Description of Data Collection

A. Advance Notification

In October 1998, the Principal Investigator met with the Council of Chief State School Officers' Subcommittee on Statistics, the Education Information Advisory Committee. The proposed study and survey instruments received a favorable review. Notification letters were mailed to the Chief State School Officers on May 25, 1999, advising them of the format and schedule of the study and identifying the schools in their states that had been sampled for the survey.

Three weeks later, similar information letters were mailed to superintendents of districts in which sampled public schools were located. District officials were asked to contact Horizon Research, Inc. if they had any questions or concerns, if any sampled schools had closed, or if school address information was incorrect.

B. Pre-Survey

In September 1999, a pre-survey packet was sent to the principal of each sampled school which had not refused participation at the district level. Based on information obtained during the initial district contact, packets for a few schools were directed to school district officials, who then forwarded them to the schools.

The pre-survey packet consisted of a cover letter from the data collection subcontractor (Westat), a fact sheet about the survey, and an eight-page pre-survey booklet. The booklet was designed to obtain the following information from the school principal, or someone designated by the principal:

- The names of the heads of the science and mathematics departments or, if there were no official departments, individuals who were knowledgeable enough about the science and mathematics programs at their school to complete school program questionnaires;

- The name of a person to act as our contact point for the survey;

- Names of those who taught science and mathematics at the school; and

- Key characteristics about the school and the population it served: number of students, grades included in the school, Chapter 1 status, community size description, number of students receiving free or reduced price lunches, and racial/ethnic breakdown of school population.

As an incentive for schools to participate, schools were offered a voucher redeemable for science and mathematics instructional materials. Schools which completed the pre-survey form were credited $50. (Later, during the questionnaire phase of the study, the value of the voucher increased by $15 for each completed teacher questionnaire and $15 for each completed program questionnaire.)

Principals from non-responding schools received telephone prompts from Westat. It generally required a series of telephone calls to determine whether anyone had received the pre-survey, to whom the task had been delegated, and whether or not that person was planning to complete it. In many cases, schools requested a re-mailing of the survey materials. For some of the smaller schools, prompters were able to complete the pre-survey form over the telephone. All schools were offered the option to send in teacher "codes" rather than actual teacher names, thereby preserving the anonymity of the respondents. Thirteen principals exercised this option.

A few school officials directly refused to participate at this stage, citing that the current state of school funding or low teacher salaries would not permit this additional burden. When this occurred, telephone prompters attempted to change the respondent's mind. If a completed pre-survey was not received soon thereafter, a follow-up telephone call was made. While this method was effective in some cases, most direct refusers were fairly unyielding in their original decision.

Table D-1 summarizes the results of the pre-survey by stratum. A total of 8 schools were identified as ineligible. Completed pre-survey forms were received from 1,298 of the remaining 1,792 schools for an overall response rate of 72 percent.

Table D-1
Results of Pre-Surveys, by Stratum

	Stratum 1	Stratum 2	Stratum 3	TOTAL
Response Rate	75%	74%	66%	72%
Completed	700	319	278	1,298
Non-Response	238	111	146	494
Ineligible	2	0	6	8
TOTAL	940	430	430	1,800

Westat staff reviewed the completed pre-survey booklets carefully to ensure that school staff had provided the information needed for sampling teachers. In particular, the following checks were made:

- The address was the same as that found on the original Quality Education Data (QED) sampling frame;

- The school's enrollment (by grade) was consistent with that reported by QED; and

- The number of teachers listed was consistent with the reported enrollment.

Discrepancies in this information were resolved by a call to the local contact.

In general, schools were asked to report information in a manner consistent with the way QED reported the grade range. If this was not possible because the QED file was in error or there had been a reorganization at the school, the school's revised grade range was used.

The pre-survey resulted in a file of 22,785 teachers. From this frame, a sample of 8,670 science and mathematics teachers was drawn. The number of teachers sampled per school ranged from 1 to 27, with a mean of 6 teachers and a median of 7. Teachers were sampled on a rolling basis in order that late responders to the pre-survey would not delay the main data collection effort.

C. Teacher Survey

In February 2000, Westat staff mailed program head and teacher questionnaires by priority mail to local contacts for the first sample of teachers. Additional mailings were sent as new samples were drawn. When requested, the packets were sent to district officials. The packets contained:

- A cover letter from Westat.

- A catalog of school supplies available through the redemption of the incentive voucher.

- A School Summary Sheet. This sheet listed the school name, address, ID number, grade range, local contact, program heads, sampled teachers and their subjects, and the potential value of the school's incentive voucher. It also provided an area for the local contact to keep track of which individuals had responded to the survey.

- A sealed envelope for each sampled teacher, the science program representative, and the mathematics program representative. Each packet contained:

    - A cover letter from Westat;

    - The appropriate version of the questionnaire, with a label identifying the particular class the teacher should consider when answering the class-specific sections of the questionnaire;

    - List of course codes to be used in identifying particular classes; and

    - A postage-paid return envelope.

Many of the individuals designated to respond for the program questionnaires were teachers and, consequently, had been randomly sampled as teachers as well. While these individuals received copies of both questionnaires, they were given a special cover letter which explained why both questionnaires had been included in the packet.

The 2000 National Survey of Science and Mathematics Education received letters of support from the following groups:

- American Federation of Teachers,
- National Catholic Education Association,
- National Council of Teachers of Mathematics,
- National Education Association, and
- National Science Teachers Association.

The endorsements were noted on the cover letters accompanying the questionnaires.

D. Presidential Awardees

In conjunction with the 2000 National Survey of Science and Mathematics Education, 2,652 recipients (from the years 1983–1999) of the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) were mailed copies of the science and mathematics questionnaires, as well as a questionnaire specific to the PAEMST program. Awardees received $15 for taking part in the survey. A small number of awardees had also been sampled as part of the main study. These individuals were sent only one copy of the questionnaire, but the resulting data were included in both datasets. A total of 1,996 out of 2,401 eligible[1] Presidential Awardees completed questionnaires, yielding an overall response rate of 83 percent.

E. Prompting Respondents

A series of steps was taken to increase the response rate, primarily through extensive telephone follow-up. In a number of instances, schools indicated they had not received materials, in which case materials were re-mailed.

Periodically, local school contacts were sent updated school summary sheets, indicating which teachers had returned completed questionnaires. The summary sheet also showed the current value of the school's supply voucher vs. the expected value if all sampled teachers and department heads returned questionnaires.

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[1] The 251 "ineligibles" include those who were deceased, as well as those who could not be located at the most recent address NSF had on file or through post office forwarding information.

F. Response Rates

Data collection was originally scheduled to conclude at the end of the 1999–2000 school year. However at this point, the response rate was only 53 percent. Horizon Research, Inc. continued data collection on the original sample in the fall of 2000 without sampling any new teachers.

Completed program questionnaires were received from 2,048 out of the 2,589 possible, for a response rate of 79 percent. A total of 5,728 out of 7,779 eligible teachers took part in the survey; the response rate was 74 percent.[2] Tables D-2 and D-3 provide response rate breakdowns for program heads and teachers, respectively.

Table D-2
Results of Program Questionnaires, by Stratum and Subject

	Sampled	Non-Response	Ineligible	Completed	Response Rate (Percent)
Stratum 1	**1,400**	**300**	**3**	**1,097**	**79**
Science	700	147	1	552	79
Mathematics	700	153	2	545	78
Stratum 2	**638**	**127**	**1**	**510**	**80**
Science	319	69	1	249	78
Mathematics	319	58	0	261	82
Stratum 3	**556**	**114**	**1**	**441**	**79**
Science	278	59	1	218	79
Mathematics	278	55	0	223	80
TOTAL	**2,594**	**541**	**5**	**2,048**	**79**

Table D- 3
Results of Teacher Questionnaires, by Stratum and Subject

	Sampled	Non-Response	Ineligible	Completed	Response Rate (Percent)
Stratum 1	**4,446**	**1,132**	**399**	**2,914**	**72**
Science	2,240	589	218	1,432	71
Mathematics	2,206	543	181	1,482	73
Stratum 2	**1,969**	**455**	**210**	**1,304**	**74**
Science	969	236	100	633	73
Mathematics	1,000	219	110	671	75
Stratum 3	**2,255**	**460**	**282**	**1,510**	**77**
Science	1,117	238	149	730	75
Mathematics	1,138	222	133	780	78
TOTAL	**8,670**	**2,047**	**891**	**5,728**	**74**

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[2] In the fall of 2000, a final questionnaire mailing was sent to non-respondent teachers. Over the summer, some teachers left the schools at which they taught when they were originally sampled. If these teachers are considered ineligible for the study, the teacher response rate was 74 percent. When they were included as non-respondents, the response rate was 67 percent.

G. Data Retrieval

Survey respondents did not always complete all items in the questionnaire data. A set of guidelines was developed to determine the course of action for varying degrees of missing data. For the pre-survey, certain items were considered crucial for verifying the correctness of the school sampling and the completeness of the teacher and program head sampling frame. Specifically, these items included:

- School grade range;
- Number of students;
- Names of teachers with either their subject area or the grade number of the self-contained class they taught;
- Names of science and mathematics program representatives; and
- Name of local contact.

Data retrieval was also conducted when information was missing from the program or teacher questionnaires. The following items were data-retrieved for the program questionnaires:

- Missed pages or sections;
- Reported grade ranges discrepant with school grade ranges; and
- Unclear or missing information for school course offerings.

For the teacher questionnaire, the following items were data-retrieved:

- Missing pages or sections;
- Missing or incomplete textbook titles;
- Teacher's class load (or breakdown of time spent on various subjects for teachers in self-contained classrooms);
- The size of the class randomly sampled for Sections C and D of the questionnaire; and
- Missing subject for academic degrees.

Because it was difficult to reach individual teachers by telephone, those whose questionnaires required data retrieval were first sent forms on which they could check off the correct information or clarify their answers. The questionnaire included a space for teachers to write their e-mail address if they had one, and it was possible in many instances to get the necessary information in this manner. In some cases it was possible to obtain information about the number of classes taught, course names, and class sizes from school office staff.

H. File Preparation

Completed questionnaires were recorded in Westat's receipt system and given a batch number. Next they were routed to editing. Manual edits were used to identify missing information and obvious out-of-range answers; to identify and, if possible, resolve multiple answers; and to make several consistency checks.

Questionnaires requiring data retrieval were turned over to appropriate staff for follow-up. Those that were completely coded were given a final batch number and sent to Horizon Research, Inc. for scanning. The scanned data were sent through a machine-edit program, which checked for missing data, out-of-range answers, adherence to skip patterns, and logical inconsistencies. Corrections were made in the scanned data.

As questionnaires were processed, codes were created for open-ended questions. Many of the answers needing special codes involved course titles, as well as textbook titles and publishers.