Technical Notes
Secondary School Arts Education Survey: Fall 2009

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Data perturbations were conducted on some background data to preclude identification of individuals and institutions.

Fast Response Survey System

The Fast Response Survey System (FRSS) was established in 1975 by the National Center for Education Statistics (NCES), U.S. Department of Education. FRSS is designed to collect issue-oriented data within a relatively short time frame. FRSS collects data from state education agencies, local education agencies, public and private elementary and secondary schools, public school teachers, and public libraries. To ensure minimal burden on respondents, the surveys are generally limited to three pages of questions, with a response burden of about 30 minutes per respondent. Sample sizes are relatively small (usually about 1,000 to 1,500 respondents per survey) so that data collection can be completed quickly. Data are weighted to produce national estimates of the sampled education sector. The sample size is large enough to permit limited breakouts by classification variables. However, as the number of categories within the classification variables increases, the sample size within categories decreases, which results in larger sampling errors for the breakouts by classification variables.

Sample and Response Rates

The nationally representative sample for the FRSS secondary school survey on arts education consisted of 1,202 regular public secondary schools in the 50 states and the District of Columbia. This secondary school survey was part of a study consisting of seven surveys that were administered during the 2009–10 school year. At the elementary school level, the study included a survey of school principals and three teacher-level surveys, one each for self-contained classroom teachers, music specialists, and visual arts specialists. At the secondary school level, the study included a survey of school principals and two teacher-level surveys, one each for music specialists and visual arts specialists. NCES is releasing separate data files for each of the seven surveys.

The sampling frames for the school surveys and teacher list collections were based on regular public schools from the 2006–07 NCES Common Core of Data (CCD) Public School Universe file, which was the most current file available at the time of sample selection. The sampling frame included 85,962 regular public schools. Of these, 52,807 were elementary schools, 31,133 were secondary schools, and 2,022 were combined schools. The frame included regular public elementary and secondary schools[1] in the 50 states and the District of Columbia and excluded special education, vocational, home, adult education, private, and alternative/other schools; schools in the outlying U.S. territories; schools operated by the Department of Defense or Bureau of Indian Education; schools lacking any grade higher than kindergarten; and schools with only ungraded students. Charter schools were eligible for inclusion because they were classified as regular schools in the CCD.

Separate stratified samples of public elementary and secondary schools were selected to receive the appropriate survey instrument for the school-level surveys and teacher list collections. Combined schools were given a chance for selection for both surveys and, if selected, were asked to complete only the survey instrument for which they were selected. To select the sample, the sampling frame was stratified by instructional level. Elementary and secondary schools were also stratified by school enrollment size. To improve the representativeness of the sample, an implicit stratification was induced by sorting the schools within each stratum by geographic region; community type; percent combined enrollment of Black, Hispanic, Asian/Pacific Islander, or American Indian/Alaska Native students; and percent eligible for free or reduced-price lunch.

Secondary schools were selected for the principals' survey in two phases. In the first phase of selection, a sample of 1,602 schools was selected for the purpose of constructing teacher lists for the related surveys of music and arts specialists. Within each stratum, the first-phase sample of schools was selected systematically and with probabilities proportionate to the square root of the estimated number of teachers in the school. In the second phase of selection, a subsample of 1,202 schools was selected for the principals' survey from the 1,602 schools in the initial sample. The subsample was selected at rates that were inversely proportional to the probabilities of selection for the initial sample, thereby equalizing the within-stratum selection probabilities for the principals' survey to the extent feasible. The remaining 400 secondary schools in the first phase sample were asked to provide lists of music specialists and visual arts specialists only (i.e., they were not sampled to complete the school-level survey).

Survey and list collection materials were mailed to the principal of each sampled secondary school in September 2009. The survey packages for the 1,202 schools selected to respond to the principal survey included a school-level questionnaire and a cover letter indicating that the survey was designed to be completed by the school principal. Respondents were given the option of completing the survey online or

[1] Regular school is defined as a public elementary or secondary/combined school that does not focus primarily on vocational, special, or alternative education.

on paper. Also included in the packages were forms for respondents to insert the names of their full- or part-time music specialists and visual arts specialists to provide sampling information for the secondary school teacher survey. Telephone follow-up for those who did not respond to the initial questionnaire mailing was conducted from October 2009 through June 2010.

Of the 1,202 secondary schools that were sampled for the school-level survey, 32 were found to be ineligible for the survey because they were closed, reconfigured, or did not include secondary grades. For the eligible schools, the unweighted response rate was 87 percent (1,014 responding schools divided by the 1,170 eligible schools in the sample). The weighted response rate was 89 percent. Of the schools that completed the survey, 55 percent completed it by web, 33 percent completed it by mail, 12 percent completed it by fax, and less than 1 percent completed it by telephone.

Although item nonresponse for key items was low, missing data were imputed for the items with a response rate of less than 100 percent. The missing items included both numerical data such as the number of visual arts courses offered by the school, as well as categorical data such as whether coursework in the arts was a specific requirement for graduation. The missing data were imputed using a "hot-deck" approach to obtain a "donor" school from which the imputed values were derived. Under the hot-deck approach, a donor school that matched selected characteristics of the school with missing data (the recipient school) was identified. The matching characteristics included characteristics of the school such as categories of school enrollment size; locale; categories for percent combined enrollment of Black, Hispanic, Asian/Pacific Islander, or American Indian/Alaska Native students; and categories for percent of students in the school eligible for free or reduced-price lunch. In addition, relevant questionnaire items were used to form appropriate imputation groupings. Once a donor was found, it was used to obtain the imputed values for the school with missing data. For categorical items, the imputed value was simply the corresponding value from the donor school. For numerical items, an appropriate ratio (e.g., percent of part-time music teachers who are specialists) was calculated for the donor school, and this ratio was applied to available data (e.g., number of part-time music specialists) for the recipient school to obtain the corresponding imputed value. Imputation flags are included in the data.

Weighting Procedures and Sampling Errors

The response data were weighted to produce national estimates (see table 1). The weights were designed to adjust for the variable probabilities of selection and differential nonresponse. FRSS survey data are based on complex sample designs that require the use of weights to compensate for variable probabilities of selection, differential response rates, and possible deficiencies in the sampling frame.

The reciprocal of the probability of selection, referred to as the "base weight," will produce unbiased (or consistent) estimates of population totals and ratios if there is no nonresponse in the survey. Since a stratified sample design was employed for the survey, the base weight for the i-th school in stratum h was computed as $w_{hi}=1/P_{hi}$ where P_{hi} is the overall probability of selecting school i in stratum h.

Adjustment of the base weights was necessary to compensate for the survey nonrespondents (i.e., whole questionnaire or unit nonresponse). To compensate for unit nonresponse, an adjustment factor was computed as the inverse of the base-weighted response rate within selected weighting classes. This factor was then used to inflate the base weights of the schools in the weighting class to obtain the final nonresponse-adjusted weight.

Table 1. Number and percentage distribution of responding public secondary schools in the study sample, and estimated number and percentage distribution of schools the sample represents, by school characteristics: School year 2009–10

School characteristic	Respondent sample (unweighted)		National estimate (weighted)	
	Number	Percent	Number	Percent
All public secondary schools	1,014	100	31,650	100
Enrollment size				
Less than 500	278	27	13,420	42
500 to 999	366	36	10,460	33
1,000 or more	370	36	7,770	25
Community type				
City	228	22	6,390	20
Suburban	302	30	7,890	25
Town	159	16	5,010	16
Rural	325	32	12,360	39
Region				
Northeast	182	18	5,150	16
Southeast	260	26	7,620	24
Central	265	26	8,980	28
West	307	30	9,900	31
Percent combined enrollment of Black, Hispanic, Asian/Pacific Islander, or American Indian/Alaska Native students[1]				
Less than 6 percent	206	20	7,710	24
6 to 20 percent	264	26	7,910	25
21 to 49 percent	244	24	7,150	23
50 percent or more	300	30	8,880	28
Percent of students eligible for free or reduced-price lunch				
0 to 25 percent	287	28	7,930	25
26 to 50 percent	338	33	10,940	35
51 to 75 percent	260	26	8,450	27
76 percent or more	128	13	4,250	13

[1]Black includes African American and Hispanic includes Latino.
NOTE: Detail may not sum to totals because of rounding or non-ascertained data.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Secondary School Arts Education Survey: Fall 2009," FRSS 101, 2009–10.

The survey findings are presented in the *First Look* report titled *A Snapshot of Arts Education in Public Elementary and Secondary Schools: 2009–10* (NCES 2011-078) and a more detailed forthcoming report. The reported findings are estimates based on the sample selected and, consequently, are subject to sampling variability. The standard error is a measure of the variability of an estimate due to sampling. It indicates the variability of a sample estimate that would be obtained from all possible samples of a given design and size. Standard errors are used as a measure of the precision expected from a particular sample. If all possible samples were surveyed under similar conditions, intervals of 1.96 standard errors below to 1.96 standard errors above a particular statistic would include the true population parameter being estimated in about 95 percent of the samples. This is a 95 percent confidence interval. For example, the estimated percent of secondary schools that offered music instruction is 90.8 percent, and the standard error is 1.1 percent. The 95 percent confidence interval for the statistic extends from 90.8 – (1.1 x 1.96) to 90.8 + (1.1 x 1.96), or from 88.6 to 93.0 percent. The coefficient of variation ("c.v.," also referred to as the "relative standard error") of an estimate (y) is defined as c.v. = (s.e. / y) x 100%, where s.e. is the standard error of the estimate y.

Because the data from the survey were collected using a complex sampling design, the variances of the estimates from this survey (e.g., estimates of proportions) are typically different from what would be expected from data collected with a simple random sample. Not taking the complex sample design into account can lead to an underestimation of the standard errors associated with such estimates. Estimates of standard errors were computed using a technique known as jackknife replication. As with any replication method, jackknife replication involves constructing a number of subsamples (replicates) from the full sample and computing the statistic of interest for each replicate. The mean square error of the replicate estimates around the full sample estimate provides an estimate of the variance of the statistic. To construct the replications, 50 stratified subsamples of the full sample were created and then dropped one at a time to define 50 jackknife replicates. A computer program (WesVar) was used to calculate the estimates of standard errors using the JK1 option.

Nonsampling Errors, Coding, and Editing

The survey estimates are also subject to nonsampling errors that can arise because of nonobservation (nonresponse or noncoverage) errors, errors of reporting, and errors made in data collection. These errors can sometimes bias the data. Nonsampling errors may include such problems as misrecording of responses; incorrect editing, coding, and data entry; differences related to the particular time the survey was conducted; or errors in data preparation. While general sampling theory can be used to determine how to estimate the sampling variability of a statistic, nonsampling errors are not easy to measure and, for measurement purposes, usually require that an experiment be conducted as part of the data collection procedures or that data external to the study be used.

To minimize the potential for nonsampling error, the questionnaire was pretested with public secondary school principals. During the design of the survey and the survey pretest, an effort was made to check for consistency of interpretation of questions and definitions and to eliminate ambiguous items. The questionnaire and instructions were extensively reviewed by content experts in the arts education community.

Editing of the questionnaire responses was conducted to check the data for accuracy and consistency. Cases with missing or inconsistent items were recontacted by telephone to resolve problems. A coding source file and editing specifications were used to produce the codebook. The codebook served as the main tool for coding, editing, and processing completed questionnaires. Coders used the codebook to identify cases requiring data retrieval or clarification and prepare cases for entry into the web application. The source file served as a data dictionary and included the data file layout, a description of each data item, a list of valid response codes or range formats with codes for nonresponse and inapplicable, and defined skip patterns.

Logics, ranges, and validation checks were prepared prior to data collection and included online edit checks, manual logic checks, and automated checks using SAS. Online checks were incorporated into the web application and manual edits were conducted to process cases received by mail, fax, or telephone. Steps were taken to ensure that the method of entering data from web and hardcopy questionnaires was the same, regardless of mode. For example, to enter survey data received by mail, fax, or telephone, the data processing staff accessed the survey website as “respondents” and “completed” the survey using the responses on the hardcopy survey. Subjecting all survey responses to the same set of built-in logics, ranges, and validation checks helps to ensure that data entry does not produce systematic differences in the survey data. In addition, all hardcopy data were subject to 100 percent verification using “doublekeying.”

Definitions of Selected Analysis Variables

Many of the school characteristics, described below, may be related to each other. For example, school enrollment size and community type are related, with city schools typically being larger than rural schools. Other relationships between these analysis variables may exist.

Enrollment Size (SIZE)—This variable indicates the total number of students enrolled in the school based on data from the 2006–07 CCD Public School Universe file. The variable was collapsed into the three categories below.

Less than 500 students
500 to 999 students
1,000 or more students

Community Type (URBAN)—This variable indicates the type of community in which the school is located, as defined in the 2006–07 CCD Public School Universe file. These codes are based on the location of school buildings. This classification system is referred to as the "urban-centric" classification system to distinguish it from the previous "metro-centric" classification system. The urban-centric locale codes are assigned through a methodology developed by the U.S. Census Bureau's Population Division in 2005. This classification system has four major locale categories—city, suburban, town, and rural—each of which is subdivided into three subcategories. These 12 categories are based on several key concepts that Census uses to define an area's urbanicity: principal city, urbanized area, and urban cluster, as discussed below.

- A principal city is a city that contains the primary population and economic center of a metropolitan statistical area, which, in turn, is defined as one or more contiguous counties that have a "core" area with a large population nucleus and adjacent communities that are highly integrated economically or socially with the core.

- Urbanized areas and urban clusters are densely settled "cores" of Census-defined blocks with adjacent densely settled surrounding areas. Core areas with populations of 50,000 or more are designated as urbanized areas; those with populations between 25,000 and 50,000 are designated as urban clusters.

This variable was based on the 12-category urban-centric locale variable from CCD and collapsed into the four categories below.

City—Territory inside an urbanized area and inside a principal city
Suburban—Territory outside a principal city and inside an urbanized area
Town—Territory inside an urban cluster
Rural—Territory outside an urbanized area and outside an urban cluster

Geographic Region (OEREG)—This variable classifies schools into one of the four geographic regions used by the Bureau of Economic Analysis of the U.S. Department of Commerce. Data were obtained from the 2006–07 CCD Public School Universe file. The variable was collapsed into the four categories below.

Northeast—Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont

Southeast—Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia

Central—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin

West—Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming

Percent Combined Enrollment of Black, Hispanic, Asian/Pacific Islander, or American Indian/Alaska Native students (MINST)—This variable indicates the percentage of students enrolled in the school whose race or ethnicity is classified as one of the categories below based on data in the 2006–07 CCD Public School Universe file.

- American Indian/Alaska Native is defined in CCD as a person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition. American Indian includes Alaska Native.
- Asian/Pacific Islander is defined in CCD as a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa. Asian includes Native Hawaiian or other Pacific Islander.
- Black, non-Hispanic is defined in CCD as a person having origins in any of the black racial groups of Africa. Black includes African American.
- Hispanic is defined in CCD as a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race. Hispanic includes Latino.

This variable was collapsed into the four categories below.

Less than 6 percent
6 to 20 percent
21 to 49 percent
50 percent or more

Percent of Students Eligible for Free or Reduced-Price Lunch (POVST)—This item serves as a measure of the concentration of poverty at the school. This variable is based on responses to question 27 on the survey questionnaire. If question 27 was not answered, this variable was obtained from the 2006–07 CCD Public School Universe file. This variable was collapsed into the four categories below.

25 percent or less
26 to 50 percent
51 to 75 percent
76 percent or more

School Level (LEVEL)—This variable classifies schools into levels based on the highest and lowest grades taught in the school. Data were obtained from the 2006–07 CCD Public School Universe file. The variable was collapsed into the two categories below.

Secondary school—If (a) the high grade was 7 or more and the low grade was 6 or more; or (b) the high grade was 7 or 8 and the low grade was 5.

Combined school—If the high grade was 9 or more and the low grade was 5 or less.

Definitions of Terms

The following is the exact wording of the definitions that were included on the questionnaire:

Artist-in-Residence—A visual, literary, or performing artist or folklorist—sometimes called **Artist-in-the-School**—who visits a school for an extended period (more than 1 week) for the purposes of teaching artistic techniques and concepts, conducting inservice teacher training, and/or consulting in the development of curricula.

Arts specialist—An education professional with a teaching certificate in an arts discipline, such as visual arts, music, dance, or drama/theatre, who provides separate instruction in that discipline.

Creative writing—An instructional program that describes the process and techniques of original composition in various literary forms, such as short stories, plays, and poetry.

Dance—An instructional program that prepares students to express themselves through creative movement and refine performance skills in a variety of dance styles, such as ballet, modern, jazz, world dance, and traditional dances of various cultures. Instruction includes choreography, dance history and criticism, and dance production.

Drama/theatre—An instructional program that generally describes the study and creation of dramatic works. Includes instruction in dramatic literature, dramatic styles and types, technical theatre, and the principles of organizing, producing, and performing plays.

Music—An instructional program for the purpose of helping students learn to perform, create, and respond to (appreciate) music. Performance studies include voice, choir, and instrumental studies such as guitar, piano, band, and orchestra. Creating studies include music improvisation, arranging, and composition. Music classes typically foster appreciation by developing an understanding of music theory, criticism, and the historical development of music in various cultures.

School or district funds and/or grants—General school or district funds and/or grants from local, state, or federal sources.

School-sponsored activities outside of regular school hours—Arts instructional activities that are sponsored by the school before or after school, on weekends, or during the summer. These activities must be **guided by a curriculum**; thus, they do **not** include extracurricular activities.

State or local arts agencies—State arts agencies are governed by councils or commissions and receive support from the National Endowment for the Arts (NEA) for statewide grant-making and services. Local arts agencies include arts councils, departments of cultural affairs, and arts commissions. While the majority of local arts agencies are private nonprofit entities, others are public municipal, county, or regional agencies that operate in cooperation with mayors and city/county managers.

Visiting artist—A visual, literary, or performing artist or folklorist who visits a school to perform, demonstrate, or teach for a period of 1 week or less.

Visual arts—An instructional program for the purpose of helping students learn to create and respond to the visual arts. Students create their own artwork in a range of media and processes. Art classes typically foster appreciation by developing an understanding of art history and criticism and the roles visual arts play within various cultures, times, and places.