The Schools and Staffing Survey: Research Issues

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Introduction

Until relatively recently, data on the workplace and main workforce of our education system, schools, teachers, and administrators, have not been available on a regular basis. The Schools and Staffing Survey (SASS) was designed to meet the need for information on the characteristics and experience of teachers and administrators, to describe the essential features of the school as a place to work and a place to learn, and to provide data on aspects of teacher supply and demand, and attrition. The SASS was first fielded in the 1987-88 school year, was repeated in the 1990-91 school year, and is intended to be conducted every three years.

The SASS is a complex undertaking, both in design and in implementation. Because of its complexity and the fact that it is a regular recurring program of the National Center for Education Statistics (NCES), the SASS staff realize that opportunities exist to learn from the successes and failures of each collection cycle. These lessons provide the opportunity to make improvements to the program as well as gather information on the quality of the survey's data products.

This paper is intended to serve two purposes: 1) to provide a brief overview of the SASS program; and 2) to identify areas of research or survey evaluation in which work is ongoing or planned.

Overview of the SASS

The SASS is an integrated system of surveys of public and private schools, school districts, school principals and administrators, and teachers. The data collection program consists of seven mailout/mail-back surveys implemented during one school year, followed by a mail survey of a subsample of teachers one year later. These surveys include:

1. a survey of public school districts (local education agencies);
2. a survey of schools, public and private;
3. a survey of school administrators/principals in the public and private sectors;
4. a survey of teachers in the public and private sectors.

In the school year following the implementation of the SASS, a subsample of teachers in the SASS teacher survey are selected to be included in the SASS Teacher Followup Survey. This mail survey, a survey of public and private school teachers, was designed to provide information on teacher attrition and retention in public and private schools.

The SASS program has also included a research sample as part of its ongoing operations, thus providing opportunities to study questionnaire design, content, operational and survey methods issues in the context of a large scale operation.

The SASS is a broad multi-dimensional program, guided by four principal objectives:

1. to provide data on the components of teacher supply and demand, shortages and turnover, and the policies and practices influencing supply and demand.
2. to provide data on the principal/administrator workforce, including demographics and economic characteristics as well as their academic background, qualifications, and experience.
3. to provide data on teachers, including demographic characteristics, academic background, qualifications and experience, teaching assignments, workloads, and compensation.
4. to provide data on school conditions and programs, including enrollments, staffing, organization, teaching load, problems and locus of control.

The SASS accomplishes these objectives through a design that allows the development of state and national estimates for public schools and affiliation and national estimates for private schools. Schools are the primary sampling unit, and a sample of teachers, on average between four and eight, is selected in each sample school selected. Public school districts are included in sample when one or more schools in the district are selected. The following are sample sizes for the 1990-91 SASS: 5400 local education agencies; 13,200 schools (9,900 public and 3,300 private); 13,200 school principals/administrators (9,900 public and 3,300 private); and 65,200 teachers (56,000 public and 9,200 private).

By the nature of its content and design, the SASS provides opportunities to address issues on education policy. The existing SASS data linkages among the levels of the education hierarchy - teachers, principals, schools,and school districts - and the potential to add several more, namely students and parents, indicates the importance of the SASS in the elementary and secondary education statistics program in the National Center for Education Statistics. With this in mind, this paper presents the current operational and research issues of the program. The topics covered are: 1) frame and coverage issues; 2) questionnaire design; 3) data collection; 4) estimation and nonresponse; 5) measurement issues; and 6) evaluation of survey data.

Frame and Coverage Issues

The sampling frames for the school component of the 1990-91 SASS are the "public school universe" of the NCES' Common Core of Data (CCD) and the Private School Universe Survey (PSS). The CCD contains statistical information collected annually on all public elementary and secondary schools and school districts in the nation. State Education Agencies (SEA) compile and transmit data they collect from schools and school districts into formats defined by NCES. Information they provide includes school or district name, address, school type, enrollment and student characteristics, and the number of classroom teachers.

The Private School Universe Survey (PSS) is a data collection aimed at building an accurate and complete list of private schools in the U. S. The schools on the PSS come from a combination of private school lists and area frame searches. The PSS contains data on religious orientation, level and size of school, enrollment, number of graduates, and number of teachers employed.

CCD - SASS Differences

The 1990-91 SASS represented one of the first uses of the CCD for sampling purposes. School data in SASS were collected using the definitions established in CCD. However, an understanding of the relationship of these definitions to principals' and administrators' understandings of our concepts was limited. Furthermore, because of the time needed to edit several CCD variables and the time needed to draw and prepare the sample, the 1988-89 CCD was used to draw the 1990-91 SASS sample. Consequently, a number of schools in the SASS sample reported teacher counts and student enrollment counts that differed from the CCD file. Timing, school reorganization, CCD misreports and definition misunderstandings may play a role. A project is underway to understand these differences by characterizing the schools with discrepant information.

Evaluation of the Private School List Building

The sampling frame for private schools is a combination of list and area frame samples, the latter being necessary to compensate for the known undercoverage of the list frame. The private school list frame is composed of private schools contained on a commercially available list from Quality Education Data (QED), private school associations, state departments of education, and other sources listing private schools. Recognizing the large undercoverage of the list frame in the previous PSS (approximately 20%), the 1991-92 PSS made a substantial effort to acquire additional private school lists from the states. A project to evaluate this effort and the impact of these new sources is underway.

Evaluation of the Teacher Listing

The sampling of the teacher component of the SASS requires schools in the SASS sample to provide a list of teachers in their school along with the following information: whether new or experienced; race/ethnicity; bilingual/English as a Second Language (ESL); field of teaching. The issue for the SASS program is whether the school is filling the teacher list properly. SASS data have shown an inconsistency in the number of teachers listed by the schools during the listing operation early in the school year versus the numbers provided later in the year on the school questionnaire. A study is being developed that we expect will improve our insight as to how teacher estimates can be improved. This study will involve a reinterview of the person providing the teacher lists. Reconciliation of differences in the original and reinterview list will provide an approximate idea of the "true" number of teachers. Also, under consideration is a reinterview and reconciliation of responses from the teacher listing operation and the school questionnaire.

SASS Student Sample

In recent years, interest has grown in augmenting the SASS program with a sample of students. Because SASS is a national probability sample of schools, SASS is capable of providing a national probability sample of students distributed across elementary and secondary grades. Other NCES school-based surveys do not yield such samples, because they are oriented to one or two grade levels. This sample could lead to the study of equity issues: which students are taught by better/worse prepared teachers? Which students are participating in various programs? The statistical issues with the student sample are the development of procedures to draw a sample of students at the school and the ability to correctly calculate a probability of selection.

During the 1990-91 SASS, a research panel was fielded to address the issue of how a student sample should drawn - whether by an employee of the school or by the

Census Bureau. Frazier (1992) reported on the results of this test and found that it was difficult for an untrained school employee to correctly draw the sample. This field test also showed that the questions aimed at determining the probability of selection did not work well. Thus, NCES and Census Bureau staff continue to work on this problem with a view to implementing another pretest in early 1993.

Expand Survey Coverage

The SASS target population is limited in two ways. First, schools offering only kindergarten and prekindergarten classes are defined to be out-of-scope in the SASS. This is a serious limitation given the current strong interest in policy issues related to early childhood education. Furthermore, NCES has no sampling frames that adequately cover the prekindergarten and kindergarten programs in the public and private sectors. During the next year, NCES plans to study alternative approaches to improving the coverage of prekindergarten and kindergarten programs. The adequacy of different sources of information on these programs will be reviewed and assessed. An exploration of the possibility of using the area search and area sampling approaches used in the PSS will also be reviewed. Second, the American Trust Territories (American Samoa, Guam, Virgin Islands, Northern Marianas, and Puerto Rico) are included in the CCD universe, but not in the SASS. Staff will explore the feasibility and cost of expanding SASS coverage to include the territories.

Questionnaire Design

SASS is a system of mail surveys with telephone follow-up. The surveys require teachers, principals, personnel officers, and administrative assistants to be able to respond to questions about complex concepts without much help. The complexity of the current forms and concepts offer many opportunities for the respondent to make mistakes. Several projects are now underway to address the shortcomings of the design and format of the current questionnaires.

Cognitive Research Program

Results from the reinterview program at the conclusion of the 1988 cycle of the SASS indicated a number of items required improvement (Bushery, Royce, and Kasprzyk, 1992). The program's response was two fold: 1) to commit a substantial amount of professional time to reviewing completed questionnaires); and 2) to conduct a cognitive research program in preparation for the 1990-91 SASS. Similarly, in preparation for the next cycle of SASS, a research program of detailed, probing interviews using the public school questionnaire was initiated in the fall of 1991. Jenkins (1992) reports on results of the latter study. This program of cognitive research will next focus on two questionnaires. First, the SASS student questionnaire will be reviewed and redesigned for testing in the spring of 1993. Second, the school questionnaire, already the focus of much review, will be redesigned, reformatted, and tested.

Computer Assisted Interviewing

The increasing availability of personal computers in schools and school districts suggests a potential application of computer assisted interviewing in the SASS. Since SASS is a mail survey, a suggestion has been made to consider sending diskette-based data collection instruments to schools and school districts as an alterative to the paper and pencil instruments. This data collection system's potential for improving the data collected in SASS is significant. Automated range checks, edits, logical edits, and skip pattern checks provide opportunities to clarify reported data at their source -- the respondent -- immediately upon reporting. Plans are being developed to design, implement, and evaluate an automated data collection instrument.

Teacher's Self-Report of Academic Background

The 1987-88 SASS provided evidence of teachers having difficulty reporting their academic backgrounds. In response, two views of collecting these data have been proposed - by asking for the number of credits earned in critical subject areas or by asking for the number of courses taken in each critical subject area. During the 1990-91 SASS, a small research panel, 200 schools, having a sample of 867 teachers was fielded to test these two approaches. As part of the test, we asked for a signed authorization from each teacher to allow the NCES to obtain transcripts from the schools he/she attended. Transcripts will be coded by subject area to allow comparisons to the self reported data.

Data Collection

Several issues have arisen concerning the operation of the SASS data collection system. These issues bear on the quality of the reported data and the improvement of the timing of the availability of the SASS sample.

Data Collection Mode

SASS was designed to be primarily a mailout/mail-back survey. Telephone followup was used for all sample units not returning the mail questionnaire. Because there is a substantial telephone followup (33% for the public schools and 46% for the private schools), there is concern about possible response bias due to the mode.

Parmer, Shen, and Tan (1992) address the issue of possible response bias by mode.

Improving the Availability of the SASS Sample

Teacher sampling for the SASS requires the development of a teacher list for each sampled school. These lists of teachers are requested from the schools in the SASS sample, checked in at the regional office for completeness, mailed to Jeffersonville where the total number of teachers of each type are keyed and transmitted to Washington. Washington then sends sampling instructions back to Jeffersonville where the specific teachers are selected. The data for the selected teachers are keyed and transmitted back to Washington. Washington then matches the teacher information to the school information to create the sample file. The sample file is then used to mail questionnaires to the teachers.

This cumbersome process has an obvious and direct bearing on the timeliness of the availability of the teacher sample. A working group has been established to study the potential for improving the efficiency of this operation.

Data Comparability Project

Response burden is a concern for all federal data collections. The hierarchical design of the SASS and a number of individual items, particularly as they relate to school district staffing, have proven burdensome to SASS respondents. In response to the reactions of several school districts and in pursuit of better data collection methods, NCES developed a project to test whether state education agencies have the capacity to provide data from their automated record systems that would otherwise be collected in SASS from local education agencies. How comparable are the data available from the state education agencies to the data collected in the SASS from the individual local education agencies? Blank (1992) reports on the results of this project and its direction in the future. Successful collection of district level staffing items from a state automated record system would lead to major rethinking of SASS data collection methods for the teacher demand and shortage survey.

Estimation and Nonresponse

While unit response rates in the SASS are quite good, nonresponse remains a concern because of the hierarchical nature of the SASS design. Principals may often act as gate-keepers for the teachers in sample by not providing lists of the teachers in their schools; principals may complete the principal/administrator form but not the school form. Districts may also serve as gate-keepers for their schools.

Nonresponse

A project to investigate the characteristics of nonrespondents in the 1990-91 SASS is under development. Characteristics of SASS units districts, schools, principals/administrators, and teachers - respondents and nonrespondents will be compared across many dimensions with a view to providing an understanding of nonresponse in the SASS.

Work has also begun on assessing the nonresponse adjustment cells chosen for the SASS school survey and the associated cell-collapsing strategy. These cells had been selected based on intuitive analytic judgement. This study, however, is intended to quantify these judgments and propose alternatives if necessary. Some preliminary results for the school component of the SASS are available in Shen, Parmer, and Tan (1992). A replication of the study on other SASS analytic units - principals/administrators, school districts, and teachers - is also desirable.

Plans are underway to increase the number of followups in the Teacher Followup Survey component of the SASS, thereby making this component a multiwave longitudinal study of teachers. Even though item nonresponse is relatively small in this survey, research on imputation methods that use previously collected data is desirable.

Variance Estimation

In SASS, the sampling unit is the school. School districts are brought into the sample because a school in the district has been selected in the SASS sample. Thus, the school district collection unit is an aggregation of schools (the sampling unit) belonging to the district. Kaufman (1992) addresses the issue of how well balanced half-sample replication methods estimate variances when the collection unit (school districts) is an aggregation of sampling units (schools).

Generalized variance models provide data users an easy way of obtaining variance estimates for complex sample surveys. A project is under way to develop generalized variance models for each component of the SASS.

Measurement Issues

Much attention has been given to resources and students as the principal measures of institutional improvement -- expenditures per pupil, for example. Statistics such as

these, however, provide little information about school quality or the quality of the educational experience in schools. To remedy this situation, a number of ideas, as discussed in the report of a Panel on Education Indicators (1991), will be developed as potential measures of educational experience and institutional quality. A series of research projects, field studies, and feasibility studies will be developed during the next several years. The research will be a combination of conceptual research (appropriate measures), item and content research (the possible ways the measures can be implemented), and field and validation research (do these measures work in practice and do they work in large scale surveys). Originally conceived as a component of the SASS, the direction of the research may either lead to a new survey or significant modifications to an existing survey.

Evaluation of Survey Data

Evaluation of the quality of survey data can take several approaches. Microdata studies which evaluate the quality of the individual response, field performance statistics, experiments to test competing methodologies, and macrocomparisons with other established data sources are all used to establish the validity of a data set. SASS has several projects, ongoing and in the planning stages, which will bring information to bear on the quality of the SASS data.

SASS Reinterview Program

SASS has fielded a reinterview program in each cycle. Each reinterview was aimed at measuring simple response variance, a measure of the inconsistency between responses over repeated applications of the question. Thus, the purpose of the reinterview was to identify questions needing improvement in the next cycle of SASS. Bushery, Royce, and Kasprzyk (1992) describe results from the reinterview programs and show how these programs can be a tool for identifying problem items in a questionnaire. While the Bushery et al paper shows results from a limited number of questions in both the 1987-88 and 1990-91 SASS, an analysis of the quality of substantially more items is available in an internal memorandum (Royce, 1992).

The 1991-92 Teacher Followup Survey (TFS) component of the SASS also conducted a reinterview to ascertain the quality of individual items. This reinterview program, however, featured the use of a probing, reconciled interviews to improve the reinterview's diagnostic power. In this case, we expect to obtain information not only on questions that are unreliable, but also on the reasons for the inconsistency in responses.

Comparing Estimates Across Forms

The SASS obtains the same or similar data across several survey forms. Thus, for example, it is possible to obtain rates of attrition and separation not only in the SASS but also in the TFS. National counts of teachers are available from the teacher, school, and district forms. Estimates of the number of certified teachers are available from both the teacher and district questionnaires. The relationship between these seemingly equivalent estimates is not well understood. During the next year, a project will begin to identify all estimates of the same phenomena across the different components, to quantify the differences if they exist, and to try to understand the reasons for the differences.

Evaluating Self-Reports of Urbanicity

In both the 1987-88 and 1990-91 cycles of SASS, the question, "Which best describes the community in which this school is located?" was asked of the principal (for the administrator/principal survey) and the respondent to the school survey. The response categories were given as rural, small city or town, medium-sized city, suburb of a medium city. etc. These reports are highly subjective and have exhibited moderate response variance as determined through the reinterview program (Bushery et al, 1992). Recently Johnson (1989) developed a methodology for assigning "type of locale" codes based on the school mailing address being matched to Bureau of the Census data files containing population and population density data, Standard Metropolitan Statistical Area (SMSA) codes, and a Census code defining urban and rural areas. A study is in progress to compare codes derived through the Johnson algorithm to the self-reported classifications found in the two cycles of SASS. These comparisons will give us a better understanding of this survey item. Since the self-report method is used on many NCES surveys, the results of this study have wider applicability than the SASS.

SASS Quality Profile

Work on developing a quality profile for the SASS has begun. The quality profile will summarize methodological and evaluation research related to the SASS and will provide an overview of procedures for all phases of the survey - sample selection, data collection, data processing and estimation. It is intended to provide an overview of what is known about the sources and magnitude of errors in the SASS, and thus a sourcebook of information on the quality of the SASS data.

SASS User Survey

In designing the SASS approximately six years ago, NCES anticipated a variety of users education planners, policymakers, managers, government analysts, and academic researchers. By the end of 1992, SASS will

have released several major reports, a number of E.D. Tabs, public use microdata tapes and CD ROMS, and restricted access data tapes. In February 1992, the SASS Review Board, a working group of researchers interested in the use and evaluation of the SASS, suggested the need for a SASS user survey. The purpose of the survey would be to identify uses/users of the SASS and to assess whether they are consistent with the uses and users as identified in the design phase. The survey would also attempt to assess whether the available survey products meet user needs and how dissemination efforts could be improved. In the near future after the goals of survey are more clearly defined, we anticipate developing such a survey.

Data Analysis: Quantity and Quality of Teacher Labor Supply

This year an analytic project that focusses on estimating the effects of compensation and other policy variables on the quantity and quality of the teacher labor supply will begin. This project will address: 1) the estimation of the external labor supply facing schools and the effect of compensation and other school-level variables on this supply; 2) the estimation of internal labor supply, i.e. the retention of the teaching workforce and the effect of compensation and other policy variables on temporary and permanent flows in and out of the teaching profession. While a decidedly substantive analytic project, this project is intended to also re-evaluate the vacancy matrix data on the 1987-88 Teacher Supply and Demand Questionnaire, data that were not released on the public use tapes due to response inconsistencies.

Endnote

Any large complex data collection raises numerous questions about methods and data quality. SASS is still in its infancy in terms of understanding and use. The 1990-91 SASS included a methods research panel to help assist in answering unresolved methods issues. The 1993-94 SASS will also include such a panel. This commitment as well as the research commitment described in the projects above will provide a much deeper understanding of the SASS data as well as improve the quality of the survey operations.

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