free- or reduced-price lunch and the grades taught at the school. By addressing access to and support for current and emerging educational technology in public schools, the survey will provide valuable national data for OET and other educational policymakers at the national, state, and district levels.

This is one of three proposed surveys that OET has requested be conducted with the FRSS. The other two are district-level and teacher-level surveys.¹ OET envisions the three new surveys as a barometer of technology access and use within public elementary and secondary school districts, schools, and classrooms.

The FRSS survey, under OMB clearance #1850-0733, is authorized under Section 153 (a) of the Education Science Reform Act of 2002 (Public Law 107-279), which states that the purpose of NCES is "to collect, report, analyze, and disseminate statistical data related to education in the United States and in other nations."

Overview of Data Collection

Westat will collect the information for the Early Childhood, International and Crosscutting Studies Division, NCES, U.S. Department of Education, using the FRSS. Westat is responsible for the questionnaire

¹ Separate OMB clearance packages are being submitted for the district and teacher surveys.

development; sample design and selection; data collection; telephone follow up; editing, coding, keying, and verification of the data; and production of tabulations and the report detailing the results of the survey.

Because this survey includes new topics, substantial development work was conducted. The development of the survey involved several phases. First, after discussions with OET about desired survey topics, Westat conducted a brief literature review and a search of existing survey instruments. The initial draft instrument included some newly crafted items as well as some adapted items from existing surveys. Second, Westat conducted four rounds of feasibility calls to test and improve the instrument. During feasibility calls, respondents were not required to complete the questionnaire, but rather to review and give feedback about the survey in telephone interviews. These calls were conducted over an extended period (April 2007 through January 2008) and the questionnaire for each round was substantially different than in the previous rounds. We contacted 9 or fewer respondents for each round. Respondents were asked about the clarity and relevance of the survey items, and also about whether they could answer each question without too much burden. After each round of calls, the instrument was revised and submitted to OET and NCES for review and further revision. Following the NCES Questionnaire Review Board (QRB) meeting, the questionnaire was revised and submitted for NCES review and approval. This questionnaire draft was then pretested through calls to technology specialists of selected public elementary and secondary schools. Following the pretest, the questionnaire was revised again and is being submitted with an official request for OMB clearance.

We propose a nested sample design that links districts, schools, and teachers. The proposed design includes a nationally representative sample of about 2,000 schools selected from the NCES Common Core of Data (CCD) Public School Universe File. The data collection will be accomplished by means of a self-administered survey. Respondents will have the option of completing the survey on a traditional paper and pencil questionnaire or on a Web version of the questionnaire that will be accessed through the Internet. The questionnaire is limited to three pages of information readily available to respondents and can be completed by most respondents in 30 minutes or less. These procedures are typical for FRSS surveys and result in minimal burden on respondents.

Prior to contacting schools for survey collection, a courtesy information packet consisting of a cover letter and copy of the questionnaire will be mailed to the superintendent of each district with schools selected for participation. The packet also will include a list of the schools within the districts that are in the sample. Any special requirements that districts have for approval of surveys will be met before schools in those districts are contacted.

To minimize the burden on schools, Westat will coordinate the collection of the school survey with the collection of teacher sampling lists (the collection of teacher sampling lists is included in a separate OMB package for the teacher survey). Collection and followup activities for the school surveys and teacher lists will be handled by the same Westat staff to minimize the number of contacts made to principals and other school staff.

Questionnaires and information needed to access the Web survey will be mailed in September 2008 to the principals of each sampled school. One week after mailout, we will send thank-you/reminder postcards thanking those who responded and reminding those who have not yet responded. Telephone follow up for nonresponse will begin about 3 weeks after the questionnaires have been mailed to the schools. Experienced telephone interviewers will be trained to conduct the nonresponse follow up and will be monitored by Westat supervisory personnel. The response rates for FRSS surveys of schools typically have been 90 percent or greater.

Data Collection Instrument

The questionnaire package will include two cover letters: (1) a principal cover letter asking that the survey be completed by the person most knowledgeable about educational technology within the school; and (2) a cover letter for the survey respondent. These cover letters are enclosed as Attachments 1 and 2. Both cover letters request participation and introduce the purpose and content of the survey. The cover letters also include instructions on how to complete and return the survey, as well as contact information in case of queries. Included in the mailing will be information about the option to complete a Web version of the survey.

The questionnaire (Attachment 3) collects information on various aspects of educational technology availability and use in public schools, as summarized below.

- Questions 1-4 collect counts of computers by characteristics (e.g., instructional use, type, location, Internet access, age).
- Question 5 asks about the operating system(s) for the instructional computers in the school.
- Questions 6-7 collect counts of hand-held devices (e.g., Palm OS, Windows CE, Pocket PCs, BlackBerries) and other hardware (e.g., LCD projectors, interactive whiteboards, digital cameras) in the school.
- Questions 8-9 are designed to collect the type of wireless network access in the school and the use of the district network and Internet for various activities.
- Questions 10-12 collect information on time required for technical support activities (question 10) and the leadership and support available to help integrate technology into instruction and provide technical support (questions 11 and 12).
- Question 13 asks respondents to report their perceptions about technology issues in the school and district.
- Question 14 collects the number of instructional classrooms so that the average number of computers per classroom can be reported.
- Questions 15-16 collect information on the percentage of students eligible for free- or reduced-price lunch and the grades taught at the school, which will be used to update and/or verify information from the sampling frame.

Review by Persons Outside the Agency

All development work occurred in close collaboration with the Office of Educational Technology. The various draft versions of the instrument were also tested with individuals in the field, for example, educational technology specialists in schools. In addition to multiple rounds of feasibility calls, the questionnaire was most recently pretested through calls to educational technology specialists in schools. Based on input from these respondents, NCES, and OET, the questionnaire was revised and submitted as Attachment 3 in this official request for OMB clearance.

Survey Cost

The survey is estimated to cost the Federal government about \$330,000, including about \$300,000 for contractual costs and \$30,000 for salaries and expenses. Based upon costs of past FRSS sample surveys, contractual costs are divided into the subtask costs shown in Exhibit 1.

Exhibit 1. Estimated contractual costs by subtask

Subtask	Cost
Sampling	10,000
Survey preparation	50,000
Data collection	125,000
Data analysis	40,000
Report preparation and dissemination	75,000
Total	300,000

Time Schedule

Mailing of the survey is planned for September 2008. One week after mailout, we will send thank-you/reminder postcards thanking those who responded and reminding those who have not yet responded. About 3 weeks after mailout of the surveys, Westat will begin telephone follow up for nonresponse. Data collection is scheduled for completion about 12 weeks after initial mail out. Exhibit 2 shows the anticipated schedule.

Exhibit 2. Anticipated data collection schedule

	Cumulative workdays	
	From submission to RIMG/OMB	From RIMG/OMB approval
Package to OMB	0	-
Package approved by OMB	45	0
Mail-out of questionnaire	55	10
Telephone Follow up started	70	25
Follow up completed	115	70

Plan for Tabulation and Publication

Most of the analyses of the questionnaire data will be descriptive in nature, providing NCES, OET, and other data users with tables and appropriate explanatory text. Survey responses will be weighted to produce national estimates. Tabulations will be produced for each data item. Crosstabulations of data items will be made with selected classification variables, such as the following.

- School level (elementary and secondary/combined)
- School enrollment (less than 300, 300-999, and 1,000 or more);
- Geographical region (Northeast, Southeast, Central, and West);
- Locale (city, urban fringe, town, rural);
- Percent minority enrollment (less than 6 percent, 6-20 percent, 21-49 percent, 50 percent or more); and
- Percent of students eligible for free or reduced-price lunch (less than 35 percent, 35-49 percent, 50-74 percent, 75 percent or more).

Reports of the findings will be distributed to the data requester, survey respondents, and, upon request, to other interested individuals and organizations, as well as published on the NCES website.

Statistical Methodology

Reviewing Statisticians

Adam Chu, Senior Statistician, Westat, (301) 251-4326, was consulted about the statistical aspects of the design.

Respondent Universe

The respondent universe for the proposed survey on educational technology will include the individuals most knowledgeable about educational technology in all regular public elementary and secondary/combined schools in the United States. This survey is one of three related surveys to be conducted under a nested design involving a sample of districts, schools within districts, and teachers within schools. For the purpose of this survey, elementary schools are defined to be those with a high grade of 8 or less and a low grade of 6 or less. All other schools are considered to be "secondary/combined" schools. Vocational education, special education, alternative/other non-regular schools, and schools operated by the Department of Defense or Bureau of Indian Affairs are ineligible for the survey, as are schools with a high grade of kindergarten or lower, ungraded schools, and schools in the outlying U.S. territories. As described in the following section, a stratified sample of approximately 1,000 elementary schools and 1,000 secondary/combined schools will be selected from the most up-to-date NCES Common Core of Data (CCD) Public School Universe File. Table 1 summarizes the distribution of schools in the CCD Public School Universe File by level, enrollment size class, and percent of students eligible for free/reduced price lunch. Note that while the counts in the table are based on 2005-06 CCD data, the more current 2006-07 CCD file will be used for sampling if it is available.

Table 1. Number of schools in the 2005-06 CCD Public School Universe File by level, enrollment size class, and percent of students eligible for free/reduced price lunch

Level/enrollment size class*	Number of schools	Percent of students eligible for free/reduced price lunch				
		Missing	Less than 35	35 to 49	50 to 75	75+
<i>Elementary</i>						
Less than 300	16,335	348	5,294	3,230	4,366	3,097
300 to 499	20,895	96	7,705	3,701	5,183	4,210
500 to 599	8,731	38	3,539	1,332	2,067	1,755
600 to 749	8,405	37	3,370	1,272	1,990	1,736
750 or more	9,281	31	3,777	1,371	1,978	2,124
<i>Secondary/combined</i>						
Less than 300	6,718	296	2,594	1,449	1,439	940
300 to 499	3,622	52	1,620	780	753	417
500 to 999	5,615	43	2,910	1,118	1,070	474
1,000 to 1,499	2,842	23	1,687	510	467	155
1,500 or more	3,275	54	1,998	581	490	152
TOTAL†	85,719	1,018	34,494	15,344	19,803	15,060

* For sampling purposes, schools with a low grade of 6 or less and a high grade of 8 or less are considered to be "elementary" schools. All other schools are considered to be "secondary/combined" schools.

† Counts in this table are given for illustration. The more up-to-date 2006-07 CCD file will be used for sampling if it is available.

Statistical Methodology

The sample design for the school survey on educational technology will be a stratified sample with primary strata defined by level, enrollment size class, and percent of students eligible for free/reduced price lunch (see Table 1). Stratification by size class and the five categories for percent-free/reduced price lunch will ensure that schools of all sizes and all poverty levels are appropriately represented in the sample. It should be noted that the percent free lunch information required for stratification is missing for about one percent of the schools in the CCD frame. Although it will not be possible to assign these schools to the appropriate stratum for sampling purposes, all such schools will be given a chance of selection for the survey.

A total of 2,000 schools will be selected for the survey, including approximately 1,000 elementary schools and 1,000 secondary/combined schools. Initially, the 1,000 elementary schools and 1,000 secondary/combined schools will be allocated to the primary strata in rough proportion to the aggregate measure of size of the schools in the stratum, where the measure of size is defined to be the square root of the number of teachers (FTE) in the school. Such an allocation is expected to be reasonably efficient for jointly estimating school-level characteristics and quantitative measures correlated with the number of teachers and/or school enrollment. Within the primary strata defined above, schools in the sampling frame will be sorted by type of locale (city, urban fringe, town, rural) and Office of Education (OE) region. When used in conjunction with systematic sampling, the sorting will induce additional implicit substratification within the primary strata. Within each stratum, the specified sample of schools will then be selected systematically with probabilities proportionate to the measure of size. Although the use of the measure of size to select the schools will increase unequal weighting design effects for school-level estimates, it will also help control the variation in teacher sample sizes across schools for the subsequent teacher survey. The expected numbers of schools to be selected under the proposed design by level and enrollment size class are summarized in the last column of Table 2.

Table 2. Proposed allocation of the public school sample for survey on educational technology by level and size class

Instructional level	Enrollment size class	Number of schools to be sampled
1. Elementary	Less than 300	173
	300 to 499	314
	500 to 599	150
	600 to 749	158
	750 or more	205
2. Secondary/ combined	Less than 300	165
	300 to 499	135
	500 to 999	272
	1,000 to 1,499	175
	1,500 or more	253
TOTAL		2,000

Expected Levels of Precision

Table 3 summarizes the approximate sample sizes and standard errors to be expected under the proposed design for selected domains. Note that the standard errors in Table 3 include approximate design effects ranging from 1.05 to 1.40 to reflect the increase in variance due the use of variable sampling fractions. Under the proposed stratified sample design, (1) large schools will be sampled at relatively higher rates (i.e., have smaller sampling weights) than small schools, and (2) secondary/combined schools will be sampled at relatively higher rates than elementary schools to improve subgroup comparisons within the major instructional levels. Since the sample sizes in Table 3 are based on preliminary tabulations of the CCD file, the actual sample sizes may differ from those shown. Also, note that the sample sizes represent the expected numbers of schools returning completed questionnaires, and not the initial numbers of schools to be sampled. The standard errors in Table 3 can be converted to 95 percent confidence bounds by multiplying the entries by 2. For example, an estimated proportion of the order of 20 percent ($P = 0.20$) for the total sample would be subject to a margin of error of ± 2.2 percent at the 95 percent confidence level. Similarly, an estimated proportion of the order of 50 percent ($P = 0.50$) for elementary schools would be subject to a margin of error of ± 3.4 percent at the 95 percent confidence level.

Table 3. Expected sample sizes (number of responding schools) and corresponding standard errors for estimates of proportions for selected analytic domains

	Sample size*	Standard error† of an estimated proportion equal to ...		
		P = 0.20	P = 0.33	P = 0.50
<i>Total sample</i>	1,800	0.011	0.013	0.014
<i>Instructional level</i>				
Elementary	900	0.014	0.016	0.017
Secondary/combined	900	0.014	0.017	0.018
<i>Type of locale</i>				
City	472	0.020	0.024	0.025
Urban fringe	641	0.017	0.020	0.021
Town	170	0.033	0.039	0.042
Rural	518	0.019	0.022	0.024
<i>Percent eligible for free/reduced price lunch</i>				
Less than 35 percent	817	0.015	0.018	0.019
35 to 49 percent	330	0.024	0.028	0.030
50 to 75 percent	387	0.022	0.026	0.028
75 percent or more	266	0.027	0.031	0.033
<i>Region</i>				
Northeast region	362	0.023	0.027	0.029
Southeast region	415	0.021	0.025	0.027
Central region	457	0.020	0.024	0.025
West region	566	0.018	0.021	0.023
<i>Level by enrollment size class</i>				
Elementary				
Less than 300	156	0.033	0.039	0.041
300 to 499	283	0.024	0.029	0.030
500 to 749	277	0.025	0.029	0.031
750+	185	0.030	0.035	0.038
Secondary/combined				
Less than 500	149	0.034	0.040	0.043
500 to 999	366	0.022	0.026	0.027
1,000 or more	385	0.021	0.025	0.027

* Expected number of responding schools, assuming 90% survey response rate.

† Assumes design effects ranging from 1.05 to 1.33 to reflect increase in variance due to disproportionate allocation to instructional levels and size classes.

Estimation and Calculation of Sampling Errors

For estimation purposes, sampling weights reflecting the overall probabilities of selection and adjustments for nonresponse will be attached to each data record. To properly reflect the complex features of the sample design, standard errors of the survey-based estimates will be calculated using jackknife replication. Under the jackknife replication approach, 50 subsamples or "replicates" will be formed in a way that preserves the basic features of the full sample design. A set of estimation weights (referred to as "replicate weights") will then be constructed for each jackknife replicate. Using the full sample weights and the replicate weights, estimates of any survey statistic can be calculated for the full sample and each of the 50 jackknife replicates. The variability of the replicate estimates is used to obtain a measure of the variance (standard error) of the survey statistic. Previous surveys, using similar sample designs, have yielded relative standard errors (i.e., coefficients of variation) in the range of 2 to 10 percent for most national estimates. Similar results are expected for this survey.