The National School District and Network Grants Program

Year 2 Evaluation Report

Technical Appendix

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TECHNICAL APPENDIX

Like the National School District and Network Grants Program itself, the evaluation design attends to the multiple levels of the education system (districts, schools, classrooms). The evaluation employs a multilevel, mixed-method design to examine the work and progress of the initiative. This appendix begins with a description of the overall design of the evaluation, continues with detail on the data collection activities, and concludes with information on data analysis methods and results. Specifically, it discusses the grantee and school sampling plans, the characteristics of sites in the 2001-02 and 2002-03 school data collections, and the conceptual framework that guided instrument development and data analysis. It describes the school survey methods and data, the qualitative data collections, and the analysis activities and results.

EVALUATION DESIGN

The evaluation design for the initiative includes four interrelated research strands:

- *Case studies of foundation grantees* to describe and assess the several intervention strategies the foundation is supporting.
- *School qualitative strand* to obtain a dynamic picture of the processes of school change and its relationship to school and student outcomes.
- *School survey strand* to assess both intermediate and longer-term outcomes and the relationships between grantee interventions and outcomes.
- *Student achievement strand* designed specifically to assess student learning and the relationship between student learning and school and instructional attributes.

This appendix discusses the first three strands. Data collection to support the fourth evaluation strand got under way during 2003-04 and will continue as the initiative and evaluation move forward.

School Sampling Design

We began our case study research with foundation grantees in summer of 2001. At that time, the foundation had funded 19 organizations, including urban school districts, network organizations working directly with schools, organizations providing technical assistance to other grantees on issues central to school reform (e.g., on school leadership), and organizations

advocating for more positive policy environments for school change (e.g., for performance-based assessment). In 2002, the foundation added additional intermediary organizations to the grant program.

In this report, we focus on 12 of the first 19 grantees, as well as 4 more recently included intermediary organizations. All are working directly with educators and communities to start new small secondary schools or to convert large high schools into small learning communities.

At the time we selected schools for the spring 2002 data collection, the first 12 intermediary organizations funded to foster the creation of schools had partnerships under the grant program with 40 schools. Some of the schools were models of the school designs grantees hoped to replicate, some were newly created or restructured small schools in 2001-02, and some were large schools beginning to convert or planning for a fall 2002 conversion into small learning communities.

Our 2001-02 design called for conducting surveys and site visits in 5 model schools, 10 start-up schools, and 5 schools undergoing conversion. We also planned to administer surveys in an additional five schools undergoing conversion. After we selected our school sample, two start-up schools and one school that had undergone conversion declined to participate in the major data collection activities (the two start-up schools did provide principal interviews) in light of the other pressures they were facing during 2001-02. We were able to arrange a substitute school for the declining school undergoing conversion. One school that had converted into three academies and one school planning conversion did participate in the data collection but had such low response rates for the student and teacher surveys that they could not be included in the survey data analysis, but qualitative data were collected from those sites. In view of the loss of two start-up schools from the site visit sample, we conducted site visits at an additional two schools undergoing conversion.

By 2002-03, the intermediary organizations in our study were working with a total of 76 model, start-up, and large high schools. Our data collection design called for yearly survey administration in start-up schools and biennial administration in converting schools. It called for annual site visits to start-up schools and converting high schools. From the 2002-03 school cohort, we added 14 new start-up schools to the survey sample and 3 new large schools planning for conversion. To our site visit sample, we added 7 start-up schools and 2 large schools planning for conversion. Two large schools that we visited in 2001-02 and that were planning

for conversion in 2002-03 decelerated their schedules and did not begin conversion in fall 2002 as planned. We postponed our second visit to these schools until after their conversion; thus, they were not included in our spring 2003 site visit sample.

Table A-1 shows the population of schools and the 2001-02 and the 2002-03 samples for both surveys and site visits. As the table shows, our final school sample included approximately a third of the population of schools partnering with grantees.

Table A-1
School Populations and Samples

School Type	Number Working with Grantees in 2001-02	Survey Sample	Site Visit Sample	Number Working with Grantees in 2002-03	Survey Sample	Site Visit Sample
Model schools	5	5	5	5	0	0
Start-up schools[a]	19	9	8	54	21	15
Large schools planning to convert[b]	15	8	6	9	3	2
Converted large high schools[c]	1	1	1	8	0	4
Total	40	23	20	76	24	21

[a] Those opening that year.
[b] Those planning to convert the following year.
[c] Those converted into small schools.

School Characteristics

Tables A-2 through A-5 provide descriptive information about the schools in our survey sample; the tables are organized by school type. Table A-2 provides the basic characteristics of model schools in the evaluation sample. Data were collected from these schools during the 2001-02 school year and are included in this report to provide a context for interpreting the status of start-up schools and planning to convert schools. Foundation officials visited these and other innovative schools in 1999 and 2000 and these schools provided foundation leaders with inspiration concerning high school renovation.

Table A-3 provides information on large schools that were planning to convert into smaller schools or learning communities (preconversion schools). These data describe converting schools in the planning year prior to their conversion. Data on the small schools or learning communities that were developed through conversion will be provided in next year's report.

Table A-4 provides school characteristics at two points in time for start-up schools that opened in 2001-02: (1) 2001-02 data from their first year of operation and (2) 2002-03 data from their second year of operation. Table A-5 provides 2002-03 school characteristics data for the schools that opened in fall 2002.

Table A-2
Characteristics of the Model Schools

School Characteristics						Teacher Characteristics			Student Characteristics			
School Name	Grantee Name	Community Type	School Authority	Title I Eligibility	Current Grade Levels	Number of Teachers	Average Years Teaching	Percent Certified	Number of Students	Percent Nonwhite	Percent Eligible for Free/ Reduced-Price Lunch	Percent English Language Learners
High Tech High School, San Diego	High Tech	Urban	District Charter	No	9-12	22	4.8	69	280	55	24	3
Leadership Academy	BayCES	Urban	District Charter	No	9-12	25	6.3	68	335	80	22	Not available
Metropolitan Regional Career & Technical Center	Big Picture	Urban	State Public	Yes	9-12	9	4.2	56	104	66	74	39
Minnesota New Country School	EdVisions	Rural	District Charter	Yes	7-12	12	8.2	82	124	7	18	0
New Technology High School	New Tech	Suburban	Public	No	11-12	10	7.9	100	223	32	4	6

Source: School information form, principal survey, and site visits.
Note: All data were collected during the 2001-02 academic year.

Table A-3
Characteristics of the Large-Schools Undergoing Conversion

School Characteristics						Teacher Characteristics			Student Characteristics			
School Name	Grantee Name	Community Type	School Authority	Title I Eligibility	Current Grade Levels	Number of Teachers	Average Years Teaching	Percent Certified	Number of Students	Percent Nonwhite	Percent Eligible for Free/ Reduced-Price Lunch	Percent English Language Learners
Campbell	CSC	Urban	Public	No	9-12	68	13.8	91	2,156	67	64	36
Clearwater	CCC	Urban	Public	No	9-12	56	3.4	71	1,129	65	80	2
Hillside	CSC	Urban	Public	No	7-12	63	15.7	88	1,341	78	29	3
Lincoln*	CSC	Urban	Public	Yes	6-12	51	19.0	80	894	98	62	<1
Logan	CSC	Urban	Public	No	9-12	54	15.0	65	1,415	51	49	12
Montezuma*†	FEE	Urban	Public	Yes	9-12	114	NA	NA	2,031	99	50	0
Morristown	CSC	Suburban	Public	Yes	9-12	63	15.5	78	1,379	2	7	<1
Parkview*	FEE	Urban	Public	No	9-12	82	15.0	63	1,652	91	43	9
Salazar	CSC	Urban	Public	Yes	9-12	91	19.2	78	1,650	66	41	0
Von Humboldt	CSC	Suburban	Public	Yes	9-12	67	15.1	96	1,247	2	4	<1
Western	CCE	Suburban	Public	No	9-12	77	11.4	68	1,131	49	51	9

Source: School information form, principal survey, and site visits.

Note: All data were collected in the year prior to a school's conversion. In most cases, this was the 2001-02 academic year. An asterisk (*) indicates that data were collected during 2002-03. One school, which converted for the 2001-02 school year had its planning year prior to the inception of the evaluation and is not included in this table.

† This school was not included in analyses of preconversion schools' survey data because of low response rates (<60%).

Table A-4
Characteristics of Start-up Schools That Opened in 2001-02

School Characteristics						Teacher Characteristics						Student Characteristics							
School Name	Grantee Name	Community Type	School Authority	Current Grade Levels		Number of Teachers		Average Years Teaching		Percent Certified		Number of Students		Percent Nonwhite		Percent Eligible for Free/ Reduced-Price Lunch		Percent English Language Learners	
				02	03	02	03	02	03	02	03	02	03	02	03	02	03	02	03
Cedar Hill	NCLR	Urban	Charter	9	9-10	8	14	9.9	9.3	75	62	120	226	72	56	75	84	28	31
Del Monte	EdVisions	Suburban	Charter	9-10	9-11	7	10	3.5	5.5	91	80	50	153	30	58	22	36	2	6
Desoto	CCE	Urban	Public Magnet	9-12	9-12	24	28	9.6	9.3	71	81	351	360	83	85	54	75	7	8
Freedom	High Tech	Urban	Charter	9	NA	7	NA	4.8	NA	65	NA	105	NA	95	NA	61	NA	0	NA
Green Gables	EdVisions	Urban	Charter	9-10	9-11	11	8	6.9	8.2	90	82	108	120	32	23	15	15	1	2
Lakeshore	MSSP	Urban	Public	10	10-11	NA	8	NA	8.5	NA	25	255	380	NA	100	NA	75	NA	0
Lancaster†	MSSP	Urban	Public	9	9-10	NA	11	NA	9	NA	62	NA	154	NA	100	NA	91	NA	0
Somerville	Aspire	Urban	Charter	9	9-10	5	12	12	8.4	100	100	80	163	100	100	98	98	5	25
Springtown	BayCES	Urban	Public	9-12	9-12	16	15	5.9	7.1	56	58	250	253	99	100	56	66	53	51

Source: School information form, principal survey, and site visits.
Note: Data were collected during the first and second year of a school's operation. "NA" indicates that data are not available because of nonresponse or because the school and grantee no longer were in partnership. We omitted the Title I column from this table because this information was not yet available for many start-up schools.
† This school was not included in analyses of first-year start-up schools' survey data because of low response rates (<60%).

Table A-5
Characteristics of Start-up Schools That Opened in 2002-03

School Characteristics					Teacher Characteristics			Student Characteristics			
School Name	Grantee Name	Community Type	School Authority	Current Grade Levels	Number of Teachers	Average Years Teaching	Percent Certified	Number of Students	Percent Nonwhite	Percent Eligible for Free/ Reduced-Price Lunch	Percent English Language Learners
Audobon	New Tech	Suburban	Public	9	4	6.5	75	61	18	2	3
Biotech Academy	CCE	Urban	Public Magnet	9-12	8	10.2	92	325	50	53	2
Front Street	Big Picture	Urban	State Public	9-11	4	3.5	50	56	68	50	25
Glenbrook	New Visions	Urban	District Public	9	6	4.3	83	81	99	91	0
Irvington	Big Picture	Urban	District Public	9	1	6.0	100	32	94	56	9
Lakeport	EdVisions	Urban	Charter	9-10	7	4.2	90	102	7	33	0
Metro Academy	MSSP	Urban	Public	9	8	10.3	75	82	95	100	0
New Media Academy	CCE	Urban	Public	9	4	4.0	50	75	95	100	5
Patterson	Big Picture	Rural	District Charter	9	2	14.5	50	30	10	7	0
Riverside	New Visions	Urban	District Public	9-12	11	5.5	62	112	96	97	0
Trenton	Aspire	Urban	Charter	9-10	15	9.2	40	248	100	100	2
Twin Bridges	New Tech	Suburban	District Public	11	5	11.0	100	57	15	18	0
Universal Arts Academy	MSSP	Urban	Public	9	8	9.4	86	117	90	100	0

Source: School information form, principal survey, and site visits.

Note: Data were collected during the first year of a school's operation. We omitted the Title I column from this table because this information was not yet available for many start-up schools.

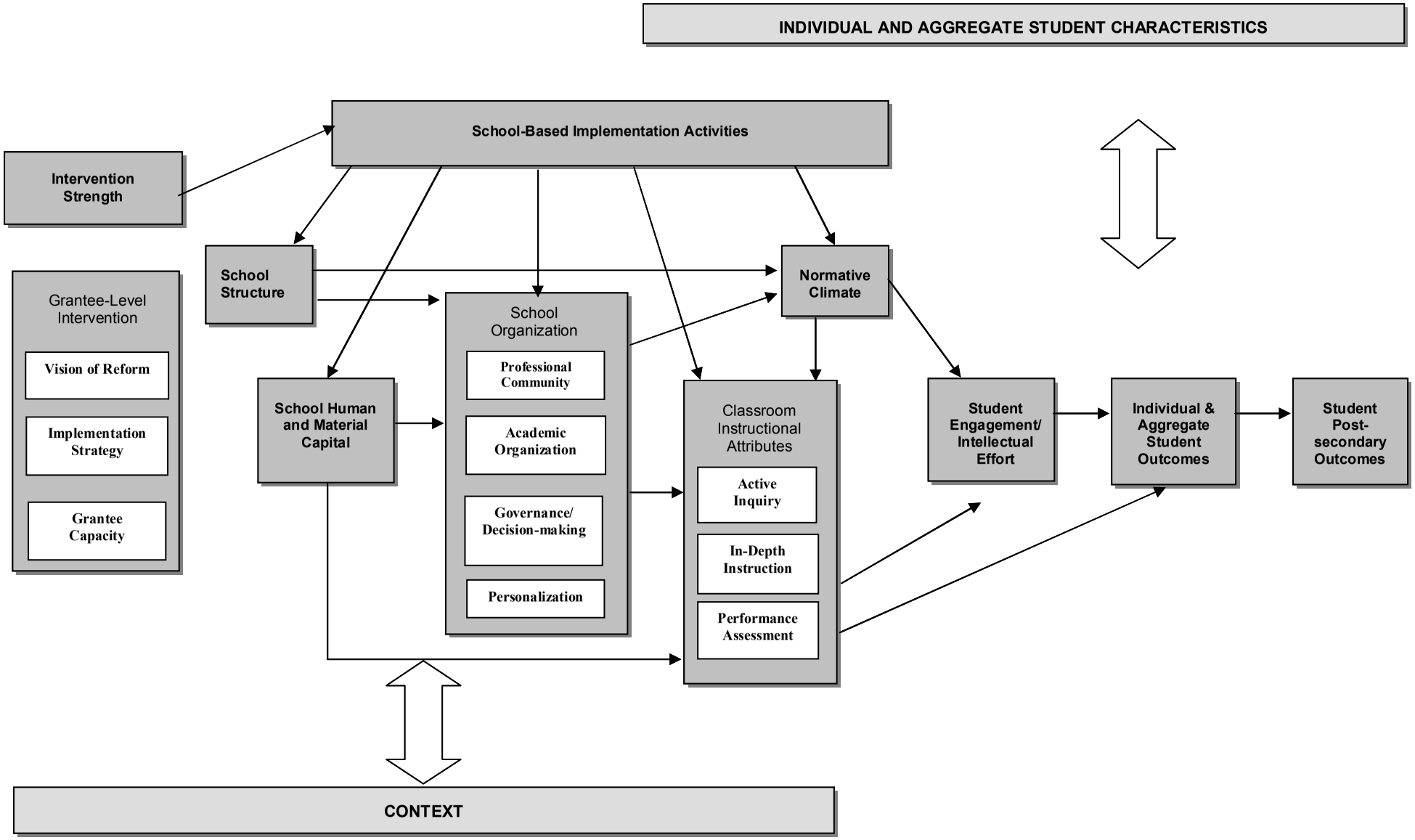
Conceptual Framework

Building on the foundation's theory of change, we developed a conceptual framework to guide the development of both qualitative and quantitative data collection instruments. The conceptual framework was intended to place the foundation's theory of change in the broader context of the research literatures on effective schools and education reform. Figure A-1 provides a graphic illustration of the major elements of the framework.

Reflecting its derivation from the foundation's theory of change, this framework concentrates on the predicted impact of grantees on the schools and students with which they work. Thus, the framework depicts student outcomes (on the far right-hand side of Figure A-1) as the ultimate dependent variable of interest and the foundation-supported activities (enacted through the grantees; far left-hand side of the model) as the main independent variable or intervention of interest. Also, as in the theory of change, the impact of the intervention is predicted to occur through the grantees' influences on specified characteristics of schools and classrooms. More specifically, the conceptual framework portrays grantee interventions as influencing the presence and strength of characteristics associated with high-performing schools and with in-depth, inquiry-based instruction. These in turn are posited to positively influence student engagement and intellectual effort, student learning, and ultimately postschool outcomes.

Overall, the conceptual model depicted in Figure A-1 posits that the impact of foundation-supported activities will be influenced by a combination of grantee-level factors, including the grantees' *vision*, *strategy*, and *capacity* and the ways these interact to influence the overall *strength of the grantee's intervention*. These grantee-level factors will then influence various aspects of the schools with which the grantees work (including the *school's structure, organization, human and material capital,* and *normative climate*) and of the *classroom instruction* within those schools. Some of these school characteristics are also posited to influence one another, and all are expected to be affected by the environmental context in which the school resides. The school characteristics are then expected to have an impact on students, first through *student engagement and intellectual effort* and ultimately through specified *student outcomes* in high school and beyond. As with environmental context**,** individual and aggregate student characteristics are posited as important influences on the success of grantees' work that are extrinsic to the intervention.

Figure A-1
Conceptual Framework for National School District and Network Grants Program Evaluation



This conceptual framework expands on the theory of change in several ways. For example, on the basis of our review of the relevant literature, we have unpacked the attributes of high-achieving schools, placing them into two interrelated dimensions of schooling: school structure and normative climate. We have also added variables left out of the theory of change, such as the quality and the stability of instructional staff (which the framework posits as part of the human and material capital available to the school). Figure A-1 also recognizes that student learning is co-produced by teachers and students together. Thus, the impact of instruction occurs primarily through its effect on the active engagement and effort of students.

Implicit in this figure is the assumption of considerable variation in outcomes. Investigating and explicating the sources of variation are important aspects of this evaluation, because by doing so, we can better understand the conditions and strategies that are most likely to facilitate the desired results.

Potential sources of the anticipated variation in outcomes include (1) the nature of the grantee intervention strategies, (2) variations in school context and implementation, and (3) differences in school capacity, will, and understanding, which include the characteristics of students.[1]

This conceptual framework guided our development of surveys for principals, teachers, and students. It also helped structure our thinking about school information forms used to gather data on school characteristics.

QUANTITATIVE DATA COLLECTION METHODS

The quantitative data presented in this report came from the principal, teacher, student, and school information surveys administered in the springs of 2002 and 2003. The principal and school information surveys were personalized and printed in-house and mailed directly to principals or school leaders. Respondents were asked to return completed surveys to AIR, where staff entered the responses into a database. (See Tables A-6 and A-7 for response rate information.)

A more involved process guided the administration of the teacher and student surveys. Research staff were assigned to each school and acted as liaisons between the school and the research team. A school employee was also recruited to serve as the school's survey

[1] From years of studying secondary teaching, McLaughlin, Talbert, and their colleagues (McLaughlin & Talbert, 2001) conclude that students are in fact the most salient and influential context for high school teachers.

coordinator. Prior to administering the survey, the coordinators provided teacher and student lists to the research team. With the help of the survey coordinator, the liaisons arranged administration dates for the teacher and student surveys.

Prior to administering any student survey, parents received a letter informing them about the pending survey and advising them of their rights to request that their child not participate. Each school or district determined how parental consent for student participation should be obtained. Most schools opted to have passive parental consent (i.e., parents were notified of the survey and asked to respond if they did not want their student to participate). However, some schools required active parental consent for student participation (i.e., parents had to return a permission slip stating that their child could participate). All schools administered the survey on a single date and then provided make-up sessions if a large proportion of students missed the main administration.

For the teacher surveys, many schools elected to give the surveys out on a single date, for example, at a staff meeting. Other schools elected to distribute the surveys to teachers individually. In these cases, coordinators instructed teachers to return the surveys by a certain date.

NCS Pearson, the subcontractor who printed the surveys, received the completed surveys from the schools. These surveys were optically scanned into a database. If NCS Pearson received a survey for a student with a parental refusal, they deleted the record before forwarding the survey response files to AIR.

This project's evaluation design includes three waves of annual data collection activities, the spring 2002 administration being the first year. The start-up and preconversion schools analyzed in this report will be surveyed in subsequent years, while the model schools will not. The start-up schools are being surveyed for three consecutive years. The seven start-up schools completing surveys in 2002 were surveyed again in 2003. An eighth start-up school that opened in 2001-02 was not able to complete its 2002 surveys but did return survey forms for the first time in 2003. The preconversion schools from the 2002 data collection effort will be surveyed again in spring of 2004, permitting comparisons of these schools before conversion and after the schools have had 2 years of experience as smaller learning communities. Additionally, a group of comparison schools not receiving funds from the Bill & Melinda Gates Foundation will be

included in spring of 2004 collection activities. These schools will enable comparisons of schools that do and do not adopt the smaller learning communities design.

Table A-6
Survey Response Rates, by School, 2001-02

School	Grade Levels Served [a]	Principal Survey	School Demographic Survey	Teacher Response Rate (percent)	Student Response Rate (percent)	Included in Analysis
Models						
High Tech High San Diego	9-11	Y	Y	77.3	79.2	Y
Leadership Academy	9-12	Y	Y	76.0	85.3	Y
Metropolitan Regional Career & Technical Center	9-12	Y	Y	100.0	79.6	Y
Minnesota New Country School	7-12 [b]	Y	Y	91.7	68.1	Y
New Technology High School	11-12	Y	Y	90.0	76.3	Y
Start-ups						
Cedar Hill	9	Y	Y	100.0	69.2	Y
Del Monte	9-10	Y	Y	100.0	97.6	Y
DeSoto	9-12	Y	Y	82.8	79.1	Y
Freedom	9	Y	Y	50.0	80.4	Y
Green Gables	9-10	Y	Y	90.9	88.7	Y
Lakeshore	10	N	N	100.0	56.2	Y
Lancaster [c]	9	N	N	0.0	2.0	N
Somerville	9	Y	Y	50.0	76.3	Y
Springtown	9-12	Y	Y	100.0	81.5	Y
Preconversions/Conversions						
Campbell	9-12	Y	Y	64.2	61.1	Y
Clearwater	9-12	Y	N	74.7	68.0	Y
Community	9-12	Y	Y	33.8	47.3	N
Hillside	9-12	Y	Y	96.9	61.6	Y
Logan	9-12	N	Y	64.3	63.7	Y
Morristown	9-12 [d]	Y	Y	82.9	53.2	Y
Salazar	9-12	Y	Y	70.0	56.6	Y
Sullivan						
Academy #1	9-12	Y	N	40.0	34.9	N
Academy #2	9-12	Y	N	66.7	35.7	N
Academy #3	9-12	N	N	31.6	12.8	N
Von Humboldt	9-12 [c]	Y	Y	84.8	69.0	Y
Western	9-12	Y	Y	98.7	78.6	Y

[a] These are the grade spans served by the schools during the 2002 survey administration. Many schools have plans to add other grades.
[b] Only students in grades 9-12 were surveyed.
[c] District required returned permission slips from parents for students to take the survey. School staff declined to complete surveys.
[d] Only students in grades 9-11 were surveyed.

Table A-7
Survey Response Rates, by School, 2002-03

School	Grade Levels Served [a]	Principal Survey	School Demographic Survey	Teacher Response Rate (percent)	Student Response Rate (percent)	Included in Analysis
Start-ups In Second Year						
Cedar Hill	9-10	Y	Y	66.7	87.7	Y
Del Monte	9-11	Y	Y	100.0	84.3	Y
DeSoto	9-12	Y	Y	100.0	89.0	Y
Green Gables	9-11	Y	Y	100.0	89.3	Y
Lakeshore	10-11	Y	Y	80.0	87.6	Y
Lancaster	9-10	Y	Y	88.2	83.2	Y
Somerville	9-10	Y	Y	100.0	78.6	Y
Springtown	9-12	Y	Y	90.0	87.6	Y
Start-ups In First Year						
Audobon	9	Y	Y	80.0	85.9	Y
Biotech Academy	9-12	Y	Y	75.0	87.8	Y
Front Street	9-11	Y	Y	100.0	90.6	Y
Glenbrook	9	Y	Y	100.0	86.3	Y
Irvington	9	Y	Y	100.0	96.9	Y
Lakeport	9-10	Y	Y	80.0	86.9	Y
Metro Academy	9	Y	Y	100.0	88.3	Y
New Media Academy	9	Y	Y	80.0	98.4	Y
Patterson	9	Y	Y	100.0	93.3	Y
Riverside	9-12	Y	Y	100.0	72.8	Y
Trenton	9-10	Y	Y	100.0	80.0	Y
Twin Bridges	11	Y	Y	100.0	91.9	Y
Universal Arts Academy	9	Y	Y	77.8	80.5	Y
Preconversions/Conversions						
Lincoln	6-12 [b]	Y	Y	91.7	53.9	Y
Montezuma	9-12	Y	Y	58.6	50.9	N
Parkview	9-12	Y	Y	71.7	39.2	Y

[a] These are the grade spans served by the schools at the time of the 2003 survey administration. Many schools have plans to add other grades in future years.

[b] Only students in grades 9-12 were surveyed.

QUALITATIVE DATA COLLECTION METHODS

Our qualitative data collections included interviews with staff from the grantee organizations, interviews with personnel from districts that worked closely with grantee organizations and their school partners, and site visits to schools. Two-person teams conducted the grantee, district, and school site visits. We describe these data collection activities in turn.

Grantee Organizations

Within grantee organizations, site visitors interviewed three to five key players and staff. Among them was the principal investigator for the grant, his or her deputies, the internal evaluator if there was one, and a business manager if there was one. Some grantee organizations also had coaches or liaisons for schools in our qualitative sample, and we interviewed these individuals. If grantees said parents or community members were key players in the organization, we also interviewed one or two of these individuals.

In interviews with grantee organization staff, the site visit teams focused on grantees' goals and progress. Interviews with grantee staff employed protocols designed to capture information concerning the evolution of the grantee's vision for small schools, the specific schools the grantee was working with and timetables for their activities, resources provided to those schools, barriers and facilitators encountered in their work with schools, and efforts to build organizational capacity.

Districts

In cases where the grantee was working closely with a district, district staff members were interviewed. Typically in these cases, site visitors interviewed the superintendent or deputy superintendent (whichever made sense, given the responsibilities of the district staff) and the reform manager, high school director, or other member familiar and involved with the reform effort. Site visitors sought context concerning the community in which the schools operated, district reform efforts, assessment and accountability requirements, district perceptions of the foundation-supported work, and any ways in which the district planned to support the grantee's work with schools.

Schools

School site visits were conducted with the support of a school staff member assigned to coordinate sample selection and scheduling. Two-person teams visited each school over a period of 2 to 4 days, as needed to complete the activities described below. Some school data collection instruments were tailored to the circumstances of start-up, preconversion planning, and conversion sites. Interviews and focus groups were audiotaped to support the completeness and accuracy of the data records.

PRINCIPAL AND LEAD STAFF

Site visit teams began and ended school visits with principal interviews (where possible). Site visitors also interviewed reform facilitators, coaches, design team leaders, curriculum leaders, and others considered key to the success of the reform. These interviews covered topics such as conception of the school's mission, supports attributed to the grantee organization, school governance, and academic organization.

TEACHERS

Site visit teams interviewed five teachers at each school. Teachers to be interviewed were selected to meet the following criteria at schools where the criteria were consonant with the structure of the staff:

- A 10th-grade mathematics teacher (if the school didn't have a 10th-grade mathematics teacher, we interviewed a 9th- or 11th-grade mathematics teacher).
- A 10th-grade English/language arts teacher (if the school didn't have a 10th-grade English/language arts teacher, we interviewed a 9th- or 11th-grade English/language arts teacher).
- A teacher of any subject at the 9th-grade level (if the school didn't have a 9th grade, we selected a teacher in the lowest grade above 8th grade).
- A teacher of any subject at the 11th- or 12th-grade level (if the school didn't have an 11th or 12th grade, we selected a teacher at the school's highest grade).
- Someone who taught an innovative class (e.g., service-learning, career course, student advisory, etc.), preferably at a higher grade level in the school.

These categories were incongruent with the school structures of some of the schools, particularly the model schools. For example, some schools don't have discrete English/language arts or mathematics classes; in these cases, we asked leaders to identify teachers of classes where

mathematics and English/language arts were substantial parts of instruction. Some of these schools don't group students by grade level in mathematics and language arts. In these cases, we selected teachers so that their five classes represented a range of student levels. Site visit teams tried to schedule teacher interviews so that the same teachers could be part of the classroom observations (see below).

In addition to topics addressed by school leader protocols, teacher interviews probed for relationships among teachers and between teachers and students, the school's learning environment, and the school's ability to serve all students well.

STUDENTS

Site visit teams completed two student focus groups per school. Students were taken from the classes of teacher interviewees, when possible, with one six-member group coming from one of the lowest-grade classes in the school and one from one of the highest-grade classes. Schools were asked to select from among the more heterogeneous of these classes. Selected classes were asked to take parent consent forms home for parent signature, and focus group students were selected from among those who returned signed forms. School coordinators were asked to select a mix of students by gender, racial/ethnic group, and native language status for each group.

In focus groups, students were asked to describe how their school is different from or similar to other schools, the nature of relationships among students and between students and teachers at the school, the nature of their schoolwork, and their assessment of how well the school is preparing them for life after graduation.

CLASSROOMS

The site visit teams conducted 25-minute observations in the classrooms of interviewed teachers. Structured observation forms were used to code the structure of the instructional activity, teacher actions, and student actions. The instructional activity codes indicated how the teacher and students were grouped for teaching and learning—for example, whether the teacher was lecturing to the whole class, students were working individually, or students were working in small groups. Teacher action codes captured the role of the teacher within the activity, that is, whether the teacher was giving directions, posing questions, leading discussions, monitoring student work, and so on. Student action codes indicated what the observed students were doing,

that is, whether students were listening, reading, collecting data, writing, performing, and so on. In another section of the observation form, observers provided a narrative description of the activities they had observed. The form also required observers to note the instructional resources used and aspects of classroom management, such as the proportion of students who were "on task" during the activity. After the observations, visitors met with teachers to discuss what they had seen. Observers asked teachers whether the work they had observed was part of a long-term product and, if so, whether students were using rubrics to examine their work, whether students would have opportunities to revise their work, and whether students would have opportunities to apply what they had learned to real-world contexts.

BUILDINGS AND STRUCTURES

At the conclusion of the school visit, site visitors completed an Implementation and School Environment Inventory. The inventory described the physical environment of the school, catalogued the school design components that were in planning or in place, noted the correspondence between the school model and school environment, and described the school location and neighborhood.

QUALITATIVE DATA ANALYSIS

After returning from visits to grantees, districts, and schools, site visitors organized the data they had collected into a standard set of sections within data-capture forms. For each type of interview, there was a form with a set of headings, organizing the data in a structure parallel to the flow of the interview protocol. In addition, a school summary form was used to capture more general or synthetic impressions. Site visitors completed the data-capture forms on the basis of their notes, checking interview tapes when appropriate for clarification or to obtain exact wording for quotations. Conventions were used to indicate the source for each piece of information, to designate the speaker's exact words as opposed to paraphrases, and to separate data that came directly from the interview from inferences or clarifications provided by the site visitor. Senior analysts reviewed the data-capture forms and requested clarifications and additions as needed.

Data Coding

In preparation for data coding, we developed a manual of codes, definitions, and procedures. Codes were developed for the constructs in the foundation's theory of change and for additional constructs in the conceptual framework. Codes described capacity issues, key school attributes, characteristics of curriculum and instruction, learning outcomes, other student and school outcomes, and many other topic areas. Each of these broad coding categories included codes for subtopics. Codes were designed to allow parsing of data-capture forms by topic. There were 125 codes in all.

Data coding began with test coding, moved on to reliability and validity coding, and concluded with operational coding. After the coding structure used with 2002 data was refined, coders were trained to use the new draft coding manual and worked in pairs on a sample set of data-capture forms to test the codes. Throughout the test coding process, weekly meetings among the coders and several analysts offered an opportunity for joint review of coding results and discussion of potentially ambiguous codes or other needed revisions to the coding manual.

Once the coding structure was tested and refined, subsets of five data-capture forms were selected to cover a wide variety of form types and content areas. These data forms were used to conduct reliability and validity trials. The trials were designed to promote common uses of codes across coders and to ensure that segments of text were coded as analysts would expect. Coder pairs coded the text segments individually and then negotiated an agreed-upon set of codes. These agreed-upon codes were then reviewed and refined by senior analysts. The resulting set of codes, agreed upon by coders and analysts, was taken as the standard against which coders' original individual responses were compared in order to examine the reliability of coding decisions. Agreements and disagreements with the standard codes for each paragraph were tallied by code, and agreement was calculated as agreements/(agreements + disagreements). In a meeting, the reasons for any low scores were explored and other outstanding issues were resolved. The coding definitions were then updated to improve clarity where necessary, and the process was repeated with the new set of definitions.

We then conduced a second reliability round on school data, in which, 74% of codes that were used more than five times in the coding sample had estimated reliabilities ranging from 70% to 100%. Codes below that threshold corresponded to concepts that generally were difficult to separate from related topics in the narratives. For example, school personnel often talked

about schoolwide policies that promote close teacher-student relationships in the same breath as practices that promote personalization of learning within the classroom. Interrelated constructs like this made coding distinctions challenging. In cases like these, we computed reliability estimates for two interrelated codes together and encouraged the use of narrative data by paired codes.

Once we moved from reliability to operational coding, weekly meetings continued for the resolution of any new issues that arose. Pair coding was used on an ongoing basis for selected data-capture forms; for example, the first report representing each grantee was pair-coded to negotiate any nuances of code application that resulted from the particular circumstances and strategies of each grantee.

Data Analysis

Analyses of qualitative data followed two paths, one for the school-level analyses and another for the analysis of data on grantee visions and strategies. Many of the analysts of school-level data began their work by reviewing samples of data-capture forms for schools in their analysis group. These reviews helped analysts get a more comprehensive view of the school contexts and schoolwide issues. Those who examined grantee data began their work in similar fashion.

School-level analysts then queried the ATLAS.ti database to review coded data. In some cases, they used coded data to find examples of issues that surfaced in survey analysis. More often, however, they used the narrative data to surface and substantiate the most prevalent themes in the coded data and to confirm or disconfirm findings suggested by the survey data. To accomplish these aims, analysts consulted the coded data on each topic, generated an initial set of themes to pursue, and developed matrices and other supporting documents to track whether or not, and in what way, a particular issue was in evidence at each school. To vet and refine the emerging themes, analysts worked in small teams by topic area and iteratively reviewed and discussed data until they reached consensus on the supported themes. A larger team of qualitative and quantitative analysts met weekly to evaluate the qualitative themes and examine the consistency of findings across the qualitative and survey data and to decide on areas that warranted further analysis.

For analysis of the grantee data (for which survey findings to guide analysis were limited), two researchers reviewed reports from both grantee and school staff about grantee visions and strategies to make judgments about the characteristics of each organization's strategy along six different dimensions. These independent judgments were identical for an average of 86% of cases (with a range of 73% to 100%) for the six dimensions. The two analysts revolved discrepancies through further discussion.

QUANTITATIVE DATA ANALYSIS

We discuss the details of the analysis of data presented in Chapters 3 through 7, sequentially. For each chapter, specific discussion begins with a data "road map" that provides details on the specific information used in the chapter. After the road map, we explain the outcome or dependent variables of interest in the chapter. This is followed by a description of independent variables we used in the analysis. There are two types of independent variables. First, the independent variables of interest are the groups of schools or attributes of schools that we focus on when looking for differences in the outcome variable. The second type of independent variables are a set of controls that are included in statistical models to prevent other factors from clouding the relationship between the dependent and independent variables of interest. Because the control variables are consistent across all chapters that use survey data, they are discussed in detail only in the write-up for Chapter 3.

Chapter 3

Chapter 3 defines our measurement of the school attributes the foundation hopes to instill in the schools. Once the measures are defined, the chapter examines the relationship between school type and the desired school attributes. The data used to answer the two primary questions in Chapter 3 are described in Table A-8.

Dependent Measures

In Chapter 3, we examined the effects of the foundation's initiative on the development of desired organizational attributes in start-up high schools. Specifically, we assessed the initiative's effects on an overall index of school attributes. Employing factor analysis, we constructed a set of scales that were mapped onto the six key attributes for effective high

schools: common focus, high expectations, personalized, climate of respect and responsibility, time to collaborate and technology as a tool.[2] The relevant survey items comprising each of the scales and the reliabilities of the scales in both 2002 and 2003 are listed in Table A-9.

Table A-8
Chapter 3 Data Road Map

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 1: To what extent do foundation-supported small high schools exhibit the attributes of effective high schools one year after opening? What processes and challenges characterize these schools' first year?					
Surveys: Teachers = 739 Students = 7,808 Schools = 37	2001-02 2002-03	Teacher surveys Student surveys	Multiple regression for analysis of the school attribute index Two-level HLM models for analysis of teacher-student scales (teachers-students at level 1 and schools at level 2)	School attribute index Personalization-social (T scale) Personalization-academic (T scale) Personalization-school actions (T scale) Personalization (S scale) High expectations (T scale) High expectations (S scale) Instructional coherence (T scale) Time toi Collaborate (T scale) Reflective professional dialogue (T scale) Collegiality (T scale)	For multiple regression: Relative risk index Preconversion vs. start-up Model vs. start-up For HLM models: Teacher-level: gender, years of teaching experience, certification, education, and subjects taught. Student-level: gender, language, mother's education, race, and grade level. School-level: relative risk index, preconversion vs. start-up, and model vs. start-up
Qualitative: School leaders= 16 Teachers =70 Schools=14 first-year start-ups	2001-02 2002-03	School leader interviews Teacher interviews Classroom observations 2002-03 School Environment and Implementation Inventory	Cross-case analysis	School attributes	Aids and barriers to implementation

[2] We did not include the performance-based attribute in creating the overall index because the measure we have for this particular attribute is highly unreliable and poorly correlated with the other six attributes. The reliability of the overall index increased from .67 to .93 as a result of the exclusion of the performance-based attribute.

Table A-8
Chapter 3 Data Road Map, continued

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 2: For start-up schools that opened in fall of 2001, to what extent did implementation of the desired attributes improve during these schools' second year?					
Surveys: Small start-up schools = 8	2001-02 2002-03	Teacher surveys Student surveys	Descriptive analysis Paired-samples t-test	School attribute index	
Qualitative: School leaders= 14 Teachers = 71 Schools=8 second-year start-ups	2001-02 2002-03	School leader interviews Teacher interviews Classroom observations	Cross-case analysis	School attributes	Aids and barriers to implementation

Higher values of the attribute index indicate a stronger presence of the foundation's desired organizational attributes in the school. This overall indicator of implementation status, the school attribute index, was created through the following steps[3]:

- Aggregate the teacher scales and student scales comprising the six attributes to the school level.
- Standardize the aggregated teacher and student scales.
- For each of the six attributes, create an attribute measure as the mean of the standardized teacher and student scales comprising the attribute.
- Standardize the six attribute measures.
- Create the Attribute Index as the mean of the six standardized attribute measures.
- Standardize the attribute index.

In addition to the composite school attribute index, we also assessed the impact of the foundation's initiative on individual scales.

Independent Measures

The primary independent variable of interest in Chapter 3 was school type. All the other independent variables were used primarily as control variables. That is, they were included in

[3] The attribute index was also calculated with Year 2 data. To ensure that the Year 1 and Year 2 values of the index are comparable, we standardized Year 2 teacher/student scales, attribute measures, and the implementation index using the means and standard deviations of the Year 1 data; i.e., standardized Year 2 measure=(Year 2 measure – Year 1 mean)/(Year 1 SD).

the models to improve our tests of school type differences on the school attribute index and individual component constructs. Below we provide detail on the independent variables at the school, teacher, and student levels.

School-Level Measures

School type (PRECONV, MODEL): The primary predictor for Chapter 3 analyses is school type, which was represented by two dummy variables: PRECONV (1=preconversion; 0=start-up); and MODEL (1=model; 0=start-up), with start-ups as the reference group.

Relative risk index (RISKAVE): The relative risk index was a composite measure based on the following student composition characteristics: percent of students with an IEP, percent of LEP students, percent of students with free or reduced-price lunch status, and percent of minority students (African American, Hispanic, and Native American). Those measures were standardized and then averaged to create the continuous relative risk index. Higher values of the risk index are associated with more risk-related student characteristics in schools.

Table A-9
Survey Items Comprising the Scales Used to Measure School Attributes

Scales	Survey Items	2002 Reliability (α)	2003 Reliability (α)
	Common Focus		
Common Focus	How much agree: Teachers have different visions for student learning How much agree: Teachers share beliefs about what the central mission of the school should be How much agree: Teachers are committed to developing strong relationships with students How much agree: Teachers are committed to developing partnerships with parent(s)/guardian(s) for student learning How much agree: Parent and community members do share vision for student learning	Teacher (.77)	Teacher (.83)
Instructional Coherence	How much agree: Support programs linked curricula, instruction, and assessments How much agree: Professional development supports the implementation of a set of common curricula, instructional strategies, and assessments How much agree: Curricula are coordinated to avoid repeating subject matter with students as they move from grade to grade How much agree: Familiar with curricula and instructional strategies used by colleagues who are also teaching my students in subject areas other than my own How much agree: Teachers have adequate opportunity to meet with one another	Teacher (.71)	Teacher (.81)

Table A-9
Survey Items Comprising the Scales Used to Measure School Attributes, continued

Scales	Survey Items	2002 Reliability (α)	2003 Reliability (α)
	High Expectations		
High Expectations	How much agree: Most teachers: Set high standards for teaching How much agree: Most teachers: Set high standards for students' learning How much agree: Most teachers: Make expectations for instructional goals clear to students How much agree: Most teachers: Carefully track students' academic progress	Teacher (.89)	Teacher (.90)
High Expectations	How much agree: Teachers at school: Believe all students can do well How much agree: Teachers at school: Given up on some students How much agree: Teachers at school: Care only about smart students How much agree: Teachers at school: Expect very little from students How much agree: Teachers at school: Work hard to make sure all students are learning	Student (.71)	Student (.76)
	Personalization		
Personalization Social	% of students for whom know: Their first and last names % of students for whom know: Their academic aspirations % of students for whom know: Their academic background prior to this year % of students for whom know: Their home life % of students for whom know: Names of person/people with whom they live % of students for whom know: Who their friends are % of students for whom know: Their cultural and linguistic background	Teacher (.93)	Teacher (.93)
Personalization Academic	Extent to which help students with academic difficulties by: Diagnosing problems the students are having Extent to which help students with academic difficulties by: Determining how to match school resources to student needs Extent to which help students with academic difficulties by: Gathering info to help understand students' difficulties Extent to which help students with academic difficulties by: Helping students learn how to overcome their difficulties in ways that compensate for different learning disabilities	Teacher (.88)	Teacher (.89)
Personalization School Action	Extent to which your school provides following help to students with academic difficulties: Extra attention from you Extent to which your school provides following help to students with academic difficulties: Extra help from other staff member during regular school day, week, or year Extent to which your school provides following help to students with academic difficulties: Extra help from school staff outside regular school day, week, or year Extent to which your school provides following help to students with academic difficulties: Parent-teacher meetings to discuss what the school and the student's parent(s)/guardian(s) can do to help Extent to which your school provides following help to students with academic difficulties: Referrals to community organizations for assistance Provide students: Extra help from other students	Teacher (.82)	Teacher (.86)

Table A-9
Survey Items Comprising the Scales Used to Measure School Attributes, continued

Scales	Survey Items	2002 Reliability (α)	2003 Reliability (α)
Personalization	How many adults in your school: Willing to give extra help with your homework if needed How many adults in your school: Willing to help you with a personal problem How many adults in your school: Really care about how well you are doing in school How many adults in your school: Have helped you think about whether you are meeting the requirements for graduation All teachers/adults willing: Help you think about what you need to do to prepare for college or a career	Student (.84)	Student (.85)
	Time to Collaborate		
Time to Collaborate	How often have you engaged in: Observing other teachers while they teach How often have you engaged in: Being observed by other teachers while teaching How often have you engaged in: Receiving feedback from other teachers based on their observations of your teaching How often have you engaged in: Providing feedback to other teachers based on your observations of their teaching How often have you engaged in: Co-teaching or mentoring other teachers or staff in your school How often have you engaged in: Diagnosing individual students' learning with other teachers	Teacher (.80)	Teacher (.84)
Reflective Professional Dialogue	How often met with other teachers to discuss: The goals of this school How often met with other teachers to discuss: The structure of the school day How often met with other teachers to discuss: Development of new curricula or modification of existing curricula How often met with other teachers to discuss: Teaching practices or instructional issues How often met with other teachers to discuss: General classroom administration and management	Teacher (.87)	Teacher (.87)
Parent Involvement	How often have you: Involved parent/guardian in setting up particular learning objectives for student How often have you: Involved parent/guardian in judging student work How often have you: Provided parent/guardian with exemplars of excellent student work to demonstrate standards for good performance How often have you: Involved parent/guardian as mentor for individual students or groups of students	Teacher (.79)	Teacher (.86)
Community Resources	How often have you: Consulted community members to better understand your students How often in your selected instructional period: Had a guest speaker from the school's community How often in your selected instructional period: Discussed different cultures in your community How often in your selected instructional period: Taken students to visit places or organizations in the community	Teacher (.59)	Teacher (.55)

Table A-9
Survey Items Comprising the Scales Used to Measure School Attributes, continued

Scales	Survey Items	2002 Reliability (α)	2003 Reliability (α)
	Respect and Responsibility		
Respect and Responsibility	How much agree: Teachers feel good about parents'/guardians' support of their work How much agree: Students treat one another with respect How much agree: Relationships between students and teachers are based on mutual trust and respect How much agree: Students get teased if they take academics seriously How much agree: Student success/failure is due to factors beyond teachers' control How much agree: I can usually get through to even the most difficult students How much agree: It is the responsibility of teachers to keep students from dropping out How much agree: Teaching makes a difference in students' lives	Teacher (.73)	Teacher (.74)
Respect and Responsibility	How much agree: Many students in this school do not respect one another How much agree: There are groups of students in this school who do not get along How many students: Feel OK to make racist or sexist remarks How many students: Feel OK to cheat How many students: Feel OK to get into physical fights How many students: Feel OK to steal things from students How many students: Feel OK to destroy or steal school property	Student (.84)	Student (.86)
Collegiality	How much agree: Teachers really don't support each other or work together How much agree: Teachers in this school trust and respect one another How much agree: Teachers, administrators, and other staff at this school model responsible behavior for students to see	Teacher (.79)	Teacher (.75)
School Climate Safe	How often have you felt unsafe: In your classes How often have you felt unsafe: In hallways, stairs, and bathrooms How often have you felt unsafe: Immediately outside the school	Teacher (.87)	Teacher (.93)
School Climate Safe	How often have you felt unsafe: In your classes How often have you felt unsafe: In hallways, stairs, and bathrooms How often have you felt unsafe: Immediately outside the school	Student (.88)	Student (.85)
Orderly Climate	How often has this occurred in school: Fighting How often has this occurred in school: Destroying property How often has this occurred in school: Verbal bullying How often has this occurred in school: Physical bullying How often has this occurred in school: Cheating How often has this occurred in school: Theft	Student (.91)	Student (.94)

Table A-9
Survey Items Comprising the Scales Used to Measure School Attributes, continued

Scales	Survey Items	2002 Reliability (α)	2003 Reliability (α)
	Technology as a Tool		
Technology as a Tool	How often do your students use technology for: Expressing themselves in writing How often do your students use technology for: Communicating electronically about academic subjects How often do your students use technology for: Exploring ideas and information How often do your students use technology for: Analyzing information How often do your students use technology for: Presenting information to an audience How often do your students use technology for: Improving computer skills	Teacher (.90)	Teacher (.90)

Teacher-Level Measures

Teaching experience (YEARS): Teaching experience was measured by the number of years the teacher worked as either a half-time or full-time elementary or secondary school teacher.

Gender (FEMALE): Gender is a dummy variable, with female coded as 1 and male coded as 0.

Educational attainment (GRADDEGR): Educational attainment is represented by a dummy variable indicating whether a teacher had an advanced degree, which could be a master's degree, an education specialist or professional diploma, or a doctorate or first professional degree.

Professional certification (CERTIFY): Professional certification is a dummy variable comparing teachers with National Board for Professional Teaching Standards Certification, regular or standard state or advanced professional certificate, or probationary certificate (the initial certificate issued after satisfying all requirements except the completion of a probationary period) with teachers with other types of certification.

Subject taught (READING, MATH, SOCIAL, SCIENCE, MULTISUB): Based on teachers' survey responses, we created six mutually exclusive subject categories: reading, math, social, science, multiple subjects, and non-academic subject. Teachers who indicated that they taught multiple subjects or had "no primary affiliation with a single subject (e.g., self-contained classroom)" were assigned to the *multiple subjects* category. Teachers who indicated that they taught art/music, a vocational field, health/physical education, special education, English as a

second language, computer or technology, or subjects other than reading, math, social studies, and science were assigned to the *non-academic subject* category, which is the reference category.

Student-Level Measures

Gender (FEMALE): Gender is a dummy variable, with female coded as 1 and male coded as 0.

English language exposure (NONENG): English language exposure is represented by a dummy variable comparing students who stated that a language other than English was spoken at home for any amount of time with students for whom English was the only language spoken at home.

Mother's educational attainment (MOMHS, MOMCOLLG): Mother's educational attainment was measured by two dummy variables: MOMHS (1=mother did not attend school beyond high school; 0=otherwise) and MOMCOLLG (1=mother had at least some college education; 0=otherwise). The reference group is students who "do not know" their mothers' educational attainment.

Race/Ethnicity (ASIAN, HISPANIC, BLACK, MULTI/OTHER): Students were assigned into five mutually exclusive racial categories represented by four dummy variables. Students who stated that they were Asian, Native Hawaiian, or Pacific Islanders were grouped to the ASIAN category. Students who indicated that their heritage was of more than one race were assigned to the MULTI/OTHER category. WHITE is the reference category.

Grade level (GRADE): This continuous variable represents the grade in which the student was enrolled. It was coded as 1 for 6th grade, 2 for 7th grade, 3 for 8th grade, 4 for 9th grade, 5 for 10th grade, 6 for 11th grade, and 7 for 12th grade.

Analysis

We used HLM models to compare start-up schools with preconversions and model schools on the composite school attribute index and individual scales. Given that the data for such assessments were of a hierarchical or nested nature—i.e., teachers or students nested within schools—we employed two-level hierarchical linear models for this type of analysis. The HLM model for the analyses of teacher scales is as follows:

Level-1 Model

Y = B0 + B1*(YEARS) + B2*(FEMALE) + B3*(GRADDEGR) + B4*(CERTIFY) + B5*(MULTISUB) + B6*(READING) + B7*(MATH) + B8*(SOCIAL) + B9*(SCIENCE) + R

Level-2 Model

B0 = G00 + G01*(PRECONV) + G02*(MODEL) + G03*(RISKAVE) + U0

B1 = G10

B2 = G20

B3 = G30

B4 = G40

B5 = G50

B6 = G60

B7 = G70

B8 = G80

B9 = G90

Note. The independent variables in the teacher-level model were grand-mean centered; the two dummy variables representing school type (PRECONV and MODEL) were uncentered in the school-level model; and the RISKAVE control variable in the school-level model was grand-mean centered.

The level-1 model is a teacher-level model, in which the teacher-level outcome was predicted by a set of teacher background characteristics. In the school-level model at level 2, school average outcome estimated at level 1 (i.e., level 1 intercept B0) is modeled as a function of certain school characteristics. The level-2 coefficients G01 and G02 represent the effects of being a preconversion or a model school versus a start-up school on the school attribute measured by the specific teacher scale, controlling for teacher characteristics and school risk factor.

The HLM model for analyzing the effects of the foundation's initiative on attributes measured by student scales is similar to that for analyzing teacher scales, except that the level-1 predictors are student characteristics instead of teacher characteristics.

Level-1 Model

Y = B0 + B1*(FEMALE) + B2*(NONENG) + B3*(MOMHS) + B4*(MOMCOLLG) + B5*(ASIAN) + B6*(HISPANIC) + B7*(BLACK) + B8*(MULTI/OTHER) + B9*(GRADE) + R

Level-2 Model

B0 = G00 + G01*(PRECONV) + G02*(MODEL) + G03*(RISKAVE) + U0

B1 = G10

B2 = G20

B3 = G30

B4 = G40

B5 = G50

B6 = G60

B7 = G70

B8 = G80

B9 = G90

Note. The independent variables in the student-level model were grand-mean centered; the two dummy variables representing school type (PRECONV and MODEL) were uncentered in the school-level model; and the RISKAVE control variable in the school-level model was grand-mean centered.

Results of the t-tests and HLM analyses as discussed above are presented in Table A-10, expressed in terms of effect sizes.

Table A-10
Effect Sizes Based on Comparisons of Start-up Schools with Preconversions and Model Schools on the School Attribute Index and Measures of School Attributes

Measures	Start-up vs. Preconversion	Start-up vs. Model
School attribute index[4]	1.65**	-0.15
Personalization-social (T scale)	1.37**	0.42
Personalization-academic (T scale)	0.39**	-0.26
Personalization-school actions (T scale)	0.85**	-0.24
Personalization (S scale)	0.56**	0.03
High expectations (T scale)	0.79**	-0.20
High expectations (S scale)	0.81**	0.01
Instructional Coherence (T scale)	1.10**	-0.02
Collegiality (T scale)	0.92**	-0.01
Time to Collaborate (T scale)	0.82**	-0.44*
Reflective professional dialogue (T scale)	1.07**	0.18
ADDITIONAL ANALYSIS OF 9 T/S SCALES		
Common Focus (T scale)	1.19**	0.04
Parental involvement (T scale)	0.17	-0.49**
Community resources (T scale)	0.50**	-0.24
Respect and responsibility (T scale)	0.96**	-0.36*
Respect and responsibility (S scale)	0.88**	0.00
Measures	Start-up vs. Preconversion	Start-up vs. Model
School climate safe (T scale)	0.27~	-0.04
School climate safe (S scale)	0.31**	-0.04
Orderly climate (S scale)	0.76**	-0.05
Technology as a tool (T scale)	0.65**	-0.27

Notes. We conservatively calculated the effect sizes as the adjusted mean differences between two types of schools divided by the standard deviation of the outcome. Given that the outcomes are standardized with a standard deviation of 1, the effect sizes are the same as the adjusted mean differences. The effect size estimates would be larger if we had used pooled within-group standard deviation or between-group standard deviation of the outcome as the denominator in the calculation.

The effect size result for the school attribute index was based on independent-samples t-tests, and results for teacher and student scales were based on two-level HLM models.

~p<.10; * p < .05; ** p < .01

Chapter 4

Chapter 4 describes the experiences of four new small learning communities during 2002-03. Students in these schools attended the preconversion schools in our 2001-02 survey sample. The

[4] The effect size results for the implementation index change slightly if we adjust for the school risk factor: the effect size for start-up vs. preconversion changes from 1.645 to 1.653, and the effect size for start-up vs. model changes from -.145 to -.08.

data used to answer the questions in Chapter 4 are described in Table A-11. Because the preconversions schools from 2001-02 were not surveyed in 2002-03, Chapter 4 is based solely on qualitative information.

Table A-11
Chapter 4 Data Road Map

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 1: What does "conversion" look like?					
Qualitative: Schools = 4 School Leaders = 15 Teachers = 28 Students = 53 Parents = 28	2002-03	School leader interviews Teacher interviews Student focus groups Parent focus groups Classroom observations Implementation and School Environment Inventory District and school artifacts	Cross-case analysis	School conversion plans and activities	
Question 2: To what extent have conversion schools implemented the foundation's school attributes?					
Qualitative: Schools = 4 School Leaders = 15 Teachers = 28 Students = 53 Parents = 28	2002-03	School leader interviews Teacher interviews Student focus groups Parent focus groups Classroom observations Implementation and School Environment Inventory District and school artifacts	Cross-case analysis	Effective school attributes	Aides and barriers to implementation of the school attributes
Question 3: How well are conversions meeting the needs of all students?					
Qualitative: Schools = 4 School Leaders = 15 Teachers = 28 Students = 53 Parents = 28	2002-03	School leader interviews Teacher interviews Student focus groups Parent focus groups Classroom observations Implementation and School Environment Inventory District and school artifacts	Cross-case analysis	Early student outcomes	School and classroom attributes

Chapter 5

Chapter 5 examines the relationship between teaching practices and school type. The chapter also addressed the relationship between the foundation's desired school attitudes and the teaching practices of faculty. The data used to address the questions in Chapter 5 are described in Table A-12.

Table A-12
Chapter 5 Data Road Map

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 1: To what extent do teachers in foundation-supported small high schools follow each of these models of instructional practice?					
Surveys: Teachers = 676 Schools = 36	2001-02 2002-03	Teacher surveys Demographic surveys	Two-level HLM models for analysis of teacher scales (teachers at level 1 and schools at level 2)	Reform-like teaching Conventional teaching	<u>For HLM models:</u> Teacher-level: gender, years of teaching experience, certification, education, and subjects taught School-level: relative risk index, preconversion vs. start-up, and model vs. start-up
Qualitative: Teachers = 70 Schools = 14 first-year start-ups	2001-02 2002-03	Teacher interviews Classroom observations	Cross-case analysis	Reform-like teaching Conventional teaching	Aids and barriers to reform-like and conventional teaching practice
Question 2: What is the relationship between implementation of the foundation's school attributes and reform-like instructional practice?					
Surveys: Teachers = 676 Schools = 36	2001-02 2002-03	Teacher surveys Demographic surveys	Two-level HLM models for analysis of teacher scales (teachers at level 1 and schools at level 2)	Reform-like teaching Conventional teaching	<u>For HLM models:</u> Teacher-level: gender, years of teaching experience, certification, education, and subjects taught School-level: relative risk index, school attribute index
Qualitative: Teachers = 70 Schools = 14 first-year start-ups	2001-02 2002-03	Teacher interviews Classroom observations	Cross-case analysis	Reform-like teaching Conventional teaching	Effective-school attributes

Table A-12
Chapter 5 Data Road Map, continued

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 3: Is there a significant change in reform-like and conventional teaching between Year 1 and Year 2 of small start-up schools?					
Surveys: Schools = 7	2001-02 2002-03	Teacher surveys (aggregated to school level) Demographic surveys	Descriptive statistics Paired t-test OLS regression	Reform-like teaching Conventional teaching	For OLS regression models: School-level: Difference in school size (Year 2 minus Year 1)

Dependent Measures

We use two scales to measure teaching: reform-like teaching and conventional teaching. Creating the two scales involved a two-step process. The first step involved a series of factor analyses that created the following individual scales (see Table A-13): (1) active inquiry, (2) in-depth learning, (3) performance assessment, (4) technology as a tool, (5) traditional instruction, and (6) preparation for standardized tests. The second step of the index creation consisted of combining standardized versions of teaching scales into the two composite scales. The reform-like teaching scale combined: (1) active inquiry, (2) in-depth learning, (3) performance assessment, and (4) technology as a tool ($\alpha = .82$). The conventional teaching scale combined standardized versions of: (1) traditional instruction and (2) preparation for standardized tests ($\alpha = .70$).

Table A-13
Teacher Scales and Items

Latent Scale	Individual Survey Items	α 2002	α 2003
Teacher preparedness: Teaching new methods (4-point scale)	How prepared: Implement methods of teaching new to you How prepared: Implement state/district curriculum/standards How prepared: Integrate technology into subject How prepared: Use student performance assessments	.73	.78
Teacher preparedness: Teaching diverse students (4-point scale)	How prepared: Teach students with mixed abilities How prepared: Address needs with poor English proficiency How prepared: Address needs of students with disabilities How prepared: Address needs from diverse cultures How prepared: Address needs performing below grade level How prepared: Address needs who don't read well	.89	.89
Teacher preparedness: Teaching project-based activities (4-point scale)	How prepared: Implement project-based learning activities How prepared: Teach important content in subject matter area How prepared: Create instruction to include problem solving	.65	.72
Instructional materials (4-point scale)	How available: Technology How available: Textbooks How available: Supplementary textbook materials How available: Test score data How available: Copies of the standards your school uses How available: Library materials for your use	.79	.80
Instructional resources (4-point scale)	Do you have onsite: Classroom aides for instruction Do you have onsite: Subject matter specialist(s) Do you have onsite: Reading specialist Do you have onsite: Special education resource teacher Do you have onsite: Bilingual teacher(s) Do you have onsite: School psychologist/social worker Do you have onsite: Parent liaison Do you have onsite: Translators for family languages	.79	.84
Active inquiry (5-point scale)	Emphasis in instructional period: Explore interesting topics Emphasis in instructional period: Guide student research/analysis In instructional period do you: Monitor student-led discussions In instructional period do students: Collect/organize/analyze info/data In instructional period do students: Decide to present what learned In instructional period do students: Evaluate/defend ideas and views	.77	.72
In-depth learning (5-point scale)	Emphasis in instructional period: Relate content to real life Emphasis in instructional period: Help students explore topics In instructional period do students: Solve real-world problems In instructional period do students: Research topics enough to be expert In instructional period do students: Work on multidisciplinary projects In instructional period do students: Participate in community projects	.70	.72

Table A-13
Teacher Scales and Items, continued

Latent Scale	Individual Survey Items	α 2002	α 2003
Traditional instruction (5-point scale)	Emphasis in instructional period: Help students with facts and procedures Emphasis in instructional period: Help students with/reading/math In instructional period do you: Lecture to class as a whole In instructional period do you: Lead on practices facts/definitions/computation In instructional period do students: Practice computations/procedures In instructional period do students: Memorize facts/definitions/formulas	.72	.71
Preparation for standardized tests (5-point scale)	Emphasis in instructional period: Cover materials in state/district standard Emphasis in instructional period: Cover materials on state/district tests Emphasis in instructional. period: Testing students How often in instructional period: Multiple-choice tests How often in instructional period: Short-answer tests In instructional period do students: Prepare for state/district tests Teaching in instructional period: Prepare to take standardized tests	.77	.83
Performance assessment (5-point scale)	How often in instructional period: Open-ended problems How often in instructional period: Portfolios of student work How often in instructional period: Group projects How often in instructional period: Individual projects How often in instructional period: Student peer reviews How often in instructional period: Hands-on demos/exhibitions/presentations How often in instructional period: Performance assessments	.80	.79
Technology as a tool (5-point scale)	Teaching in instructional period: Express themselves in writing Teaching in instructional period: Communicate electronically Teaching in instructional period: Explore ideas and information Teaching in instructional period: Analyze information Teaching in instructional period: Present information to an audience Teaching in instructional period: Improve computer skills	.90	.90

INDEPENDENT MEASURES

As was the case in Chapter 3, the independent variables of most interest were at the school level. Specifically, we explored differences in teaching practice by school type. The relationship between the school attribute index created in Chapter 3 and teaching practices was also a focus of Chapter 5. The relative risk index described in our discussion of Chapter 3 was also used as a control in Chapter 5.

Teacher-Level Measures

Teacher characteristics include teaching experience, gender, professional certification, educational attainment, and subjects taught. Teaching experience was measured by one survey item regarding the number of years the teacher worked as either a half-time or full-time elementary or secondary teacher. Gender is a dummy variable, where female is coded as 1, and male is coded as 0. Professional certification is a dummy variable that compares teachers with

National Board for Professional Teaching Standards Certification, regular or standard state or advanced professional certificate, or probationary certificate (the initial certificate issued after satisfying all requirements except the completion of a probationary period) to teachers with all other types of certification. Educational attainment is a dummy variable that compares teachers who have advanced degrees (master's degree, education specialist or professional diploma, or doctorate or first professional degree) with teachers who have other degrees. Subjects taught included dummy variables of reading, math, science, and multiple subjects, where the comparison group is teachers who taught other subjects, such as art/music, vocational, health/physical education, special education, English as a second language, computer or technology, or other subjects.

Three four-point scales measured teacher preparation (see Table A-13). The first scale, related to feeling prepared to implement new teaching methods, includes items such as feeling prepared to implement methods of teaching new to the teacher, implement state or district curriculum and standards, and integrating technology into a subject. The second scale, related to feeling prepared to teach nontraditional students, includes items such as feeling prepared to teach students with mixed abilities, poor English proficiency, and disabilities. The third scale, related to feeling prepared to use project-based or problem-solving activities and instruction, includes items such as feeling prepared to implement project-based learning activities and creating instruction to include problem solving. Higher numbers are associated with more feelings of preparedness; these scales are not standardized.

Instructional materials were measured by one four-point scale that includes such items as having available in the classroom the use of technology, textbooks, test score data, and library materials. Instructional resources were measured by one four-point scale that includes such items as having onsite classroom aides for instruction, subject matter specialists, bilingual teachers, social workers, and translators. Higher numbers are associated with more availability of the instructional materials and resources; these scales are not standardized.

Analysis

For the first question, whether small schools provide a different kind of teaching, a two-level hierarchical linear model was used with the reform-like and conventional teaching outcome measures. The HLM model was as follows:

Teacher-level:

$Y_{ij} = \beta_{0j} + \beta_{1j}$ (Years teaching) $+ \beta_{2j}$ (Female) $+ \beta_{3j}$ (Certificate) $+ \beta_{4j}$ (Graduate degree) $+ \beta_{5j}$ (Multiple subjects) $+ \beta_{6j}$ (Reading) $+ \beta_{7j}$ (Math) $+ \beta_{8j}$ (Social studies) $+ \beta_{9j}$ (Science) $+ \beta_{10j}$ (Teacher preparation 1) $+ \beta_{11j}$ (Teacher preparation 2) $+ \beta_{12j}$ (Teacher preparation 3) $+ \beta_{13j}$ (Instructional materials) $+ \beta_{14j}$ (Instructional resources) $+ r_{ij}$

School-level:

$\beta_{0j} = \gamma_{00} + \gamma_{01}$ (Preconversion school) $+ \gamma_{02}$ (Model school) $+ \gamma_{03}$ (Relative risk index) $+ \mu_{0j}$

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

$\beta_{10j} = \gamma_{100}$

$\beta_{11j} = \gamma_{110}$

$\beta_{12j} = \gamma_{120}$

$\beta_{13j} = \gamma_{130}$

$\beta_{14j} = \gamma_{140}$

The control variables were grand-mean centered, with the exception of model and preconversion schools, which were left uncentered. The random effects of the slopes as outcomes at level 2 were fixed.

Table A-14
The Relationship between School Type and Reform-like and Conventional Teaching

	Reform-like Teaching	Conventional Teaching
School-level Characteristics (N = 36)		
Preconversion school	-0.43**	0.67***
Model school	0.37	-0.53**
Relative risk student composition	-0.17	0.07
Student-level Characteristics (N = 676)		
Number of years teaching	0.00	0.00~
Female	-0.10~	-0.06
Graduate degree	0.10	-0.13*
Teaching certification	-0.10	-0.03
Teaching multiple subjects	0.10	-0.40*
Teaching reading	0.11	-0.08
Teaching mathematics	-0.38***	0.84***
Teaching social studies	0.07	0.11
Teaching science	-0.16~	0.31**
Teacher preparation for new methods	0.30***	0.15*
Teacher preparation for diverse students	0.11*	0.18***
Teacher preparation for project-based activities	0.38***	0.01
Instructional materials	-0.09	-0.06
Instructional resources	0.10~	0.13**
Variance Component		
School (level 2), μ_{0j}	0.11***	0.08***
Teacher (level 1), r_{ij}	0.58	0.62

Source: School-level data from the demographic survey. Teacher-level data from the teacher survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The coefficients are effect sizes.

For the second question, whether the school attribute index was associated with more reform-like teaching, a two-level hierarchical linear model was used with the reform-like and conventional teaching outcome measures. The HLM model was as follows:

Teacher-level:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Years teaching}) + \beta_{2j}(\text{Female}) + \beta_{3j}(\text{Certificate}) + \beta_{4j}(\text{Graduate degree}) + \beta_{5j}(\text{Multiple subjects}) + \beta_{6j}(\text{Reading}) + \beta_{7j}(\text{Math}) + \beta_{8j}(\text{Social studies}) + \beta_{9j}(\text{Science}) + \beta_{10j}(\text{Teacher preparation 1}) + \beta_{11j}(\text{Teacher preparation 2}) + \beta_{12j}(\text{Teacher preparation 3}) + \beta_{13j}(\text{Instructional materials}) + \beta_{14j}(\text{Instructional resources}) + r_{ij}$$

School-level:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{School attribute index}) + \gamma_{02}(\text{Relative risk index}) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

$\beta_{10j} = \gamma_{100}$

$\beta_{11j} = \gamma_{110}$

$\beta_{12j} = \gamma_{120}$

$\beta_{13j} = \gamma_{130}$

$\beta_{14j} = \gamma_{140}$

All the control variables were grand-mean centered. The random effects of the slopes as outcomes at level 2 were fixed.

Table A-15
The Relationship between School Attribute Index and Reform-like and Conventional Teaching

	Reform-like Teaching	Conventional Teaching
School-level Characteristics (N=36)		
School attribute index in school	0.39***	-0.47***
Relative risk student composition	-0.18~	0.14
Student-level Characteristics (N=676)		
Number of years teaching	0.00	0.00~
Female	-0.09	-0.06
Graduate degree	0.10	-0.13*
Teaching certification	-0.10	-0.02
Teaching multiple subjects	0.04	-0.32~
Teaching reading	0.12~	-0.10
Teaching mathematics	-0.39***	0.84***
Teaching social studies	0.09	0.10
Teaching science	-0.16~	0.31**
Teacher preparation for new methods	0.29***	0.15*
Teacher preparation for diverse students	0.12*	0.17**
Teacher preparation for project-based activities	0.38***	0.01
Instructional materials	-0.10	-0.04
Instructional resources	0.09	0.13**
Variance Component		
School (level 2), μ_{0j}	0.07***	0.10***
Teacher (level 1), r_{ij}	0.58	0.61

Source: School-level data from the demographic survey. Teacher-level data from the teacher survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The coefficients are effect sizes.

In addition to the model above for the second question, post-hoc models were run to determine if the relationship between school attribute index and teaching practices was due to school type (preconversion and model versus small start-up schools). Hence, the post-hoc models control for preconversion and model schools (start-up schools being the reference group), as well as the school attribute index and the relative risk index at the school level (see Table A-16 for the post-hoc models). These results indicate that, indeed, above and beyond the effect of school type, school attribute index has an influence on teaching practices. For example, in the model with reform-like teaching, the post-hoc model shows that school type is not significant; with the model for conventional teaching, model schools have significantly less conventional teaching. In both models, school attribute index retains its significance.

Table A-16
The Relationship between School Attribute Index and Reform-like and Conventional Teaching (Controlling for School Type)

	Reform-like Teaching	Conventional Teaching
School-level Characteristics (N=36)		
Preconversion school	0.33	0.30
Model school	0.27	-0.49**
School attribute index in school	0.51***	-0.26*
Relative risk student composition	-0.14	0.07
Student-level Characteristics (N=676)		
Number of years teaching	0.00	0.00~
Female	-0.09	-0.06
Graduate degree	0.09	-0.12*
Teaching certification	-0.10	-0.03
Teaching multiple subjects	0.01	-0.33~
Teaching reading	0.12~	-0.09
Teaching mathematics	-0.39***	0.84***
Teaching social studies	0.09	0.11
Teaching science	-0.16~	0.31**
Teacher preparation for new methods	0.29***	0.15*
Teacher preparation for diverse students	0.12*	0.17**
Teacher preparation for project-based activities	0.38***	0.01
Instructional materials	-0.10~	-0.05
Instructional resources	0.09~	0.13**
Variance Component		
School (level 2), μ_{0j}	0.07	0.08***
Teacher (level 1), r_{ij}	0.58	0.61

Source: School-level data from the demographic survey. Teacher-level data from the teacher survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The coefficients are effect sizes.

For the third question, whether there are differences in teaching among start-up schools in Year 1 versus Year 2 of operation, two analyses were run. The first analysis was a paired t-test to determine if there were significant mean differences for reform-like and conventional teaching across two years. The second analysis was an OLS regression, which controlled for school size. The results are shown in Table A-17.

Table A-17
Year 1 vs. Year 2 Differences in Reform-like Teaching and Conventional Teaching for Seven Start-up Schools

	Y1 vs. Y2 Mean Difference	Y1 vs. Y2 Mean Difference Adjusted for Change in School Size
Reform-like teaching	-.332*	-.319
Conventional teaching	-.071	-.324

Note: Y1 vs. Y2 differences were based on paired-sample t-tests; Y1 vs. Y2 differences adjusted for change in school size were based on regression analyses. * $p<.05$.

Chapter 6

Chapter 6 examined the relationship between school type and student educational attitudes as well as the relationship between student attitudes and the foundation's desired school attributes. The data used to answer the four research questions in Chapter 6 are described in Table A-18.

Table A-18
Chapter 6 Data Road Map

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 1: What is the relationship between school type and early student outcomes?					
Surveys: Students = 8,637 Schools = 36	2001-02 2002-03	Student surveys Demographic surveys	Two-level HLM models for analysis of student scales (students at level 1 and schools at level 2) HLM models with interaction terms for mother's education HLM models with interaction terms for student race	Overall student learning attitudes Academic interest Academic persistence Academic self-concept Social responsibility Academic progress	For HLM models: Student-level: gender, language, mother's education, race, and grade level School-level: relative risk index, preconversion vs. start-up, and model vs. start-up
Qualitative: Students = 384	2001-02 2002-03	Student focus groups Classroom observations	Cross-case analysis	Student attitudes	Preconversion vs. start-up, and model vs. start-up
Question 2: What is the relationship between the implementation of the foundation's school attributes and early student outcomes?					
Surveys: Students = 8,637 Schools = 36	2001-02 2002-03	Student surveys Demographic surveys	Two-level HLM models for analysis of student scales (students at level 1 and schools at level 2)	Overall student learning attitudes Academic interest Academic persistence Academic self-concept Social responsibility Academic progress	For HLM models: Student-level: gender, language, mother's education, race, and grade level School-level: relative risk index, school attribute index
Qualitative: Students = 384	2001-02 2002-03	Student focus groups observations	Case study methods? Grounded theory? Open coding?	Student attitudes	Preconversion vs. start-up, and model vs. start-up

Table A-18
Chapter 6 Data Road Map, continued

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 3: What is the relationship between the teaching process and early student outcomes?					
Surveys: Students = 8,637 Schools = 36	2001-02 2002-03	Student surveys Teacher surveys (aggregated to school level) Demographic surveys	Two-level HLM models for analysis of student scales (students at level 1 and schools at level 2)	Overall student learning attitudes Academic interest Academic persistence Academic self-concept Social responsibility Academic progress	For HLM models: Student-level: gender, language, mother's education, race, and grade level School-level: relative risk index, reform-like teaching, conventional teaching
Qualitative: Students = 384	2001-02 2002-03	Student focus groups Classroom observations	Cross-case analysis	Student attitudes	Preconversion vs. start-up, and model vs. start-up
Question 4: Is there a significant change in student attitudes between Year 1 and Year 2 of small start-up schools?					
Surveys: Schools = 7	2001-02 2002-03	Student surveys (aggregated to school level) Demographic surveys	Descriptive statistics Paired t-test OLS regression	Overall student learning attitudes Academic interest Academic persistence Academic self-concept Social responsibility Academic progress	For OLS regression models: School-level: difference in school size (Year 2 minus Year 1)
Qualitative: Students = 84	2001-02 2002-03	Student focus groups observations	Case study methods? Grounded theory? Open coding?	Student attitudes	Preconversion vs. start-up, and model vs. start-up

DEPENDENT MEASURES

We measured student attitudes about learning in the following manner. First, using the student surveys, five individual scales were created that assessed students': (1) academic interest, (2) academic persistence, (3), academic self-concept (4) academic progress, and (5) social responsibility (see Table A-19 for more information about the individual factors). Second, the five indices were standardized and then averaged to create one overall index of student attitudes ($\alpha = .82$). Finally, we standardized this average student attitude index. Higher values on all scales are associated with more positive attitudes about school and learning. In addition to using the overall student attitudes as an outcome variable, we also ran analyses based on the individual scales.

Table A-19
Student Scales and Items Used in Chapter 6

		2002	2003
Academic Interest (5-item scale)	I have: Talked to my family about what I am learning I have: Asked my friends for advice about schoolwork I have: Asked questions or discussed something in class I have: Worked with classmates outside class or school I have: Asked teachers to meet/talk about grades/schoolwork	.75	.76
Academic Persistence (7-item scale)	How often: Gave up on homework when too hard How often: Got help when homework was too difficult How often: Gave extra effort to challenging projects How often: Kept trying even if work was not interesting How often: Tried really hard to do a good job How often: Found my schoolwork interesting How often: Did not care much about my schoolwork	.76	.73
Academic self-concept (5-item scale)	I am good at: Asking teachers for help when stuck I am good at: Working in a group with other students I am good at: Taking part in class or group discussions I am good at: Understanding what I read I am good at: Writing papers or stories I am good at: Learning math	.69	.70
Academic progress (5-item scale)	How well taught: Be a good reader How well taught: Speak clearly and effectively How well taught: Write clearly and effectively How well taught: Analyze and solve math problems How well taught: Learn on your own with little help	.84	.80
Social responsibility (5-item scale)	How well taught: Be a responsible member of community How well taught: Understand rights of people in U.S. How well taught: Respect opinions of different backgrounds How well taught: Prepare for the work world or college How well taught: Think critically about ideas, problems	.86	.83

INDEPENDENT MEASURES

School-Level Measures

Similar to Chapter 5, school type and the school attribute index were the primary independent variables of interest in Chapter 6. As we did in Chapters 3 and 5, we included the relative risk measure in all multivariate models.

Student-Level Measures

Student characteristics often associated with educational outcomes were used as control variables. Specifically, student gender is a dummy variable, where female is the reference group. For student race, the following dummies were used, with white as the reference group: Asian, Hispanic, African American, and other race (including Pacific Islander, Native American, and

other race). Language other than English spoken at home is a dummy variable, where the reference group is those students who speak only English at home. Grade level is an ordinal variable from 1 to 7, where 1 = 6th grade, 2 = 7th grade, 3 = 8th grade, 4 = 9th grade, 5 = 10th grade, 6 = 11th grade, and 7 = 12th grade. Mother's education, as a proxy for socioeconomic status, is measured by two dummy variables: mother's education high school or less and mother's education at least some college, where the reference group is mother's education unknown.

ANALYSIS

For the first question, regarding the differences between school types, a two-level hierarchical linear model was used with the six student outcome measures (Model 1).

MODEL 1: DIFFERENCES IN SCHOOL TYPES

Student-level:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Female}) + \beta_{2j}(\text{Asian}) + \beta_{3j}(\text{Hispanic}) + \beta_{4j}(\text{Black}) + \beta_{5j}(\text{Other}) + \beta_{6j}(\text{Language}) + \beta_{7j}(\text{Mother high school education}) + \beta_{8j}(\text{Mother college education}) + \beta 9_j(\text{Grade level}) + r_{ij}$$

School-level:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Preconversion school}) + \gamma_{02}(\text{Model school}) + \gamma_{03}(\text{Relative risk index}) + \mu 0j$$

$$\beta 1j = \gamma 10$$

$$\beta 2j = \gamma 20$$

$$\beta 3j = \gamma 30$$

$$\beta 4j = \gamma 40$$

$$\beta 5j = \gamma 50$$

$$\beta 6j = \gamma 60$$

$$\beta 7j = \gamma 70$$

$$\beta 8j = \gamma 80$$

$$\beta 9j = \gamma 90$$

Preconversion and model schools were uncentered, while the other control variables were grand-mean centered. The random effects of the slopes as outcomes at level 2 were fixed.

To determine if there were any interactions between student characteristics, most notably student socioeconomic status (mother's educational attainment) and race, a second set of HLM models were conducted. Because of the number of parameters in the interaction models and the small number of cases in level 2, student socioeconomic status and race were run separately (Model 2 and Model 3).

Model 2 refers to the HLM models that take into account the cross-level interactions between mother's education high school or less, mother's education at least some college, and mother's education unknown as a comparison group.

MODEL 2: DIFFERENCES IN SCHOOL TYPES BY MOTHER'S EDUCATION

Student-level:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Female}) + \beta_{2j}(\text{Asian}) + \beta_{3j}(\text{Hispanic}) + \beta_{4j}(\text{Black}) + \beta_{5j}(\text{Other}) + \beta_{6j}(\text{Language}) + \beta_{7j}(\text{Mother high school education}) + \beta_{8j}(\text{Mother college education}) + \beta 9_j(\text{Grade level}) + r_{ij}$$

School-level:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Preconversion school}) + \gamma_{02}(\text{Model school}) + \gamma_{03}(\text{Relative risk index}) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

$$\beta_{5j} = \gamma_{50}$$

$$\beta_{6j} = \gamma_{60}$$

$$\beta_{7j} = \gamma_{70} + \gamma_{71}(\text{Preconversion school}) + \gamma_{72}(\text{Model school})$$

$$\beta_{8j} = \gamma_{80} + \gamma_{81}(\text{Preconversion school}) + \gamma_{82}(\text{Model school})$$

$$\beta 9_j = \gamma_{90}$$

Model 3 refers to the HLM models that take into account the cross-level interactions between Hispanic and African American students, with white students as the reference group.

MODEL 3: DIFFERENCES IN SCHOOL TYPES BY STUDENT RACE/ETHNICITY

Student-level:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Female}) + \beta_{2j}(\text{Asian}) + \beta_{3j}(\text{Hispanic}) + \beta_{4j}(\text{Black}) + \beta_{5j}(\text{Other}) + \beta_{6j}(\text{Language}) + \beta_{7j}(\text{Mother high school education}) + \beta_{8j}(\text{Mother college education}) + \beta 9_j(\text{Grade level}) + r_{ij}$$

School-level:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Preconversion school}) + \gamma_{02}(\text{Model school}) + \gamma_{03}(\text{Relative risk index}) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30} + \gamma_{31}(\text{Preconversion school}) + \gamma_{32}(\text{Model school})$$

$$\beta_{4j} = \gamma_{40} + \gamma_{41}(\text{Preconversion school}) + \gamma_{42}(\text{Model school})$$

$$\beta_{5j} = \gamma_{50}$$

$$\beta_{6j} = \gamma_{60}$$

$$\beta_{7j} = \gamma_{70}$$

$$\beta_{8j} = \gamma_{80}$$

$$\beta_{9j} = \gamma_{90}$$

In the interaction models, preconversion and model schools were left uncentered at the intercept and slopes as outcomes, while the other control variables were grand-mean centered. Because of the small sample size at level 2, the equations for the interaction terms were fixed.

For the second question, regarding the effect of the school attribute index, a two-level hierarchical linear model was used with the six student outcome measures. The HLM model was as follows:

MODEL 4: DIFFERENCES IN THE SCHOOL ATTRIBUTE INDEX

Student-level:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Female}) + \beta_{2j}(\text{Asian}) + \beta_{3j}(\text{Hispanic}) + \beta_{4j}(\text{Black}) + \beta_{5j}(\text{Other}) + \beta_{6j}(\text{Language}) + \beta_{7j}(\text{Mother high school education}) + \beta_{8j}(\text{Mother college education}) + \beta 9_j(\text{Grade level}) + r_{ij}$$

School-level:

$\beta_{0j} = \gamma_{00} + \gamma_{01}$ (School attribute index) + γ_{02} (Relative risk index) + μ_{0j}

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

All control variables were grand-mean centered, and the random effects of the slopes as outcomes at level 2 were fixed.

In addition to the model above for the second question, post-hoc models were run to determine if the relationship between the school attribute index and student attitudes was due to school type (preconversion and model versus small start-up schools). Hence, the post-hoc models control for preconversion and model schools (start-up schools being the reference group), as well as the school attribute index and the relative risk index at the school level.

MODEL 5: DIFFERENCES IN THE SCHOOL ATTRIBUTE INDEX (CONTROLLING FOR SCHOOL TYPE)

Student-level:

$Y_{ij} = \beta_{0j} + \beta_{1j}$ (Female) + β_{2j} (Asian) + β_{3j} (Hispanic) + β_{4j} (Black) + β_{5j} (Other) + β_{6j} (Language) + β_{7j} (Mother high school education) + β_{8j} (Mother college education) + $\beta 9_j$ (Grade level) + r_{ij}

School-level:

$\beta_{0j} = \gamma_{00} + \gamma_{01}$ (Preconversion school) + γ_{02} (Model school) + γ_{03} (School attribute index) + γ_{04} (Relative risk index) + μ_{0j}

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

All control variables were grand-mean centered, and the random effects of the slopes as outcomes at level 2 were fixed. In general, the results indicate that, indeed, above and beyond the effect of school type the index of school attributes has an influence on student attitudes. For example, in the model with the overall student attitudes as an outcome variable (see Table A-20), the post-hoc model shows that model schools have significantly more positive student attitudes than students in start-up schools; however, the school attribute index continues to retain its significance, where more attributes in the school are associated with more positive student attitudes.

For the third question, regarding the differences between teaching practices, a two-level hierarchical linear model was used with the six student outcome measures.

MODEL 6: DIFFERENCES IN TEACHING PRACTICES

Student-level:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Female}) + \beta_{2j}(\text{Asian}) + \beta_{3j}(\text{Hispanic}) + \beta_{4j}(\text{Black}) + \beta_{5j}(\text{Other}) + \beta_{6j}(\text{Language}) + \beta_{7j}(\text{Mother high school education}) + \beta_{8j}(\text{Mother college education}) + \beta 9_j(\text{Grade level}) + r_{ij}$$

School-level:

$\beta_{0j} = \gamma_{00} + \gamma_{01}$ (Reform-like teaching) + γ_{02} (Conventional teaching) + γ_{03} (Relative risk index) + μ_{0j}

$\beta_{1j} = \gamma_{10}$

$\beta_{2j} = \gamma_{20}$

$\beta_{3j} = \gamma_{30}$

$\beta_{4j} = \gamma_{40}$

$\beta_{5j} = \gamma_{50}$

$\beta_{6j} = \gamma_{60}$

$\beta_{7j} = \gamma_{70}$

$\beta_{8j} = \gamma_{80}$

$\beta_{9j} = \gamma_{90}$

All control variables were grand-mean centered, and the random effects of the slopes as outcomes at level 2 were fixed.

Tables A-21 throughout A-26 present the results of analyses using these six models.

Table A-20
The Relationship between Overall Attitudes and School Types, School Attribute Index, and Teaching Practices

	Model 1 *School Types*	Model 2 *School Types: Interaction Mother's Education*	Model 3 *School Types: Interaction Student Race*	Model 4 *School attribute index*	Model 5 *School attribute index: Controlling for school type*	Model 6 *Reform-like and Conventional Teaching*
hool-level Variables (N = 36)						
Preconversion school	-0.26**	-0.26**	-0.28**		0.05	
Model school	0.42**	0.47**	0.38**		0.40***	
Reform-like teaching						0.11
Conventional teaching						-0.28**
School attribute index				0.21***	0.20*	
Relative risk	0.00	0.00	0.02	-0.02	0.03	0.02
Student-level Variables (N = 8,637)						
Mother high school education	0.08*	0.09	0.08*	0.08**	0.08*	0.08**
Preconversion school		-0.01				
Model school		-0.08				
Mother college education	0.22***	0.26***	0.22***	0.22***	0.22***	0.22***
Preconversion school		-0.02				
Model school		-0.29*				
Female	0.23***	0.23***	0.23***	0.23***	0.23***	0.23***
Asian	-0.12***	-0.12***	-0.12**	-0.12***	-0.12***	-0.12***
Hispanic	-0.10***	-0.11***	-0.20***	-0.10***	-0.10***	-0.10***
Preconversion school			0.10			
Model school			0.23*			
African American	0.10~	0.10~	0.03	0.10~	0.10~	0.11~
Preconversion school			0.11			
Model school			-0.10			
Other race	-0.19*	-0.18*	-0.20*	-0.19*	-0.19*	-0.19*
Non-English at home	0.17***	0.16***	0.16***	0.17***	0.17***	0.17***
Grade level	0.03*	0.03*	0.03	0.03*	0.03*	0.03*
Variance Component						
School (level 2), μ_{0j}	0.06***	0.06***	0.06***	0.06***	0.05***	0.05***
Student (level 1), r_{ij}	0.92	0.92	0.92	0.92	0.92	0.92

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

Table A-21
The Relationship between Individual Student Outcomes and School Types (Model 1)

	Academic Interest	Academic Persistence	Academic Self-Concept	Social Responsibility	Academic Progress
School-level Variables (N = 36)					
Preconversion school, γ_{01}	-0.49***	-0.45***	-0.28***	0.04	0.04
Model school, γ_{02}	0.01	0.04	0.08	0.69***	0.69***
Relative risk, γ_{03}	-0.07	0.01	0.02	0.02	0.02
Student-level Variables (N = 8,637)					
Mother high school education, γ_{10}	0.12***	0.02	0.12**	0.03	0.03
Mother college education, γ_{20}	0.28***	0.12***	0.26***	0.12*	0.12*
Female, γ_{30}	0.17***	0.25***	0.11**	0.19***	0.19***
Asian, γ_{40}	-0.19***	0.08	-0.10*	-0.13**	-0.13**
Hispanic, γ_{50}	-0.06**	-0.09*	-0.11***	-0.08*	-0.08*
African American, γ_{60}	0.08*	0.07~	0.17***	0.05	0.05
Other race, γ_{70}	-0.02	-0.23*	-0.28***	-0.12~	-0.12~
Non-English at home, γ_{80}	0.15***	0.18***	0.12***	0.11**	0.11**
Grade level, γ_{90}	0.03*	0.03***	0.03***	0.01	0.01
Variance Component					
School (level 2), μ_{0j}	0.03***	0.02***	0.00***	0.06***	0.06***
Student (level 1), r	0.67	0.47	0.24	0.38	0.38

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

Table A-22
The Relationship between Student Outcomes, School Types, and Interactions with Mother's Educational Status (Model 2)

	Academic Interest	Academic Persistence	Academic Self-Concept	Social Responsibility	Academic Progress
School-level Variables (N = 36)					
Preconversion school, γ_{01}	-0.49***	-0.45***	-0.28***	0.04	0.04
Model school, γ_{02}	0.04	0.06	0.09	0.75***	0.75***
Relative risk, γ_{03}	-0.07	0.01	0.03	0.02	0.02
Student-level Variables (N = 8,637)					
Mother high school education, γ_{10}	0.06	0.04	0.14~	0.05	0.05
Mother high school education/Preconversion school, γ_{11}	0.10	-0.03	-0.03	-0.03	-0.03
Mother high school education/Model school, γ_{12}	-0.06	-0.08	-0.07	-0.06	-0.06
Mother college education, γ_{20}	0.26***	0.12~	0.30***	0.19***	0.19***
Mother college Education/Preconversion school, γ_{21}	0.05	0.01	-0.05	-0.06	-0.06
Mother college education/Model school, γ_{22}	-0.20~	-0.16~	-0.11	-0.33*	-0.33*
Female, γ_{30}	0.17***	0.25***	0.11**	0.19***	0.19***
Asian, γ_{40}	-0.18***	0.08	-0.10**	-0.13***	-0.13***
Hispanic, γ_{50}	-0.06**	-0.09*	-0.11***	-0.08**	-0.08**
African American, γ_{60}	0.08*	0.07~	0.17***	0.05	0.05
Other race, γ_{70}	-0.02	-0.23*	-0.28***	-0.11~	-0.11~
Non-English at home, γ_{80}	0.15***	0.18***	0.12***	0.10**	0.10**
Grade level, γ_{90}	0.03*	0.03***	0.03***	0.02	0.02
Variance Component					
School (level 2), μ_{0j}	0.03***	0.02***	0.00***	0.06***	0.06***
Student (level 1), r_{ij}	0.67	0.47	0.24	0.38	0.38

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

Table A-23
The Relationship between Student Outcomes, School Types, and Interactions with Student Race (Model 3)

	Academic Interest	Academic Persistence	Academic Self-Concept	Social Responsibility	Academic Progress
School-level Variables					
Preconversion school, γ_{01}	-0.51***	-0.47***	-0.28***	0.02	0.02
Model school, γ_{02}	0.01	0.00	0.06	0.65***	0.65***
Relative risk, γ_{03}	-0.06	0.04	0.03	0.03	0.03
Student-level Variables (N = 8,637)					
Mother high school education, γ_{10}	0.12***	0.02	0.12**	0.03	0.03
Mother college education, γ_{20}	0.28***	0.12***	0.26***	0.12*	0.12*
Female, γ_{30}	0.17***	0.25***	0.11**	0.19***	0.19***
Asian, γ_{40}	-0.19***	0.08	-0.10*	-0.13**	-0.13**
Hispanic, γ_{50}	-0.16**	-0.16*	-0.14**	-0.16**	-0.16**
Hispanic/Preconversion school, γ_{51}	0.12*	0.06	0.04	0.09	0.09
Hispanic/Model school, γ_{52}	0.20*	0.19*	0.05	0.23*	0.23*
African American, γ_{60}	0.03	-0.07	0.11~	0.01	0.01
African American/Preconversion school, γ_{61}	0.05	0.20*	0.10	0.06	0.06
African American/Model school, γ_{62}	0.14~	-0.03	-0.08	-0.18~	-0.18~
Other race, γ_{70}	-0.03	-0.23*	-0.28***	-0.12~	-0.12~
Non-English at home, γ_{80}	0.15***	0.17***	0.12***	0.10**	0.10**
Grade level, γ_{90}	0.03*	0.03***	0.03***	0.01	0.01
Variance Component					
School (level 2), μ_{0j}	0.03***	0.02***	0.00***	0.06***	0.06***
Student (level 1), r_{ij}	0.67	0.47	0.24	0.38	0.38

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

Table A-24
The Relationship between Student Outcomes and the School Attribute Index (Model 4)

	Academic Interest	Academic Persistence	Academic Self-Concept	Social Responsibility	Academic Progress
School-level Variables (N = 36)					
School attribute index, γ_{01}	0.29***	0.29***	0.18***	0.06	0.06
Relative risk, γ_{02}	-0.03	0.07	0.03	-0.06	-0.06
Student-level Variables (N = 8,637)					
Mother high school education, γ_{10}	0.12***	0.02	0.12**	0.03	0.03
Mother college education, γ_{20}	0.28***	0.12***	0.26***	0.12*	0.12*
Female, γ_{30}	0.17***	0.25***	0.10**	0.19***	0.19***
Asian, γ_{40}	-0.19***	0.08	-0.10*	-0.13**	-0.13**
Hispanic, γ_{50}	-0.06**	-0.08*	-0.10***	-0.08*	-0.08*
African American, γ_{60}	0.08*	0.08*	0.17***	0.05	0.05
Other race, γ_{70}	-0.02	-0.23*	-0.28***	-0.11~	-0.11~
Non-English at home, γ_{80}	0.15***	0.18***	0.13***	0.11**	0.11**
Grade level, γ_{90}	0.02*	0.04***	0.03***	0.02	0.02
Variance Component					
School (level 2), μ_{0j}	0.01***	0.01***	0.00***	0.08***	0.08***
Student (level 1), r_{ij}	0.67	0.47	0.24	0.38	0.38

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

Table A-25
The Relationship between Student Outcomes and School Attribute Index (Model 5)

	Academic Interest	Academic Persistence	Academic Self-Concept	Social Responsibility	Academic Progress
School-level Variables (N = 36)					
Preconversion schools, γ_{01}	-0.10	0.00	-0.06	0.15	0.15
Model schools, γ_{02}	-0.03	-0.01	0.06	0.68***	0.68***
School attribute index, γ_{03}	0.25***	0.29***	0.14**	0.07	0.07
Relative risk, γ_{04}	-0.04	0.06	0.03	0.03	0.03
Student-level Variables (N = 8,637)					
Mother high school education, γ_{10}	0.13***	0.02	0.12**	0.03	0.03
Mother college education, γ_{20}	0.28***	0.12***	0.26***	0.12*	0.12*
Female, γ_{30}	0.17***	0.25***	0.10**	0.19***	0.19***
Asian, γ_{40}	-0.19***	0.08	-0.10*	-0.13**	-0.13**
Hispanic, γ_{50}	-0.06**	-0.08*	-0.11***	-0.08*	-0.08*
African American, γ_{60}	0.08*	0.08*	0.17***	0.05	0.05
Other race, γ_{70}	-0.02	-0.23*	-0.28***	-0.12~	-0.12~
Non-English at home, γ_{80}	0.15***	0.18***	0.12***	0.11**	0.11**
Grade level, γ_{90}	0.03*	0.04***	0.03***	0.02	0.02
Variance Component					
School (level 2), μ_{0j}	0.01***	0.01***	0.00***	0.06***	0.06***
Student (level 1), r_{ij}	0.67	0.47	0.24	0.38	0.38

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

Table A-26
The Relationship between Student Outcomes and Teaching Practices (Model 6)

	Academic Interest	Academic Persistence	Academic Self Concept	Social Responsibility	Academic Progress
School-level Variables (N = 36)					
Reform-like teaching, γ_{01}	0.26***	0.41***	0.20***	-0.17	-0.17
Conventional teaching, γ_{02}	-0.17*	0.03	-0.03	-0.42**	-0.42**
Relative risk, γ_{03}	-0.01	0.08	0.03	-0.02	-0.02
Student-level Variables (N = 8,637)					
Mother high school education, γ_{10}	0.12***	0.02	0.12**	0.03	0.03
Mother college education, γ_{20}	0.28***	0.12***	0.26***	0.12*	0.12*
Female, γ_{30}	0.17***	0.25***	0.11**	0.19***	0.19***
Asian, γ_{40}	-0.19***	0.07	-0.10*	-0.13**	-0.13**
Hispanic, γ_{50}	-0.04*	-0.07*	-0.09**	-0.08*	-0.08*
African American, γ_{60}	0.08*	0.07~	0.17***	0.05	0.05
Other race, γ_{70}	-0.02	-0.23*	-0.28***	-0.11~	-0.11~
Non-English at home, γ_{80}	0.15***	0.18***	0.13***	0.11**	0.11**
Grade level, γ_{90}	0.02*	0.03***	0.03**	0.02	0.02
Variance Component					
School (level 2), μ_{0j}	0.02***	0.02***	0.00***	0.06***	0.06***
Student (level 1), r_{ij}	0.67	0.47	0.24	0.38	0.38

Source: School-level data from the demographic survey and aggregated student and teacher surveys. Student-level data from the student survey.
Note: ~ p<.10, * p<.05, ** p<.01, *** p<.001. The HLM coefficients are effect sizes.

For the fourth question, whether there are differences in student attitudes among seven start-up schools in Year 1 versus Year 2 of operation, two analyses were run. First, the student outcome variables were aggregated to the school level. Using the aggregated student attitudes as school-level outcome measures, the first analysis was a paired t-test to determine if there were significant mean differences in student attitudes across the two years. The second analysis was an OLS regression, which controlled for the difference in school size between Year 1 and Year 2. Table A-27 displays results of these analyses. In both sets of analyses, there were no differences in overall student attitudes, academic self-concept, interest, and persistence in start-up schools in Year 1 versus Year 2. Academic progress and social responsibility were significantly lower in the second year ($p<.001$ for both outcomes), even after controlling for school size ($p<.01$ and $p<.05$, respectively).

Table A-27
Year 1 vs. Year 2 Differences in Student Attitudes for Seven Start-up Schools

	Y1 vs. Y2 Mean Difference	Y1 vs. Y2 Mean Difference Adjusted for Change in School Size
Student attitudes	-.195	.108

Note: Y1 vs. Y2 differences were based on paired-sample t-tests; Y1 vs. Y2 differences adjusted for change in school size were based on regression analyses.

Chapter 7

Chapter 7 examines grantee involvement with schools and the success schools have in demonstrating desirable school attributes. The data used to answer the two questions in Chapter 7 are described in Table A-28.

Table A-28
Chapter 7 Data Road Map

Sample (N)	School Years	Data Source	Analysis	Dependent Variables	Independent Variables
Question 1: What factors (including grantee vision, strategy, capacity) influence the success of the foundation-supported schools?					
Surveys: Principals = 30	2001-02 2002-03	Principal surveys	Multiple regression Descriptive analyses	School attribute index	Relative risk index Preconversion vs. start-up Model vs. start-up Grantee support Grantee contact Grantee intervention
Qualitative: School leaders = 21		School leader interviews Grantee interviews	Pattern coding Cross-case analysis		
Question 2: To what extent have grantees developed mechanisms to scale up and sustain their efforts when foundation funding ends?					
Qualitative: Grantee leaders = 16		Grantee interviews			

Dependent Measures

The school attribute index was used as the dependent variable in Chapter 7. For more information on the creation of this variable, refer to the discussion above for Chapter 3.

Independent Measures

Grantee involvement with the schools was the primary independent variable of interest in Chapter 7. Using principal survey data, we created three scales to measure grantee involvement in the school reform process: support, frequency of contact, and intervention. Grantee support is measured by 13 principal survey items, such as the principal's view of grantee support concerning developing or shaping a small set of focused goals for student learning and designing specific pedagogical strategies and tasks. Grantee frequency of contact, a two-item scale, includes the principal's perception of grantee communication by phone or e-mail and grantee meetings with school staff. Grantee intervention power is a six-item scale, with items such as principal's view of grantee's work being consistent with state and district standards and grantee's work fitting well with the school. See Table A-29 for details.

Table A-29
Principal Scales and Items

Latent Scale	Individual Survey Items	α 2002	α 2003
Grantee frequency of contact (2-item scale)	During the school year, how many times has someone from grantee communicated with you by phone or e-mail? During the school year, how many times has someone from grantee met with members of the school staff?	.87	.69
Grantee support (13-item scale)	Describe the type of support provided by grantee: Developing or shaping a small set of focused goals for student learning Describe the type of support provided by grantee: Designing specific pedagogical strategies and tasks Describe the type of support provided by grantee: Creating a climate of mutual respect and responsibility among and between staff and students Describe the type of support provided by grantee: Creating a climate of high expectations for students Describe the type of support provided by grantee: Involving parents and community in the school Describe the type of support provided by grantee: Creating smaller, personalized learning environments Describe the type of support provided by grantee: Attracting students to the school Describe the type of support provided by grantee: Retaining students in the school Describe the type of support provided by grantee: Attracting and retaining quality teachers Describe the type of support provided by grantee: Providing quality professional learning opportunities for staff Describe the type of support provided by grantee: Creating time for teachers to collaborate with one another Describe the type of support provided by grantee: Using technology as an instructional tool Describe the type of support provided by grantee: Establishing a stronger financial base	.88	.93
Grantee intervention power (6-item scale)	This partnership/relationship with grantee has been endorsed by people whose opinion I value. The goals and components of grantee's work with our school are well understood by school staff. The components of grantee's work with this school fit together well. Grantee's work with this school is consistent with state and district standards. Grantee's work with this school is well aligned with the school's goals. Professional development for staff supports this school's work with grantee.	.89	.82

School type and the relative risk index (see discussion under Chapter 3 for more details) were included as controls.

Analytic Models

For the question regarding the relationship between grantee support strategy and school reform implementation, we ran an ordinary least squares (OLS) multiple regression. The OLS regression model was as follows:

$Y = \beta_0 + \beta_1$ (Grantee support) $+ \beta_2$ (Grantee frequency of contact) $+ \beta_3$ (Grantee intervention) $+ \beta_4$ (Model school) $+ \beta_5$ (Preconversion school) $+ \beta_6$ (Relative risk of school) $+$ r

Table A-30 displays the results of this analysis.

Table A-30
Effect Sizes for School Attribute Index

	School Attribute Index
School-Level Characteristics	
Intercept	1.563
Grantee support	0.490*
Grantee frequency of contact	-0.107
Grantee intervention	-0.501
Preconversion school	-1.920***
Model school	-0.093
Relative risk	-0.072

Note: $R^2 = .786$.
~ p<.10, * p<.05, ** p<.01, *** p<.001.

For the second question, concerning grantee strategies to sustain their work, findings are based entirely on the qualitative data analysis.