The Cost of Instructional Improvement: Resource Allocation in Schools Using Comprehensive Strategies to Change Classroom Practice

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Abstract

This paper provides the results of a resource allocation analysis of eleven elementary schools in four states. Nine of the eleven schools studied have implemented one of the following comprehensive strategies to improve instruction: Success for All, Accelerated Schools Project, or America's Choice. The authors used an expenditure model (see Odden, Archibald, Fermanich, & Gross, 2003) that assigns resources according to the various educational strategies deployed in the school as well as a professional development cost framework (see Odden, Archibald, Fermanich, & Gallagher, 2002). The study reports the differences in implementation of the school improvement designs and the models' proposed resource allocation. Additionally, the authors present a comparison of an evidence-based design strategy and how schools choose to allocate resources (see Odden, Picus, Fermanich, & Goetz, 2004) under comprehensive school reform (CSR) programs. The authors suggest future research to connect these allocation patterns to student achievement as well as further exploration of the level of implementation of the designs in each site and the relationship between that level and the school, district, and state contexts.

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School finance policy and research is increasingly focused on how education dollars are used as compared to the level of education funding and the equitable distribution of resources (see for example, Ladd & Hansen, 1999). Several factors have moved *resource use* towards the center of the school finance agenda: 1) the modest improvements in student results despite significant increases in real dollars per pupil over the past decades; 2) the push of state standards-based education reform followed by the federal No Child Left Behind (NCLB) Act for dramatically improved student performance that implicitly require an increase in the productivity of the education dollar as desired performance increases are much greater than potential revenue increases; 3) the shift of school finance from equity to adequacy, with many adequacy methodologies identifying programs and strategies that can boost student performance and claiming that their total costs would constitute adequate funding (e.g., Odden, Picus, Fermanich, & Goetz, 2005); and 4) the emergence of new, more detailed, disaggregated data sets that allow further micro-analyses of the links between education dollar uses and student performance gains (e.g., Odden, Borman, & Fermanich, 2004; Milanowski, Kimball, & Odden, 2005).

Research at the Consortium for Policy Research in Education (CPRE) has also taken this direction. CPRE's first analyses examined how districts used their educational dollars (e.g., Goertz & Stiefel, 1998; Odden, Monk, Nakib, & Picus, 1995; Odden & Picus, 1992, 2000, 2004; Odden & Busch, 1998; Picus & Wattenbarger, 1995). However, the shortcomings of analyses based on *district* level expenditure data organized

by function (instruction, administration, etc.) soon became apparent, and CPRE staff encouraged state policymakers to add school-level expenditure data to their standard fiscal reporting systems (see Odden & Busch, 1997). Unfortunately, even school-level expenditure reports provided information only within the broad functional categories such as instruction, instructional support, and administration, which are insufficiently detailed to tell the full story of how these education dollars are used to provide students instruction, how use has changed over the past four to five decades, or how resource allocation could be linked to student performance.

Thus, CPRE developed a new expenditure reporting structure that identifies spending by educational program within the instructional functions (Odden, Archibald, Fermanich, & Gross, 2003). The general objective for the expenditure framework (see Figure 1) was to "unpack" the instructional category and report spending of dollars by educational strategy such as core instruction, specialist instruction, professional development, and types of extra help for students with special needs to achieve standards. This framework includes several other non-dollar indicators, each of which provides additional information about resource use, such as number of minutes allocated for reading and math instruction in elementary schools, class sizes, and percentage of core versus elective classes in high schools. The goal was to provide a richer and more detailed report on how the education dollar was used within the instructional category. Through subsequent empirical work at several schools, CPRE researchers have found that using the framework to report expenditures (Odden, Archibald, Fermanich, & Gross, 2002) provides a comprehensive and more explanatory portrait of education resource use for the delivery of instruction.

Figure 1

School Expenditure Structure and Resource Indicators*

<table>
<tr><th colspan="2">School Resource Indicators</th></tr>
<tr><td>Student Enrollment
Percent Low Income
Percent Special Education
Percent ESL/LEP
Expenditures Per Pupil
Professional Development Expenditures Per Teacher
Special Academic Focus of School/Unit
Length of Instructional Day
Length of Class Periods</td><td>Length of Reading Class
Length of Mathematics Class
Reading Class Size
Mathematics Class Size
Regular Class Size
Percent Core* Teachers

*Grade Level Classroom Teachers</td></tr>
<tr><th colspan="2">School Expenditure Structure</th></tr>
<tr><td>Instructional</td><td>1. Core Academic Teachers
- Grade Level Teachers (in elementary schools)
- Math, Science, History, Language Arts teachers (in secondary schools)

2. Specialist and Elective Teachers/Planning and Preparation
- Art, Music, Physical Education, etc.
- Academic Focus With or Without Special Funding
- Vocational
- Librarians
3. Extra Help
- Tutors
- Extra Help Laboratories
- Resource Rooms (Title I, special education or other part-day pull-out programs)
- Inclusion Teachers
- English as a Second Language Classes
- Special Education Self-contained Classes for Severely Disabled Students (Including Aides)
- Extended Day
- Summer School
- District-Initiated Alternative Programs
4. Professional Development
- Teacher Time (Substitutes and Stipends)
- Trainers and Coaches
- Administration
- Materials, Equipment and Facilities
- Travel & Transportation
- Tuition and Conference Fees
5. Other Non-Classroom Instructional Staff
- Coordinators and Teachers on Special Assignment
- Instructional Aides
6. Instructional Materials and Equipment
- Supplies, Materials and Equipment
- Computers (hardware, software, peripherals)
7. Student Support Services
- Counselors
- Nurses
- Psychologists
- Social Workers
- Extra-Curricular and Athletics</td></tr>
<tr><td>Non-Instructional</td><td>8. Administration
- Principal/Assistant Principal
- Clerical Staff and Supplies
9. Operations and Maintenance
- Custodial
- Utilities
- Security
- Food Service</td></tr>
</table>

* Revised version of framework in Odden, Archibald, Fermanich, & Gross (2002). See Appendix A for indicator definitions.

In addition, a recent study by colleagues at the National Center for Educational Accountability, University of Texas at Austin, used the expenditure structure to compare high performing and average performing schools with similar demographics (Brinson, Mellor, & Dougherty, 2005).

To complement our overall expenditure framework and to provide a tool more directly related to instructional improvement, CPRE also developed a cost-framework for professional development (see Odden, Archibald, Fermanich, & Gallagher, 2002). This professional development framework, depicted in Figure 2, is based on key features of effective professional development that researchers trace to changes in teachers' instructional practices and improvements in student learning. The framework separates professional development costs into several factors, including teacher time, trainers and coaches, administration, materials and facilities, travel, and tuition and conference fees. CPRE researchers have used the framework several times to identify district expenditures on professional development, and every study has shown that districts spend much more on this function than identified in any professional development budget (e.g., Gallagher, 2002; Archibald & Gallagher, 2002; Fermanich, 2002; Miles, Odden, Archibald, & Fermanich, 2004).

Figure 2
A Cost Structure for Professional Development*

Cost Element	Ingredient	How Cost is Calculated
Teacher Time Used for Professional Development	***Time within the regular contract***: -when students are not present before or after school or on scheduled in-service days, half days or early release days	- teachers' hourly salary times the number of student free hours used for pd
	-planning time	- the cost of the portion of the salary of the person used to cover the teachers' class during planning time used for pd
	Time Outside the regular day/year: -time after school, on weekends or for summer institutes	- the stipends or additional pay based on the hourly rate that teachers receive to compensate them for their time
	Other Time During the regular day/year -release time provided by substitutes	- substitute wages
Training and Coaching	***Training*** -salaries for district trainers -outside consultants who provide training; may be part of CSRD	- sum of trainer salaries - consultant fees or comprehensive school design contract fees
	Coaching -salaries for district coaches including on-site facilitators	- sum of coach and facilitator salaries
Administration of Professional Development	Salaries for district or school level *administrators* of professional development programs	- salary for administrators times the proportion of their time spent administering pd programs
Materials, Equipment and Facilities Used for Professional Development	***Materials***	- materials for pd, including the cost of classroom materials required for CSRDs
	Equipment	- equipment needed for pd activities
	Facilities	- rental or other costs for facilities used for professional development
Travel and Transportation for Professional Development	***Travel***	- costs of travel to off-site pd activities
	Transportation	- costs of transportation within the district for professional development
Tuition and Conference Fees	***Tuition***	- tuition payments or reimbursement for college-based pd
	Conference Fees	- fees for conferences related to pd

* Revised version of framework in Odden, Archibald, Fermanich & Gallagher (2002)

Instructional Improvement Strategies

This research project uses both of the above frameworks to identify the costs of several all-inclusive instructional improvement strategies that CPRE researchers at the University of Michigan are investigating in their Study of Instructional Improvement (see http://www.sii.soe.umich.edu/). That large-scale, multi-year research project identified three comprehensive instructional improvement strategies that are embodied in comprehensive school reform (CSR) programs – Success for All, America's Choice and Accelerated Schools Project. For the past five years, the Michigan group has been studying the design, operation, impact on instructional practice, and links to student achievement of these three intensive instructional improvement strategies. The team has also studied instructional regimes in several "comparison" schools – schools without an externally created design to improve instructional practice.

The three programs studied are described more generally at http://www.successforall.net/, http://www.ncee.org/acsd, and http://www.acceleratedschools.net/. The specific instructional visions in these different programs and initial findings of their impact on classroom instructional practice are summarized below.

Accelerated Schools Program (ASP)[1]

ASP has the least specified instructional design of the three CSR programs participating in the Study of Instructional Improvement (SII). Rather than being built around an explicit set of curricular guidelines or standards or mandating the use of a particular set of curricular materials or instructional practices, ASP calls on teachers to

[1] The following sections on the instructional strategies in the three different intervention program draw heavily from Correnti (2005).

internalize the ideal of "powerful learning" in their classrooms. To achieve this ideal, the program supports a particular process of organizational development in schools. One element of this process is known as "big wheels." Here, staff in a school take stock, analyze their own situation, engage in local inquiry, and make decisions about directions for instructional improvement that meet recognized local needs. The second element of this process is called "little wheels." Here, individual teachers develop their own innovations as they gradually internalize the cultural ideal of powerful learning.

To realize the ideal of "powerful learning," ASP provides implementation support primarily through an ASP coach. Although not located on-site, the coach checks in with the school staff weekly. An important job of the ASP coach is to provide teachers with exemplars of teaching activities that illustrate the principles of powerful learning. Typically, these examples encourage the use of literature-based instructional approaches rather than instructional strategies that put students in passive roles working directly with textbooks or handouts. Apart from these exemplars, however, ASP coaches rely on teachers to use the "little wheels" process of innovation and their own understandings of the ASP philosophy to create a series of powerful learning experiences using the instructional materials and curriculum guidelines already in use at a school.

Despite these aspirations, our colleagues at Michigan found that literacy instruction in the ASP schools studies differed very little from comparison schools.[2] In all, 69 instructional contrasts between ASP and comparison schools were conducted. Only 5 of the 69 contrasts revealed significant differences ($p<.05$) in literacy instruction between ASP and comparison schools. Using a 95% confidence interval, by chance

[2] These analyses applied causal models to the data by controlling for each school's propensity to be an ASP versus a comparison school. In addition, these hierarchical linear models also controlled for the day the log was administered as well as differences among teachers.

alone, we would expect somewhere between 3 and 4 of the contrasts to show a significant difference. ASP schools, therefore, had literacy instruction very similar to literacy instruction in the comparison schools. In addition, these models showed that ASP schools also do not differ from the comparison schools in the rate at which the teaching of literacy strategies changed over grade levels (Correnti, 2005).

America's Choice (AC)

In contrast to ASP, America's Choice specifies language arts curriculum in more detail and is more explicit about the instructional practices teachers should use. A central feature of the program is a daily literacy block composed of a 60-minute writer's workshop, a 60-minute reader's workshop, and (for grades K through 3) a 30-minute "skills" block. In addition, the program lays out specific performance standards for students at each grade in a school and provides examples of student work that meets (or does not meet) these standards.

A particularly noteworthy feature of AC's literacy program is its focus on writing instruction and the integration of instruction across reader's and writer's workshops. In particular, the program recommends that teachers begin implementation of the AC literacy program by establishing a writer's workshop within their classrooms. One reason for this effort is that the routines for writer's workshop remain consistent across days and can be built upon when implementing the reader's workshop. Another reason is that students' work in writing can be more easily evaluated against the AC performance standards than students' reading.

In terms of the impact on literacy instruction, our Michigan colleagues expected to show differences in literacy instruction between teachers in AC schools and teachers in

the comparison schools, particularly in writing. In general, teachers in AC schools did more writing instruction, and they sometimes did less instruction in other literacy topics such as word analysis, vocabulary, reading fluency, grammar, and spelling (Correnti, 2005). In all, instruction in AC schools was significantly different from the comparison schools on 29 of 69 instructional contrasts.

Differences were found between teachers in AC and comparison schools in the frequency they taught writing. In the causal models, AC teachers were predicted to focus on writing in 58% of all lessons, whereas comparison teachers were predicted to focus on writing in just 38% of all lessons. In addition, when they taught writing, AC teachers did more writing strategies, and they had students write longer passages of text. The only differences between AC and comparison schools in comprehension were that AC teachers were more likely to integrate writing into reading comprehension instruction. Finally, there were also differences between AC and comparison schools in the rate at which they focused on topics over grade levels. In general, AC teachers more quickly phased out word analysis instruction in the upper grades in favor of an increased emphasis on writing and, in particular, on the production of greater amounts of written text (Correnti, 2005).

Success for All (SFA)

Of the three instructional intervention programs studied, SFA has the most specified instructional design, coupled with support to promote instructional change in schools. The SFA instructional design was built around a systematic approach to reading instruction and includes a set of lesson scripts that teachers are asked to use to provide literacy instruction to students. In the early grades, these scripts are designed around program-provided curricular materials. In later grades, these scripts are adapted for use

with existing textbook series. In the instructional design, students with similar abilities are grouped together for instructional purposes using a Joplin plan (cross-age grouping by similar achievement levels). A system of criterion-referenced testing is used to regroup students for instruction every eight weeks.

The hallmark of the SFA program is a 90-minute reading period in which all of the students and teachers in a school focus (without interruption) on reading instruction, preferably in groups of 15 students. The daily, 90-minute reading block is composed of three timed segments—listening comprehension (20 minutes), reading comprehension instruction (55 minutes), and skills instruction (15 minutes). The 55-minute reading block follows a five-day cycle through each story or book chapter that students are reading. During this cycle, students are asked to activate prior knowledge about the story being read; predict the story ending; read the story silently or with a partner; answer basic comprehension questions; learn and study new vocabulary; practice comprehension strategies and answer comprehension questions in both group and individual settings; and, if time permits, share some story-related writing.

CPRE- Michigan researchers found that SFA produced the greatest number of significant contrasts versus the comparison schools (Correnti, 2005). Teachers in SFA schools were different from teachers in the comparison schools on 37 of the 69 instructional contrasts. Means on topics and strategies targeted by the SFA design were higher in SFA versus comparison schools, but were often lower in other areas.

Differences were found between teachers in SFA and comparison schools in the frequency they taught reading comprehension. In causal models, SFA teachers were predicted to focus on comprehension in 70% of all lessons, whereas comparison teachers

were predicted to focus on comprehension in just 51% of all lessons. In addition, when they taught comprehension, SFA teachers used more comprehension strategies, particularly strategies focusing on obtaining a literal understanding from the text and requiring brief answers from students.

Finally, there were also differences between SFA and comparison schools in the rate at which they focused on topics over grade levels. In general, SFA teachers more quickly phased out most elements of word analysis instruction. In addition, students in SFA schools were asked to write shorter passages of text in general, but relative to comparison teachers, SFA teachers increased the production of student writing faster as grade level increased. The primary difference between SFA and comparison schools was in the production of student writing in the 1st grade only. Thus, while SFA teachers executed more instruction in comprehension at all grade levels, they tended to phase out their word analysis instruction in the upper grades in favor of doing more writing (Correnti, 2005).

In this paper, findings are presented first on how the schools implementing these three different instructional improvement interventions used their resources across instruction and administration functions. Second, the expenditures are identified for these schools where applicable on professional development activities, as captured by the professional development cost structure. Third, these resource use patterns are compared to those proposed by their respective comprehensive school reform models. Lastly, resource use of schools implementing CSR models are compared to an evidence-based school finance adequacy strategy (Odden, Picus, Fermanich, & Goetz, 2005). The SII results show that CSR models differ from each other and, at least in the case of SFA and

AC, lead to different instructional practice and organization than schools not adopting models. In this work we investigate whether these different practices also translate into different resource allocations in schools.

Methods

Sample Selection

The sample is linked to the sample of schools followed in the Michigan study. That study followed about 120 schools over a three-year time period. Approximately 30 schools were involved in the Success for All instructional improvement strategy, 30 in the America's Choice strategy, 30 in the Accelerated Schools Program, and 30 comparison or "no-design" schools. Of this universe, 12 "case study" schools were studied more intensely.

The goal was to select a sample of 12 schools for the resource analysis. Because more data was available on the case study schools, the initial intention was to maximize the number of those 12 case study schools that made it into the cost analysis sample. However, because those schools had endured an intensive research burden during the Michigan SII study, several were unwilling to be part of this resource analysis study. Thus, the final sample of 11 schools included three from the case study list and eight from the larger University of Michigan sample.

Description of the Schools

The 11 schools from which resource information was collected for this paper shared a number of demographic characteristics, as displayed in Figure 3. All are fairly high poverty schools, ranging from 36 to 95 percent of students eligible for free or reduced-price lunch.

Figure 3
School Demographics[3]

	Accelerated Schools Project				America's Choice		Success for All			Comer	Non-CSR Design
School	Beech	Tilia	Walnut	Willow	Hazel	Norway	Maple	Pine	Poplar[4]	Redwood	Wych
State	MO	WA	NJ	NJ	HI	HI	NJ	NJ	HI	NJ	WA
Grades	K-5	K-5	PK-6	PK-6	PK-6	K-6	PK-7	PK-5	K-5	PK-6	PK-5
Student Enrollment	664	460	367	401	828	537	394	453	269	601	384
% FRL	36	64	71	71	72	71	69	68	95	72	85
% SPED	38	12	10	5	11	13	12	9	20	6	6
% ELL	20	28	0	25	17	0	0	22	43	38	35
% White	92	36	14	2	3	1	0	4	2	6	13
% Black	6	16	36	53	2	1	96	41	1	25	20
% Hispanic	1	19	49	46	2	0	4	54	1	68	20
% Asian	1	29	0	0	5	1	0	2	27	1	46
% Hawaiian/Pacific Islander	0	0	0	0	72	96	0	0	59	0	0
% Other	0	0	0	0	6	2	0	0	11	0	1

Student enrollment: the total student enrollment of the school; **Percent free and reduced lunch (% FRL):** the percent of students in the school eligible for federally-subsidized free or reduced-price lunches; **Percent of students who receive special education services (% SPED):** the percent of students in the school with an Individualized Education Program indicating their eligibility for special education services; **Percent English language learners (% ELL):** the number of students eligible for services through an English as a second language program or a bilingual program.

[3] Percentages are rounded so may not equal 100% when summed. The school demographic data is from 2004-05 for all schools other than those in New Jersey, for which data is from 2003-04.
[4] Poplar employs the Success for All program in K-2, only.

Ten of the eleven schools had majority-minority student populations; the percent of white students ranges from 0 to 36 percent, with Beech as an outlier with 92 percent white students. The grades served in these schools range from pre-school to seventh grade, with class size averaging 20.5 students for kindergarten through third grade and 22.2 students per class for grades four through seven.

The more varied aspects of these schools include school size, ranging from 269 students in the smallest school to 828 students in the largest. The percentage of students with disabilities varied from 5 to 38 percent of their total student population. The number of students who are English language learners (ELL) also ranged from 0 to 43 percent of the students in these schools. Two of the schools are situated in northwestern United States, one in the Midwest, five on the East coast, and three in the far West.

Data Collection

Drawing on the methods used in Odden, Archibald, Fermanich, and Gross (2002) and Odden, Archibald, Fermanich, and Gallagher (2002), a variety of 2004-05 data were collected from several sources, including:

- School budgets, which varied considerably in detail across the study districts;
- Budget documents for the districts and for each school;
- Budgets for Title I and other federally financed programs;
- School report cards and school staffing lists; and

- Interviews with key district and school personnel, including those responsible at both levels for developing school budgets, funding professional development, and tracking school expenditure and resource use.[5]

Using the protocols and frameworks, resources for instructional improvement in the 11 schools were assigned. As illustrated in the previous section, the expenditure structure captures all the resources devoted to the school, not just the resources over which the school had control, but also resources that came from district, state, and federal sources as well as private grants. In gathering the qualitative data, we employed collective case study methods focused on comparing and contrasting multiple instrumental cases (Stake, 2000).

As we analyzed resource use data for each school, we were mindful of the specific resource dimensions of the comprehensive school design in which each of the instructional improvement interventions was embedded. Brief descriptions of these resource requirements are presented below.

- Accelerated Schools Project has evolved over the years and is now officially called Accelerated Schools Plus. The schools implementing the design in this project have the "project" version of the design, which includes fewer specified resource dimensions than the model. For example, ASP only required a 0.25 instructional coach at the school site when it began; they have now increased that requirement to 0.5. Its general goal is to have schools adopt a very rigorous instructional program and "accelerate" each student's movement through this higher-expectations curriculum. Thus, the intervention was more a system that took a school through a planning process to identify specific new instructional approaches and school and classroom organization strategies. Now, the cost of the program is $61,500 plus the 0.5 instructional coach on-site. The Accelerated Schools Project website provides more detail on these requirements: http://www.acceleratedschools.net/.

- America's Choice requires two instructional coaches to work in teachers' classrooms modeling instructional practices, observing, giving feedback, and meeting with them to

[5] Odden, Archibald, Fermanich, & Gross (2003) and Odden, Archibald, Fermanich, & Gallagher (2002) provide more detail on data collection strategies for the overall resource use analysis and the professional development expenditure analysis.

help plan. Professional development is required for principals, also, since they must serve as the instructional leader of the school. The cost of professional development provided by the America's Choice Design Team is approximately $70,000. The America's Choice website provides more detail on these requirements: www.americaschoice.org.

- Success For All requires as least one instructional facilitator/coach, one professional teacher tutor for struggling students (and many more in schools with high concentrations of students from poverty backgrounds), one family outreach/pupil support coordination (and a full, five person health-pupil support team in an all poverty school of 500 students), summer and school year professional development, and purchase of the instructional materials required for the Success for All reading program. The approximate cost for services provided by the design is $75,000. The Success for All website provides more detail on these requirements: www.successforall.net.

In order to compare data across districts and states, national average school salaries (Education Week, 2005) and fixed benefits rates are applied to staff in the study schools, and non-personnel expenditures are adjusted by the Geographical Cost of Education Index (CGEI). The CGEI contains provisions for pricing certified and non-certified personnel as well as school costs not associated with personnel, such as textbooks and furniture (Chambers, 1995, 1998). To further standardize comparisons across schools, resource allocation and professional development data are presented in per-pupil expenditures when appropriate (Levin & McEwan, 2002).

School Resource Allocation and Use Patterns

Figure 4 displays the resource indicators for the 11 schools in this study. The indicators represent uses of non-fiscal resources, such as instructional time and class size. Grouped by instructional improvement strategy, the figure shows various instructional time variables – length of the school day as well as formal length of mathematics and reading instruction, average class

sizes in grades K-3 and upper elementary grades, and the percent of licensed staff in the school who teach core classes, such as grade level or multi-age classes.

Figure 4 shows that the length of the school day was quite different across the schools and states, varying from a low of 280 to a high of 405 minutes, a difference of 125 minutes, or just over 2 hours. If gross instructional time is a critical resource, it seems that it was provided in widely varying amounts to the students in these schools. The 280 minute school provided only 4 hours and 40 minutes of instruction, whereas the 405 minute school provided 6 hours and 45 minutes of instruction.

The variation in the overall length of the instructional day was matched by the variation in the length of reading classes, which ranged from 55 minutes in 4th-5th grade in Tilia to 150 minutes in the America's Choice schools' early elementary grades. At grades K-3, reading instruction ranged from 85 minutes in one school, 90 minutes for most schools, and up to 120 minutes in several schools, with a high of 150 minutes, or from about 1 ½ to 2 hours or more. Interestingly, these differences were not strongly related to the differences in the length of the school day. These long time periods for reading/language arts instruction probably reflect a national push, especially in high poverty schools, to increase instructional time spent on reading, under the assumption that, other things being equal, more academic time on reading should produce greater reading achievement. On the other hand, the data show that mathematics instruction was just one hour in all but possibly one school, where the math period ranged from 60-75 minutes.

In terms of differences by instructional improvement strategy, the America's Choice schools provided for the longest time for reading instruction (150 minutes), Success for All provided 90 to 110 minutes, Accelerated Schools from 55 to 120 minutes, the one Comer school

only 85 minutes, and the non-design school 120 minutes. There were no differences in instructional time provided to mathematics across the four instructional improvement models in this sample, with all schools but one providing 60 minutes of instruction for this subject.

Class sizes ranged from 17 to 25.5. Although class sizes in grades 4-5 were slightly higher than in grades K-3 in a few instances, the differences were modest and in some of the schools class sizes in the upper elementary grades were slightly smaller than in grades K-3. Class size differences seemed not to be associated with instructional improvement strategy. One interesting finding is the variation in class sizes across the five New Jersey schools where state regulations call for a maximum class size of 21 for K-3 and 23 for grades 4-5 in that state's urban schools.[6]

Core teachers in elementary school are those professional staff who teach a regular grade or multi-age class. Other teachers could be, for example, tutors, instructional facilitators, and pupil support personnel. Figure 4 shows that the percent of core teachers varied considerably in these schools, from 47 to 66 percent of licensed school staff, with the average in the high-50 percent range. This variation is in part due to the instructional improvement strategies in the different models. For example, the Success for All strategy calls for instructional coaches (two in a school of five hundred students) to help teachers improve their instructional practice, tutors for struggling students (five in an all poverty school with 500 students), and an ambitious pupil support/family outreach program. As a result, the schools with this model should have a smaller percent of core teachers. However, other contextual factors account for some of this variation as well. In New Jersey, for example, state regulations require all urban schools to provide a media specialist/librarian, a technology coordinator, and a family support team composed of a nurse

[6] Note, SFA schools often further reduce reading/language arts class sizes by regrouping students by ability with a greater number of teaching personnel, and these regrouped class sizes are not part of this study.

Figure 4
School Resource Indicators

	Accelerated Schools Project				America's Choice		Success for All			Comer	Non-CSR Design
School	Beech	Tilia	Walnut	Willow	Hazel	Norway	Maple	Pine	Poplar[7]	Redwood	Wych
State	MO	WA	NJ	NJ	HI	HI	NJ	NJ	HI	NJ	WA
Length of Instructional Day (min.)	405	280	345	345	298	305	345	345	298	345	K-2: 325 3-6: 340
Length of Reading Class (min.)	120	K-3: 90 4-5: 55	90	90	K-3: 150 4-6: 120	K-3: 150 4-6: 120	90	90	110	85	120
Length of Math Class	60	60	60	60	60	60	60	60-75	60	60	60
Avg. Class Size (K-3)	23.4	22.4	24.3	18.3	20.5	18.3	17.0	20.5	18.5	22.2	21.1
Avg. Class Size (4-5/6/7)	25.5	24.3	23.5	18.2	26.0	17.8	18.3	18.1	24.0	23.5	25.3
% Core Teachers	53	64	47	54	66	57	53	47	53	53	62

Length of instructional day: the number of minutes per day that students are present for instruction; **Length of class periods:** the typical length of class periods in minutes. This indicator provides a benchmark of how much time is available for instruction in each subject; **Length of reading and mathematics class periods:** the length of math and reading class periods in minutes. These include periods when students are specially grouped for extended math or literacy instruction; **Average class size:** the size of the regular education, self-contained classroom which may be different from mathematics and reading classes if the school organizes those subjects differently, and is also different from "specials" classes such as art, music and physical education; **Percent core teachers:** the percent of all licensed school staff except the principal and assistant principal(s) who are regular classroom teachers (K-5/6/7). This percentage provides a measure of core academic teachers to all licensed staff in the school.

[7] Poplar's Success for All program exists in K-2, only.

Figure 5
Resource Allocation of Eleven Elementary Schools[8]

	Accelerated Schools Project												America's Choice					
School	Beech (n=664)			Tilia (n=460)			Willow (n=401)			Walnut (n=367)			Hazel (n=828)			Norway (n=537)		
Indicator	FTE	Cost / Pupil	% of Total	FTE	Cost / Pupil	% of Total	FTE	Cost / Pupil	% of Total	FTE	Cost / Pupil	% of Total	FTE	Cost / Pupil	% of Total	FTE	Cost / Pupil	% of Total
Teachers																		
Pre-K	2.0	$171	4%				1.0	$142	2%	2.0	$310	5%	1.0	$69	1%			
Core: K-7	27.0	$2,310	48%	20.0	$2,470	50%	19.0	$2,692	40%	13.0	$2,012	32%	38.0	$2,607	50%	25.0	$2,645	46%
Specialist Teachers	6.1	$522	11%	3.2	$395	8%	5.0	$710	10%	5.0	$776	12%	4.5	$334	6%	4.0	$423	7%
(% over core)	21%			16%			25%			33%			12%			16%		
Extra Help (Tutors)	13.2 (0)	$961	20%	8.1 (0)	$763	15%	8.0 (1)	$1,105	16%	7.0 (1)	$957	15%	15.0 (0)	$911	17%	11 (0)	$860	15%
Professional Development	0.0	$15	0%	1.5	$281	6%	1.8	$467	7%	0.5	$348	6%	3.0	$265	5%	2.0	$359	6%
(Inst. Fac.)	(0.0)			(1.5)			(0.8)			(0.5)			(3.0)			(2.0)		
Other Non-Classroom Instruct Staff[9]	1.4	$64	1%	4.1	$216	4%	6.0	$293	4%	4.0	$213	3%	4.3	$205	4%	0.0	$0	0%
Instructional Materials and Equipment	N/A	$77	2%	N/A	$40	1%	N/A	$528	8%	N/A	$427	7%	N/A	$129	2%	N/A	$93	2%
Student Support Services	9.1	$327	7%	2.6	$341	7%	4.7	$696	10%	3.2	$725	12%	3.0	$223	4%	7.7	$613	11%
Administration Staff/Supplies	4.0	$359	8%	4.5	$452	9%	2.0	$359	5%	3.5	$552	9%	7.0	$521	10%	6.0	$724	13%
Total Per Pupil	$4,806			$4,958			$6,990			$6,319			$5,271			$5,717		

[8] All dollar values expressed in terms of per-pupil allocations. Expenditures are based on national average salaries and benefit rates of 25% for certified staff and 30% for non-certified staff or, in the case of stipends, were adjusted by the GCEI. See Appendix B for details.
[9] Note, instructional materials and supplies are school reported; additional district expenditures may exist, also.

Figure 5 (cont.)
Resource Allocation of Eleven Elementary Schools[10]

	Success for All									Comer			Non-CSR Design		
School	Maple (n=394)			Pine (n=453)			Poplar (n=269)			Redwood (n=601)			Wych (n=384)		
Teachers															
Pre-K	1.0	$144	2.0%	2.0	$251	3%				1.0	$95	2%	1.5	$222	5%
Core: K-7	19.0	$2,740	38%	20.0	$2,508	34%	13.0	$2,745	36%	26.0	$2,458	39%	15.5	$2,293	48%
Specialist Teachers	5.0	$719	10%	8.0	$1,005	14%	1.5	$317	4%	8.0	$757	12%	2.8	$414	9%
(% over core)	25%			36%			12%			30%			17%		
Extra Help (Tutors)	8.5 (.5)	$884	12%	11.0 (1)	$1,171	16%	8.4 (2.6)	$1,776	24%	11.0 (2)	$950	15%	5.4 (1.4)	$535	11%
Professional Development (Instruct. Fac.)	4.1 (3.1)	$819	11%	2.0 (2.0)	$570	8%	1.5 (1.5)	$505	7%	0.3 (0.3)	$154	2%	2.0 (2.0)	$401	8%
Other Non-Classroom Instruct. Staff[11]	5.0	$248	3%	5.0	$216	3%	0.0	$0	0%	7.0	$228	4%	4.3	$216	5%
Instructional Materials and Equipment	N/A	$406	6%	N/A	$377	5%	N/A	$121	2%	N/A	$468	7%	N/A	$109	2%
Student Services	5.5	$953	13%	4.2	$673	9%	6.5	$1,434	19%	7.5	$785	12%	2.7	$234	5%
Administration Staff/Supplies	3.0	$454	6%	5.0	$617	8%	3.5	$635	8%	5.6	$539	8%	2.5	$399	8%
Total per Pupil[12]		$7,368			$7,389			$7,534			$6,435			$4,824	

[10] All dollar values are expressed in terms of per-pupil allocations. Expenditures are based on national average salaries and benefit rates of 25% for certified staff and 30% for non-certified staff, or, in the case of stipends, were adjusted by the GCEI. See Appendix B for details.
[11] Excluding full and part-time substitute teacher costs.
[12] Expenditures include instruction and administration expenditures only—operations and maintenance are excluded.

and guidance counselor, as well as art, music, and physical education teachers and an instructional facilitator (Goertz, Gross & Weiss, 2005).

Figure 5 exhibits the expenditure structures of the 11 schools, showing how schools implementing the focused comprehensive school reform programs and the comparison school allocate resources across the various educational strategies depicted in the expenditure structure (e.g. core teachers, professional development, and administration/supplies). This figure also shows how schools allocate resources across functions. For each school, we identify full-time equivalent (FTE) staff, per-pupil expenditures, and percent of total expenditures on elements in the expenditure structure, not including resources for operations (e.g. food service, utilities, custodial service, transportation) or resources dedicated to substitutes covering classes for teachers who are out sick or on leave. As with every figure, all costs reflect the use of national average salaries for personnel, and non-personnel costs are adjusted by the GCEI to allow more direct comparisons.

Overall expenditures, excluding operations, range from $4,806 to $7,534, a difference of 57 percent, with a weighted average of $5,977. Even though nearly all of these schools represent sites with large concentrations of needy children, their per pupil expenditures vary significantly, reflecting the unequal distribution of resources across America's schools. Five of the six highest spending schools were in New Jersey, a wealthy state where the state court has mandated an extensive array of educational services for the state's poor urban schools (Goertz & Edwards, 1999). The sixth and highest expenditure school, Poplar, has unusually large numbers of students with special needs relative to its small enrollment.

Driven by class sizes and enrollments (see Figure 4), core teachers comprise the largest portion of school-based expenditures per pupil. Figure 5 shows that core teacher expenditures range from 32 to 50 percent of schools' expenditures, with most schools also implementing pre-K programs for at least some portion of the students in their communities. Although there is considerable variation in the percent of spending allocated to core teachers, there is little difference in per pupil expenditures for core teachers, ranging only from $2,012 to $2,745. Thus, as discussed below, most of the large variation in total expenditure comes from the differential allocation of other resources, particularly the provision of specialists and extra help teachers, professional development, and student services.

The next highest use of school expenditures are extra help strategies for struggling students, including students in special education. Variation is great in extra help (11-24 percent) and student services (4-19 percent), as these services tend to vary with the number of high-need students. Poplar Elementary, for example, with 95 percent of students eligible for free and reduced-price lunch, 43 percent ELL, and 20 percent special education, has the greatest extra help expenditures as well as the highest percent of expenditures dedicated to student support services. However, even though the Success for All design requires tutors as an extra help strategy, the schools with that design have few tutors. In fact, there are few tutors in any of the other schools, even though research has shown that tutoring is the most effective extra help strategy, particularly for struggling elementary students (Torgeson, 2005).

Specialist teachers, who offer necessary instruction outside of core subjects (e.g. art, music, physical education) and simultaneously provide classroom teachers the time

for planning and preparation, comprise a sizable portion of expenditures. Figure 5 illustrates the variety of time offered to teachers for planning and preparation. As we discuss later in this paper, the evidence-based model requires one specialist for every five core teachers—or 20% more—in order to provide adequate planning time for classroom teachers. Tilia, Hazel, Norway, and Poplar have fewer than 17 percent specialist teachers over core teachers, which would not provide enough coverage for all teachers to have a daily planning and preparation period. The New Jersey schools, on the other hand, have at least an additional 25 percent, and up to 33 percent, specialist teachers over the number of core teachers. This higher level of staffing is driven by the state court decision and regulations referenced earlier. This larger number of specialists, however, does potentially allow these schools to provide their teachers with up to 90 minutes of planning time every day, if the schools employed a block schedule.

Figure 5 also shows that in line with the instructional designs, schools employing Success for All and America's Choice had more instructional facilitators (generally 1.5 to 3.0 FTE) than schools using other models. These individuals, if used correctly, provide the much needed in-classroom coaching for teachers that makes professional development lead to actual change in classroom instructional practice. Though this study does not include the actual activities of these individuals, they at least existed in schools, contrary to the scant appearance of tutors.

Overall – specialist teachers and those serving students with special needs – extra help and student support services staff – drive expenditures. Because students from low-income homes and students with special needs require additional services, variation in the concentration of such students could help explain some difference in expenditure levels.

Even though spending on professional development, primarily instructional coaches, is not a large percentage of overall spending (0-11%), if used as instructional coaches, these resources could have important and large impacts on efforts to improve instructional practice in these schools. Finally, the differences in resource allocations across these schools are, to some extent, also a function of the instructional change models they are using. The section titled *Comparisons Among School Resource Allocation and Model Parameters* provides further detail on which expenditures were made as a result of model prescriptions and which were not.

Comparisons among Professional Development Expenditures

Researchers generally accept and have shown that teacher practice is central to student academic improvement and ongoing professional development is important to improving instruction (Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Showers, 2002). Not only is professional development a central component of all three of the instructional improvement interventions, but districts and states often require teacher professional development; a considerable amount of local, state, and federal (e.g., ESEA Title II) funds are earmarked for it. These expenditures are an important part of the budget; it is helpful for policymakers to understand how such resources are used and how they relate to any instructional improvement program. The breakout of professional development expenditures, using the professional development framework (Odden, Archibald, Fermanich, & Gallagher, 2002), captures the critical elements of professional development. For example, coaches and instructional facilitators, who have been deemed

critical to effective professional development (Joyce & Showers, 2002), and their costs are detailed in this analysis.

Figure 6 uses the cost framework for professional development (see Odden, Archibald, Fermanich, & Gallagher, 2002) that disaggregates professional development expenditures into teacher time used for professional development, training and coaching, and travel and transportation. The per-pupil expenditures in the professional development category in Figure 6 do not match the expenditures found in Figure 5 because some of the resources that we consider professional development expenditures in Figure 6 are already included in other areas of the school expenditure structure. For example, when teachers have common planning time during the school day that they use for professional development, we account for the cost to the school of providing that time as a portion of the salary of the specialist teachers who educate the students during that time.

Figure 6 shows the teacher time used for professional development, the facilitators and/or coaches who work at the schools to assist teachers in improving their instructional practice, and the travel, transportation, tuition, and conference fees dedicated to teachers and administrators for professional development.

Figure 6
Professional Development Expenditures*

	Accelerated Schools Project								America's Choice			
School	**Beech (n=664)**		**Tilia (n=460)**		**Willow (n=401)**		**Walnut (n=367)**		**Hazel (n=828)**		**Norway (n=537)**	
Indicator	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil
Teacher Time Used for Professional Develop												
-Within contract days	$113,696	$171	$69,371	$151	$69,422	$173	$53,401	$146	$140,025	$169	$98,504	$183
-Outside regular day/year	$0	$0	$28,066	$61	$20,319	$51	$11,717	$32	$37,994	$46	$1,400	$3
-Other times during regular day/year	$8,901	$13	$27,496	$60	$83,319	$208	$15,286	$42	$9,600	$12	$18,484	$34
Training and Coaching												
-Training	$1,257	$2	$4,956	$12	$37,933	$95	$63,756	$174	$16,000	$19	$14,500	$27
-Facilitators/ Coaches (#)	$0 (0)	$0	$96,926(1.5)	$211	$51,694(.8)	$129	$32,309(.5)	$88	$193,853(3)	$234	$129,235(2)	$241
Travel and Transportation	$0	$0	$0	$0	$5,432	$14	$10,813	$30	$0	$0	$15,000	$28
Tuition and Conference Fees	$0	$0	$0	$0	$6,247	$16	$2,716	$7	$0	$0	$15,700	$29
Total	$123,854		$226,816		$274,366		$189,998		$397,471		$292,823	
-Per teacher	$2,710		$7,768		$8,365		$7,451		$7,162		$7,914	
-Per student	$187		$493		$684		$518		$480		$545	

Figure 6 (cont.)

Professional Development Expenditures[13]

	Success for All						Comer		Non-CSR Design	
School	**Maple (n=394)**		**Pine (n=453)**		**Poplar (n=269)**		**Redwood (n=601)**		**Wych (n=384)**	
Indicator	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil	Total	Cost Per Pupil
Teacher Time Used for Professional Develop										
-Within contract days	$64,082	$163	$77,432	$171	$103,760	$386	$90,783	$151	$50,686	$132
-Outside regular day/year	$8,107	$21	$26,645	$59	$400	$1	$18,626	$31	$7,790	$20
-Other times during regular day/year	$67,387	$171	$34,762	$77	$15,942	$59	$0	$0	$9,890	$26
Training and Coaching										
-Training	$38,945	$99	$72,792	$161	$16,075	$60	$18,477	$31	$13,000	$34
-Facilitators/Coaches (#)	$200,314(3)	$508	$129,235(2)	$285	$96,926(1.5)	$360	$19,385(.3)	$32	$129,235(2)	$337
Travel and Transportation	$8,263	$21	$4,425	$10	$0	$0	$10,705	$18	$1,754	$5
Tuition and Conference Fees	$4,928	$13	$14,415	$32	$7,018	$26	$18,954	$32	$0	$0
Total	$392,027		$359,706		$240,121		$201,229		$226,816	
-Per teacher	$12,044		$8,993		$10,625		$4,542		$7,768	
-Per student	$995		$794		$893		$335		$553	

[13] All dollar values expressed in terms of per-pupil allocations. All expenditures are based on national average salaries and benefit rates of 25% for certified staff and 30% for non-certified staff. See Appendix B for details. These calculations do not include salaries for district level administrators of professional development programs.

Within the *teacher time used for professional development* category, the *time within the regular contract* subcategory includes the portion of teachers' salaries dedicated to scheduled in-service days, early release days, or before or after school when teachers took part in PD related activities. This spending is largely driven by teacher contract negotiations and the number of contract days teachers participate in professional development. This section also includes the cost of teachers' time used for collaborative work. *Time outside the regular day* includes stipends teachers receive for participating in professional development outside their contracts, which primarily consists of stipends teachers receive. *Other time during the regular day* is the cost of hiring substitute teachers to release classroom teachers to engage in professional development.

Training and coaching refers to the amount spent on professional development materials, contracted services, and purchased professional services as well as the salaries of instructional facilitators and coaches whose time is spent working with teachers to improve their practice. *Travel and transportation* are funds for travel to professional development activities and *tuition and conferences* are the fees to attend conferences.

Professional development represents a considerable expenditure in all of the schools, averaging almost $590 per pupil, with the highest amounts in schools using the Success for All model. Professional development spending ranged from $187 to $995 per pupil, or $2,710 to $12,044 per teacher, with an average of $7,758 per teacher. The average for the Success for All schools was $10,554 and for the American's Choice schools was $7,538. These higher numbers reflect a primary focus of these designs—the use of school-based facilitators to ensure implementation of their specific instructional "regime."

The two largest components of professional development costs are 1) instructional facilitators and coaches and 2) the amount of teacher time spent on professional development *within the contract day*. Spending on instructional coaches had a weighted average of $201 per pupil, though it ranged from $0 in Beech to $508 in Maple, and, as discussed in an earlier section of this paper, the differences generally reflected the model designs and requirements. There was much less variation in the cost of teacher time within the contract day, ranging only from $132 to $183 per pupil across 10 of the 11 schools. Poplar, however, spent $386 per pupil. The number of in-service days and dedicated planning time with the school day drives some of the differences in this line item. For example, Poplar Elementary teachers spend 10 days participating in in-service, compared to six to eight days in four other schools and two days in the New Jersey schools. Yet, while the New Jersey district mandates only two professional development days, teachers in these schools also contract for 60 minutes a week of collaborative planning time. The use of the professional development cost framework allows readers to see how schools using different designs as well as different contract provisions decide to spend their resources on the different categories of professional development expenditures. A useful follow-up to this study would be to track variations in professional development spending on changes in instructional practice linked to improvement in student achievement. Although no causal connections could be drawn, it would be important to begin understanding how these factors are related.

Comparisons Among School Resource Allocation and Model Parameters

The comprehensive school reform models specify how schools should allocate at least a portion of their resources. Since these schools have been engaged with these models for at least three years, another perspective in understanding how they were spending their resources is to compare actual use with use suggested by the adopted instructional improvement model. This tenure of the schools' models may mean that some schools are not employing what is prescribed and several had reduced contracts with providers of the model; in a few cases, the principals claimed to no longer participate in the designs or participated in limited aspects of the designs (e.g. Beech Elementary and Poplar).

The main specifications for ASP, AC, and SFA include the quantity of tutors a school uses to aid students struggling with learning, the number of instructional facilitators or coaches used for professional development, the number of parent advocates, and the contract fees associated with being a part of a model. Figures 7 through 10 list the model parameters and show how schools use resources compared to how their comprehensive school reform models suggest resources use. In other words, the figure illustrates actual tutors, instructional facilitators and coaches, and student support (including parent liaisons) as well as, in parenthesis, the number of personnel/resources the model specifies given enrollment and the schools' low-income populations.

Figure 7 illustrates that, with the exception of Beech, which is phasing out the program, all the schools either meet or exceed the parameters for staff specified by the ASP model. As ASP does not require tutors or parent liaisons and only 0.5 coaches, it may be relatively easier to meet the staffing expectations of this particular model. America's Choice, detailed in Figure 8, shows a similar situation.

Figure 9 illustrates school uses of resources compared to that suggested by the Success for All Model. Poplar Elementary uses 2.6 certified tutors, equal to the SFA model's recommendation of certified tutors given the school's high proportion of students who participate in free or reduced-price lunch in the school. Meanwhile, both Maple and Pine clearly have fewer tutors than recommended by the SFA model. Likewise, all schools employ fewer parent liaisons than the model specifies. Since these schools are beyond the initial three-year contract period, the contract costs to be affiliated with SFA may be less, and Figure 6 illustrates this is the case for Maple and Poplar.

Redwood and Wych, with the Comer School Development Program and non-CSR design, respectively, have tutors even though their school model does not require them (Figure 10). Further, while the Comer program does recommend an instructional facilitator, Wych has an abundance of them, more than the number specified by SFA.

Figure 7
Resource Allocation Compared to Accelerated Schools Program (ASP) Model

	ASP Model	Beech (n=664) 36% FRL	Tilia (n=460) 64% FRL	Walnut (n=367) 71% FRL	Willow (n=401) 71% FRL
Tutors	None	None	3.6 (0) Uncertified Tutors	1.0 (0) Cert. Tutor	1.0 (0) Cert Tutor
Instructional Facilitators/ Coaches	.5 FTE in a school of 500	None	1.5 (.5) FTE	.5 (.4) FTE	.8 (.4) FTE
Student Support (Parent Advocate/Community Liaison)	None	None	.27 (0) FTE	1.0 (0) FTE	1.0 (0) FTE
Contracted Service Fees	Evolved from $20,000 to $61,500	$0	$3500	$46,035	$15,345

Figure 8
Resource Allocation Compared to America's Choice (AC) Model

	AC Model	Hazel (n=828) 72% FRL	Norway (n=537) 71% FRL
Tutors	None	None	None
Instructional Facilitators/ Coaches	2.0 FTE in a school of 500	3.0 (3.3) FTE	2.0 (2.2) FTE
Student Support (Parent Advocate/Community Liaison)	None	1.0 (0) FTE	.5 (0) FTE
Contracted Service Fees	$70,000	$10,000	$14,500

Figure 9
Resource Allocation Compared to Success for All (SFA) Model

	SFA Model (n=500)	Maple (n=394) 69% FRL	Pine (n=453) 68% FRL	Poplar (n=269) 95% FRL
Tutors	1.0 FTE Certified Tutor/100 FRL Students, with a minimum of 1	.5 (2.7) Cert. Tutors	1.0 (3.1) Cert. Tutor	2.6 (2.6) Cert. Tutors
Instructional Facilitators/ Coaches	1.0 FTE per SFA subject in school of 500	[Reading and Math] 3.1 (1.8) FTE	[Reading and Math] 2.0 (1.9) FTE	[Reading only] 1.5 (.25) FTE[14]
Student Support (Parent Advocate/Community Liaison)	1.0 FTE/100 FRL students	1.0 (2.7) FTE	1.0 (3.1) FTE	2.0 (2.6) FTE
Contracted Service Fees	$75,000	$42,780	$75,000	$22,700

Figure 10
Resource Allocation Compared for Schools Without SFA, ASP, or AC Models[15]

	Redwood (n=601) Comer 72% FRL	Wych (n=384) Non-Design 85% FRL
Tutors	2.0 Cert. Tutors	1.4 Cert. Tutors 4.3 Uncert. Tutors
Instructional Facilitators/ Coaches	0.3 FTE	2.0 FTE
Student Support (Parent Advocate/Community Liaison)	2.0 FTE	None
Contracted Service Fees	$8,000	$13,000

[14] Expected Instructional Facilitators of model adjusted given Poplar has SFA for only K-2.
[15] Comparisons to model are not made for comparison schools.

By comparing the allocation of schools' resources to those suggested by the models, one can see both significant deviations and significant adherence to the model prescriptions. This is true even though many of these schools have diminished or ended their formal contract with the designs, and it is true even with the influence of each respective district on the design. For example, the America's Choice Design does not recommend tutors, and neither study school with this design employs them. While it is true that some of the schools employing designs that recommend tutors do not employ as many as the models specify[16], the designs appear to have a lasting influence on one aspect of their resource allocation – resources to help struggling students. However, we could raise an issue with all schools, since tutoring is one of the most effective extra help strategies for struggling elementary students, why do not all designs suggest the use of tutors and why do not all schools deploy tutors? All of the designs included in this study recommend the use of instructional facilitators, a relatively new position in schools, and all but one of the schools in the study had such facilitators, even the non-design school.

Comparison of Schools to Evidence-Based Model

In recent years, methods to determine school finance adequacy have proposed certain levels of school resources. The "evidence-based model" (see Odden & Picus, 2004; Odden, Picus, Fermanich, & Goetz, 2005), which increasingly is being used by states addressing the school finance adequacy challenge, provides a very detailed, and research based set of school resources, and for all the educational strategies included in the expenditure framework. None of these schools were attempting to implement an evidence-based educational and staffing model, but we thought it would be useful to

[16] For additional contextual information on low tutor counts in NJ, see Goertz, Gross, & Weiss, 2005.

assess these schools' levels and uses of resources with respect to the evidence-based model, as well as the previous section's comparison to the model itself.

Based on a prototypical elementary school of 500 students, Table 11 compares how the case study schools actually deployed staffing resources by educational strategy compared to the elements in the evidence-based model, the latter in parentheses. Keep in mind that none of the schools in this study were attempting to implement the evidence-based model nor were any of the CSR models designed to incorporate all elements of the evidence-based model.

What Figure 11 shows is that the evidence-based adequacy model would have provided more core teachers, more tutors, more instructional facilitators, and more professional development days for nearly all the schools, as compared to the resources the schools actually spent on those items. Only the SFA schools had at least the number of instructional facilitators for which the evidence-based model calls.

The evidence-based model calls for no assistant principals for schools with 500 or fewer students, but begins phasing in such staff for larger schools. The schools actually provided somewhat more than the evidence-based model would suggest. The evidence-based model provides no instructional aides, while most schools had such staff, with a range of 0-6.3 aides in K-7 grades, plus additional pre-school aides. Schools provided more staff for ELL students, generally resource room specialists, while the evidence-based model prefers tutoring first, and then English as a second language classes. Finally, most schools allocated more staff for pupil support services than the evidence-based model would have provided.

Table 11
Comparison between Actual School Uses of Staff Resources and the Evidence-Based Model Recommendations

	Accelerated Schools Project				America's Choice	
School	**Beech**	**Tilia**	**Willow**	**Walnut**	**Hazel**	**Norway**
Elementary School	664	460	401	367	828	537
FRL Students	239	294	285	261	596	381
ELL Students	133	129	100	0	141	0
Class Size K-3: 15	23.4 (15)	22.4 (15)	18.3 (15)	24.3 (15)	20.5 (15)	18.3 (15)
Class Size 4-7: 25	25.5 (25)	24.3 (25)	18.2 (25)	23.5 (25)	26 (25)	17.8 (25)
1.0 Principal	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)
0.0 Assistant Principal	1.0 (0.17)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.0 (0.3)	1.0 (0.0)
2.5 Instructional Facilitators/Mentors	0.0 (3.3)	0.0 (2.3)	0.8 (2.0)	0.5 (1.8)	3.0 (4.4)	2.0 (2.7)
29 Core Teachers	27 (38.5)	20 (26.7)	19 (23.3)	13 (21.3)	38 (48.0)	25 (31.1)
6 Specialist teachers (20% more)	6.1 (7.7)	3.2 (5.3)	5.0 (4.7)	5 (4.6)	4.5 (9.6)	4.0 (6.2)
0 Instructional aides	1.0 (0.0)	4.4 (0.0)	4.0 (0.0)	2.0 (0.0)	1.0 (0.0)	0.0 (0.0)
1 tutor per 100 students in poverty	4.2 (2.4)	0.0 (2.9)	1.0 (2.9)	1.0 (2.6)	0.0 (6.0)	1.0 (3.8)
An additional 0.4 teachers for every 100 ELL/LEP students	3.0 (0.5)	1.0 (0.5)	3.0 (0.4)	1.0 (0.0)	0.0 (0.6)	0.0 (0.0)
Pupil support staff: 1/ 100 poverty students	9.1 (2.4)	2.6 (2.9)	4.7 (2.9)	3.2 (2.6)	3.0 (6.0)	7.7 (3.8)
10 professional development days	6.5 (10)	6.1 (10)	2.0 (10)	2.0 (10)	10 (10)	8 (10)
$100/pupil for professional development	2 (100)	73 (100)	189 (100)	266 (100)	65 (100)	87 (100)

Table 11 (cont.)
Comparison between Actual School Uses of Staff Resources and the Evidence-Based Model Recommendations

	Success for All			Comer	Non-CSR Design
School	**Maple**	**Pine**	**Poplar**	**Redwood**	**Wych**
Elementary School (n=500)	394	453	269	601	384
FRL Students	272	308	256	433	326
ELL Students	0	100	116	228	134
Class Size K-3: 15	17.0 (15)	20.5 (15)	18.5 (15)	22.2 (15)	21.1 (15)
Class Size 4-7: 25	18.3 (25)	18.1 (25)	24.0 (25)	23.5 (25)	25.3 (25)
Full Day Kindergarten	Yes	Yes	Yes	Yes	Full and Half-Day
1.0 Principal[17]	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)
0.0 Assistant Principal	0.0 (0.0)	1.0 (0.0)	0.0 (0.0)	1.0 (0.1)	0.0 (0.0)
2.5 Instructional Facilitators/Mentors	3.1 (2.0)	2.0 (2.3)	1.5 (1.4)	0.3 (3.0)	2.0 (1.9)
29 Core Teachers	19 (22.9)	20 (26.3)	13 (15.6)	26 (34.9)	15.5 (22.3)
6 Specialist teachers (20% more)	5.0 (4.6)	8.0 (5.3)	1.5 (3.1)	8.0 (7.0)	2.8 (4.5)
0 Instructional aides	3.0 (0.0)	3.0 (0.0)	1.8 (0.0)	6.0 (0.0)	6.3 (0.0)
1 tutor per 100 students in poverty	0.5 (2.7)	1.0 (3.1)	2.6 (2.6)	2.0 (4.3)	1.4 (3.3)
An additional 0.4 teachers for every 100 ELL/LEP students	0.0 (0.0)	3.0 (0.4)	1.0 0(.5)	0.0 (0.9)	0.0 (0.5)
Pupil support staff: 1/ 100 poverty students	5.5 (2.7)	4.2 (3.1)	6.5 (2.6)	7.5 (4.3)	2.7 (3.3)
10 professional development days	2.0 (10)	2.0 (100)	10.0 (10)	2.0 (10)	6.1 (10)
$100/pupil for other Professional Development	167 (100)	286 (100)	100 (100)	119 (100)	59 (100)

[17] Principals are not pro-rated below 500 students as the evidence-based model sets a minimum of 1 principal for these student enrollments.

Conclusion

Many of the schools in this study had previously grappled with how to raise student achievement. In response, they adopted national instructional improvement designs, each with specifications for allocating resources in order to enable the school to fully implement the design, improve instructional practice and boost student achievement. The analysis presented above found both wide variations in levels of resources across the 11 schools studied, differences in the use of the resources, deviation in resource use from what the instructional improvement designs suggested, and differences from (usually fewer) resources than prescribed by the adequacy model.

Time for reading instruction varied the most. All provided long time periods for reading – the America's Choice schools provided 150 minutes of reading instruction daily, Accelerated Schools 90-120 minutes, and Success for All 90 minutes. On the other hand, for mathematics, all schools provided one hour of instruction daily.

The percent of core teachers varied across the schools, with the smallest percent being in the design – Success for All – that had the most intensive non-core class strategies and in other New Jersey schools subject to a court-mandated reform. Success for All included a large professional development program, tutoring for struggling students, and an extensive family outreach/pupil support strategy. The result was there was more spent on all of the other elements in the expenditure framework.

Reflecting the high concentrations of students from poverty backgrounds, the schools spent between 25 and 35 percent of their budget on some combination of extra help programs, both instructional and student support services.

Though not the largest elements of expenditure at the schools, the schools nevertheless spend considerable, some might say surprisingly high, sums on professional development. Professional development spending averaged almost $600 per pupil and $7,758 per teacher. (See Miles, Odden, Archibald, & Fermanich for comparison numbers from other districts.) Since each design was focused on a specific instructional intervention and had extensive professional development strategies as part of the intervention, it should not be surprising to find such expenditure emphasis on this part of the budget. Nearly all schools had instructional coaches as well as significant funds for training.

Finally, when comparing the resources in these schools to an evidence-based adequacy model, the resources in all schools fell short of what the adequacy model would provide, indicating that schools could have benefited from even more resources. At the same time, there were several resources in some of the intervention models that did not appear in recommended levels in the schools studied. The most striking were the under-use of tutors for struggling students, even though tutoring by a certified teacher is the most effective extra help strategy, and the overuse of instructional aides, which was not a part of any of the designs nor the adequacy model and not an effective use of resources (Gerber, Finn, Achilles, & Zaharias, 2001). One the other hand, most of the schools, even those without one of the models analyzed in the Michigan study, allocated resources for instructional coaching, a key element in making professional development work, because it leads to meaningful change in classroom instructional practice.

Overall, this study found that schools in their fifth or sixth year using a comprehensive school reform model were still devoting considerable resources to

professional development, reflecting each design's emphasis on implementing a new instructional "regime" in the schools. This was the most common resource use practice across the schools. Except for time allocation for mathematics instruction, school uses of resources differed substantially across all possible uses. Additionally, except for time for reading instruction, and resources for interventions outside of the regular classroom, the differences in school uses of resources was not strongly linked to the specific instructional design adopted. In one set of schools, those in the New Jersey study district, this lack of a linkage is explained by state and district policy that overwhelmed differences in model designs (Goertz, Gross, & Weiss, 2005).

Although our sample size was too small, and we had insufficient performance data to make connections between the resource use patterns found and increases in student achievement, investigating such connections should be a goal in future studies. What we have been able to show is that resource use varies across schools. Some differences in resource use patterns reflect emphases of various instructional improvement designs, some seem to be emerging for many schools (e.g. instructional coaches), and some reflect traditional but ineffective practices (e.g. instructional aides and lack of teacher tutors). Future research needs to continue to identify such micro-variations in school uses of resources as well as impacts on student learning gains that such different resource use patterns produce.

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Appendix A
School Resource Indicator Definitions

Student enrollment: The total student enrollment of the school.

Percent low-income: The percent of enrolled students eligible for the federal free- and reduced-price lunch program.

Percent Special Education: The percent of students in the school with an Individual Education Program indicating their eligibility for special education services.

Percent ESL/bilingual: The number of students eligible for services through the English as a second language program or a bilingual program.

Expenditures per pupil: Calculated by dividing total school operating expenditures from all funds and all sources by total student enrollment.

Professional development expenditures per teacher: Calculated by dividing a school's total expenditures for professional development by the total number of licensed teachers.

Length of instructional day: The number of hours per day that students are present for instruction.

Length of class periods: The typical length of class periods in minutes. This indicator provides a benchmark of how much time is available for instruction in each subject.

Length of reading and mathematics class periods: The length of math and reading class periods in minutes. These include periods when students are specially grouped for extended math or literacy instruction.

Reading and mathematics class size: The average number of students per teacher in math and reading classes; some educational strategies just reduce class sizes for reading or mathematics, not for all classes.

Regular class size: The size of the regular education, self-contained, classroom, which may be different from mathematics and reading classes if the school organizes those subjects differently, and is also different from "specials" classes such as art, music and physical education.

Percent core teachers: The percent of all licensed school staff except the principal and assistant principal(s) who are regular classroom teachers. This percentage provides a measure of core academic teachers to all licensed staff in the school.

Appendix B
Annual Salary and Benefits used in calculations

Position	Salary ($)	Benefits ($)	Total Compensation ($)
Elementary school principal	74,062	18,516	92,578
Elementary school vice-principal	63,398	15,850	79,248
Teacher	45,448	11,362	56,810
Counselors	51,046	12,762	63,808
Librarians	50,125	12,531	62,656
School Nurses	37,450	9,363	46,813
Other professional staff	51,694	12,924	64,618
School secretaries	24,109	7,233	31,342
Teacher aides	15,039	4,512	19,551
Custodians	16,848	5,054	21,902
Cafeteria workers	13,621	4,086	17,708

Source: Salary information from National Research Service, National Survey of Salaries and Wages in Public Schools, 2004-05. Rate for cafeteria workers does not include supervisors; this paper uses this figure for supervisors and non-supervisors. Instructional facilitators, coaches, psychologists, and OT/PT are costed using "other professional staff" salaries. Teacher aides, custodians, and cafeteria staff salaries are calculated based on 7.5 hours/day for 180 school days. Benefits based on an average 25% of salary for certified staff and 30% of salary for non-certified staff.