

Rethinking The Allocation Of Teaching Resources: Some Lessons From High Performing Schools

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Introduction

School reform proposals aimed at improving student achievement range from developing new standards and curriculum to personalizing student-teacher relationships and increasing time for teacher planning and learning. Research over the last 30 years has indicated that student achievement is higher, dropout rates are lower, and student affect and behavior are better in schools where students are well-known to their teachers (for reviews see Darling-Hammond, 1997; Braddock and McPartland, 1993; Lee, Bryk, and Smith, 1993). These findings have emerged from studies of school size, class size, and school organization. In terms of structural variables other than size, two critical conditions concern reduced tracking or curriculum differentiation and greater opportunity for students to work intensely with a smaller number of teachers over longer periods of time (Gottfredson and Daiger, 1979; Lee, Bryk, and Smith, 1993; Lee and Smith, 1994, 1995). Other studies have emerged that document problems with “pullout” models of instruction that serve students’ needs by assigning them for brief periods of time to a variety of specialists, each of whom is supposed to treat one “problem” independent of the others (Commission on Chapter 1, 1992; Soo Hoo, 1990).

Meanwhile, reformers continually note that teachers need substantial time together in order to create new practices and engage in shared problem

solving (see, for example, Darling-Hammond, 1997; Little, 1993; Sizer, 1992). Studies of teacher development in other countries, notably China and Japan, point out how teachers become more proficient from continually working on curriculum, demonstration lessons, and assessments together (National Commission on Teaching and America’s Future, 1996; Stigler and Stevenson, 1991). The new curriculum reforms in the United States require substantial teacher learning which is, ideally, content-based and collaboratively pursued in tight connection to teachers’ ongoing classroom work (Ball and Cohen, in press). In an era of belt-tightening and rising student enrollments, finding the resources for these reforms will require schools to reexamine the use of every dollar.

Much publicity has surrounded efforts to redirect dollars from administrative functions back to the classrooms. New Jersey’s governor has even refused to reimburse district administrative costs above a fixed percentage that is lower than many districts currently spend. However, little attention has been given to rethinking the use of existing instructional resources, especially teachers—schools’ most important and expensive resource.

On the surface it would seem that schools should have the needed resources to create more individual time for students and increase professional time for teachers. From 1960 to 1992, the number of pupils

per teacher dropped from 26 to 17.6. Furthermore, schools employ 1 adult for every 9 students (NCES, 1994). Despite these generous ratios, class sizes exceed 25 for most students most of time, student loads are well over 100 for most teachers in secondary schools, and teacher planning time is both minimal and conducted in isolation from other teachers. The basic structure of schools has remained essentially the same across districts and over time, with new resources added largely around the regular classroom, rather than into it. And despite recent calls for “restructuring,” a number of surveys suggest that public schools rarely engage in major reallocations of resources (Rettig and Canady, 1993).

How might existing resources be used to personalize student-teacher relationships and provide teachers time to plan and work more closely together? Can these goals be met in ways that also support student learning for all students, including those with special needs? With so few examples of public schools organized in different ways, there is little empirical research on these questions. Furthermore, researchers have not had common ways to describe and measure different models. This study aims to begin to fill these gaps by describing in detail how five schools have reallocated resources while supporting high levels of student learning. The sample is too small and the schools too unique to claim a causal connection between their organizational designs and their students’ successes.¹ However, the schools do demonstrate that it is possible to support student achievement at extraordinarily high levels in contexts that manage instructional resources to maximize individual attention for students and learning time for teachers.

We sought to identify the elements of organization and resource use that seem most important in these contexts and to quantify objectively the ways in which these schools use resources differently than

traditional schools. We also aimed to learn from these examples about the conditions that facilitate or hinder resource restructuring. Although the schools look very different from one another, they share six principles of resource allocation implemented in different ways depending on their specific educational goals and strategies. In what follows, we describe their approaches, present a framework for examining resource allocation and use, and develop a methodology that may be used to measure the extent to which schools use their resources in focused ways to support teaching and learning.

Opportunities for Fundamental Reallocation of Resources

It is unlikely that schools can find ways to create more individual time for students or more shared planning time for teachers without prohibitively raising costs, unless they rethink the existing reorganization of resources. In this article, we focus primarily on the assignment and use of teaching staff because it is the most sizable and the most underexplored area for potential resource reallocation. As we noted above, pupil teacher ratios have dropped substantially and real expenditures have nearly doubled over the last 30 years. A recent analysis of staffing and spending patterns from 1967 to 1991 in nine very different districts across the country found that few of the new teaching staff were deployed to reduce class sizes for regular education students; most went to provide small classes to the growing number of students in special programs and to add a modest amount of time for teachers free from instruction during the school day (Miles, 1997a, 1997b; Rothstein and Miles, 1995).

As instructional staff have increased, the proportion of teachers has declined. Since 1950, the proportion of school staff who are classified as teach-

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¹ Some large-scale quantitative studies do, however, suggest that student achievement is correlated with school designs that enable teachers to spend more extended time with smaller numbers of students and that allow teachers to make instructional decisions in teams (Gottfredson and Daiger, 1979; Lee, Bryk, and Smith, 1993; Lee and Smith, 1995; Darling-Hammond, 1997).

ers has dropped from 70 percent to 53 percent, not all of whom are classroom teachers. Overall, about 43 percent of staff are regularly engaged in classroom teaching (National Commission on Teaching and America's Future [NCTAF], 1996). By contrast, 60 percent to 80 percent of education staff in most European countries are classroom teachers, enabling much greater time for collaborative planning and professional development (OECD, 1995).

An analysis of the allocation of teaching resources in Boston public schools identified six reasons for the gap between potential and reality in U.S. schools (Miles, 1995). Many of these organizational practices are so widespread that Tyack (1994) describes them as the "grammar of schooling" while Sarason (1982) calls them "school regularities." These practices form the basis of our conceptual framework for understanding and quantifying the use of teaching resources in both traditional and nontraditional schools. Below we briefly describe the impact of each on the use of teaching resources.

1. Specialized programs conducted as add-ons. In most school districts, a large portion of teachers work outside the regular classroom with special populations of students in categorical programs such as special education, Title 1 compensatory education, bilingual education, remedial education or gifted education. Such programs for special student populations absorbed 58 percent of the new dollars devoted to education from 1967 to 1991 (Rothstein and Miles, 1995). Most of these programs operate under federal, state, or district regulations and sometimes collective bargaining agreements that prescribe how teachers may be used and students may be grouped. Most districts operate these programs using a "pull-out" model in which students leave the regular classroom for portions of the day for in-

struction in small groups. In 1991, in Boston, teachers in specialized programs working outside the regular classroom represented over 40 percent of the teaching force.² Not only are pull-out strategies extremely costly, they also segregate students in sometimes stigmatizing ways and provide services that are often ineffective due to their fragmentation and lack of connection to the student's classroom experience. Schools rethinking resources will consider how remedial, special education, Title 1 and bilingual education resources might work together in an integrated plan to benefit all students in "regular education" settings.

2. Isolated instruction-free time for teachers. Currently, most school districts provide teachers with short periods of time free from instruction while using other classroom teachers to give instruction at these times. At the elementary level, teachers often have a 45 minute duty-free period four or five times a week which is covered by specialists in art, music, or physical education. In 1991, this represented 9 percent of Boston's elementary teaching resources. At the secondary level, a teacher might teach 5 of 7 instructional periods, using one for planning and the other for lunch or duties (monitoring hallways, the lunchroom, or study hall). Other teachers cover instruction during the portion of the student's instructional day in which the teacher is not teaching. Although secondary

teachers have more preparation time than elementary teachers (about 4 or 5 hours per week as opposed to 3 hours), the short blocks of individual non-instructional time do not allow much substantive planning or collaboration. These activities would require longer blocks of uninterrupted time that is coordinated with other teachers. Schools rethinking their use of resources will consider ways of creating longer periods of time for teachers to plan and develop curriculum together.

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² A similar analysis quantifies the impact of these practices in three other districts: Fall River, Massachusetts, Middletown, N. Y., and East Baton Rouge, Louisiana. See Miles 1997a.

3. Formula-driven student assignment. In search of efficiency and standardization, American schooling processes have been broken into segments, like grades and tracks, through which students are expected to move at an even, uniform rate. Districts use formulas to assign students to classrooms in a regularized fashion by age, subject, and program. These practices are costly, because the uneven allocation of teachers over grades, small programs and undersubscribed subjects contributes to unplanned differences in class size that do not reflect educational strategies. These practices may also preclude approaches such as multi-age or multi-ability grouping that can be more effective when teachers are prepared to engage in them (Anderson and Pavan, 1993; Slavin, 1990).

Using formulas to allocate students to classrooms by age can create huge variation in class sizes. For example, Boston public schools cap elementary class sizes at 28. When the 29th student enters a school with only one class in that grade, a new teacher must be added. Thus, the class size average falls dramatically from 28 to 14.5. In 1991, regular elementary class sizes in Boston's 645 elementary classrooms varied from 15 to 31. Class sizes could vary by 8 or 9 students from one grade to another in the same school. The more separate programs and subjects a school has, and the more constrained by age grading or tracking practices, the more often this kind of unplanned variation in allocation of resources occurs. Schools looking to better match resources to student needs will consider assigning students to groups based on educational strategies rather than standard classifications. Schools may also strategically vary group sizes and the daily schedule for particular kinds of lessons or skill work.

4. Fragmented high school schedules and curriculum. The problems of age grading are compounded in high schools by tracking, schedules with large numbers of short periods (typically 45 to 50 minutes), and teacher and subject special-

ization. One unfortunate effect of this fragmented approach to schooling is its impact on teachers' pupil loads. With five classes of 25 to 30 students each, most secondary teachers work with 125 to 150 students per day. Reducing teaching loads without dramatically increasing costs can be accomplished by reducing the number of different groups teachers teach, either by combining traditionally separate subject areas, lengthening the duration of classes, or having smaller groups of students work intensively with teachers in smaller numbers of subjects, as in universities (Carroll, 1994).

5. Large high schools. Secondary schools average nearly twice the size of elementary schools (NCES, 1994), and frequently exceed 2,000 students. The conventional justification is that larger enrollments create economies of scale by distributing administrative and operating costs and offering a more diverse curriculum cost effectively. However, existing research suggests that high schools have created more internal specialization and departmentalization than can be scientifically justified. Most studies have found that, all else equal, above about 800 students, larger schools produce lower student achievement and lead to increased alienation, higher dropout rates, and larger numbers of administrative staff, thereby deflecting resources from classroom instruction. Furthermore, beyond about 400

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students, there are few if any gains in curriculum quality (for reviews, see Lee, Bryk and Smith, 1993; Darling-Hammond, 1997).

6. Inflexible teacher work day and job definition. In Boston, like many other cities, the teacher contract specifies the required hours of work, starting and ending times, and how teachers can be assigned over the day. This makes it difficult to stagger starting times in order to make the best use of staff time or to meet student needs more fully. The contract prevented one high school from changing the work hours of its guidance staff to start and end later in the day so that students' meetings with counselors would not conflict with

their courses. The contract also requires that planning time be spread out over the day; this makes it difficult to combine instruction-free periods to create longer, shared blocks of time.

The use of part-time teachers is forbidden if they substitute for potential full-time positions. While intended to discourage management from substituting lower cost and potentially lower quality teachers for dedicated full-time ones, this regulation limits affordable solutions to coverage for teachers' noninstructional time. One way to create common planning time for groups of teachers, for example, is to schedule coverage for them by hiring a larger number of part-time specialist teachers during this time. Finally, rigid definitions of the work day exclude individuals who would be willing to work at times beyond the typical school hours. Schools looking to better match resources to student and staff needs may want to consider the use of highly-skilled staff in part-time positions and on varied job schedules.

The strategies observed in schools that have sought to change these conditions can be described by six principles of resource reallocation:

1. Reduction of specialized programs to provide more individual time for all in heterogeneous groups,
2. More flexible student grouping by school professionals,
3. Structures that create more personalized environments,
4. Longer and varied blocks of instructional time,
5. More common planning time for staff, and
6. Creative definition of staff roles and work schedules.

These kinds of changes can create opportunities for realigning teaching resources to school goals (Miles, 1995). Our observations in schools suggest, however, that altering any one practice alone may

not free enough resources to significantly change the possibilities for student or teacher learning.

Study Methods and Analytic Framework

Sample

To create a sample of schools that could offer insight into the possibilities and challenges involved in rethinking the allocation of instructional resources, the study sought elementary and secondary schools that:

1. Had engaged in a significant rethinking of resources touching on at least four of the resource principles listed above.
2. Used no significant extra resources above the school system average per pupil except startup or training grants.
3. Served a diverse student population in terms of income, ability, language background, and special needs.
4. Had used a new model of organization for at least 2 years.
5. Had evidence of strong and improving student performance.

To find such schools, we surveyed experts involved in reform networks nationwide. The five schools we selected represent different educational strategies. Three of

the schools started from scratch with a new design in mind, and had considerable flexibility in hiring staff and creating programs. The other two schools restructured existing programs and staff. We selected three elementary schools and two secondary schools:

Quebec Heights Elementary School, Cincinnati, Ohio had, at the time of the study, 500 students in grades K–6, with 15 percent classified as having special education needs and 70 percent eligible for Title 1. Quebec Heights eliminated

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age- and program-based instructional grouping and put students in smaller, multi-aged, heterogeneous groups that remain together for 3 years. The school created reading groups of 8 or smaller each day. Teachers have common planning time each day and pursue professional development in the school's priority areas during the school day. Cohort analysis of student performance data shows that both special education and regular education students have improved faster than the Cincinnati average.

The Douglass Elementary School, Memphis, Tennessee had 475 students with 17 percent classified as requiring special education and 88 percent qualifying for Title 1 support. At the time of the study, the school was in its third year of implementing the "Success for All" program which restructured school resources to allow 90 minutes a day of reading plus daily individual tutoring for first and second graders who did not meet grade level standards. In addition, Douglass was working to integrate its special education students and teachers fully into the regular classroom. After the second year of implementing the program, the percent of second-graders (the only students with two years of the new model) above the median in language arts climbed from 17 to 59 percent. In addition, the school's evaluation of special education integration showed these students continuing to progress academically and socially.

The Mary C. Lyons Model Elementary School, Boston Massachusetts had 90 students in grades K-5, 60 of whom were classified as regular education and 30 of whom had severe emotional disturbances that previously required placement in highly restrictive settings. Over 80 percent of students qualified for Title 1. The school fully integrated all special education students into regular classes of 15 or smaller, each with a teacher and instructional assistant. Mary C. Lyons created extended school hours lasting from 7:00 am to 5:15 p.m. using outside contractors to provide instruction. The variety of different staffing arrangements included paraprofessionals, teacher interns, part-time workers, and staggered shifts. The school was 1 of 15 (out of 115) Boston schools to be over-chosen by every race for both special education and regular education slots for 3 years in a row. Achievement scores for both

special education and regular education students improved faster than the Boston average, and 100 percent of the students were reading on grade level.

Central Park East Secondary School (CPESS), New York, New York served 450 students in grades 7 through 12, about 25 percent of whom qualified for special education and 60 percent for free or reduced-price lunch. All students were integrated into heterogeneous classrooms. The school restructured the typical secondary schedule to create two hour blocks of instructional time in both the humanities and math/science. Teachers had more than 7 hours each week of common planning time in addition to their daily individual preparation period. To reduce academic group sizes, CPESS allocates nearly all of its positions for teaching, rather than hiring guidance counselors and various administrative staff. All professional staff members serve as advisors to about 12 to 15 students each year. The school hires some teachers on a part-time consulting basis for electives like foreign languages. CPESS has been nationally heralded for its consistently exceptional outcomes: each year since its first graduating class, more than 90 percent of its students have graduated and more than 90 percent have been accepted to college.

International High, New York, New York is an alternative school of 475 recent immigrant students in grades 9 through 12. Only students who have been in the United States less than 4 years and who score below the 20th percentile on an English language proficiency exam are admitted. At the time of the study, over 75 percent of the students were eligible for free or reduced-price lunch. International High integrates all state-mandated subject matter in an interdisciplinary curriculum taught in multi-aged heterogeneous groups. Teachers work with no more than 75 students a term and spend 70 minutes or more with them each day. The teachers have nearly six hours each week of common planning and professional development time. All staff members lead a small advisory group which meets weekly to discuss issues of personal, academic, and social growth. Despite its "high risk" population, the school's dropout rate was less than 1 percent in 1993-94 as compared with 30 percent citywide, and both the graduation rate and college acceptance rates exceeded 95 percent. For more than a decade,

these rates have exceeded 90 percent annually (IHS, 1995; Darling-Hammond, Aness, and Falk, 1995).

Figure 1 summarizes the resource allocation strategies used in the five sample schools. It shows that each school implemented many strategies for allocating teachers and teaching time to address student needs and create planning time. Only the three alternative schools—Mary C. Lyons, CPESS, and International High—created new teaching roles by contracting with other providers for teaching or by restructuring some teaching positions.

Data Collection and Analytic Framework

To understand the resource allocation practices in each of the five schools, we collected information about school expenditures, staffing, and student scheduling. We collected comparable data for traditional schools, along with district level budget and staffing information. We conducted interviews with administrators and teachers and examined available written material at each school to understand the school's organization and its link to educational purposes and outcomes.

In addition to describing the strategies each school used, this study created measures which allow comparison of resource allocation patterns between these school models and traditional schools. The measures were developed by taking each resource allocation principle, hypothesizing the quantifiable impact it might have on resources, and then testing this impact by using indices that are: (1) descriptive of practices in both traditional and nontraditional schools, (2) easy to understand, and (3) replicable.

Creating measures that accurately portray practices in the fluidly organized sample schools yet allow comparison to traditional schools creates a tension between the use of measures that are easily understood and calculated and those that can provide meaningful description. The subtleties in-

involved can be seen through one example: the attempt to measure the impact of the principle “reduction of specialized programs to create more individual time for all.” In a traditional school, regular class size provides a useful gauge of how much access to individual attention a student might have. But, regular class size does not reflect the student's experience in some innovative schools because it does not describe the way these schools organize by subject and over the course of the day. For example, the regular class sizes of 24 at Quebec Heights school do not reflect the fact that all students spend 90 minutes a day in groups of 8 for reading. In order to capture the additional individual time for all students, a measure of average instructional group size, rather than regular class size, is used. This measure relies on greater descriptive knowledge of a school, but it more accurately reflects student experience.

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Figure 2 summarizes the measures used for each resource allocation principle. The first principle, “reduction of specialized programs to create more individual time for all in heterogeneous instructional groups” should lead to smaller average instructional groups for all regular education students and more even distribution of resources between regular and special program students. Three measures helped assess the extent to which innovative schools differed from traditional schools here.

- 1. Students per teacher:** This number includes all teachers and students in the school from all programs. Our sample elementary schools had similar numbers of students per teacher. However, a school can reduce its functional student to teacher ratio by converting typical non-teaching slots to teaching roles as CPESS did. The index of students per teacher indicates only the opportunity to create small, flexible instructional groups. It does not reflect the actual size of the groups in which most students spend time.

Figure 1.—Resource reallocation strategies used by sample sites

| Strategy | Mary C. Lyons Model Elementary | Quebec Heights Elementary | Douglass Elementary | International High | Central Park East Secondary |
|--|--------------------------------|---------------------------|---------------------|--------------------|-----------------------------|
| 1. Reduction of specialized programs | X | X | X | X | X |
| 2. More flexible student grouping | X | X | X | X | X |
| 3. Structures to create more personal environments | X | X | X | X | X |
| 4. Longer and varied blocks of instructional time | X | X | X | X | X |
| 5. More common planning time | X | X | X | X | X |
| 6. Creative definitions of staffing roles and work day | X | | | X | X |

X=Sample school implements strategy.

SOURCE: Unpublished tabulations.

2. Weight average group size: This measure calculates the weight average size of the instructional group which a typical student experiences over the day for academic subjects. It incorporates the time spent in different group sizes over the day. For example, if students in a classroom of 24 spent 90 minutes a day (25 percent of their school day not including lunch) in reading groups of 8, then the weight average group size would be 20 (.75 times 24 plus .25 times 8). In a traditional school, the average group size and the regular class size would be the same. This measure may offer a clearer sense of how much access to individual attention most students in the school have.

3. Percent of teachers in regular education instructional groups: This figure divides the number of teachers who work with regular education students (including classroom teachers, subject specialists and other teachers who work all day instructing groups that include regular education students) by the total number of teachers in the school. The figure gives a sense of the extent to which a school has concentrated its resources on core classroom functions as opposed to pull-out programs of various kinds.

The second principle, more flexible student grouping, should allow educators to create instruc-

tional groupings that more closely match instructional needs. Formulas that mandate the size of groups and classrooms can create situations where group sizes vary for no educational reason. When teachers can create their own groups using criteria linked to educational strategies, they can reduce these unplanned variations and create a strategy which maximizes the use of limited resources. The *percent of regular education students in targeted group sizes* represents the extent to which a school has minimized random variation in class size. In schools where no group size target existed other than the contractually defined class size maximums, we measured how many students were in classes which were within 5 percent of the average size. More flexible student grouping also allows teachers to create smaller groups for target subject areas. The *average size of instructional groups in focus area* measures how schools focus resources to create more individualized attention in some subjects where they do so. If some regular education students spend time in much smaller instructional groups, this would be reflected in the average by calculating the percent of students receiving such support.

Four aspects of the third principle, structures to support more personal relationships between teachers and students, lend themselves to measurement. First, a primary indicator of a teacher's op-

Figure 2.—Measuring resource allocation patterns (staff allocation)

| Resource allocation principles | Expected impact on resources | School measure |
|---|--|--|
| Reduction of specialized programs to provide more individual time for all in heterogeneous groups | Smaller sized regular education instructional groups | Students per teacher |
| | More even distribution of resources between regular and special program students | Average size of regular education instructional groups |
| | | Percent of teachers in regular instructional groups |
| More flexible student grouping by school professionals | Smaller instructional groups in focus areas | Percent of students in target regular education size groups |
| | Less unplanned variation in class sizes | Average size of group in focus area |
| Structures to create more personalized environments | Lower teacher/student loads | Teacher/student loads per day |
| | More adults involved in instruction | Percent of adult instructors/advisors |
| | Smaller teams of teachers and students | Size of teacher/student clusters |
| | Multi-year relationships between students and teachers | Length of student/teacher relationship |
| Longer and more varied blocks of instructional time | Longer instructional periods for academic subjects | Average length of instructional period for academic subjects |
| More common planning time for staff | More minutes of common planning | Common planning minutes/week |
| | Longer periods of time for planning | Length of longest planning period |
| Creative definition of staff roles and work schedules | Use of part-time or contract staff | Not applicable |
| | Use of interns or paraprofessionals for instruction | |
| | Staggered work schedules | |

SOURCE: Unpublished tabulations.

portunity to build relationships with each student is the academic teacher’s *student load*. A second indicator of a school’s effort to maximize personal relationships might be the *percent of professionals who serve as instructors or advisors* to regularly scheduled groups of students in an ongoing fashion. Thus, an assistant principal who worked with occasional discipline problems or a guidance counselor meeting once with each of 200 students to ensure compliance with graduation requirements would not be included. Although these singular contacts with

students can be important, they do not aim to build long term, personal relationships between school professionals and students. The *average size of teacher and student teams or clusters* provides a third measure of the opportunity to create a more personal educational environment. For this measure, student-teacher teams had to be self-managing and self-contained. This means that virtually all instruction occurs within the cluster and that the cluster has primary responsibility for curriculum, grouping, discipline, and evaluation of its students. A fi-

nal strategy schools might use to create personal relationships would be to keep teachers and students together for longer than the typical year. Thus, we include a measure of the *number of years teachers and students stay together*.

The extent to which sample schools created *longer blocks of instructional time* is measured by the average scheduled *length of instructional period* for academic subjects in secondary schools. In some of the schools studied, teachers vary the length of instruction from the schedule to suit a particular lesson. These variations were not calculated here.

Finally, two measures are used to understand how sample schools create more useful common planning time for teachers. The *number of minutes of common planning time* is defined as the amount of time each week that is shared with other teachers and spent on collaborative planning regarding curriculum, students, or school practices. A second indicator of the usefulness of the planning time is the *length of the longest planning period*. For some kinds of planning and development, teachers need time periods longer than the typical 40 to 50 minutes.

Each innovative school is compared with a typical school in the same district with a similar student population. Meaningful comparisons must include an adjustment for the mix of students eligible for special services because schools typically receive additional resources to serve them. Adjusted for student mix, the schools in this sample used no greater resources than traditional schools on an ongoing basis. In two cases, no “traditional” school existed in the district which served the same mix of students as our sample sites. Mary C. Lyons Model Elementary School in Boston draws a large percentage of its population from special education students typically served by private schools. In this case, a hypothetical comparison was created, based on the assumption that these students were served in separate, self-contained classrooms of 4 each, the smallest existing class size, and that social services and

other support staff were the same as at Mary C. Lyons.

International High in New York City serves a unique population of limited English speaking students. Traditional schools serve such students through bilingual programs and ESL courses offered separately from the rest of the high school curriculum, but do not typically have 100 percent of their population requiring such services. To create a comparison to International High, we used the New York City staffing allocation formula to determine the number of teachers the school would have received for these special needs students; we assumed the additional resources would be used to fund separate bilingual or ESL classes. Although this generous assumption about universal ESL services to limited English proficient students does not hold true in many of New York’s traditional schools, it offers a best case scenario for the allocation of resources in a traditional model.

Adjusted for student mix, the schools in this sample used no greater resources than traditional schools on an ongoing basis.

These calculations are intended to provoke discussion and to provide an objective way of comparing schools to each other. Obviously, other factors which are not incorporated in these measures contribute to the opportunity for individual attention and shared teacher time. For example, a teacher in a class of 24 may use sophisticated grouping practices that allow her or him to provide targeted individual or small group instruction to students throughout the day. These grouping strategies are not incorporated into this measurement scheme unless the entire school uses the strategy. The existence of planning and development time does not guarantee that it is used to improve teaching quality. Further, many schools find common planning time for teachers outside the school day on a volunteer basis. Thus, these measures are intended to be used in conjunction with a descriptive understanding of the way a school has organized itself to match resources to student needs and to provide opportunity for teacher growth.

Study Findings

We discuss our findings concerning elementary and secondary schools separately because they begin with such different organizational structures. With their relatively small teaching loads and self-contained multi-subject classrooms, elementary schools already allow more flexible, individual instruction. But their simple structures, with limited teacher time free from instruction, do not offer the same opportunities for freeing time and resources as secondary schools. Because of these simpler daily schedules, reducing the use of pull-out programs for special education, language and Title 1 instruction becomes a primary lever for creating smaller groups for all in elementary schools. In contrast, traditional secondary schools, with their short periods, multiple classes, large teaching loads, and greater amounts of non-teaching time offer more ways to reconfigure their resources.

Elementary Schools

Figure 3 presents the resource allocation measures for the three elementary schools. In the three urban districts studied, the traditional schools served regular education students in age-graded, self-contained classrooms. About 75 percent of the teachers worked with regular education students; the other 25 percent worked with Title 1 and special education students outside the regular classroom (figure 3, line e). Because all of these schools are in urban areas with high concentrations of students in poverty, even the traditional schools were using at least some of their Title 1 resources to add regular classroom teachers. Thus, their regular education class sizes averaged between 19 and 22 (line b). Class composition and class size stayed the same all day, for all subjects, except when students were pulled out for special education or Title 1 instruction. The elementary classroom teacher instructed all subjects except specialties like art, music, and gym which were taught by specialists during the classroom teacher's free period. Teachers had 45 minutes 3 to 5 times a week free from instruction in addition to short lunch periods. These

Because all of these schools are in urban areas with high concentrations of students in poverty, even the traditional schools were using at least some of their Title 1 resources to add regular classroom teachers.

times were not coordinated with other teachers in any systematic way.

Reduction of Specialized Programs

In departing from this organization, all of the sample schools increased to above 90 percent the percentage of teachers who worked with heterogeneous groups of students (figure 3). The comparable percentages in the traditional schools ranged from 28 to 77 percent. The only teachers in the restructured schools not working with heterogeneous groups of students were teachers of special education students in separate classrooms at Quebec Heights.

Each elementary school used different levers for matching instructional resources to student needs, depending on its educational goals. First, Quebec Heights decided to use multi-age grouping to respond more effectively to diversity

in student skill levels. Students were assigned to multi-age clusters, called "families," containing three to four teachers and 75 to 85 students in grades 1–3 or 4–6; the families remain together for 3 years. Students may work with any instructor within the family during the day but each has a homeroom teacher who has primary responsibility for a class of 22 students for the full year. Rather than divide the curriculum by age level, all students in the family study the same basic topics during the year, but at their own

developmental level.

Second, Quebec Heights eliminated separate Title 1 programs and used these resources to reduce the size of reading groups for all students. Third, special education students and teachers were fully integrated into the families. In the primary grades, the special education resource teacher works as 1 of 4 teachers in a team responsible for a group of 85 students.

Figure 3.—High performing versus traditional elementary schools

| Resource allocation principles | School measure | Quebec Heights Elementary | | Douglass Elementary | | Mary C. Lyons Model Elementary | |
|---|--|---------------------------|-------------|---------------------|-------------|--------------------------------|-------------|
| | | Average | Traditional | Average | Traditional | Average | Traditional |
| Reduction of specialized programs to provide more individual time for all in heterogeneous groups | a. Students per teacher | 15 | 15 | 16 | 16 | 11 | 7 |
| | b. Average size of regular education instructional group | 19 | 21 | 26 | 22 | 13 | 19 |
| | c. Percent of teachers in regular education instructional groups | 91% | 77% | 95% | 76% | 100% | 28% |
| More flexible student grouping by school professionals | d. Percent students in target size instructional groupings | 100% | 65% | 100% | 60% | — | — |
| | e. Average size of instructional group in reading | 7 | 21 | 20 | 22 | — | — |
| Structures to create more personalized environments | f. Student loads for primary classroom teachers | 22 | 21 | 24 | 19 | 13 | 19 |
| | g. Length of time students stay with teacher (in years) | 3 | 1 | 1 | 1 | 1 | 1 |
| More common planning time for staff | h. Common planning minutes/week | 325 | 100 | 135 | 0 | 405 | 45 |
| | i. Length of longest planning period | 45 | 45 | 45 | 45 | 105 | 45 |

— Not applicable.
SOURCE: Unpublished tabulations.

The Douglass Elementary School in Memphis used its Title 1 budget as the primary lever for re-thinking resources to improve student performance. Because 97 percent of its students qualify for Title 1 assistance, Douglass has long been free to use Title 1 dollars across the school. At approximately \$250,000 dollars per year, these resources represent nearly 20 percent of the school budget. Douglass restructured resources using an existing model for improving student performance, the “Success for All” program. Following this model, Douglass uses Title 1 dollars to hire reading teachers to work as one-on-one tutors with students who do not meet reading standards in the first and second grades. These teachers and all special education teachers combine with regular classroom teachers to reduce the size of instructional groups from 24 to about 17 for 90 minutes of reading a day for all students.

The Douglass example illustrates why simple measures of class size do not provide enough information about how resources follow instructional

goals. Prior to implementing “Success for All,” Douglass used Title 1 dollars for regular classroom teachers and had classes averaging 17 across the school. As Principal Myra Whitney commented, “We had slowly reduced all class sizes over the years with no plan for how anything in the classroom would change. It wasn’t working, our students were still at the bottom in reading.” To implement Success for All, Douglass raised class sizes for all other subjects in order to reduce group sizes for reading and provide targeted one-on-one tutoring assistance to ensure all students are reading by third grade. Douglass also redirected resources from grades 3–6 to the early grades. The decision to take resources away from some students and teachers to focus on others can produce tension. Douglass’s use of a proven model that included clear staffing requirements minimized this friction. As one teacher put it, “Everything is specified by ‘Success for All;’ we didn’t consider quarreling with it because research shows this works.”

Douglass used “Success for All” as a catalyst for including its special education teachers and students in regular classrooms. By the third year of the program, all students and teachers from previously self-contained classrooms and resource rooms spent most of their time in heterogeneous groups. During the daily 90 minutes of reading time, special needs students worked in heterogeneous groups based on their reading skill levels. The integration of special education students was made easier by the fact that cooperative learning plays a large role in “Success for All” classrooms. Assigning special education teachers their own reading groups that included students from all programs further reduced the size of reading groups for all students. During most of the rest of the day, special education teachers team taught with regular education teachers. They used approximately one-quarter of their time for performing individual assessments and working with students needing more targeted help outside the regular classroom.

While Quebec Heights redesigned traditional age-grading practices and Douglass rethought its use of Title 1 resources, the Mary C. Lyons school used the reallocation of special education dollars as a redesign lever. By including special education students, who were previously educated in a private setting at a cost of over \$30,000 each per year, with regular education students, Mary C. Lyons created a unique, individualized environment for students and teachers. Mary C. Lyons is open to all students from 7:15 a.m. to 5:00 p.m. daily. Each classroom had 15 or fewer students—10 “regular” education students and 5 students with severe emotional/behavioral issues—and was staffed by a teacher, a teacher intern, and an after-school teacher. The pairs of six classroom teachers and six teaching interns included three teachers with regular education certification and three with special education certification. This unusual integration of special education students and teachers is driven not by finances but by a belief that schools must meet children’s academic and emotional needs at their level of development. The teaching staff is hired to

ensure attitudes, skills, and expertise to meet a broad range of academic, social and behavioral considerations. They work closely as a team to analyze the effectiveness of their instructional efforts. Academic teachers have close to two hours daily of common planning time.

Virtually all teaching resources at Mary C. Lyons supported this design, including Title 1 funds and funds which would have paid for subject specialists in traditional schools. A typical Boston elementary school has four subject specialists (in art, music, physical education and computers) who supplement instruction and cover planning time for classroom teachers. Instead of this costly arrangement, Mary C. Lyons pooled these dollars to contract with outside teachers for the provision of art and music and part of the after school program.

In summary, each elementary school used its resources from special programs to support its core design. Quebec Heights and Douglass raised regular education class sizes and redirected funds to reduce reading group sizes. Mary C. Lyons used funds freed from eliminating separate programs to lower teacher student ratios dramatically all day. In each case, staff organization depended on the educational strategies and approach the school had adopted. The organization of resources and the educational goals in these schools were inextricably intertwined because

the organization enabled the schools to implement new teaching strategies.

(E)ach elementary school used its resources from special programs to support its core design (and) . . . staff organization depended on the educational strategies and approach the school had adopted.

More Flexible Student Grouping

Perhaps the most striking difference between the sample elementary schools and traditional schools is the proactive, strategic way in which teachers adapted instructional grouping to student needs. In a traditional school, administrators assign students to programs and classrooms according to bureaucratic rules and categories that stay constant over time and subject. Teachers in sample schools used their knowledge of student needs, rather than a student’s program classification or age, to assign

each to a regular homeroom class and to manage their instruction throughout the day.

In sample schools, reading groups were significantly smaller than in traditional schools. Mary C. Lyons and Quebec Heights organized staff to allow groups of six and seven, respectively. Mary C. Lyons used the classroom teacher and teaching intern to create reading groups of six. Quebec Heights rotated Title 1 teachers and instructional assistants through regular classroom, so that each classroom had three instructors for 90 minutes of reading time per day. The primary classroom teacher determined the composition of the groups and content of lessons daily based on consultation with the expert reading teachers and review of students' progress in specific areas. Some lessons divided students into groups based on areas where they need further skill development, others grouped students heterogeneously to discuss reading content. This concentration of resources on the reading rotation meant that homeroom class sizes were one student larger on average than the traditional model.

At Douglass, all students spent 90 minutes per day in reading groups of 15–17, as compared with 22 in traditional schools. The composition of these reading groups varied each day and over the course of the year depending on the teachers' assessment of student needs. A team including the teachers, reading specialists, and the "Success for All" facilitator assigned students to skill-based reading groups across grades using formal assessments every 6 weeks. Since assignment to groups indicated skill level, as opposed to age or a static assignment of aptitude, the student moved on once he/she demonstrated these skills. Students not mastering skills by agreed upon times received one-on-one tutoring for 20 minutes each day from one of the three reading specialists. About 15 percent of first and second grade students received tutoring at any one time, but the students receiving tutoring varied over the year depending on who needed extra assistance in particular skill areas.

Perhaps the most striking difference between the sample elementary schools and traditional schools is the proactive, strategic way in which teachers adapted instructional grouping to student needs.

This continuous assessment and regrouping of students required significant time and joint effort. A full time "Instructional Facilitator" helped teachers to conduct, analyze, and act on the assessments. The facilitator received in-depth training for using "Success For All" reading assessment tools and worked with a district wide expert in "Success For All" who had further expertise. In pulling this facilitator from the classroom, Douglass once again traded general regular education class sizes for a strategic use of resources which supported their school design. In this case, the facilitator enabled a more careful matching of instruction to student needs as well as more effective use of joint planning time.

Traditional schools experience variations in class sizes driven by formulas and enrollment swings. Boston's school choice plan allowed Mary C. Lyons to cap the number of students by grade through the student assignment process. Mixed age grouping at Douglass and Quebec Heights allowed teachers to control group sizes. For example, if Douglass had used age-based grading, class sizes in the first and second grade would have been 24 and 26, respectively, with class sizes declining as the student moved toward sixth grade. Instead, the Douglass staff combined grades to create smaller groups of 23 in the first three grades and 26 in the intermediate grades. Thus, sample schools exerted more control over class sizes by combining ages and programs so that all students were in targeted class sizes rather than the 60 to 65 percent who would have been in such group sizes using traditional age grading.

Structures to support more personal relationships

Quebec Heights' family structure aimed to strengthen relationships between teachers and students by keeping teachers with the same family of 85 students for 3 years, usually with the same homeroom class. This meant that some teachers received as few as nine new students each year. As an

intermediate teacher stated, “It’s hard to overestimate how much time this saves us. We get started quickly in the new school year, students know the rules and boundaries, and I know what they can do.”

The Mary C. Lyons school’s small size and intense staffing ratios created a highly personal environment for all students. The staff also created time to discuss each student’s progress as a team. All the professionals working with each group of students—the classroom teacher, intern, a special education evaluation specialist, the afterschool director, and a social worker—met weekly for 45 minutes. Together, they identified problems, discussed possible strategies, and shared successes and frustrations.

More Common Planning Time

All three schools created more common planning time, but the constraints of time and collective bargaining agreements meant that only Mary C. Lyons made dramatic changes (figure 3). Both Douglass and Quebec Heights increased common planning time using the conventional method of scheduling specialists to allow meeting time for small groups of teachers. Mary C. Lyons’ academic teachers shared a 30 minute lunch period followed by 1 hour and 15 minutes of common planning time while students had lunch and recess and received instruction from their instructional intern and after-school teacher. In combination with the “student support” team meetings described above, teachers met together for a total of 405 minutes weekly, in contrast to no more than 60 minutes in a traditional school.

Creative Definition of Staff Roles and Work Day

The Mary C. Lyons school was able to create so much more planning time because it redefined teaching roles throughout the day. Whereas in a traditional school only the classroom teacher or subject specialists assume responsibility for classroom instruction, Mary C. Lyons had a master teacher and

a highly trained and supervised “instructional assistant trainee” in each classroom. In contrast to often poorly trained paraprofessionals, the Mary C. Lyons “trainees” were college educated students working on their master’s degrees in special education at Wheelock University. To do this, Mary C. Lyons negotiated with the Boston Teachers Union to convert paraprofessional slots to “instructional assistant trainee” positions. As part of their program, the Wheelock students work in schools for stipends of \$10,000 per year and participate in intensive coursework over holidays and summer. Wheelock sends a faculty member every two weeks to observe and discuss the trainee’s practice with the master teacher. The trainee’s stipend costs less than the \$18,000 in salary and benefits for a paraprofessional. The savings allowed the school to give each teacher an “instructional assistant trainee.” Where possible, the new instructional assistants

were recruited from the existing paraprofessional staff. While the trainee position represented a short term cut in pay, this position led to full-fledged certification as a special education teacher for these staff.

In addition, Mary C. Lyons contracted with teachers to cover “schoolwide” planning time. The “afterschool” teachers overlapped the regular school day by one hour. During this time, they managed the classroom along with the instructional assistant trainee. In addition to providing regular

teachers with planning time, this overlap provided a chance for after school teachers to transition from the regular academic day along with someone who had been with the students all day, thus allowing more continuity and better care for the children. The eight afterschool teachers, who were provided through a contract with a private nonprofit organization, specialized in behavior management and brought a wide range of experience with emotionally disturbed as well as gifted students. The principal worked closely with the contractor to specify the qualifications of these teachers, and the contract was contingent on the hiring of such exceptional teachers.

...Lyons school’s small size and intense staffing ratios created a highly personal environment for all students. The staff also created time to discuss each student’s progress as a team.

Secondary Schools

The traditional high school, with its departmentalized instruction and highly-segmented school day, offers many more opportunities for rethinking resource allocations than do elementary schools. We examined a typical comprehensive high school in New York City serving about 3,300 students.³ The school is considered a “good” school serving a largely middle- and working-class population of students. It had nearly as many special needs and Title 1 students as CPESS and was in the process of beginning to restructure its programs. At the time of the study, however, it used traditional staffing and scheduling practices.

As figure 4 shows, the sample high schools looked very different from the traditional high school on virtually every dimension measured. Although our analysis is focused on the use of instructional staff, it is worth noting that the traditional high school had many more non-teaching staff than the two restructured schools. Not including custodial and food service workers, more than 40 percent of its total staff had non-teaching assignments. These included 1 principal, 9 assistant principals, 13 secretaries, 10 school-based services specialists (social workers, psychologists, etc.), 3 librarians, 17 security guards, 22 non-teaching school aides, and 14 classroom-based paraprofessionals. In the restructured schools, just over 25 percent of staff had non-teaching assignments and most of them taught at least part-time (Darling-Hammond, 1997).

The traditional high school had one instructional staff person for every 14.7 students—and New York City staffing allocations would reduce the student load to 13 for a population of students like that

at International High.⁴ Because fewer than two-thirds of these instructional staff members taught full-time, however, class sizes averaged about 33. Special education, bilingual education, English as a Second Language, and Title 1 programs were administered separately, with generally smaller class sizes. The typical student attended school from 8:05 a.m. to 2:13 p.m. participating in seven different 42-minute classes with seven different teachers, plus one lunch period. Teachers taught five instructional periods a day, with two periods free from instruction: one used for planning and the other for rotating “building assignments” such as cafeteria duty or hall duty or other administrative or program responsibilities. Excluding these special duties, teachers routinely saw about 167 students per day.

By contrast, the two sample high schools began with resources roughly similar to the traditional school and ended with dramatically smaller group sizes and teacher loads. As noted, the first difference was allocating a greater share of resources to instructional staff rather than administrative and support staff. The second was assigning almost all instructional staff to work directly with students. As a consequence, all students experienced much smaller class sizes (18 at CPESS and 25 at International High), while their teachers also had much more planning and professional development time. Because teachers taught a smaller number of longer periods, pupil loads were also reduced: teachers at CPESS saw 36 students and those at International High saw 75 students in a given term. The schools achieved this by reducing specialization, reorganizing student groups and teaching structures, and investing heavily in professional development. The strategies the two

The traditional high school, with its departmentalized instruction and highly-segmented school day, offers many more opportunities for rethinking resource allocations than do elementary schools.

³ In a related study (Darling-Hammond, 1997), Darling-Hammond and colleagues also examined a smaller, more affluent suburban high school of about 1,600 students. However, the large difference in student populations between this school and the redesigned schools in New York City made this school inappropriate for the current analysis.

⁴ Because International High has a unique student population comprised of 90 percent Title 1 eligible and 100 percent limited English proficient students, an analogous traditional school could not be found for comparison. Instead, we used the New York City staffing guidelines, as outlined in the New York City publication *Comparative Analysis of the Organization of High Schools, 1992–93*, to estimate staffing for students identified for special needs programs.

Figure 4.—High performing versus traditional secondary school

| Resource allocation principles | School measure | Central Park East Elementary | International High | Traditional |
|---|---|------------------------------|--------------------|----------------|
| Reduction of specialized programs to provide more individual time for all in heterogeneous groups | a. Students per instructional staff member | 10.2 | 10.2 | 14.7/13* |
| | b. Students per full-time teacher | 13.3 | 15.8 | 23.6 |
| | c. Average size of regular instructional group | 18 | 25 | 33.4 |
| | d. Percent teachers in regular instructional groups | 89% | 100% | 70% |
| More flexible student grouping by school professionals | e. Percent students in target size grouping | 100% | 100% | 60% |
| | f. Average size of advisory group | 15 | 12 | 29 (home room) |
| Structures to create more personalized environments | g. Student loads per term | 36 | 75 | 167 |
| | h. Percent professional staff serving as instructors/advisors | 100% | 100% | 65% |
| Longer and more varied blocks of instructional time | i. Average length of instructional period (in minutes) | 120 | 70 | 42 |
| More common planning time for staff | j. Common planning minutes/week | 450 | 350 | 0 |
| | k. Length of longest planning period (in minutes) | 120 | 140 | 42 |

* A traditional high school that had a 100 percent Limited English Proficient student population like that at International would receive additional staff to reduce its student/teacher ratio for those students to 13:1.

SOURCE: Unpublished tabulations.

schools used reflected their instructional purposes and philosophies.

Reduced Specialization

CPESS reduced specialization in a host of ways in order to create smaller teacher-student loads and focus resources on academic subjects. CPESS follows the principles embraced by the Coalition of Essential Schools, one of which is that “less is more.” Instead of aiming for broad coverage of content, CPESS has organized its curriculum around five “Habits of Mind” which encompass the abilities to weigh evidence, take varying viewpoints into account, see connections and relationships, speculate about possibilities, and assess value. These goals are reinforced in every course and in a comprehensive portfolio assessment system. The school concentrates its resources on a common core curriculum in grades 7–10, and uses college and commu-

nity resources to expand curriculum options in the upper grades.

At the time of the study, all students took academic subjects in heterogeneous groups of about 18. Students in divisions I and II (grades 7–10) took two, two-hour academic courses each day, humanities and math/science plus a foreign language offered in a shorter period before school. All full-time teachers in these grades, with the exception of two special education resource room teachers, taught one of the two interdisciplinary courses. The resource room teachers helped students with their regular classroom work, thereby reinforcing rather than fragmenting students’ learning. Students and teachers told us that the extraordinary outcomes achieved at CPESS were made possible by these small class sizes and the continuity provided by (a) having a team of teachers stay with the same students for two

years (b) providing extra help to special needs students connected to their regular classroom work. In addition, teachers were grateful for opportunities to extend their disciplinary knowledge by planning together in subject area teams and to extend their knowledge of students by also working together in “house” teams organized around the teaching of shared groups of students (Darling-Hammond, Aness, and Falk, 1994).

In the Senior Institute (grades 11–12), the school reduced its need for specialization by working out advanced course-taking opportunities for students at local colleges to supplement required courses and electives offered in the school. All students took at least two college courses during their last two years of high school, along with an internship in a local business or community organization. These strategies expanded students’ academic and vocational opportunities while freeing staff time for the one-on-one advisement needed to support students in completing extensive research projects and the other portfolio entries they would defend before their graduation committees.

Language instruction and some electives were provided through outside contracts. Although students could opt to take more advanced courses in specific subjects, there was no tracking, no separate Title 1 programs, and no separate bilingual program. Instead of hiring guidance counselors, each teacher was responsible for counseling 12 students during scheduled advisory periods. The small size, personalization, and team organization also eliminated the need for attendance officers, deans of discipline, assistant principals, and supervisors, roles that deflect resources away from teaching positions in traditional high schools.

The organization of resources at International High also followed its educational mission—the education of recent immigrants—and its philosophy, which includes the following principles:

- Language skills are most effectively learned in context and when embedded in a content area.
- Successful educational programs emphasize rigorous standards coupled with effective support systems.
- Attempts to group students homogeneously preclude the way in which adolescents learn best (i.e., from each other).
- The carefully planned use of multiple learning contexts in addition to the classroom (e.g., learning centers, career internship sites, field trips) facilitates language acquisition and content area mastery.

The existence of clear school goals and a consensus about strategies enhanced International High’s ability to design a coherent, carefully configured organization. The school reorganized its programmatic resources around 12 interdisciplinary themes. Six self-managing instructional teams, called “clusters,” were composed of four to six teachers plus guidance and paraprofessional staff who developed two thematically based courses of study (e.g., Motion, Visibility), which integrated four subject areas (e.g., literature, global studies, mathematics, and physics). The team took responsibility for the total educational experience of about 75 students during a 13-week course of study. Students chose three of these thematic courses each year.

The existence of clear school goals and a consensus about strategies enhanced International High’s ability to design a coherent, carefully configured organization.

All teachers taught heterogeneous groups of students that included all native languages and all grades, economic levels and ability levels. The faculty integrated English as a Second Language (ESL) techniques into their content-area courses while providing students with opportunities to further develop their language skills with instructors outside the core curriculum and in learning contexts such as internships outside the school. The success of this strategy is illustrated by the fact that virtually all International High students pass the New York

State competency tests in English as well as other subjects, and virtually all are accepted to college prior to graduation. Teachers designed the cluster schedule because they felt that planning and teaching in interdisciplinary teams would enable them to have more influence on student learning. They found that the school's first cluster experiment produced much greater levels of student success than had independent classes, because teachers' efforts were jointly planned and cumulative, and teachers could deal with students' needs and problems in a concerted fashion (Darling-Hammond, Aness, and Falk, 1995).

In both schools, the integration of previously specialized resources, along with the investment of greater resources into teaching positions rather than nonteaching positions, translated into much lower pupil loads and more opportunity for individual student attention than in the traditional school. In addition to focusing resources on instructional positions, the sample schools used most of their teaching resources in one core academic program in which all students participated, rather than using special program resources for add-on remedial or special education programs. CPESS used 89 percent of teaching resources in its core instructional program, while International High used all staff in the core program, as compared with roughly 70 percent of teachers working in regular instruction in the traditional high school.

Smaller class sizes were also achieved by creating a broader role for professional staff in the restructured schools, rather than using specialists to

perform "non-classroom" functions. Staff acknowledged this tradeoff in a set of "understandings that underlie professional staff work at CPESS" which includes the following statement:

In return for smaller class sizes (maximum 20) and smaller total student rolls, teachers will work with students for a total of 22 hours per week in classes, advisories, or tutorials; conducting seminars; overseeing projects; giving lectures; or advising and coaching individual students (CPESS, 1991).

More Flexible Student Grouping

Reducing the number of programs, courses, and levels made it easier for the sample schools to control the size of instructional groups. As table 1 shows, although 64 percent of all classes in the traditional high school had 29 to 34 students, 21 percent of classes were smaller than 25. Class sizes were higher in regular education academic classes than in nonacademic classes.⁵ In contrast, CPESS and International High place all of their students in target size groups.

Even more flexible grouping strategies were found in CPESS's Senior Institute (grades 11–12), where teachers and students focused substantial attention on preparing the graduation portfolio and applying to colleges. Time was allocated to allow teachers to provide coaching and support for independent study. A typical teacher would teach two classes over about 12 hours per week. He or she would also spend 4 to 5 hours per week supervising independent projects, another 4 to 5 hours in

| Class size | Academic | All classes |
|------------|------------|-------------|
| 0–19 | 6 percent | 8 percent |
| 20–24 | 7 percent | 13 percent |
| 25–28 | 13 percent | 13 percent |
| 29–34 | 72 percent | 64 percent |
| Over 34 | 3 percent | 3 percent |

SOURCE: Unpublished tabulations.

⁵ New York City Schools, *Comparative Analysis of the Organization of High Schools, 1992–93*, p. 82–92.

advisory working with his or her 12 advisees on academic and personal concerns, and another 3 1/2 hours per week for one-on-one help to students. Class periods varied in length depending on their purpose. While students took courses and completed internships outside the school, teachers got time to work and plan together.

Structures to Create Personal Relationships

The sample schools were organized more like elementary schools than most secondary schools, featuring small teaching units and closer, more sustained relationships between teacher and student. In addition to the smaller class sizes, both sample schools used “advisory groups” as a key strategy for maintaining ongoing relationships with students. Each professional staff member worked with a group of 12 to 15 students and their families. The use of all professional staff, not just teachers, allowed advisory groups to be smaller than average class sizes. Advisory groups met for approximately 4 hours a week at CPESS, and for about 2 hours weekly at International High. Teachers and advisors used the time for individual study; to discuss health, social and ethical issues; and for individual and group advising and counseling. The advisor served as the “expert” on the student, meeting regularly with the family and other teachers to discuss the student’s needs and progress, coordinating parent conferences and the preparation of narrative assessments of student work.

Whereas all professionals in the two restructured schools worked on a regularly scheduled basis with groups of students, only 65 percent of the professional staff at the traditional high school had regularly scheduled contact with a continuing group of students. While guidance counselors and other support personnel worked intensively with some students, they did so on a reactive, usually sporadic basis that was not designed to create close, long term relationships.

Longer and More Varied Blocks of Instructional Time

In contrast to the traditional high school’s seven 42-minute periods each day, both restructured high schools created longer periods and more flexible schedules to accommodate more ambitious kinds of work and to allow more time for teachers’ to support student learning. At CPESS, students in grades 7–10 had two 2-hour blocks of humanities and math/science each day. Since these two teachers worked together as a team, they could vary the split of time between the two to accommodate daily lesson plans. In addition, one morning per week students spent 2 1/2 hours in a community service project while their teachers were engaged in curriculum planning. Other coursework, such as language instruction, took place in smaller (usually 1 hour) blocks of time. In the Senior Institute, classes varied in length from 1 to 2 hours, while advisement sessions, internships, and independent work time were scheduled for longer blocks of time to allow students to undertake extended work with adequate coaching and time for research.

... both restructured high schools created longer periods and more flexible schedules to accommodate more ambitious kinds of work and to allow more time for teachers’ to support student learning.

At International High, students typically had four courses each of which met for 70 minutes four times per week. They also had a 2 hour internship and an hour long seminar each week. Because each cluster of four teachers controlled their shared students’ entire time schedule during a 13-week cycle, they could vary time across classes each day as needed for the work in which students were engaged.

More Common Planning Time

Both sample high schools created structures that demand and allow much more common planning time. In addition to individual “prep” time, CPESS teachers spent on average 7.5 hours per week in scheduled common planning time. CPESS used four strategies to create this time. First, teachers met with their disciplinary teams for 2 1/2 hours of weekly

curriculum planning while students were in community service placements. Second, while teaching fellows and other professionals provided coverage, teachers had from 1 1/2 to 3 hours each week to meet with fellow “house” teachers and with students individually. Third, students’ hours were increased during the week so they could be dismissed at 1:00 p.m. on Fridays to create time for a weekly 2 hour staff meeting. Finally, as its governance plan states, “the full staff agrees to meet during hours when the students are not in attendance to complete necessary business.” In addition to the Friday meeting, teachers attended a regular Monday meeting from 3:00 p.m. to 4:30 p.m.

At International High, teachers had 140 minutes each week to plan with their cluster while students participated in college courses and other activities. During a half day each week set aside for club activities for students, teachers staff-initiated professional development. In addition, teachers had a 70 minute individual planning period each day which often coincided with that of other members of their team. These models offer stark contrast to the traditional high school model in which teachers had one or two separate 42-minute periods free from instruction, one often devoted to nonacademic duties and the other organized as an individual preparation period.

Creative Definition of Staff Roles and Work Day

Both of the sample schools have made many changes to the roles of teachers and the typical organization of the teacher work day in ways that enable greater personalization for students. They focused teaching resources on core academic subjects by contracting with outside providers for electives and non-academic subjects. CPESS increased resources for teachers by incorporating counseling and advising into the teaching role. In both schools, teachers are involved in curriculum and assessment development, hiring and evaluation of staff, schoolwide decisionmaking, and staff develop-

ment. These broader professional roles not only reduce the need for nonteaching specialists assigned to manage and oversee teaching, they also enrich teachers’ knowledge and skill by giving teachers continuous opportunities to reflect on their teaching and learn from one another, thus expanding the expertise available in the school (Darling-Hammond, 1997).

Policies, Regulations, and Contractual Issues

To accomplish these things, the sample schools directly challenged policies, regulations, and collective bargaining agreements. First, most of the schools changed the contractually defined teacher work day and contractual rules for such matters as seniority transfers. Second, in breaking down barriers between programs, age groupings, and subjects, they confronted staffing formulas, program administration rules, and, sometimes, teacher licensing categories. Third, many of these schools redefined both teaching and non-teaching positions to create new jobs which do not fit neatly into existing contractually defined categories.

Collective bargaining agreements in most districts clearly define the teacher work day, outlining the hours teachers are required to work and limiting the number of required afternoon and evening meetings. Most go further to specify the number of minutes of time teachers must have free for lunch and planning activities, and some limit the number of hours in a row teachers can be involved in instruction, making it difficult to create connected blocks of planning time. It is easy to understand the reasons for these provisions, but it is also clear that new strategies are needed for schools in which teachers jointly develop curriculum and manage their own and students’ time.

As teaching jobs are broadened, schools can run into state, district, and collective bargaining restrictions. Using teachers across subjects or programs

Both of the sample schools . . . focused teaching resources on core academic subjects by contracting with outside providers for electives and non-academic subjects.

can require waivers. Mary C. Lyons use of three special education teachers and three regular education teachers to teach integrated classrooms of special needs and regular education students required waivers from the Boston teachers contract and Massachusetts state certification laws. The principal argued that she knew how to identify individuals with experience and disposition to handle both special education and regular education students. She developed a plan to create a team structure which took advantage of teachers' diverse skills and a professional development plan for each teacher and for the entire school, so that they would develop the skills they needed.

Schools also can run into certification problems in moving to interdisciplinary instruction, because many collective bargaining agreements and state regulations require teachers to hold certification in more than one subject to teach humanities or math/science in middle or high schools. Finding individuals with the subject and pedagogical knowledge to combine these subjects effectively is obviously critical to successful interdisciplinary instruction. Although certification in both fields is one indicator of this ability, it is not the only means for developing expertise in a second field. At CPESS, teachers with a background in one field plan in curriculum teams (a math/science team and a humanities team) that provide the additional disciplinary expertise they need to handle the breadth the core courses require.

New job positions and hiring arrangements also confront some collective bargaining agreements and traditional allocation guidelines. For example, Mary C. Lyons and CPESS created a different kind of Instructional Assistant by using teaching interns—graduate students who are preparing to become teachers—instead of paraprofessionals or untrained support staff. In addition, three of the sample schools received waivers from collective bargaining agreements to use outside contractors for specific kinds of instruction.

Selection and retention of teachers with the required qualities and experience to match these school designs is critical to their success, yet many districts treat staff as interchangeable when they make assignments and move staff on seniority transfers. Some districts have solved this problem by creating alternative personnel tracks for specially designated schools. Cincinnati has done this for Paidea and Montessori schools. In Boston, schools negotiate control over the hiring process on a position by position basis. In New York, recent contract negotiations have allowed for teams of teachers, including principals and union representatives, to select their new colleagues in the growing number of schools that have a distinctive missions. With the recent creation of over 100 new small schools in the city joining the substantial number of longer standing alternative schools, this provision paves the way for widespread use of new staffing models.

Finding individuals with the subject and pedagogical knowledge to combine these subjects effectively is obviously critical to successful interdisciplinary instruction.

Finally, teacher contracts, district policies and state regulations often define class size maximums by program, grade level, and sometimes subject. State guidelines specify the size of classroom for students at each level of special education classification. Schools can depart from these regulations if parents, teachers and special education professionals agree to an individual education plan that educates the student in a larger, more inclusive setting. Designs like that used at the Mary C. Lyons school require intense communication with students

and parents to create understanding of the new approach and strategies to insure appropriate additional support for the students. They also demand that state and district officials work with schools to allow educationally sound designs.

District student and teacher assignment policies can frustrate attempts to use teachers differently. In the sample districts, schools moving students from more restrictive special education settings into the regular classroom sometimes faced a potential loss of teachers because special education staff were allocated based upon the number of students requir-

ing separate education. If schools integrate students back into the regular classroom and resources are therefore reduced, the regular teacher in whose class the special education student now spends most of his time receives no extra resources and no reduced student load. In these cases, schools can find that regular education classrooms grow more unruly and crowded while the case loads of special education teachers decline. Over time, schools should find ways of shifting resources back into the classroom without losing special education expertise. To respond to this problem, Boston has adjusted its staffing formula to allow schools to use the resources for special needs students in inclusive settings.

Conclusion

Although these five high performing schools look very different from one another, they have all redesigned the way they allocate teaching resources to meet student needs and to create the time teachers need to implement a new vision of schooling. They demonstrate how schools can reallocate resources to implement new designs. The framework presented here aims to provide researchers and practitioners with a way to examine systematically the possibilities for reallocation and to measure their impact. Changing school organizations to better fit an instructional vision will require schools to confront long traditions and a host of state, district, and union policies and practices that conflict with many of the changes outlined here. These barriers can loom large. But, the biggest constraint may be lack of vision about the concrete changes in school organization that can create a more professional organization and improve student achievement. This paper aims to provide some clear, detailed examples schools might use to develop such a vision, including goals for student achievement along with educational strategies and an organization to accomplish these goals.

The variety of models presented here suggests that resource reallocation and the design of an instructional vision and strategy are intertwined. There is little rationale for restructuring resources without an underlying educational design. At the same time, none of these models could have accomplished their goals without making changes in the use of resources. As these models and others are tested against evidence of improved student performance, one could imagine states and districts working with schools to adopt proven designs, through a conscious process of changing resource allocations, practices, and regulations at each level. As part of the process of choosing an appropriate design, schools might undertake a comprehensive review of how their practices, resources, knowledge and skills would need to change to implement a new model. Principles of resource allocation and indicators of their use could form the basis for tools

which help schools and districts understand their progress. Districts could then organize their work to support these plans and develop strategies for helping schools make changes. This would include changes in state and district policies that may produce obstacles to alternative forms of organization.

The schools studied here have only touched the surface of opportunities for rethinking the way school resources are used; they have largely worked within existing salary structures and have not much explored the use of technology in the classroom. Nevertheless, they foreshadow the many ways schools may rethink existing resources to create more personalized education for students and more professional responsibility and growth for teachers.

Changing school organizations to better fit an instructional vision will require schools to confront long traditions and a host of state, district, and union policies and practices that conflict with many of the changes outlined here.

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