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Time and Attention in Urban High Schools: Lessons for School Systems

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April 2010

Acknowledgements:

Thanks to Randi Feinberg, Naomi Calvo, and Simmons Lettre of ERS for their help preparing this paper. Thanks as well to Jennifer Davis and Fran O'Reilly from the National Center for Time and Learning for their comments and suggestions. And we gratefully acknowledge the Bill & Melinda Gates Foundation and the Carnegie Corporation of New York for supporting this research.

Introduction

The Vision: Districts direct time and individual attention to improve student learning

There is no disputing that for high school students to be college and career ready, they need adequate time to learn, and individualized attention to meet each student's academic goals, learning styles, and social needs (Miles and Frank 2008). Over the past decade, Education Resource Strategies (ERS) has partnered with urban schools and districts to improve their use of people, time, and money in addressing students' most pressing needs. Through this work, we have studied many high-performing schools that are using every staff member, dollar, and minute in a way that is improving student learning. Specifically, these strategic schools:

- Give **individual attention** by:
  - Assessing student learning to adjust instruction.
  - Creating smaller group sizes and reducing teacher loads.
  - Organizing structures to foster personal relationships between teachers and students.
- Use **student time strategically**, emphasizing core academics[1], by:
  - Maximizing time, including longer blocks of uninterrupted time that students spend on core academics.
  - Varying time and instructional programs to ensure that all students meet the standards (Miles and Frank 2008).

The Reality: Districts often do not help schools use time and individual attention to support learning

Although individual schools have achieved dramatic results following these strategies, we see few cases where whole systems have made sustained improvement. To understand why systems fail where individual schools succeed, we must first be able to picture what is happening with time and attention in school systems. This paper aims to describe—using detailed data not usually available to researchers—the allocation of time and individual

[1] In this paper "Core Academics" refers to: English language arts, math, science, social studies, and foreign languages.

attention in high schools in six urban school districts. By comparing the patterns we see with best practices, we explore whether urban school systems' time and attention practices might explain why we don't see system-wide transformation. We also hope to provide concrete recommendations on how districts can bring their time and attention practices closer to those we see in highly successful urban schools.

ERS used its extensive resource database to generate the findings in this paper. Between SY04 and SY06, we worked closely with six urban districts to map how they were using their people, time, and money:

- Atlanta Public Schools (APS), 2005–06
- Chicago Public Schools (CPS), 2005–06
- District of Columbia Public Schools (DCPS), 2004–05
- Los Angeles Unified School District (LAUSD), 2005–06
- Rochester City School District (RCSD), 2004–05
- St. Paul Public Schools (SPPS), 2005–06

As with all our partner districts, we created an integrated view of their payroll files, detailed budgets, and course schedules—including information on human resources, special education costs by disability, and student performance evaluations. We supplemented this data with interviews at all levels of each district in the effort to show these districts their starting points, individually and relative to each other. The findings for many of these individual districts are available on our website (www.EducationResourceStrategies.org). The data has been compiled (and, where appropriate, adjusted for inflation or geography) in a comparative database that enables us to compare resource use in these six urban districts.

In addition, we conducted in-depth case studies on nine "Leading Edge Schools". These high schools stand apart from other high schools across the country in designing new ways to "do school" while outperforming most high schools in their local districts (Shields and Miles 2009). This research gave us a clearer, quantified picture of how strategic schools use their resources to improve learning. According to the study, the practices that lead these schools success include:

- Clearly defining an instructional model that reflects the schools' vision, learning goals, and student population and making tough trade-offs that prioritize use of people, time and money to support that vision.
- Increasing the overall amount of time students spend in school by an average of 20 percent more than local district schools.
- Devoting an average of 233 equivalent days more to core academics than traditional district schools, primarily by expanding core academic expectations and individual and small group academic support.
- Building a school schedule that strategically advances the school's instructional model and addresses student needs.

- Adapting their strategies in response to lessons learned and changing student needs and conditions.

For more details on methods for this analysis, see Appendix 3.

This paper uses a comparative data set to answer two important resource questions regarding time and individual attention in urban high schools:

- How did schools in these ERS partner districts allocate time and individual attention to support student learning?
- How can these and similarly organized districts change to adopt time and attention practices that are frequently seen in high-performing schools?

Summary Findings Regarding Time and Attention in Six Urban School Systems

Our study of high schools in six urban school systems yielded the following findings regarding time and attention.

FINDING 1: Student time in school varies by up to 30 percent across districts.
This difference translated into a difference of over 50 days per year, or almost an extra year of high school, between students in the two districts with the most and least time.

FINDING 2: Time allocation is strikingly similar across districts because it is driven by traditional graduation requirements and rigid structure of school schedules.
Despite the variation in the amount of student time available, the districts *used* their scheduled time in strikingly similar ways. Overall, students spent 66–73 percent of scheduled instructional time on the core academic subjects of English language arts, math, science, social studies, and foreign language, with English language arts (18–20 percent) slightly higher than other core subjects. This was true regardless of the amount of time in the school day.

FINDING 3: General Education class sizes and teacher loads are not lower for core academic subjects, high needs students, or foundation grade levels.
These six urban districts did little to reduce class sizes or teacher loads by subject or grade to give attention to high-priority subjects or students. In half the districts, the smallest class sizes were found in upper-grade electives.

FINDING 4: Schools aren't using data to adjust time and attention.
At the high school level, urban school systems did not continuously adjust time and attention throughout the year based on ongoing (formative) assessment of student needs and student progress.

FINDING 5: Struggling students get extra attention primarily through special education placement, which can drain resources from general education and

instructional support.
These districts gave added support to struggling students primarily by placing them in special education settings where students had much smaller class sizes. This shifted tremendous amounts of resources (beyond special education revenues) away from general education and other programs for instructional support.

Recommendations

To improve time and attention practices across whole systems of urban high schools, we urge district leaders to consider the following:

- **Add time** to the school calendar for all schools, or support individual schools' efforts to extend the school calendar, especially where the current school year is shorter than 1,260 hours (an average of seven hours per day for a 180-day year).
- **Help teachers adjust interventions**, based on student progress, throughout the year by:
  - Investing in ongoing assessment tools to measure student learning.
  - Ensuring that the information is used to change teaching practices.
- **Seek first to serve struggling students in general education programs**, to prevent their placement in special education. And integrate special education resources (such as resource teachers) with the general education program, through use of push-in programs and by ensuring that teachers who share special education students also share collaborative planning time and instructional materials and approaches.
- **Give school leaders the professional development, tools, support, and authority** they need to organize all their people, time, and money in ways aligned with their school's instructional vision for meeting student needs.
- **Improve collection, reporting, and use of student-level time and attention data** so that districts and schools can (a) better give struggling students the time or attention they need in high-priority subjects and (b) know that those students are receiving what they need.

Main Findings

FINDING 1: Student time in school varies by up to 30 percent across districts. This difference translated into a difference of over 50 days per year, or almost an extra year of high school, between students in the two districts with the most and least time.

Nationally, on average, students attend school for 180 days per year, 6.5 hours per day, for a total of 1,170 hours per year (Silva 2007). The issue of "how much time is scheduled and spent on core academic subjects" came to national attention with the publication of *A Nation at Risk* (National Commission on Excellence in Education 1983), which showed that U.S. students scored lower than international students on academic subject tests. The achievement gap between rich and poor students was also higher in the United States than elsewhere. Time spent in the classroom was singled out as one probable explanation for this performance gap.

Figure 1 shows the length of the school day, and school days per year, for the six districts we studied, and an estimate of the national average of time spent in school. For comparison, the table also includes the results from a recent study of the nine small high schools dubbed "Leading Edge Schools".

FIGURE 1. Summary Classroom Time, by District

District	School days per year	School day in hours	School hours per year
Chicago Public Schools (CPS)	170	5 hrs, 40 min	963
Los Angeles Unified School District (LAUSD)	180	6 hrs, 10 min	1,110
St. Paul Public Schools (SPPS)	175	6 hrs, 30 min	1,138
District of Columbia Public Schools (DCPS)	180	6 hrs, 30 min	1,170
Rochester City School District (RCSD)	181	6 hrs, 40 min	1,207
Atlanta Public Schools (APS)	180	7 hrs*	1,260
National District Average	*181*	*6 hrs, 30 min*	*1,170*
Leading Edge Schools (LES)	179	7 hrs, 12 min	1,276

*Minimum; many APS schools have extended-day programs.

In the six districts we studied, the amount of time that secondary school students spent in school varied 30 percent, from 963 hours per year in Chicago to 1,260 in Atlanta (Figure 1). That meant that Atlanta students spent the equivalent of **50 more days per year** in school than did Chicago students. To put this in perspective, it equates to an extra year of high school, or more than 3.5 extra years of schooling during every child's K–12 career (based on a six-hour day).

On average, students in the Leading Edge Schools spent more time in school than did students in any of the partner districts in this study. The 1,276 hours per school year shown for these Leading Edge Schools is 10 percent higher than the national average and 20 percent more (on average) than the time spent by each Leading Edge Schools' home district.

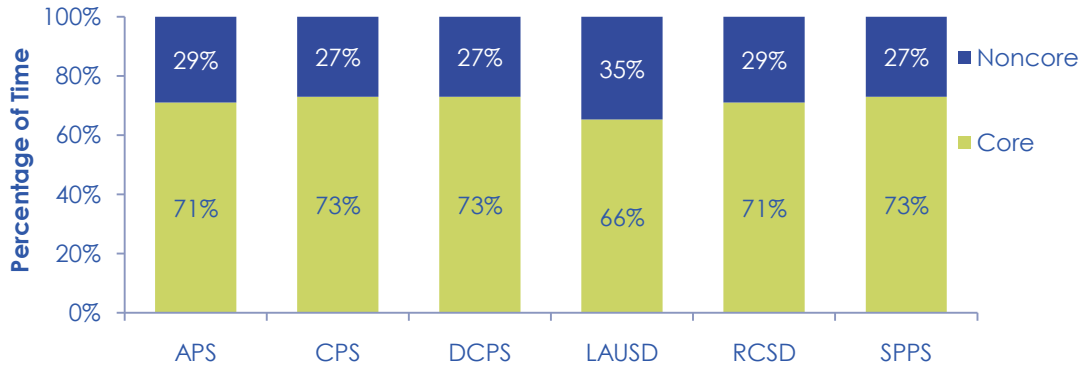
While adding incremental time to the school day may not cost as much per hour as the time that is already on the school calendar (Miles and Roza 2008), it can still be prohibitively expensive. Further, adding school time without putting structures and supports in place for schools to use that time effectively is not likely to generate the desired result. For example, for teachers in low-capacity schools to teach double periods of math, they would need professional development and coaching on how to maximize that additional time, hold the students' attention, and sequence lessons across the year. Before creating additional time, many school systems will need to examine closely how much time they already have, and determine whether they are making the most effective use of that time.

FINDING 2: Time allocation is strikingly similar across districts because it is driven by traditional graduation requirements and rigid structure of school schedules. Despite the variation in the amount of student time available, the districts *used* their scheduled time in strikingly similar ways. Overall, students spent 66–73 percent of scheduled instructional time on the core academic subjects of English language arts, math, science, social studies, and foreign language, with English language arts (18–20 percent) slightly higher than other core subjects. This was true regardless of the amount of time in the school day.

Overall Use of District Time: While the total available time is important, it is also critical to measure how that time is actually used. To do this, we examined time scheduled for instruction, based on course-level information in our district database. In most schools and districts, instructional time ranged from 84–88 percent of total available school time. Of this instructional time, we distinguished between core academic and noncore academic classes, with core academic subjects defined as English, math, science, social studies, and foreign language.

On average, urban high school students spent 70 percent of their instructional time in core academics (see Figure 2). This ranged from 66 percent in Los Angeles to 73 percent in D.C. Comparing D.C. and Los Angeles, we find a meaningful difference of about 20 days per year of core academic time between the two districts. Over a four-year high school career, this means that D.C. students spend the equivalent of 80 more school days focused on core academic subjects than do their Los Angeles counterparts. For comparison, the nine leading-edge schools we recently studied organized their time so that over a four-year high school career, students experienced an equivalent average of 233 days more on core academics than other schools in their districts (Shields and Miles 2008).

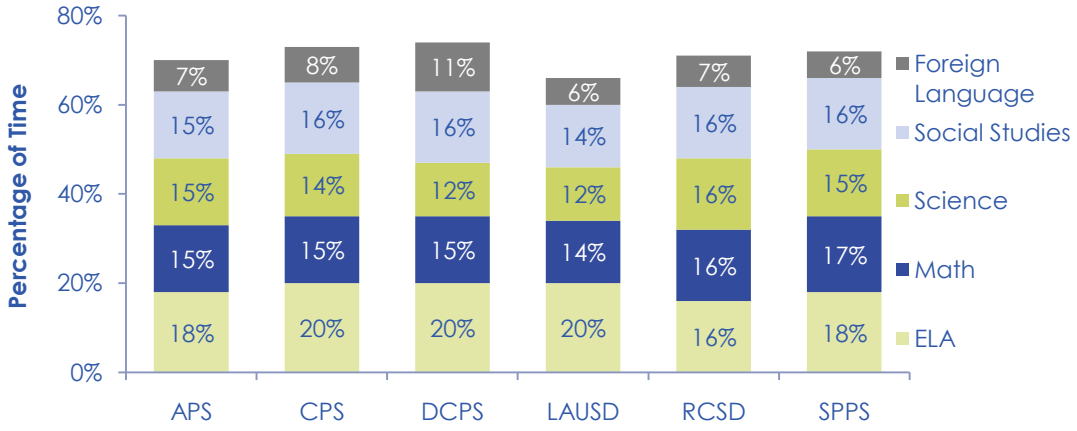
FIGURE 2. General Education Instructional Time, by Category



Note: Percentages calculated from total of core and noncore instruction. General education courses only.

We also asked how much time students spent on subjects such as English language arts (ELA) and math, which form the basis for excellence in other subjects. To examine how schools used this core academic time across six districts with different amounts of overall available time, we compared the percentage of instructional time that students spent on each subject. In Figure 3, we see that the largest segment of core academic time was devoted to ELA (about 19 percent), followed by math, science, and social studies (approximately 15 percent each). Foreign language,

FIGURE 3. Core Academic Time, by Subject (as a percentage of instruction time, grades 9–12)



Note: Percentages calculated from total of core and noncore subject instruction.

which is typically required for only two to three years, comprised only 3–9 percent of student time. Using a typical six-period schedule as a model, we would expect to see students spending 17 percent of their time in each of six subjects, including ELA. But the data shows that each district except Rochester did devote slightly more time to ELA, allocating an average of 19 percent of students' time to that subject. This was largely due to state graduation requirements (see Figure 4).

Examining the number of courses taken: The percentage figures discussed in Figure 3 may not be easy to interpret. In Figure 4 we convert them to look at the average number of classes a student might take during a four-year high school career. For comparison, we also include an average of state graduation requirements for these districts.

FIGURE 4. Number of Courses Taken per HS Student (over four years)*

Courses Taken							Graduation Requirement
Subject	**CPS**	**DCPS**	**LAUSD**	**RCSD**	**SPPS**	**APS**	**Average**
ELA**	4.9	4.9	4.8	3.9	4.4	4.3	3.9
Math**	3.6	3.5	3.4	3.9	4.2	3.7	2.7
Science**	3.3	2.8	2.9	3.7	3.7	3.7	2.5
Social Studies**	3.8	3.9	3.4	3.8	3.8	3.6	2.8
Foreign Language**	1.8	2.6	1.4	1.7	1.5	1.8	1.2
Art/Music	1.6	1.9	1.4	2.1	1.9	1.8	†
PE/Health	2.6	1.8	2.4	2.0	1.6	1.9	2.5
Vocational	1.9	1.7	n/a***	2.1	1.9	1.3	†
Other	0.5	0.9	4.6***	0.8	1.0	1.9	†
Total	24.0	24.0	24.0	24.0	24.0	24.0	18.6

*Estimated from single-year snapshot by assuming six instructional classes per day for four years.
**Core academic classes as defined by this study. ***Vocational classes included in from Other.
†Not reported here due to incompatible categories.

Figure 4 suggests that in many of these districts, students take, on average, one more class than is needed to graduate. In most districts, this is true in English, math, science, and social studies. However, note that the course failure rate in these districts is about 20 percent, which means that students take five courses in order to pass four. So, if we subtract out failed courses, these districts do not actually spend more time in core academics than necessary to meet state requirements.

We did see some efforts to "accelerate" the learning for struggling students to help them catch up with their peers. Typically, this consisted of "double dosing" with English or math classes for incoming freshmen. Summer school, after-school, and tutoring programs, while growing at the elementary school level, are used less at the secondary level, affecting as few as 2–3 percent of high school students in some districts[2]. Comparing these efforts to the amount of time that students spend in credit recovery or repeating failed courses or grades, ERS estimates that 85 percent of additional core academic time given to high school students is solely to make up ground lost after students reach high school.[3] In no case did we find a district-wide program that allotted enough time accelerating students who were multiple years behind on entering high school for them actually to catch up with their peers. By contrast, the Leading Edge Schools increased graduation requirements.

[2] No Child Left Behind Act, GAO-06-758 2006
[3] Estimate based on 6 percent grade retention rate and 20 percent course failure rate.

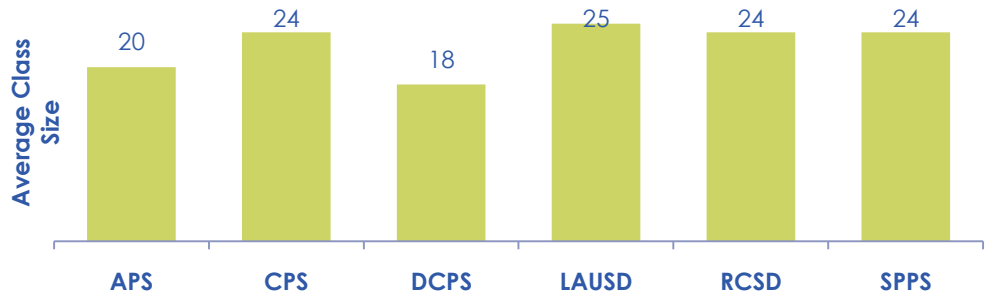
While the overall story is that little was done to devote more time to core academics than to other subjects, we should point out that, like the, most of these urban districts did increase their graduation requirements above the state requirements in at least one core academic subject. This did not typically require a lengthening of the school day. One way to increase credits earned is to divide the existing school day into the smallest possible units that are sufficient to earn Carnegie units (a widely used standard based on the amount of time spent in a course). For instance, Chicago, with its notoriously short school day, *increased* the number of ELA and math courses that students took, by rescheduling each day into seven 40-minute periods.

FINDING 3: General Education class sizes and teacher loads are not lower for core academic subjects, high needs students, or foundation grade levels.
These six urban districts did little to reduce class sizes or teacher loads by subject or grade to give attention to high-priority subjects or students. In half the districts, the smallest class sizes were found in upper-grade electives.

Individual attention and class size: Generally, when people think about providing individual attention, one of the first strategies that comes to mind is class size. While the research suggests that across-the-board class size reduction is not a consistent determinant of improved student performance (Hanushek 1997; Mosteller 1995), our experience shows that strategically adjusting class size in specific grades, subjects, or student populations may be a better way to leverage this strategy in a way that achieves goals for student learning. While there is no magic number for the perfect class size, high-performing schools are more likely to selectively adjust class sizes to affect specific student types, grades, and academic needs—for instance, to reduce class sizes significantly in English for 9th grade students—than to slightly reduce all class sizes for all grades all day long.

Class size and student type: Overall, high school class sizes ranged from 18–25 students (see Figure 5). While this dramatic difference is explained in part by the overall funding available to the district, the funding level alone does not tell the whole story. Some districts make explicit policy decisions that have a large impact on overall class sizes. For instance, despite having a high overall funding level, Rochester had higher class sizes because the district spent significant dollars to fund instructional support and other programs to increase teacher quality rather than focusing on reducing general education class sizes.

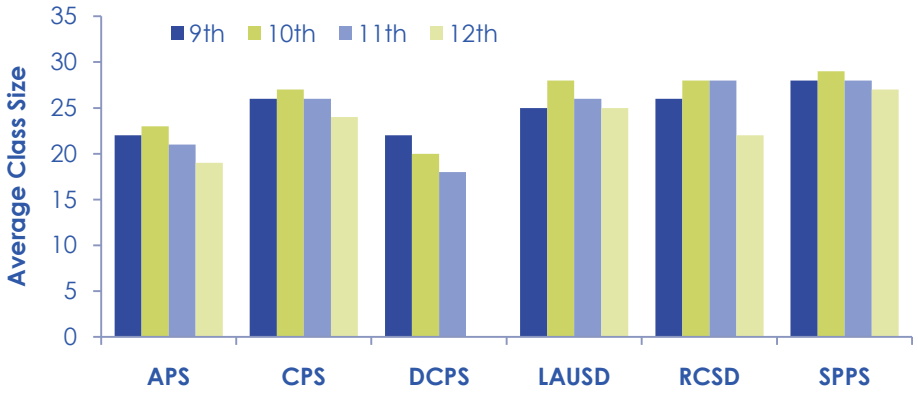
Figure 5. Overall Class Sizes, by District



Note: Includes students with disabilities courses taken in general education high schools

Class size, grade level, and subject: For students served in the general education population, school districts did not differentiate class size by grade. The small variations we did see tended to be skewed toward 12th graders getting the lowest class sizes, which, at least based on interviews or written strategy statements, did not seem to be the intent of district leadership (see Figure 6). Rather, typically, upper grades have more elective options and may also have fewer students.

Figure 6. Secondary General Education Class Sizes, by Grade



Note: Data for 12th graders was limited in DCPS and so excluded

Also, these six districts did not vary class size systematically by subject. While many schools strategically reduced class sizes in certain subjects or for certain groups of students, overall, core academic classes in the six districts were not smaller than noncore academic subjects (see Figure 7). In fact, when we exclude PE (which is typically staffed at a much higher class size), the partner districts' average noncore class sizes were significantly smaller (22) than core class sizes (26). This was especially true in upper-grade elective classes, where teachers tend to teach very small sections of highly specialized classes, such as French V. Overcoming this trend may require a deliberate strategy to consolidate elective options. (Appendix 2 contains a subject-grade breakout of class sizes for all six districts.)

Figure 7. Average Class Size, by Subject

Area	Subject	APS	CPS	DCPS	LAUSD	RCSD	SPPS	AVG
Overall								
	Core & Noncore	21	26	19	28	28	27	26
	Core	21	26	20	28	28	28	26
	Noncore	21	28	16	29	29	24	26
	Noncore (w/o PE)	21	24	15	27	24	22	22
Core								
	ELA	20	25	19	25	28	28	26
	Math	22	26	21	29	26	28	26
	Science	21	26	20	29	28	29	27
	Social Studies	22	26	21	29	29	29	26
	Foreign Language	19	25	21	27	25	23	24
Noncore								
	Art/Music	22	28	15	29	26	23	24
	PE/Health	24	38	21	36	36	29	35
	Vocational	19	22	16	22	22	21	21
	Computer Literacy	21	8	15	26	26	23	20
	ROTC	17	20	11	26	26	26	20

Note: Average class sizes across grades 9–12 in general ed. schools, excluding special education and ELL classes.

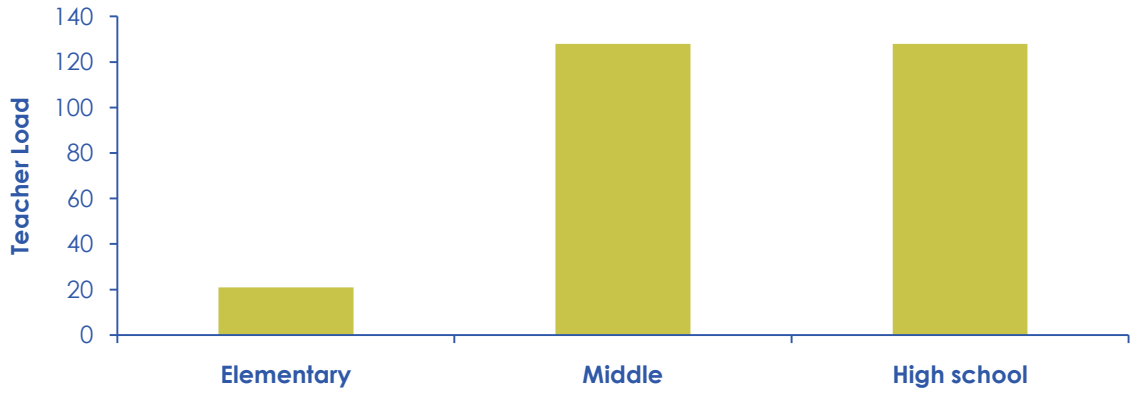
Class size and academic need: We attempted to determine whether districts reduced core class size for students with greatest academic need. Unfortunately, districts often give their remedial classes names that do not reflect and occasionally hide the remedial status by not calling them "remedial." Thus, we were unable to study this as precisely as we would have liked. But by examining courses that we knew were remedial (e.g., upper grade pre-Algebra), we discovered that the neediest students in a given academic subject were quite often pushed into classes with the most advanced special education students, during times when they were not receiving special education interventions. The class sizes for these mixed classes (class enrollment 20–40 percent special education students) were often the same as, or higher than, other classes in the same subject. Moreover—anecdotally, at least—these classes were often taught by teachers with expertise in classroom management but with little experience or certification in the academic subject being taught. While integration of special education and general education students is essential. Care must be taken to ensure that these students receive the time and attention and quality instruction that they need. More research is needed to shed light on this important potential trend.

The primary way these six districts invested in individual attention was by placing students in categorical programs for English language learners and students with disabilities—a topic we will examine in greater detail in Finding 5.

Individual attention and teacher load: While concerns about individual attention often seem riveted to the issue of class size, teacher load may be a more important indication of the ability of teachers to individualize instruction for their students. We define teacher load as the number of students a teacher sees over the course of a term. In contrast to class size, teacher load can often be changed for very little cost by adjusting the number and length of classes taken each year (e.g., double blocks of English language learners or math).

Typically, the teacher load is very low in elementary schools because teachers keep a group of students all day long. As students move to secondary school, teacher load rises. In these six urban school systems, the average teacher load rose by over 100 students, from approximately 21 in elementary schools to 128 in high schools (see Figure 8).

FIGURE 8. Rise in Teacher Load from Elementary to High School
(average of six urban school systems)



Source: ERS analysis

Teacher load can potentially have a large impact on the degree of individual attention that students receive, since a teacher who sees 150 students over the course of the day will know her students less well and will have less time to devote to them than will a teacher who sees 80 students for a longer period per day. Higher teacher loads have implications for the time a teacher has to grade each student's work, reflect on student performance, and prepare for lessons. Lower teacher loads allow teachers more time to form relationships with their students and to reflect on any specific needs. In fact, the Leading Edge Schools reduced teacher loads down to an average of 75 students, through block and semester schedules that allowed teachers to teach fewer periods per day, and through smaller class sizes (Shields and Miles 2008).

By contrast, these six urban districts had an average teacher load of 128 students, with a low of 92 in D.C. and a high of 161 in St. Paul (see Figure 9). High and low teacher loads reflect decisions not only on class sizes but also on the number of district classes taught each term. For instance, when teachers teach fewer than four groups of students each term, teacher loads are lower. When teachers teach five or more groups of students per term, teacher loads rise sharply.

FIGURE 9. Average Teacher Load, by Subject

Area	Subject	APS	CPS	DCPS	LAUSD	RCSD	SPPS	AVG	LES
Overall	Core & Noncore	106	127	92	151	129	161	128	82
	Core	109	125	98	155	110	173	128	80
	Noncore	99	133	81	148	162	134	126	84
Core	ELA	104	124	91	128	111	166	121	82
	Math	116	117	95	160	100	178	128	79
	Foreign Language	110	128	95	158	117	183	132	*
	Science	110	128	110	165	114	190	136	*
	Social Studies	106	127	104	161	104	141	124	*
Noncore	Art/Music	112	142	74	172	139	141	130	*
	PE/Health	94	186	116	152	251	154	159	*
	Vocational	74	97	76	154	102	121	104	*
	Computer Literacy	107	88	79	165	136	127	117	*
	ROTC	62	89	39	96	110	112	85	*
	Internship	92	70		41	54	102	72	*

Note: Grades 9–12 for all districts except Rochester (7–12). Teacher load is defined as the total number of students assigned to a teacher's classes for fall semester. Excludes SWD and ELL classes.
*Data not broken out by individual subjects except in ELA and math.

FINDING 4: Schools aren't using data to adjust time and attention.
At the high school level, urban school systems did not continuously adjust time and attention throughout the year based on ongoing (formative) assessment of student needs and student progress.

Research suggests that one of the best ways to provide individual attention is to adjust instruction continuously throughout the year, based on ongoing (formative) assessments of whether students have mastered the material just presented (Black and Wiliam 1998). Other research indicates the importance of teacher collaboration or of expert content support. ERS believes that time and attention can be most productively targeted to meet student needs when teachers collaboratively review student work using common rubrics and receive expert support to help them adjust instruction accordingly.

It may be instructive to start by discussing how this works in elementary schools. Many elementary schools organize their faculties into collaborative teacher teams that jointly

discuss student work with expert support and adjust instruction accordingly. When students don't learn, teachers often put them in smaller groups or give them additional time.

In traditional high school structures, it is far more difficult to continuously adjust time and attention using small groups, for many reasons. First, high school teachers see many more students in a day, making it harder to customize learning for individual students. Further, because of the departmental structure of high schools, teachers often do not have collaborative planning time with others who share the same group of students or are giving the same assignments. Also, districts rarely provide rubrics for teams of teachers to discuss and adjust instruction. And finally, flexible, ability-based grouping and regrouping is more difficult in high schools than in elementary schools because students are grouped by courses that last at least a quarter of the school year, if not for the entire year. In elementary schools, kids can change ability-based groups at any point, depending on their progress.

But none of this excuses high school teachers from adjusting their instructional practice based on their students' progress or lack of progress. Individual attention is about more than small group sizes. It is about finding ways to motivate students' efforts and hold the teachers accountable for engaging students, to make lessons personal, clear, and relevant, and to repeat them often enough that students can learn the material.

True individual attention in an academic setting begins with an understanding of whether students are actually learning the curriculum, and it requires teachers to adjust practice based on the lessons learned. All districts almost certainly administer assessments that can be called formative. Formative assessments can include homework that is scored according to a common rubric, district-wide tests or other measures by which teachers can determine whether or not their students mastered the material presented.

In all districts, we found schools and teachers who worked systematically to adjust instruction throughout the year in response to student progress. But overall, none of the six school systems had effectively implemented a systematic approach that included the following three elements, which we believe are key:[4]

1. High schools regularly use standards-aligned assessments (formal and informal) in English and math that align with each school's curriculum and pace.
2. The district provides collaborative planning time for teachers to review student work together, using a common set of rubrics and tools that allow for comparison of student progress.
3. Expert support is provided to teachers to help them adjust instruction, based on the review of student progress toward standards

[4] ERS recognizes that there is not any particular study that "proves" that having all three elements—collaborative time, formative assessments and expert content support—is better than any one element individually. In our work with urban districts, though, we have found that teachers need time and support to properly implement formative assessments. Also, expert support and collaboration time are each important factors in improving teaching quality and helping teachers learn continuously from each other. We strongly encourage districts to implement all three elements of a formative assessment system.

Atlanta had the most complete system for assessing student progress and adjusting instruction of all the districts we studied. Although the district was just beginning to implement the system in high schools, the high school strategy was informed by a very robust elementary strategy that seems informative. Atlanta elementary school students were tested every six weeks in core subjects, using formative assessments explicitly aligned to state standards. Teachers received the results quickly. Grade-level teams of elementary teachers conducted weekly collaborative planning time with the help of instructional support coaches (typically at least one per school), who helped them identify struggling students for a "hot list." They also suggested instructional adjustments where appropriate. The lowest-performing schools had as many as three instructional support coaches.

Model teacher leaders, one for every five to eight schools, visited teachers and instructional support coaches regularly. Among other things, they met with teacher teams during their collaborative planning time to ensure that district-provided protocols were followed.

At the time of the study, Atlanta was working to implement this in high schools. Formative assessments had not been completely rolled out, and the model teacher leaders were often redirected toward administrative responsibilities. Also, teams of teachers in a common subject didn't meet as frequently as anyone would have liked, due to the need for planning time for both departmental and grade-level teams.

But while this system did not work as well in high school as in earlier grades, it seemed a promising start. None of the other districts we studied used formative assessments as rigorously as Atlanta. The findings for each district are summarized in general terms in Figure 10. These summary descriptions are not meant to portray the wide range of practices that existed in each district, but only to characterize the overall picture—which is that ongoing assessments were not systematically used to adjust instructional interventions for students throughout the year. Key elements were invariably missing.

FIGURE 10. Districtwide Programs for Assessing Student Progress

District	Standards-aligned Formative Assessments in English and Math (high school only)	Collaborative Planning Time (CPT)	Adjusted Instruction (with expert school-based content support)
APS	Was still in process of rolling out state-aligned curriculum and assessments at high school level, with systematic approach not yet available.	CPT existed, but competing demands for subject and grade-level teams made the time in high schools less effective than in elementary schools.	Expert support to help with this was usurped (reassigned) to provide admin. program support, but some instructional support was available in all schools.
CPS	Working to overcome a period of curricular decentralization. A variety of assessments and programs were in use. Many schools had recently adopted the district's supported curriculum, which contained assessments.	Most Chicago high schools did not organize to create weekly collaborative time for academic teachers.	Expert support to help teachers adjust instructional practice was available in some schools, in some subjects. "Best practices" and standards were not established for the system as a whole.
DCPS	Formative assessments in literacy and math were unit bubble tests and had not been fully implemented in high schools. Formative assessments were not used to drive teacher professional development.	In most schools, there was no collaborative planning time for teachers to reflect jointly on student work.	No systematic rubrics or protocols for jointly reviewing student work had been rolled out in high schools. Coaches for schools had been approved but not hired.
LAUSD	Formative assessments existed, but their use by individual teachers varied at the high school level.	Teams of teachers did not have scheduled weekly collaborative time to evaluate the results of assessments (except in middle schools).	Coaches in every school were unable to meet with all teams of teachers regularly during "bank-time" Tuesdays. Some support was available. System standards did not exist.
RCSD	In RCSD, use of formative assessments was common but varied by school. It was more likely to be found in schools using a comprehensive school reform plan than in schools not using such a plan.	No paid collaboration time was available for teams of teachers to jointly discuss student work using a common rubric.	Multiple coaches were available in every school to provide support to individual teachers, though fewer in HS than in ES. Quality varied.
SPPS	While most elementary schools used formative assessments for reading, secondary schools used them on a very limited basis.	Most schools did not have 90 minutes of CPT per week. CPT was voluntary and not in contract. How planning time was used varied by school.	Coaching was provided throughout the district, but much of the effort to support instructional improvement was done through periodic training.

FIGURE 11. High School Staff Ratios, by District

	APS	CPS	DCPS	LAUSD	RCSD	SPPS
Students per Staff	8	9	7	12	7	9
Students per Professional Staff	13	11	11	20	10	14
Students per Instructor	14	13	13	20	10	16
Students per Teacher	15	14	14	20	12	20
Avg. HS General Ed. Class Size	21	26	23	28	27	27

Staff includes all adults tied to the school through our analysis, teaching and nonteaching, certified and uncertified.
Professional staff includes teachers and all certified or professional staff in the school, including the principal and assistant principal as well as professional-level, student-service personnel (guidance counselors, social workers, etc). It excludes aides, clerks, secretaries.
Instructors are all teachers and teaching assistants who work in classrooms doing instructional activities.
Teachers include all certified professionals with a teaching job, whether or not they have a homeroom assignment or a resource-room assignment.
General education refers both to general education and resource students who are served in a classroom with a general education teacher. It does not include resource or self-contained special education teachers or self-contained special education students.

FINDING 5: Struggling students get extra attention primarily through special education placement, which can drain resources from general education and instructional support.

These districts gave added support to struggling students primarily by placing them in special education settings where students had much smaller class sizes. This shifted tremendous amounts of resources (beyond special education revenues) away from general education and other programs for instructional support.

As part of our analysis of individual attention, we measured staff who worked in schools regardless of whether they were charged against the school's budget report or a central budget. Including all staff, we see that schools in most districts have one adult for every 7–9 students (with Los Angeles the exception, at one adult per twelve students). The baseline level of staffing (which ranged from 7–12 students per adult) is determined primarily by compensation and overall funding levels. On the other side of the staffing, we show the general education class sizes that result. Note that Rochester, which had a relatively rich staffing ratio, had about the same general education class sizes as Los Angeles, which had the fewest staff overall. This happens because districts (despite state and union regulations that dictate certain staffing limits) have a broad degree of control over how they staff schools. Factors such as the amount of planning time that a district awards play a big role in the eventual general education class sizes.

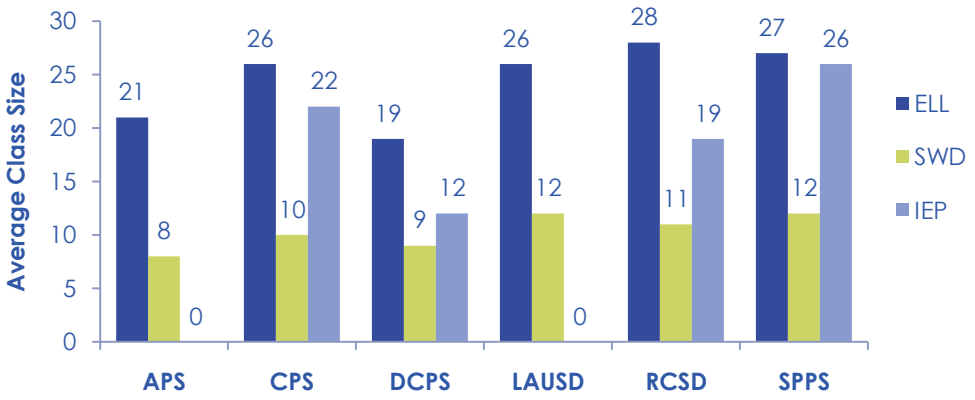
But the primary district-controlled factor is the percentage of students diagnosed with disabilities (see Figure 12) and the way these students are served, which are with greatly reduced class sizes (see Figure 13).

FIGURE 13. Students Placed in Special Education, by District

Characteristic	APS	CPS	DCPS	LAUSD	RCSD	SPPS
K-12 enrollment	47K	383K	56K	705K	33K	41K
Students with disabilities	9%	12%	15%	10%	17%	17%

Percent diagnosed: The national average incidence of SWD is around 10 percent. But these districts varied in diagnosing SWD, from a low of 9 percent, in Atlanta, to a high of 17 percent, in Rochester and St. Paul. Diagnosis, while ultimately a district-controlled factor, tends to follow state funding patterns. In states where state funding practices award additional dollars for every additional student diagnosed with special needs (e.g., MA and MN), diagnosis is higher. In states such as California, where state special education funding is capped at closer to the medically recognizable "incidence" of special needs, districts tend to diagnose special needs in line with the actual population.

FIGURE 14. Secondary Ed. Class Size, by Student Type



Note: Includes general ed. schools; ELL students in LAUSD (42 percent of overall population) were served in general ed. setings, with supplemental service investment of just under $600 per pupil.

Class sizes in special education: Federal IDEA legislation mandates that all students with disabilities served in special education programs have an Individualized Educational Program (IEP). The IEP specifies the services that special education students receive. The IEP, once written, becomes binding on the school district. IEP services can include a variety of physical, occupational, and speech therapies as well as a reduced student-teacher ratio. Student-teacher ratios are based on federal disability categories and the level of service needed by the student. State, district, and union rules can determine the requirements that exist in any given district.

With ELL programs, we see quite a bit more state and district discretion, as well as more variation in how services are provided. For instance, Los Angeles serves ELL students almost exclusively in general education settings with supplemental services. This variation in service provision methods makes it difficult to compare interventions across districts. To facilitate cross-district comparisons, we constructed a common definition of a course that serves

English language learners or students with disabilities as any course with over 60 percent of its students in that category. By this definition, the class sizes for special education students ranged from 8–12, while the class sizes for English language learners during the periods when they received ELL services ranged from 12–26. As Figure14 shows, this is much closer to a general education student experience. In some cases, few if any extra resources are devoted to ELL instruction, and where they are dedicated, the dollars are often spent on teaching assistants or materials. A notable exception was St. Paul, where dollars were spent to reduce English reading group sizes for ELL students for part of the day and where performance improved dramatically compared to the rest of the state's ELL population.

The differential diagnosis of special needs has a profound impact on time and attention practices in high schools. In Figure 14, we see that only 36 percent of school-attributed employees in D.C. schools were general education instructors. At the time of this study, D.C. had high percentages of special education students and had recently gone through a period of rapid enrollment decline. The enrollment decline resulted in extremely small schools and high spending on operations-and-maintenance employees—reported in the "all other" category, which includes operations and maintenance, lunch, busing, and other related staff. At the other end of the spectrum, 58 percent of school staff in Atlanta were general education instructors, and only 11 percent were categorical instructors. Atlanta has focused on early intervention to guard against over-diagnosis calling for special education. Comparing categorical instruction across districts, we see that Rochester allocates a total of 17 percentage points more of its staff to students with disabilities/English language learners than does Atlanta.

FIGURE 14. Staff in General Education Schools, by Use

District	General Ed Instruction	Categorical Instruction (SWD & ELL)	Pupil Services	Administration & Leadership	All Other	Total
APS	58%	11%	4%	7%	19%	100%
CPS	55%	15%	8%	7%	14%	100%
DCPS	36%	19%	8%	8%	29%	100%
RCSD	42%	28%	8%	10%	12%	100%
SPPS	41%	19%	13%	8%	19%	100%

What does this mean? Put simply, districts have a profound ability to shape such time and attention practices as how many students they place in special education, how many schools they run, and how richly they staff instructional versus non-instructional personnel. By reducing its diagnosis of special education to about the level of actual medical incidence of special needs, Atlanta was able to fund its general education program more generously, organize long blocks of weekly time for teachers to collaborate, and initiate a district-wide assessment program, where students not meeting the standards covered in a unit were placed on a "hot list" that was updated regularly.

Recommendations

These findings are intended to give district leaders a good sense of how districts across the country are currently using their resources to provide sufficient time and individual attention to students. The analysis used in this paper is very detailed and draws from multiple data sources. District leaders may probe their own resource strategies without this specific analysis by exploring several high-level questions and benchmarking answers against the findings in this paper. For example, looking at readily available district data, leaders can ask:

- How does the length of the school day for students compare to the national average of 6.5?
- Can schools choose from a menu of school designs that balance trade-offs to fit the school's size, priorities, and instructional designs?
- Are class sizes, group sizes, and teacher loads lower for core subjects, transition grades, and students with greater learning challenges?
- Could class sizes be raised strategically to fund investment in teacher quality or in high-priority subjects?
- How much time do students spend on each subject? How does that compare to the districts in this study or to high performing schools in their district?
- Do students not meeting expectations receive extra time and small group attention as needed?

Once districts understand how they are currently using time and providing individual attention, the opportunities to target time and attention more strategically will be much clearer. With that in mind, to improve time and attention practices across whole systems of urban high schools, we urge district leaders to consider the following:

RECOMMENDATION 1: Add time to the school calendar for all schools, or support individual schools' efforts to extend the school calendar, especially where the current school year is shorter than 1,260 hours (seven hours/day for a 180-day year).

The first thing that all districts must do is optimize the time already available, focusing on core academics and making sure that teachers manage classrooms effectively. But in some cases, adding time to the school day may also be a leveraged strategy. Districts that have a less than seven-hour day should consider raising the overall district average time in school or encouraging and supporting individual schools that wish to explore creative scheduling strategies, such as 4x4 blocks, that might require a slightly longer school day. This may require negotiations with the teachers' union (e.g., for pilot programs) or changes to the existing contract. Adding additional time can help schools expand academic instruction or enrichment without cutting into elective programs. It can also be used to give teachers more time to collaborate and analyze implications of formative assessments.

RECOMMENDATION 2: Help teachers adjust interventions throughout the year, based on student progress, by:

- Investing in ongoing assessment tools to measure student learning.
- Ensuring that the information is used to change teaching practices continuously.

Research on formative assessment and flexible grouping strategies suggests that students learn best when they are grouped and regrouped throughout the school day into ability groups that work on material that is currently challenging students (Black and Wiliam 1998). While these types of research-supported activities were frequently observed in elementary schools, we found scant evidence of them in most urban high schools. While scheduling and graduation requirements can prove challenging, successful urban high schools are managing these challenges and providing customized intervention support for students throughout the year (Shields and Miles 2008).

Districts need to provide schools with access to assessment tools that are aligned with the standards. They also need to help schools build the support structures needed to use the assessments to adjust instruction continuously. For example, districts can invest in collaborative planning time, results analysis that gives schools assessment data in a timely fashion, and expert coaching support to help teachers analyze the results and improve practice.

RECOMMENDATION 3: Seek first to serve struggling students in general education programs, leveraging special education resources by integrating them relentlessly with general education classrooms.

Our mandate as educators is to help all students realize their personal potential. While all students need and deserve access to a rigorous curriculum, the reality is that many struggling students are diagnosed with disabilities when what they really need is intense remediation to catch up to their peers. Moreover, even those students who are behind but not diagnosed with disabilities are often shunted into resource classrooms with students with disabilities. Our findings and interviews suggest that these students not only have large class sizes, but they often have teachers ill equipped to help them catch up with their peers in time for on-track graduation.

We did find a few school districts that invested to provided common planning periods for the general-education and SWD teachers who shared teaching responsibility for a joint classroom. But these were the exception. In the majority of these cases, special education and general education co-teaching partners had no shared period for collaborative lesson planning. Lack of time for scheduled paid collaboration makes it very difficult for these teachers to leverage each other's strengths and can lead to inefficient classroom practices.

To efficiently and effectively integrate special education and general education resources, districts must consider the planning needs of teachers and ensure that all faculty members are properly trained. They should ensure that students are taught in the least restrictive environment possible and that when multiple teachers work with a student, accountability for student learning is clearly delineated.

To integrate special education resources with general education classrooms, districts may:

- Organize supplemental resources using a push-in model, where resource teachers enter the general education classroom at predictable times to conduct small-group instruction during English and math classes.
- Ensure that resource teachers are certified in English or math (where appropriate) and trained in the district's or school's or classroom's model for literacy or numeracy.
- Structure weekly planning time so that resource teachers can meet with teacher teams to discuss shared students and coordinate curriculum and instructional approach, and continuously adjust instruction (and sometimes materials) based on student progress toward standards.

RECOMMENDATION 4: Give school leaders the professional development, tools, support, and authority they need to organize all their people, time, and money in ways that align with the school's instructional vision for meeting student needs.

Empowering school leaders to create a strategic vision—not only for time and attention but for *all* resources—requires more than simple knowledge and skills. Districts must provide professional development to ensure that all schools have the leadership capacity to use their resources in ways that address the students' most pressing needs. Further, districts need to examine their strategic planning and budgeting processes. Often, the timing of the strategic planning processes does not coincide with the actual budgeting and scheduling discussions, limiting the effectiveness of the school planning process. In these cases, a redesigned integrated planning and budget process for schools can help school leaders focus on the right questions at the right time.

Districts may also consider creating strategic design templates that guide schools in their choice of:

- Class and group sizes by subject, grade, and student performance level
- Leadership and teaming structures
- Intervention support strategies
- Student and teacher schedules
- Use of school support staff

These templates can help the district ensure that school leaders have access to research-based strategies as well as state, district, and union policy considerations as they forge strategic plans that work for their individual schools.

RECOMMENDATION 5: Improve collection, reporting, and use of student-level time and attention data so that districts and schools can (a) better give struggling students the time or attention they need in high-priority subjects and (b) know that those students are receiving what they need.

To compare time and attention across school districts, ERS constructed a data set for each individual district, which drew on multiple district data sources: payroll, budget, course schedule, HR, special education, student information services, and research and evaluation data. Within each district, this effort required significant internal validation and reconciliation across systems that contained conflicting pieces of information.

These individual system findings were so idiosyncratic that we then needed to recode and reclassify them into a common framework that allowed us to compare findings across school systems. The field as a whole would benefit greatly if:

- Districts were to improve practices for collecting data on time and attention.
- Researchers were to adopt a common framework for evaluating time and attention that included indicators of quality and quantity.
- Both districts and researchers were to improve the reporting of time and attention metrics in particular by disaggregating these down to the level of individual students and by using the resulting reports to see that the neediest students are getting the type of time and attention they require.

Conclusion

Over several years, we at ERS worked with six urban school systems, with two overarching goals. First, we sought to better understand how they organized time and provided students with individual attention. Second, we sought to determine whether existing district practices seemed likely to facilitate the type of transformational improvement found in effective schools, and to facilitate the adoption of the most successful practices over whole systems of urban schools. Overall, we found that these urban school systems did not closely mirror the time and attention practices we have seen in highly effective, or leading edge, urban high schools. These school systems did continuously assess and reallocate time and attention to the neediest high school students in priority subjects, in ways likely to prevent those students from falling further behind. But they did not offer programs or courses of study that seemed sufficient to accelerate large numbers of struggling students toward on-time graduation. Rather, students were tracked for multiple years of intervention, either by being placed in special education or through more traditional tracking methods. Perhaps the most salient factor influencing time and attention in high schools today is the way states choose to fund special education, which can lead to over-diagnosis (above the level of medical incidence).

To transform time and attention practices requires nothing less than a complete shift in paradigm: districts must think beyond special education and ensure that teachers collaboratively create personalized learning environments for students, adjusting assignments continuously based on ongoing assessments of each student's needs.

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Appendix 1: District Summary Characteristics

Characteristic	APS	CPS	DCPS	LAUSD	RCSD	SPPS
K–12 enrollment	47K	383K	56K	705K	33K	41K
Number of schools	94	592	153	691	60	97
Number of high schools*	19	105	18	134	20	30
% poverty**	71%	83%	72%	77%	>90%	71%
% English language learners	2%	14%	8%	38%	7%	42%
% Students with disabilities	9%	12%	15%	10%	17%	17%
Avg. teacher salary ($K)	$54.8K	$61.1K	$58.8K	$60.2K	$45.6K	$59.9K
Avg. teacher compensation ($K)	$65.0K	$77.2K	$67.6K	$78.0K	$60.3K	$78.3K
Total K–12 operating budget $m	$538m	$3,717m	$808m	$6,386m	$454m	$505m
Dollars per pupil	$11.4K	$9.7K	$14.3K	$9.1K	$13.6K	$12.4K
Adj. dollars per pupil ($K)***	$12.0K	$9.7K	$13.4K	$9.3K	$16.2K	$13.1K
Data collection year	2005-06	2005-06	2004-05	2005-06	2004-05	2005-06

*Schools that include grades 9–12. Rochester secondary schools are configured as grades 7–12.
**Poverty defined as eligible for free and reduced-price lunch.
***Adjusted dollars are all 2008 Atlanta dollars, adjusted by the Cost of Wage Index.

Appendix 2: Average Class Size, by Subject and Grade

Area	Subject	Atlanta				Chicago				DC				Los Angeles				Rochester				St. Paul			
GRADE		9	10	11	12	9	10	11	12	9	10	11	12	9	10	11	12	9	10	11	12	9	10	11	12
OVERALL	Core and Noncore	22	22	20	19	27	28	25	23	20	19	16	NA	28	28	26	25	29	27	26	33	29	27	26	33
	Core	21	22	21	19	26	26	26	24	21	20	18	NA	28	30	28	27	27	28	28	34	27	28	28	34
	Noncore	24	22	17	19	31	32	24	22	19	16	13	NA	29	27	24	23	33	26	20	32	33	26	20	32
CORE	ELA	20	21	20	20	25	26	26	25	20	19	17	NA	21	28	21	28	20	19	17	20	20	19	17	20
	Math	22	22	21	20	25	27	26	23	22	22	16	NA	28	30	29	26	22	22	16	20	22	22	16	20
	Science	20	23	22	19	27	27	26	22	21	18	19	NA	31	31	30	27	21	18	19	21	21	18	19	21
	Social Studies	22	22	21	20	26	26	26	25	22	21	20	NA	28	30	31	30	22	21	20	21	22	21	20	21
	Foreign Language	23	19	18	15	25	26	25	23	21	21	14	NA	30	31	27	22	21	21	14	23	21	21	14	23
NON-CORE	Art/Music	24	23	18	21	29	30	27	26	16	16	10	NA	30	29	29	29	16	16	10	18	16	16	10	18
	PE/Health	31	22	14	20	38	39	35	34	24	16	17	NA	39	37	25	23	24	16	17	17	24	16	17	17
	Vocational	23	20	17	18	26	25	21	18	17	16	15	NA	27	27	26	26	17	16	15	16	17	16	15	16
	Computer Literacy	20	25	20	18	14		3	6	16	16	7	NA	31	30	28	24	16	16	7	15	16	16	7	15
	ROTC	17	19	16	17	23	22	19	11	12	11	8	NA	16	11	12	11	12	11	8	11	12	11	8	11

Note: Average class sizes across grades 9–12, excluding special education and ELL classes

Appendix 3: ERS Analytic Methods

Data for this study comes from the 2004–06 school years from six large urban school districts: Atlanta Public Schools (APS), Chicago Public Schools (CPS), District of Columbia Public Schools (DCPS), Los Angeles Unified School District (LAUSD), Rochester City School District (RCSD), and St. Paul Public Schools (SPPS).

Data Collection

In each case, ERS conducted multiple rounds of interviews at all levels of the school system. We worked most closely with district leaders, including the Superintendent (or CEO) and the cabinet, during the period of the study and often had a multiyear relationship with the school system. We also worked with department and program heads and data personnel across most departments. In most cases, we interviewed select numbers of school principals (or, rarely, all) as well as those who supervised or provided support to school leaders.

We also pulled data from nearly every major data system as well as from publicly available sources of information, including websites. Specific district databases included:

- Budget and expenditure reports
- Payroll reports
- Course schedule data for each student
- Special education files
- Human resources files

We examined national data sources and endeavored to cross-reference and validate the data and analysis with published records, district personnel, and internal and external data sources.

Metrics

Findings in this paper centered primarily on four measures of time and attention:

1. **Percent of time.** Our percent-of-time analysis allows us to see the portion of student time spent, by subject, by grade, or by program or other factor. To ensure that each course was treated equally, we used the course schedule data to determine the number of periods and the number of days that each course met, and the number of terms each course lasted. We then accounted for the number of students in each course.
2. **Minutes of time.** In addition to the *percentage* of time spent on subjects, we also sought to determine the number of minutes that students spent on each subject. For example, while students in district A may spend a smaller percentage of time than students in district B on core subjects, they may still receive more actual instruction

time if they have a longer school day. This calculation was based on the total number of hours in the school year, adjusted for certain types of non-instructional time (e.g., lunch, hall passing).

3. **Class size**. Using the course schedule database, we determined the number of students in each class and then calculated average class size. We created a common definition for self-contained (taught in separate classrooms) special education or English language learner (ELL) classes, as follows: All classes consisting of more than 60 percent students enrolled in the self-contained or ELL program. Using this definition, we were able to analyze general education, special education, and ELL class sizes separately. We defined 9th grade courses as courses more than half of whose students were in the 9th grade. Courses without a majority of students from a particular grade were considered mixed classes.
4. **Teacher load.** Teacher load refers to the number of students a teacher saw during the course of one term.

Analytic Process

To account for variations across schools within a district, it was necessary to normalize and standardize the course schedule data. The key issues addressed included:

- **Invalid or missing data for some courses.** Sometimes key identifying information, such as the teacher ID or the class period, was missing from some of the course records. This happens, for example, if a teacher has not yet been assigned to a particular course. We isolated all courses missing key fields and then determined whether those courses should be excluded from all or only some of the metrics. For example, we typically *excluded* courses with missing rotation data in the percent-of-time calculations but then *included* them in the class size calculations.
- **Multiple (and sometimes ambiguous) course names.** There are literally hundreds of courses in any given district. Other than the course name, there is usually no information to indicate the course's subject matter. The only way to make meaningful comparisons across schools is to organize and group courses into standardized categories, which is not always an easy task due to ambiguous course names. ERS coded each course into one of four categories: core, noncore, support and enrichment, or maintenance. These are defined as follows:
    1. Core courses were further coded by subject. Core subjects include English language arts, math, science, social studies, and foreign language.
    2. Noncore courses were further coded by subject. Noncore subjects include art/music, PE/health, computer literacy, vocational/career, ROTC, and internships.
    3. Support and enrichment includes all activities that support students' social and emotional growth as well as those that provide academic support. Common examples are advisory periods, tutoring, and test prep courses.

4. Maintenance time generally refers to all nonacademic time and non–social and emotional support time. This includes lunch, homeroom, study hall (when no academic support is being provided), and passing time.

No indicator of unique classes. A class is defined as a group of students with the same teacher at the same time (term, day, period). Unfortunately, there is no easy way to identify which courses are really part of the same class in the course schedule. For example, we know that teachers often teach two different courses (general education and honors) during the same class period. To account for this, we created a unique class ID by combining (concatenating) all the data fields needed to identify a unique class—typically, course name, school code, teacher ID, term, day, period, and room number. The sum of students in each unique class ID was then used as the numerator in the class size and teacher load calculations.

Need to assign a dominant grade to each class. Class grades can be defined in two ways: (1) the actual grade of the students (i.e., 9th, 10th, 11th, 12th graders); and (2) the dominant grade of the majority of students in a class. So, for example, we could measure the average class size that 9th graders experience, or we could measure the average size of 9th grade classes. Although the former is the more interesting and insightful metric, here we focus on the latter, because the student-level data necessary to calculate this metric was not available for all districts. ERS uses the criterion that if at least half the students in the class are in the same grade, then that class is designated as that particular grade level. If no grade comprises at least half a particular class, then we designate that class as "mixed grade."

Lack of a standard definition of self-contained classes. Similarly, we designated a class as "self-contained" if more than 60 percent of the students in that class are special education or English-language learners. Although districts may indicate whether a course is designated as special education or ELL, we applied our own criteria to ensure apples-to-apples comparisons across schools and districts. Because our analysis focused primarily on time and attention for general education students, we excluded self-contained classes from all calculations.

Differences in school terms and class rotation schedules. To compare student time accurately across schools within a district, we needed to account for the fact that not all classes meet with the same frequency throughout the year. For example, science classes in school A meet three times per week for one semester, science classes in school B meet five times per week during one trimester, and science classes in school C meet daily for the entire year. To compare, we normalized the data over the course of a year. We did this by calculating "equivalent enrollments" for each class. Equivalent enrollment is the weighted student enrollment for each class, depending on the percent of time that class meets during the year. We calculated the percent of time that students spend, by subject, in each school by dividing the equivalent enrollment for a particular subject or subject area by the total equivalent enrollment for that school. When making comparisons of student time across schools within the same district, we assumed that all high schools had the same number of instructional minutes per day and that classes were of the same duration (unless blocked for more than one period). In general, we did not adjust for differences in individual bell schedules across schools unless the actual number of minutes per course was included in the source data.

Details on Cross-District Comparison Issues

This paper does not deal in depth with dollars that needed to be adjusted for inflation or geography. However, we did need to standardize key concepts so they could be compared across districts. Recategorizing with a common coding scheme accomplished this, but we had to contend with some additional issues when making cross-district comparisons. Here are those issues and how we addressed them for this paper:

Differences in school types. In addition to "general education" schools, there are many different types of schools within districts. These include magnet schools, vocational schools, nontraditional/alternative schools, special education schools, evening schools, hospitals, correctional facilities, and, occasionally, partially implemented general education schools. When making comparisons across districts, we focused on only those schools with a normal cost structure: "general education," magnet, and vocational schools. All other school types were excluded from the analysis.

Dramatic differences across districts in the length of the average school day (and the number of periods per day) and in the total number of student days per year. The overall number of minutes of instructional time per year varied significantly across districts. To account for the dramatic differences in school bell schedules and in the number of days per year students are in school, we calculated the total "minutes per year" for each class in every district. First, we calculated the average number of instructional minutes per day for each district; then we divided this figure by the district's typical bell schedule (e.g., five periods) to calculate the average number of minutes per class. We then multiplied this by the total number of student days in the district. Finally, we calculated the minutes per year for each class by multiplying the total minutes by the percent of time per year that each class met. Student time was then expressed as a percentage of the total number of minutes per year.

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