

APPENDIX C

LONGITUDINAL STUDY OF TEACHER CHANGE

In the *Longitudinal Study of Teacher Change*, we collected data from teachers in 30 schools—three schools in each of our ten In-Depth case districts. We surveyed teachers at three time points: in the fall of 1997, the spring of 1998, and the spring of 1999. Chapter 2 reports results from analyses of the baseline wave of the survey, conducted in the fall of 1997.

In the baseline wave, we asked teachers to describe a mathematics or science course they taught during the 1996-97 school year. In the sections below, we discuss the sample design and response. We then discuss the sample of courses the teachers described in the surveys.

SAMPLE DESIGN AND RESPONSE RATES FOR THE LONGITUDINAL TEACHER SURVEY BASELINE WAVE (FALL 1997)

Designing the Sample

In selecting the overall sample of 30 schools, we balanced several objectives. First, we sought schools in which teachers were likely to participate in Eisenhower-assisted activities over the 1997-98 year, the year in which we conducted site visits, as described in Appendix B. In addition, we desired a mix of elementary, middle, and high schools. Finally, we sought schools that varied in demographic composition, including percent of students in poverty, as measured by eligibility for free lunch, and percent minority. In particular, we planned to oversample high-poverty schools, those with over 50 percent of students eligible for free lunch, because the Eisenhower program intends to encourage the participation of teachers in such schools.

To achieve these objectives, we asked the Eisenhower coordinators in each case district to help us identify schools that met our criteria, and that were willing to participate in our site visits, longitudinal survey, and classroom observations. Based on information provided by the coordinators, as well as demographic information from the Common Core of Data, we selected one elementary, one middle, and one high school in each in-depth case district.¹

Of the 30 schools in our final sample, 15 are high poverty and 12 have more than 50 percent minority students. In the fall of 1997, student enrollment in the schools ranged from 247 students in one rural elementary school to 1,554 students in a suburban high school, with an average size of 818 students.

In the 30 schools, we planned to survey all teachers who taught mathematics or science during the 1997-98 year. (We did not attempt to locate teachers who taught mathematics or science in the sample schools in 1996-97 but were no longer teaching in the same school in 1997-98.) To identify teachers meeting our criteria, we asked the principals in each of the 30 schools to provide a roster of all teachers, indicating whether each teacher taught mathematics, science, or both.

¹ One district, East City, includes only elementary and middle schools, so we chose two elementary and one middle. In a second district, Weller, two K-8 schools were selected rather than an elementary and a middle school.

In most cases, the elementary schools in our sample organized instruction in self-contained classrooms, and thus most teachers were general elementary teachers who taught all subjects including both science and mathematics. In schools with self-contained classrooms, we included all elementary teachers in our sample. We randomly selected half of the elementary teachers to receive a mathematics version of the survey and half to receive a science version. Some elementary schools had specialist teachers who taught only mathematics or science and we also included these teachers in our sample.

Almost all of the middle and high schools in our sample were departmentalized, with teachers who were subject-matter specialists. We included all teachers identified as mathematics or science teachers in departmentalized schools, along with any other teachers the schools identified as teaching some mathematics or science, such as the special education teacher.

Response Rates for Teachers

Across the 30 schools, a total of 575 teachers were asked to complete the baseline wave of the survey. Of the 575 teachers surveyed, 430 returned a completed survey, for a response rate of 75 percent (see Exhibit C.1). There are differences in response rates by school; in many schools, response rates are nearly 100 percent, and in others they are below 70 percent. Of the responding teachers, 42 reported that they did not teach mathematics or science in the 1996-97 school year. Generally, these 42 teachers were new teachers in 1997, or had not taught mathematics or science before 1997. Teachers who did not teach mathematics or science were instructed to skip the subject-specific sections of their surveys. Thus, the sample of teachers describing their mathematics or science instruction for 1996-97 consists of 388 teachers.

Of these 388 teachers, 355 (91 percent) completed a sufficiently high proportion of the classroom content items on the survey to include their responses in the analyses of content discussed in Chapter 2, and 383 (99 percent) completed the necessary items on pedagogy² (see Exhibit C.1). In order to examine the relationship between content and pedagogy, we limited the sample for the analyses of pedagogy reported in Chapter 2 to the 350 teachers who completed both the content and pedagogy sections.

² Almost half of the teachers who did not fully complete the content items were elementary teachers who received the science version of the survey. It is possible that these teachers did not believe they taught science with sufficient frequency or with sufficient depth to complete the content section.

EXHIBIT C.1

Response Rates
Baseline Longitudinal Teacher Survey, Fall 1997

	Mathematics			Science			TOTAL
	Elementary School	Middle School	High School	Elementary School	Middle School	High School	
A. Number of teachers sent surveys	137	65	89	133	64	87	575
B. Number of surveys returned	91	43	73	101	48	74	430
C. Survey response rate (row B divided by row A)	66%	66%	82%	76%	75%	85%	75%
D. Number of responding teachers who did not teach mathematics or science during 1996-97 year	12	3	0	16	5	6	42
E. Number of responding teachers who taught mathematics or science during 1996-97 year (row B minus row D)	79	40	73	85	43	68	388
F. Number of teachers who completed survey but provided inadequate data for analysis of content taught	5	2	4	16	2	4	33
G. Percent of teachers completing content items (row E minus row F divided by row E)	94%	95%	95%	81%	95%	94%	91%
H. Number of teachers who completed survey but provided inadequate data for analysis of pedagogy	2	0	1	1	0	1	5
I. Percent of teachers completing pedagogy items (row E minus row H divided by row E)	97%	100%	99%	99%	100%	99%	99%
J. Percent of teachers completing both content and pedagogy items	91%	95%	93%	80%	95%	93%	90%

Sample of Teachers

The teachers in the final analysis sample are fairly representative of the general teaching population (see Exhibit C.2). Nationally, 73 percent of teachers are female (Snyder et al., 1999); in this sample, 74 percent are female. Fourteen percent of all teachers are minorities (Snyder et al., 1999) and 18 percent of this sample are minorities. Almost 10 percent of all teachers have less than three years of teaching experience (Snyder et al., 1999); in the Eisenhower Longitudinal Study sample, 9 percent of teachers have less than three years of teaching experience in total, and 11 percent of teachers have less than three years of teaching experience in the surveyed subject.

EXHIBIT C.2

Sample of Teachers: Demographics Baseline Longitudinal Teacher Survey, Fall 1997

Percent (Number³)

	Mathematics			Science			TOTAL
	Elementary School	Middle School	High School	Elementary School	Middle School	High School	
Gender							
Female	95 (70)	77 (27)	57 (39)	96 (65)	65 (26)	51 (32)	74 (259)
Male	5 (4)	23 (8)	43 (29)	4 (3)	35 (14)	49 (31)	26 (89)
Total	100 (74)	100 (35)	100 (68)	100 (68)	100 (40)	100 (63)	100 (348)
Ethnicity/Race							
Asian or Pacific Islander	-	-	2 (1)	-	-	2 (1)	1 (2)
African American	8 (6)	9 (3)	3 (2)	3 (2)	13 (5)	10 (6)	7 (24)
White	75 (54)	77 (27)	93 (63)	78 (53)	83 (33)	83 (52)	82 (282)
Hispanic	17 (12)	14 (5)	2 (1)	16 (11)	5 (2)	5 (3)	10 (34)
Other	-	-	2 (1)	3 (2)	-	2 (1)	1 (4)
Total	100 (72)	100 (35)	100 (68)	100 (68)	100 (40)	100 (63)	100 (346)
Novice Teachers[*]							
Across subjects	13 (9)	7 (2)	3 (2)	11 (7)	6 (2)	12 (7)	9 (29)
In surveyed subject	11 (6)	10 (3)	5 (3)	16 (8)	12 (4)	14 (8)	11 (32)

* Three or fewer years of teaching.

Sample of Courses Described in the Longitudinal Teacher Survey, Baseline Wave (Fall 1997)

In the longitudinal teacher survey, we asked teachers to select a mathematics or science course to describe, choosing, if possible, a year-long course they had taught in 1996-97, were continuing to teach in 1997-98, and expected to teach in 1998-99. If there were several courses they could choose, teachers were asked to select a course that enrolled students performing at mixed achievement levels.

³ Because some teachers did not complete demographic information on the surveys, the numbers of teachers reported here are slightly lower than the numbers reported in the analyses.

In general, teachers described year-long, mixed achievement courses (see Exhibit C.3). Although most teachers described year-long courses, some teachers, especially science and high school teachers, focused on semester courses. Most teachers chose courses enrolling students of mixed achievement levels, but some teachers, especially mathematics teachers and high school teachers, described classes enrolling students of homogeneous low or high achievement.

EXHIBIT C.3

Sample of Courses Described in the Baseline Longitudinal Teacher Survey, Fall 1997 (n=355*)

	Mathematics			Science			TOTAL
	Elementary School	Middle School	High School	Elementary School	Middle School	High School	
Duration							
Year	92%	97%	74%	73%	87%	73%	81%
Semester	6%	0%	26%	15%	3%	24%	14%
Other	2%	3%	0%	12%	10%	3%	5%
Total	100%	100%	100%	100%	100%	100%	100%
Composition							
Homogeneous high	1%	11%	16%	0%	2%	14%	7%
Homogeneous middle	9%	18%	32%	3%	15%	23%	17%
Homogeneous low	9%	16%	17%	6%	%	8%	10%
Mixed	80%	53%	35%	91%	78%	55%	66%
Total	100%	100%	100%	100%	100%	100%	100%

* In some cases, the n is slightly lower due to missing data.

We asked teachers to report the title of the course they described, as well as the typical grade levels of students enrolled. Not surprisingly, elementary school teachers generally described mathematics and science instruction in self-contained classrooms enrolling students at one or two grade levels (e.g., “4th-grade mathematics”). Most middle school teachers described courses titled “7th-grade or 8th-grade mathematics,” but 10 of the middle school mathematics teachers and eight of the middle school science teachers described courses with more specific titles indicating the focus of the course (i.e., pre-algebra and algebra for mathematics, life, earth, and physical science).

Most of the high school teachers described courses with specific titles. Of the high school mathematics teachers surveyed, 32 described algebra courses, 13 described geometry courses, and a few each described calculus, integrated math, or trigonometry. Of the high school science teachers, 18 described biology courses (with a few honors biology), 13 described chemistry courses, 11 described physics courses, and one to three teachers described earth science, physical science, or astronomy. Four of the science courses and five of the mathematics courses were honors, advanced, or advanced placement courses.