Annenberg Institute for School Reform | *Voices in Urban Education*

Using Data for Decisions

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Data-Informed Decision Making: Using Data Wisely and Well

Robert Rothman

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Using data in educational decision making has become one of the hottest topics in the field. A Google search of the phrase *data decision making* returned 11,900,000 hits. Unfortunately, most of the discussion around the issue focuses on the *data* side; *decision making* is still a challenge.

There is no question that schools, districts, and communities have access to a wealth of data on student and school performance. Whatever else it's done, the No Child Left Behind Act (NCLB) – with its requirements for tests in grades three through eight and once in high school and for results broken down by race, gender, socio-economic status, and other factors – has produced a vast amount of information on student achievement. More than ever before, schools are reporting test scores to the public and providing detailed reports on school performance.

As educators and community members know well, however, this data is not as useful as it might be. For one thing, it is limited to student academic achievement in two subject areas, reading and mathematics. There are many other outcomes of interest, and looking only at NCLB test scores is far too narrow a lens on educational success and development.

Test scores also come back too late to inform decision making about many programs and instruction. The scores indicate whether students have mastered the material or not – if not, the results can't help them. And in many cases, by the time the results come back, students are in another grade.

But even if test scores reflected broader outcomes and results were reported more quickly, they still would be in the form of raw data. What you do with the data makes the difference. How can districts and communities sift through data, analyze the data, and make sure those who make decisions are able to make use of the data? How can decision making really be data driven?

This issue of *Voices in Urban Education* looks at districts and communities that have shown success in using data effectively. It is based, in part, on a study conducted by the Annenberg Institute for School Reform to examine district data use. The study is aimed at identifying "leading indicators" – measures that indicate whether students and schools are on a path toward producing results down the road. The districts and community organizations included here use a variety of measures in various ways.

- Richard J. Murnane, Elizabeth A. City, and Kristan Singleton describe how the Boston Public Schools developed a set of tools and supports to enable schools to use state test scores effectively in planning instruction.
- Debra Vaughan and Kirk Kelly recount how a district and its partner, a local education fund, created a culture where using data for decision making is now the norm.
- David Chiszar shows how a district created a data reporting system to meet the needs of a broad range of constituents.
- Seema Shah shows how community organizations use data – often provided by districts themselves – to press for changes in district policies and practices.
- Jacob Mishook, Ellen Foley, Joanne Thompson, and Michael Kubiak suggest what it might take to create a system of leading indicators.

The districts and organizations represented here are exceptional in many ways; not all districts are so forthcoming in the data they report, particularly when the news isn't all good. But as these articles make
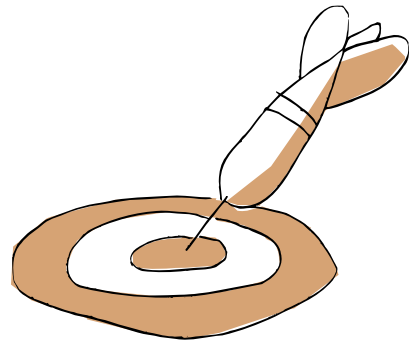
clear, building an effective data system takes a lot more than reporting data. For one thing, they show that the choice of measures is extremely important – the measures have to matter to the people who use them. They also show that the right measures can be extremely powerful. As Shah makes clear, data can reveal shortcomings and inequities and lead to real improvements.

The articles also show the importance of effective partnerships. As Vaughan and Kelly show, a community organization can enhance the capacity of a district with limited resources. But the partnerships must be true ones; as Chiszar notes, a private vendor's inflexibility threatened to limit what the district could do in building a data system.

None of these districts or community organizations has all the answers. The quest for better information on what matters continues. But students in these communities are better off because educators and community leaders are able to make smarter, more timely decisions based on real data.

Using Data to Inform Decision Making in Urban School Districts: Progress and New Challenges

Richard J. Murnane, Elizabeth A. City, and Kristan Singleton

Boston Public Schools has developed a set of tools and supports to enable schools to use state test scores effectively in planning instruction.

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One of the challenges every school district faces is to provide schools with the information and tools to educate children well. The challenge is particularly great in urban districts, which serve high concentrations of students living in poverty and students whose first language is not English. The life prospects for these students are critically influenced by the extent to which they master the skills needed to thrive in a rapidly changing society. Detailed understanding of the skills and knowledge that individual students have mastered is essential to making the best use of scarce instructional time. Having the tools to manage information on students' skills and to do so efficiently is essential to making use of that information.

From the beginning of Thomas Payzant's eleven-year tenure as superintendent of the Boston Public Schools (BPS), using student assessment results to inform decision making has been a part of the district's strategy to increase student achievement. Understanding the progress Boston has made and the challenges it still faces in developing a system of student assessments and tools to facilitate good decision making is relevant not only to improving edu-cation in Boston, but indeed education throughout the country.

In this article, we describe key elements of the progress BPS has made in moving toward a comprehensive assessment system. Then, we describe critical issues that every district must face as it strives to provide schools with the information and tools needed to improve instruction.

Informing Instruction through Assessment

Since 1998, the Boston Public Schools have been required to administer the Massachusetts Comprehensive Assessment System (MCAS) English Language Arts [ELA] and mathematics tests to virtually all students in desig-nated grades. Superintendent Payzant made clear that a key challenge for BPS schools was to improve MCAS scores and to do so in a way that actu-ally improved the quality of education BPS students received. In a January 2001 memo to the Boston School Committee, he announced that learn-ing from MCAS results would be an element of the strategy to accomplish this goal.[1]

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1 Memorandum to the Boston School Committee, January 12, 2001.

BPS has made enormous progress in providing schools with technical tools for learning from MCAS results. These tools are important because they save teachers and administrators large amounts of time, which is the scarcest resource in schools. Still, technical tools are not sufficient for schools to make constructive use of student assessment results. A culture change is also necessary, a change from a culture in which teachers work independently to a culture in which teachers work collaboratively to identify students' learning problems and to design and implement coherent strategies to ameliorate them. As we explain at the end of this section, creating a culture of shared responsibility for student learning in every school is proving more difficult to achieve than creating common facility with technical tools to examine student assessment results. We begin by describing some of the advances in technical tools.

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MCAS Tool Kit

As schools began to use their MCAS results to plan instructional changes, it became clear that they would need guidance to ensure that high-stakes testing data were not being used for purposes to which they were not well suited. For example, students' poor performance on a particular type of MCAS item does not mean that instruction should be focused in that area. Conversely, students' strong performance on another type of question does not necessarily mean that a teacher should not devote any of her instructional time to that content. To help schools implement responsible data-driven decision making, Maryellen Donahue, director of the BPS Office of Research, Assessment, and Evaluation, developed a protocol known as the MCAS Tool Kit for interpreting and analyzing student MCAS performance.

The MCAS Tool Kit was designed to provide school instructional leadership teams and data teams with an inquiry process for analyzing the data reports provided by the Massachusetts Department of Education (DOE). The Tool Kit encouraged teachers to think through a series of questions as they analyzed individual and group MCAS performance. For example:

- Was the relevant content covered during the course of the academic year?
- Did students use an incorrect or only partially correct problem-solving strategy?
- What primary and alternative teaching strategies could be used?

The MCAS Tool Kit provided a sound foundation for analyzing student data. However, it was time-consuming to use, especially since the state-generated MCAS reports included the performance results for an entire grade within

a school. To thoroughly analyze the data, school-level data teams needed to organize them into classes and into groups with particular characteristics. Doing this by hand was very time consuming. A few schools overcame this obstacle by inputting all of the data into an electronic spreadsheet program. However, the vast majority of schools lacked the resources for this work.

LIZA

In response to the problems of working with paper printouts, Albert Lau, who was at that time the director of the BPS Office of Information Systems, developed the Local Internet Zone for Administrators (LIZA). LIZA provided principals with school-based computer access to information on the school district's central data system pertaining to individual children in their schools. For example, a principal could access attendance information for individual children as well as their MCAS scores and scores on other tests, including the Stanford 9. LIZA also enabled school principals to download, to their own computers in Excel file format, test scores for groups of students in their schools.

Many school principals found the information on individual students available through LIZA to be helpful in preparing for conferences with parents. A few principals also took advantage of the capability to download test score information, which they could then examine using the Excel software. However, relatively few principals did this, in part because LIZA was somewhat cumbersome to use and in part because they lacked the time and/or skill to analyze test score data using Excel.
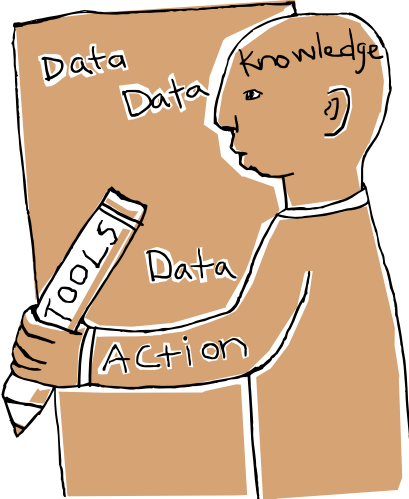
FAST Track
One of the consequences of mandating that BPS students complete benchmark assessments and, later, MCAS ELA and mathematics tests was a significant increase in the amount of available data on student achievement. Given the varying sources and types of student data, it was not uncommon for a school to have more than thirty pieces of data on each student. To fulfill central office requirements for data summaries, school principals needed to aggregate the data to grade and school levels and also present summaries for groups of students defined by race and special education status. This work was extremely time-consuming.

In response to principals' requests for help in managing these data, the Boston Plan for Excellence designed and implemented a Microsoft Access–based Formative Assessment Summary Tool (FAST Track). Using FAST Track, school teams could import student profile data files provided by the central
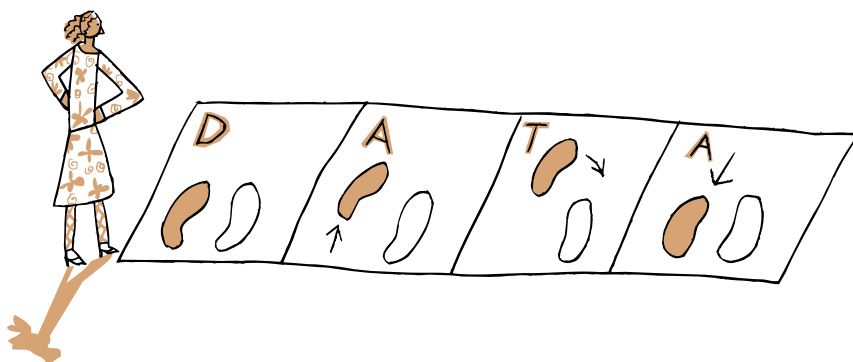
office and MCAS data provided by the DOE. They could also enter data from benchmark assessments. FAST Track enabled school data teams to easily disaggregate scores by race, gender, free/reduced-price lunch status, and up to fifteen other school-defined student variables. By 2001–2002, approximately one-third of BPS schools were using FAST Track.

Although FAST Track was a valuable tool to many school data teams, it had a critical shortcoming: FAST Track was not a "live" system that kept pace with the mobility of students within BPS. Consequently, a member of the school staff had to maintain the student profile data to keep it current. Further, the benchmark assessment data entered in FAST Track did not follow students as they moved among schools. As the school year progressed, if schools were not consistent with the data upkeep, they found that the students in their FAST Track database were not the students in their school, and that they had a good deal of missing data for students who had recently transferred to their school.

MyBPS Assessment

MyBPS Assessment was designed to lead teachers and data teams through a series of analyses that began with high-level summaries of student performance and then drilled down to finer levels of detail about student performance. An important part of the implementation of the MyBPS Assessment system was training school-based educators in its use. The BPS Office of Research, Assessment, and Evaluation and the Boston Plan for Excellence cooperatively developed and implemented a training program in which school principals and key members of school data teams learned a process for reviewing their data. They also received sets of materials aimed at helping them to replicate the training process with groups of teachers at their schools.

Including Data in Whole-School Improvement Plans

Beginning in 1996, the BPS central office required that every BPS school complete an annual Whole-School Improvement Plan (WSIP) in which it identified goals for the next year and described a plan for meeting these goals.[2] From their inception, WSIPs

2 In the 1996–1997 school year, the document was known as a school-improvement plan. It became the WSIP the following year. The WSIP is now completed on a two-year cycle, with schools reviewing the plan each year and making any relevant adjustments.

were supposed to include data as the basis for identifying student needs and improvement goals. However, data did not appear in most plans until the deputy superintendents refused to accept plans without data in 2002. This central office mandate created demand for tools that would help schools make sense of MCAS data more efficiently than they could with highlighters and state-generated score reports.

To meet these requirements, the MyBPS Assessment tool was enhanced to provide three features:

- Comparisons of a school's MCAS performance to the performance of the district and the performance of the state
- Side-by-side comparisons of student performance data disaggregated by race or gender
- The ability for schools to create ad hoc groupings of students for disaggregation of data

At this point, most schools know the fundamentals of identifying learning problems and have had enough years to work on basic implementation of the workshop and math models. Schools are ready to look at data sources in addition to MCAS, to think of new ways of framing problems, and to generate solutions that are more particular to the problem than saying that good implementation of workshop or Technical Education Research Centers (TERC) will solve the problem. The highest-performing schools in BPS use the WSIP as a living document and use the WSIP process as a real opportunity for examining practice. These schools often have WSIPs that look a little different from other schools, which is evidence of their ownership and agency in the process. However, they are still the exceptions. The enormous growth in the way schools think about and plan

for improvement over the last ten years means that schools are now poised to probe more deeply into data that support improvement.

Looking at Student Work
Developing a culture of shared responsibility for student learning is a challenge in any school. The BPS experience with looking at student work provides an interesting case study of just how difficult this process of cultural change can be. The theory behind the practice was that if teachers examined and discussed student work, they would reach some consistency in assessment (e.g., we all agree what a score of "4" means and what a "4" paper looks like on the rubric we are using), would have common standards, and would identify areas of student need. This discussion would then lead to instructional improvements in individual classrooms. In short, looking at student work (LASW) was to provide a window into teachers' work.

A challenge that surfaced as schools looked at student work was that teachers in most schools did not change their teaching practices as a result of the LASW sessions. There were

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exceptions, and in some schools LASW became a powerful way to examine and improve practice. However, in most schools, teachers engaged in LASW because it was a district mandate and then went back to their classrooms and continued teaching in the same ways as before the LASW session. This central challenge of translating looking at data into improved instruction continues today.

Joint BPS-HGSE Data Course

Another strategy for increasing BPS educators' skill and knowledge in using data emerged in a collaboration between BPS and the Harvard Graduate School of Education (HGSE). After a year of working with BPS on developing the MyBPS Assessment system, HGSE professor Richard Murnane recognized that schools now needed help in using the tools to improve instruction in their schools. He invited ten BPS schools to bring teams to a course in the 2002–2003 school year. HGSE graduate students were matched with BPS school teams and together they learned about the brand-new MyBPS Assessment tools as well as other tools for using data. Now taught by Kathryn Boudett, the course, titled A-306: Using Student Assessment Data to Improve Instruction: A Workshop, is completing its fourth year. Teams from more than thirty BPS schools have participated, with some schools participating for more than one year.

The BPS central office has made important progress in providing schools with the tools and knowledge to make constructive use of student assessment results. Advances in the area of technical tools are most pronounced. BPS has also invested significant resources in the form of change coaches and instructional coaches to help schools develop a culture of collaboration and shared responsibility and greater capacity for improving instruction. Some schools have made great progress in this dimension. However, most have a long way to go. Having the right assessments and individuals who possess the knowledge and tools to make appropriate inferences from assessment data does not guarantee that decision-makers will take constructive actions based on what they learn from analyzing that data. Clearly, analysis of assessment results must lead to decisions that improve the quality of children's education or it does not make sense to administer the assessment.

Better Decisions

Translating improvements in tools and assessments into improvements in teaching and learning has been the greatest challenge for BPS. The difficulties are of three kinds: knowing what to do next; accountability for action; and assessing improvement.

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Knowing What to Do Next

As one BPS principal said to us, "We know that we have an achievement gap. If we knew what to do about it, we'd be doing it." For the last five years, the "solutions" have usually been to do a better job in implementing readers and writers workshops and in teaching the districtwide mathematics curricula. While sensible, the slow pace with which MCAS scores have improved and the number of schools not reaching the adequate yearly progress mark indicate these "solutions" are not enough.

Accountability for Action

In most schools, principals do not regularly monitor whether teachers are taking action as a result of examining data and making decisions. This pattern is also present at the district level. School supervisors make sure that schools turn in WSIP documents, but they do not systematically assure that all schools implement their WSIPs. The accountability mechanism defaults to MCAS scores. They are clearly important. However, they are too blunt a measuring instrument to provide guidance about whether teachers' daily instructional practices are changing and, if so, whether the changes are producing improvements in student learning.

Assessing Improvement

Much of BPS's focus in using data has been examining MCAS results to identify student learning problems. Although valuable, this work does not provide teachers with timely information about whether particular changes in instructional practices have resulted in fine-grained increases in students' skills and knowledge. Interest in FAST-R [a formative assessment of students' reading skills] among BPS schools indicates a hunger for well-designed formative assessments. Providing these to BPS schools may be a necessary condition for stimulating improvements in instructional methods.

Looking Ahead

The Boston Public Schools have made important progress in providing school-based educators with information and tools. However, BPS, like every other urban district, struggles with the immense challenge of continuously improving instruction. We conclude with some suggestions for next steps toward the goal of using data to guide instructional improvement.

Right Assessments

A comprehensive assessment system provides teachers and central office officials with the information they need to do their work more effectively. Building one is difficult because the technical standards of assessments that district officials will use for holding schools accountable are quite different from those of formative assessments that teachers will use to guide instructional improvements. Questions to ask about assessments currently in use include: What is each assessment used for? What would be lost if we eliminated some assessments? Do we need some assessments that we do not have – perhaps formative assessments? Given the uses of assessments, which should be mandatory with common administration procedures? The goal in addressing these questions should be to achieve clarity on the contributions of every assessment, the reasons the

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benefits of administering each exceed the costs, and how the assessments fit together to form a coherent system.

One possibility that districts might fruitfully explore is joining groups focused on producing course-specific examinations. For example, under the auspices of the American Diploma Project, educators from several states are developing end-of-course algebra examinations. Since test development is technically challenging and expensive, and since Algebra 1 and Algebra 2 should include the same basic content in Boston as in Houston, there may be important savings in joining groups that are developing course-specific examinations in common core subjects.

Many districts, including BPS, face two pressing needs in terms of assessments. The first is for more formative assessments that provide timely information to teachers on the extent to which their students have mastered skills they have recently been taught. The second is for assessments that measure growth in student skills. Measures of growth are important to retain morale among teachers who are doing a good job but are frustrated because they do not see this translated rapidly into improvements in scores on state accountability tests. Growth measures also can guide oversight of district schools by central office supervisors.

Knowledge and Tools

As schools become more skilled in using computer-based tools for analyzing student assessment results, the analysis capabilities they request grow. District leadership must consider whether to invest in making home-grown tools like MyBPS Assessment more flexible, or whether to purchase data analysis software from an external vendor. An important consideration in evaluating the "make or buy" decision may be the inclusion of tools for the central office to improve oversight of schools. Currently, deputy superintendents in Boston have no flexible computer-based tools to compare student assessment results in the schools that they supervise.

Of course, providing district leadership teams with tools for evaluating the performance of schools will be a step forward only if team members have the skills to use the tools wisely.

This will take considerable investment. There could be two related benefits of this investment. First, deputy superintendents could provide better guidance about the performance strengths and limitations of the schools they supervise, and second, they would be modeling constructive, effective data use.

Better Decisions and Action

There is currently no urban school district in the United States where all students become proficient readers, writers, and problem-solvers. Improving on this record will require both continued support to schools and consistent pressure for change. One source of support may be instructional coaches who understand not only how to make sense of student assessment results, but also how to engage school faculties in discussions of how to bring about instructional improvements. Constructive pressure for change will require central office supervisors who have good tools for comparing the performance of students in different schools and for assessing improvements in student performance for individual schools over time.

A persistent challenge for district central offices is how to support schools with enormous variation in capacity. Relevant questions include: What forms might this differentiated support take? Which assessments are mandatory and which are optional, and how does that vary across schools? How can the central office use assessments to identify which schools need what kinds of support?

We conclude where we started, by suggesting that analysis of student assessment results can play a critical role in improving instruction. As district leadership teams think about how to do this work better, it may be helpful to ask the questions that provide the organizing structure of this paper: Do we have the right assessments? Do our educators have the knowledge and tools they need? Is the work of looking at student data resulting in better decisions about how to improve instruction? The Boston experience over the last decade demonstrates that real progress can be made in providing school-based educators with the knowledge and tools to learn from student assessment results. The experience also demonstrates that each step forward reveals new challenges.

Building a Data Culture:
A District-Foundation Partnership

Debra Vaughan and Kirk Kelly

In Chattanooga, Tennessee, a district and its partner, a local education fund, created a culture where using data for decision making is now the norm.

At the middle school principals' network meeting, the room is abuzz with principals poring over school-level, disaggregated data.

Miles away on the other side of the county, a high school leadership team (composed of the principal, assistant principal, change coach, literacy and numeracy coaches, college access counselor, and department lead teachers) is reviewing, discussing, and learning from their data with central office administrators.

Downtown, at an elementary school student-led parent conference, fifth-grade students are discussing with their parents data that describe their academic performance on state standards.

All across Hamilton County–Chattanooga, Tennessee, public schools are using data to inform instruction, enhance leadership, and motivate students to higher levels of achievement.

Having data is not a new phenomenon. In fact, in the past, schools have been inundated with data, resulting in what is comically known as "paralysis by analysis" – schools had so much data that they didn't know what to do with them all. But this is no longer the case for Hamilton County–Chattanooga schools. The Hamilton County Department of Education, in partnership with the Public Education Foundation of Chattanooga (PEF), is dedicated to providing schools with data they can use to improve teaching and learning.

Debra Vaughan is director of research effectiveness for the Public Education Foundation of Chattanooga. Kirk Kelly is director of testing and accountability for the Hamilton County (Tennessee) Department of Education.

Data are used to help schools, teachers, and students improve. Data have become a valuable tool to improve instruction and increase student achievement. Because of this, there has been a culture change – a change in educators' attitudes toward data. It began with a reluctant acceptance of data. During principal network meetings, principals were given school-level data, disaggregated in a variety of ways, and asked to reflect on the data. Protocols were used that allowed principals to focus on "what the data are saying" about their school in a safe, nonjudgmental environment. These ask:

- What do you see that you expected to see?
- What do you see that you didn't expect to see?
- How can you use this in your schools?

These meetings served as a "sanctuary" for discussions around data. Principals began to feel comfortable digging into their own data and even sharing stories of success or lack of success, sharing best practices, and seeking advice from each other.

Building a Data-Driven Culture

An important key to developing a data-driven culture is choosing metrics that matter. It is rather easy to recognize the metrics that matter to districts: meeting adequate yearly progress, scores on state assessments, attendance rates, graduation rates, etc. But more important are those that matter to principals and teachers: advanced scores on assessments, promotion from ninth to tenth grade in one year, students "on track" for on-time graduation, college readiness, and college matriculation. Teachers and principals really care when the metrics are ones that deeply affect student success. Schools can use these data to make a real difference for their students.

Choosing metrics that matter and sticking with them is important. It sends a clear message. The selected indicators drive our work for the long term; the reform efforts are not to be abandoned, and our direction will not change midway. For example, six years ago, the goals for high school reform were selected, with clear indicators of progress: more ninth-graders are promoted to tenth grade in one year, more students pass the state assessments (Gateway exams) with more students scoring at the advanced level, more students graduate, and more students enroll in college.

These goals and indicators were established at the beginning of the work and still act to guide the reform. As time passes, additional data surface that give us information about attaining our goals; for example, we determined that studen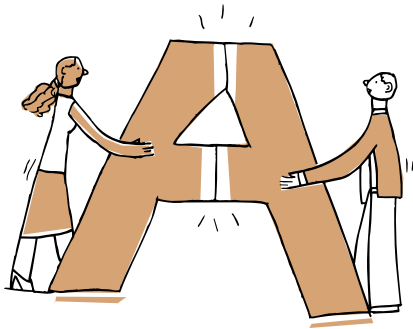t attendance was a good indicator of whether students would pass state tests and graduate. These data are shared with principals and teachers as tools to make an impact on their efforts.

To make an impact, the data must be accurate, clear, and meaningful; most important, the data must be timely. For example, in district-led data meetings, each elementary teacher (grades 3–5) receives detailed data for each student currently enrolled in his or her classroom. These data are called "class re-organized" and are based on current enrollment. Class re-organized data include the previous year's test results by standard performance indicators, the writing assessment score, the attendance rate, an indicator of
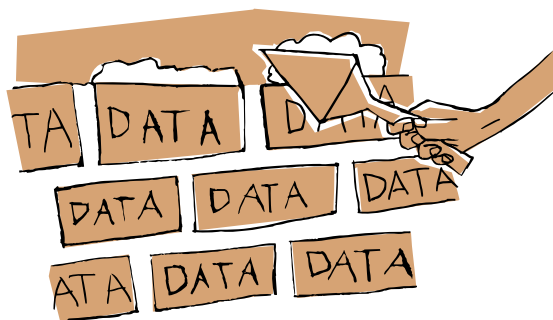
whether the student is over age for the grade, and formative assessment scores (such as DIBELS and Think Link) for every student in each class period. The design of this data report allows teachers to easily establish the skill level of an individual student or the entire classroom.

Great effort has been made to provide principals and teachers with data that are simple and easy to use; user-friendly delivery is vital. The district's department of testing and accountability creates customized data

the "why." It isn't enough to simply know that some teachers are able to move their students to high levels of achievement; it is vital to understand how that happened. It is the hope that the collection and analysis of data, both quantitative and qualitative, will lead to a greater understanding of what good instruction looks like. By identifying those best practices that are most effective for students, schools will establish a vision of instruction to help more and more students achieve advanced levels of learning.

In addition to teacher practices, student-outcome data are analyzed. For example, the district's analysis of dropout data indicated that a strong correlation exists between a student's tendency to drop out and being over age for grade level. Students who are not successful in elementary and middle schools enter high school and soon drop out. The study did confirm the important role each school has in a child's graduation and success beyond high school. Elementary and middle schools are now more aware of the impact they have on student success in the long run. The district is currently investigating various ways to prevent dropout by focusing on the early grades.

Creating a Focus

Data help to create a focus on target areas. For example, ninth-to-tenth-grade promotion rates are not part of the state's system of accountability and were not on the high school radar screen. Research by the Consortium on

reports for each school. The reports are designed to provide feedback to facilitate learning. And to help schools use the data effectively, the department holds a comprehensive data meeting at every school. At this meeting, the district and foundation partners sit with the school's leadership team and discuss data. Although this is extremely time intensive, it is well worth the effort for schools. After each meeting, the director of testing and accountability asks: What else can we (the district) do to help you? What do you need that we didn't provide? How can we make these tools more user friendly? All suggestions are considered and, if possible, implemented. The district's central office strives to provide the most appropriate data in the best format to schools.

In addition to delivering the data, the district-PEF partnership has also worked hard to conduct analysis and research. Efforts have been made to go beyond the "what" and discover

Chicago School Research and others, however, have found ninth-grade promotion to be pivotal for high school student success. In 2003, the district and PEF began to collect and analyze the data on promotion rates.

The results were disappointing. Districtwide, 77.3 percent of first-time ninth-graders met the requirements to be promoted to the tenth grade. The data were shared in the principal network meetings. Some principals were shocked by their data; others were pleasantly surprised. But all principals pledged their commitment to do all they could in their schools to provide support to students and faculty to increase student success in the ninth grade and beyond. The principals returned to their schools and worked with their teams to tackle this issue.

The story of one suburban school illustrates the power of data to influence practice – and results. The principal stunned his staff when he showed them that their ninth-to-tenth-grade promotion rate was a dismal 74.0 percent. The staff were taken aback; they had believed they were doing an excellent job with their students. "So," he asked, "what are we going to do about this?"

The staff created a plan that included a ninth-grade academy. They shifted teachers in a way that put the best teachers in front of the students that needed them the most in the courses that seemed to be the stumbling blocks for their ninth-graders. As a result, their ninth-to-tenth-grade promotion rate increased to 95.2 percent in 2006. And the percentage of district ninth-graders advancing to tenth grade in one year has increased to 89.1 percent.

Data also help to foster a foundation for professional development. As education beyond high school has become not only *possible* for all students but, indeed, *necessary*, college-readiness standards have emerged as significant data. Using data from ACT's Educational Planning and Assessment System (EPAS), schools are discovering where their students are and where they need to be so they are ready for college. Networks looked at eighth-graders' performance on EXPLORE and tenth-graders' performance on PLAN and ACT results. Each network examined the EPAS standards and recognized that college success truly does begin in kindergarten.

This recognition became the core of a wave of professional development opportunities for many schools across the district. In a K–12 network, elementary, middle, and high schools began to use the ACT standards to help plan curriculum, from kindergarten to twelfth grade. These schools are developing vertical alignment based on the standards. Elementary schools are collaborating with middle schools, and middle schools with high schools, on data that matter for students. Students and parents are engaged in these efforts, too. Students and parents may not get

It isn't enough to simply know that some teachers are able to move their students to high levels of achievement; it is vital to understand how that happened.

excited about their student's scores on the state assessments, but they get extremely excited about the prospect of their student being prepared to succeed in college.

The college-going data also serve as a great vehicle to engage the public's interest in public education. Chattanooga–Hamilton County has an extraordinarily high percentage of high school students enrolled in private schools (24.5 percent in Hamilton County, compared with 11.2 percent in Tennessee and 9.5 percent in the U.S., according to the U.S. Census Bureau.) This translates, unfortunately, into a public that fails to support and believe in public education. The college-going data help the community see the success of our public schools.

We actually create a visual of that college-going success by geo-coding the many colleges and universities where Hamilton County public school graduates enroll, as verified by the National Student Clearinghouse. For the graduating class of 2006, for example, 70 percent of students enrolled in colleges and universities in twenty-nine different states, plus Canada and St. Kitts. The resulting map provided clear evidence that public schools in Hamilton County are preparing students for college. This information is shared each year with the public through newspaper and media coverage, as well as presentations to various civic organizations such as the Chamber of Commerce.

Data Delivery

The data collection and analysis would be in vain if it never reached the classroom. Data and analyses are shared with schools in a variety of ways. The district is dedicated to holding data meetings at every school; this is the district's major method of student-level data delivery. The meetings involve the entire leadership team, and current, on-time data are clearly presented and discussed. The district data team leads the discussion and review of school and district goals.

In addition, the foundation facilitates network meetings. Within the district, there are multitudes of networks. Networks of principals (urban elementary principals, middle school principals, and high school principals) meet monthly at PEF in the Ruth S. Holmberg Center for Excellence in Leadership to discuss reform metrics. Assistant principals also have a network; their meetings are designed to parallel that of their principals. The literacy and numeracy coaches' networks meet regularly. College-access counselors and guidance counselors also participate in a network. Furthermore, K–12 networks, comprising schools within feeder patterns, meet to discuss appropriate data and metrics to determine ways that they can collaborate and support each other.

Providing data to inform instruction is not enough. Principals and assistant principals, as instructional leaders of their buildings, need support to develop a clear and conceptual vision of good instruction.

Throughout the district, networked learning communities gather to learn from their data. The networks provide a strategic forum for discussion among colleagues in like roles. The various network discussions are coordinated, however, in such a way that topics are echoed throughout the multiple levels of a school and district. Thus, networks provide both horizontal and vertical articulation of ideas.

Challenges

Creating and sustaining a data-driven, data-informed district has its challenges. The most critical component of the ability to be data focused is based on having confidence in the accuracy of the data. Therefore, accurate data entry is essential. Much of the student-level data is keyed into the district database by school office staff. This data entry must be accurate, as well as timely. There must be continuous quality checks to ensure reliability.

In addition to high-quality data-entry staff, schools need adequate instructional support. Providing data to inform instruction is not enough. Principals and assistant principals, as instructional leaders of their buildings, need support to develop a clear and conceptual vision of good instruction in the many content areas. For many schools, change coaches provide this type of support to their leadership team. Teachers also need support to interpret the data analysis and incorporate it into their classrooms. Literacy and numeracy coaches provide instructional support to teachers. They help translate data into high-quality instruction.

With the increased reliance on data, it is a challenge, at times, to meet the increasing demand for data and analyses. Between the district and PEF, the combined staff dedicated to the
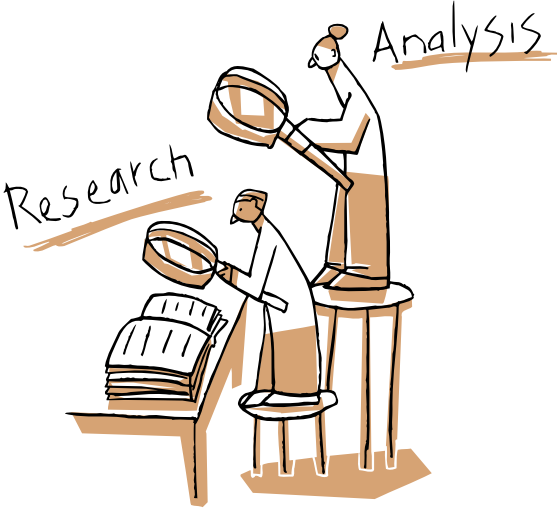
collection, analysis, and delivery of data and research totals *three individuals*. Budgetary constraints make it difficult to increase the staff and capacity of the organizations at this time.

A Common Vision and Mission about What Matters Most: Students

The partnership between the district and PEF has, however, managed to make the most of their combined resources. The district's director of testing and accountability and PEF's director of research and evaluation work closely together, taking advantage of each other's strengths to maximize their efforts to deliver information to schools, to the central office, and to PEF. The two directors meet frequently to discuss and share various projects, information, and data. Although their individual roles and responsibilities differ, they are joined by a common vision and mission for the students of the district. The work of each complements and supports the other. It is this strong and solid partnership that is responsible for much of the progress made around data collection, analysis, and delivery.

Indeed, data have become a critical tool for the district and its partners for leading reform. Constant review and discussion of data for monitoring and evaluating the implementation and impact of reform efforts allows for programmatic adjustments to be made when necessary. The results of these efforts are astounding. Across the district, elementary and middle school student-achievement scores are up, with impressive increases in many schools in the percentage of students scoring *advanced*. Careful analysis of the achievement gaps related to gender, ethnicity, and socio-economic status has brought attention to this issue; schools have responded accordingly. Achievement gaps are closing. The dropout rate is down, and the graduation rate is up. More and more students are graduating and matriculating into college. But the data show that there is still much work to be done. With the support of the district and its partners, schools are armed with relevant data. It makes a difference for school leadership teams, for teachers, and, most especially, for students. After all, that's what matters most.

Flexibility and Adaptability: Building a Data System That Works for Everyone

David Chiszar

Faced with demands from a wide range of constituents, a district built a data system to provide a broad array of information.

All data ever did for me was create more questions.
— Anonymous

David Chiszar is director of assessment and quality analysis for the Naperville (Illinois) Community Unit School District 203.

Naperville Community Unit School District 203, a 19,000-pupil district located twenty miles west of Chicago, has a history of using data to understand the effects of instruction. Where the district is today is different from where it was even a year ago, and next year will again be different. Just as schools are engaged in a continuous improvement process, so we in the district central office are continually improving the processes to collect, analyze, disseminate, and act on data.

By describing the path our district has taken in its continuous improvement process, we hope to illustrate the lessons we have learned. Our goal in sharing the stories in this article is to highlight some successes, share some growing pains, and offer suggestions on how to avoid the traps.

Overhauling an Out-of-Date System

About two years ago, the district hit a wall – a data wall. The systems we had for reporting data were not meeting our needs. Like many systems, our reporting system was built over time by adding parts and, in some cases, forcing them to work together. Faced with the data wall, we stepped back and took a clean look at why we had the reporting system in the first place. What questions were we trying to answer? What processes were we were using to answer them?

We found good things but also not-so-good things. The not-so-good things were, generally, not so good because of the limitations we had in the reporting systems, the detail of the data available to help create those reports, and, ultimately, the accuracy of the data. A look back had us asking: how did we get here? Why did we move down a road that, in the end, limited what we could do?

"You only know what you know," a wise person once said. When the district started the development of the "old" system, it was not really a system. Data warehousing, use of a data mart, statistical modeling, and multivariate analysis were not in the mix. Neither were Web-based displays or the technology to allow instant access to all staff. We added the parts we could to

the parts that were in place as time passed and, in the end, we had a system that worked but that was inefficient and that limited what we needed to do.

Determining Constituent Needs

The first task was to determine if what we had could be upgraded to meet our needs. To make that judgment, we first we had to make sure what everyone's needs were. We formed an assessment committee and held meetings among various staff and people representing various constituents around the district. Out of those meetings and subsequent discussions we created the vision of what we ultimately wanted and a map of how to attain that vision. The vision called for electronic student portfolios; multivariate, time-sensitive pictures of student performance; growth models that would show improvement in student learning over time; and evaluation and benchmarking.

We were focused on creating a better understanding what was *going to happen* – more precisely, how to understand what was ahead of us if we did not make changes and project what might be ahead of us if we did.

The constituents for this proposed system varied widely and included the federal government, the community at large, the board of education, district staff, and school staff, parents, and students. Each had a perspective and data need. And their hunger for a new system was clear; within twenty-four hours, the first response came back questioning if we could deliver the new system by August of the next school year – about six months away! We had in mind a five-year project, but our constituents clearly could not wait that long.

A Dilemma: A Limited System, or Expandability and Flexibility?

As a result, we realized we needed to think big and for the long term – but also to deliver *now*. This meant that as we overhauled the system, we had to think of expandability, how data systems integrate, and small pieces we could deliver in a timely fashion. But expandability and flexibility were precisely what our existing system lacked and were the reason we were limited in what we could accomplish.

The reason for our predicament became clear in a conversation with our data mart vendor at that time. We explained what we would like to accomplish, and the vendor told us that while what we wanted was interesting, their experience was that our staff would not want that. Translation: we cannot deliver what you want, so limit your system to what we can deliver.

That comment was a tipping point for us. And as we explored our options in the market, we realized that if we were going to buy a system from a vendor, we would always be at the mercy of what they could produce, or pay exorbitantly for what we wanted. What we had were static displays of history and, while these were informative, we were focused on creating a
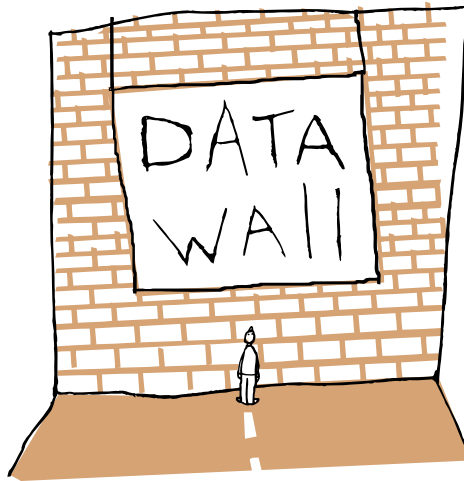
better understanding what was *going to happen* – more precisely, how to understand what was ahead of us if we did not make changes and project what might be ahead of us if we did.

Finding the Balance: Partial Customization

Of course, we were not in a position to build or finance a system completely customized to our needs. However, we found companies and consultants that had developed code on software platforms that we could buy, or purchase in annual renewable contracts with the option to buy. We own perpetual licenses to the software, which allows the district to hire outside consultants to modify and update the code running the systems. (A caveat is that maintenance agreements cease from the original developers if the code is modified.)

What the district now has are systems built on platforms where we have options. We can keep the existing agreements if they suit our needs. We can decide if elements of the system are best maintained and updated internally. Or we can choose to find other consultants to maintain or update the system. If an existing company cannot deliver to our needs, we will not lose what we have in place if we need to change. This flexibility is as much a part of our vision for the system as the displays of data.

Setting Priorities for the New Data System

Every data system has three basic parts: data collection (input), data analysis (organization), and display (output). Each of those parts has various elements, and each is separate from but interdependent with the others. Naperville's highest point of pain was the display of the data. We had lots of data but needed to paint better pictures of student learning. This was the first area to be addressed.

Fiscal Constraints

The reality was a nine-month delivery window, which was need based and fiscally driven. (Actually, this meant we had to produce something in four months in order to get staff feedback and have an opportunity to enhance it and get back to staff one more time before summer break.) What we wanted could not be produced fast

enough. We could not finance two systems at once – the one in use and the one under construction.

In order to steward the district's resources effectively, we had to use monies budgeted for the current assessment system for the new system. The operational side of the new system was targeted to come in within the current budget, and new monies were added and targeted only for development and feature enhancement. This fiscal situation helped us prioritize what we wanted; because there is limited money for development, we could reassure our constituents that enhancements are ongoing.

Designing the Displays: Whose Needs?

Choices had to be made about displays of the data. We wanted the information to meet our needs, but the difficult part was deciding just *whose* needs. As noted before, there are many constituent groups in school districts and all have a part in the process. Inside those groups are various ideas as to the best displays

of data. Believing in the invisible hand of the market and the ideas of the "intrepreneur" (those entrepreneurs that work within a system), we wanted to support and foster creativity. But if we allowed anyone and everyone to create their own displays, we would end up with a system that hindered conversation and collaboration.

We first decided that we wanted few displays that were adaptable to many data types and sources. We used the work of the assessment committee to focus the displays to make sure they served as analysis starters and were common to the whole district to facilitate the conversations that would answer the questions at hand. As we have rolled those out and continue to improve the system, we continue to adapt the displays. This is not a terrible task, because the flexibility in the system allows us to make such adaptations. And because we are responsive to staff needs, the staff has greater ownership over the product.

Focusing on Instruction

The next decision was to decide where we would focus first. It is common to satisfy the needs of the loudest questions. No Child Left Behind (NCLB) is a loud voice and is about system accountability – which we support – and thus it was easily the first place to consider. But a wide range of constituents agreed that NCLB measures were not the most appropriate focus for our first data-display efforts. NCLB measures performance on one test at a moment in time, but this is too narrow. We wanted a much broader picture of student and school performance. We knew that student learning and growth

happens every day; it is dynamic and occurs at different rates for different students. We wanted the measures to reflect that.

We quickly moved toward focusing on instruction. If we could become more efficient and effective at understanding how each student performs to the learning objectives, which objectives are mastered with the most appropriate next step, and how each student responds to various modes of instruction, we would better understand student test scores. So we set out to build a data system that would help us understand those things. The system is a work in progress. As we learn each day how to more accurately and efficiently answer those questions, we are comfortable with the system in place, since it is flexible to meet new demands.

Increasing the System's Sophistication

When we first started building the displays, we thought about the constituent groups they were for. But then we realized that was the wrong focus. We were thinking of satisfying an audience instead of answering the question – the real purpose of using data in the first place. Most constituents had the same questions, just at different levels of aggregation and in comparison to different benchmarks.

At this point, we realized that building the displays to answer these questions required better analytical processes or statistics and more detailed and precise data input. We also realized that to deliver this system would violate the rule of delivering *now*.

A Little Bit of Everything at Once
One option for addressing the need for more sophisticated analyses would have been to focus on one part, complete it,

and move on. But that would be like expecting continuous improvement to be something with a completion date. We created and delivered updated displays of data knowing we were also improving the statistical ability, as well as the data collection. As milestones were reached, the effects moved through the system. Database updates triggered the acceptance of new data that may already be available; the use of these data, in turn, triggered updates of displays into production.

Updating displays then triggered the need for more detailed data collection. In the past, the interdependence of these moving parts would once have stymied us and, indeed, would have driven us into the data wall. But now, we are flexible and we can make the changes based upon our needs and timetable.

Getting at More Complex Data
The questions we are trying to answer are as ambitious as we want the answers to be accurate. Accuracy is based on having enough valid data to be reliable. Yet, at the same time, we

Student learning happens every day; it is dynamic and occurs at different rates for different students. We wanted the measures to reflect that.

want the data collection to be as non-intrusive as possible. This means that data collection must be efficient and serve a purpose – or, more precisely, the data must be used to cause action. If we are collecting data and the majority of those data only tell us what we already know, it is typically a waste of time and resources.

There are certain pieces of data, such as state test results, that give us big-picture information about the system and student. This is important; but this information is less useful as a guide for instruction for each student. The focus of the local assessment system is to fill in each student's learning profile to inform instruction at a level of detail for each student, as well as to allow the student to take some responsibility for his or her own learning. To accomplish these purposes, the district has always invested heavily in the curriculum design process and does not let data collection get in the way of accomplishing the goals of efficient and effective data to answer our questions.

One example of complex data collection at the student level is the use of common rubrics. Having common rubrics for assessments only ensures the tool is the same; it does not ensure that everyone interprets the tool the same way. To ensure that, as a district, we provide consistent and clear feedback to students, we bring together teachers from across the district to rate student work against the common rubrics and determine whether they apply the rubrics consistently. The resulting discussions – and sometimes debates – around expectations, meaning, and how we provide feedback is as valuable as a staff development activity as is taking the data back to the students about their understanding and performance.

Another ambitious data-collection effort is around student engagement. Staff are trained, and teams "walk" a building, observing and recording the activities of each classroom. This data is presented back to the school for discussion around the types and balance of instructional activities that are provided for student learning.

The measurement of student performance, using rubrics, and of student engagement, using observational data, involves investments in staff development and does take time out of the classroom. The results, though, are much richer conversations around student expectations, learning, and instructional practices. One goal of the new assessment system is to be able to efficiently collect and effectively display these data types.

Data on Student Perceptions and Social-Emotional Learning

One type of data collected about individual students is about *student perceptions and social-emotional learning.* This type is by far the most difficult; but if we are to better understand how students might respond to modes of instruction and learning activities, it is important. The district now collects generalized data on student engagement and use of technology in the classroom, students' self-perception around the state's social-emotional standards, and students' perception of their belief in the district's mission and how they enact it.

This is the area that has the most room for growth. Currently, the district utilizes survey software to facilitate this data collection, but those data are not in the larger system. There is software

in the system that can tie into the larger system, but linking these two systems has not been the highest priority. We are still trying to better understand the best way to capture the data about student perceptions and how those data best fit in the overall learner profile of the student. When we are comfortable with those answers, we will be ready to better integrate the data.

This student information helps us develop a profile for each learner. Student success is generally measured with achievement data. How and why the student is or is not responding to the curriculum is better understood when we better understand the student. Currently, most teachers get to know their students, and those personal interactions are the best source of this type of data. We are not trying to replace this information source; rather we are trying to enhance it, as well as provide aggregate pictures at the team, school, and district levels.

Data on Student Academic Performance

Another type of individual student data is on *student academic performance*. For efficiency reasons, Naperville, like most districts, relies heavily on multiple-choice tests, even though we recognize that these provide limited information on student knowledge and skills. To better understand students' ability to think in complex ways, solve problems, and collaborate with others, the district also utilizes common rubrics for evaluating student work. Training on the use of district rubrics fosters ways to provide descriptive feedback and clarifies expectations about probable student progression or growth. By using these rubrics, the district has become more effective and accurate in describing the elements of learning to students and in engaging the students in their own learning.
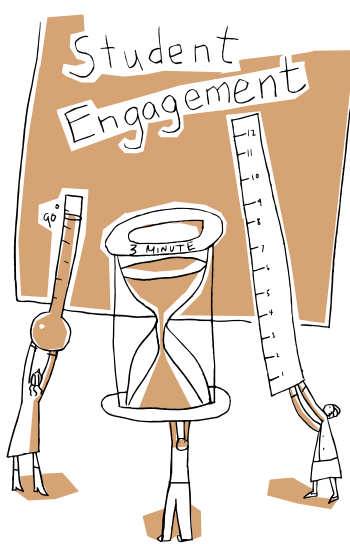
State test results give us big-picture information about the system and student. This is important; but this information is less useful as a guide for instruction.

> Data from assessments should lead directly to questions about curriculum and instruction. What is the curriculum trying to accomplish? Are we putting students in a position to demonstrate their learning?

To provide data on student performance as measured by rubrics, the district utilizes an electronic scoring system. The scores are tied into the larger system, thus providing broader information about student learning. Further integration will allow those data to be used in the multivariate analyses that help make the data more precise.

Multiple-choice tests serve a purpose, as well. If the questions are aligned to learning objectives and statistics about the questions are kept, their utility increases. Something as basic as how hard or easy the question is for the population to which it is given helps data users understand the rigor of the question, and thus enables them to describe levels of instruction. Aligning questions to learning objectives facilitates reporting on student mastery of those learning objectives.

To meet the growing demands of staff, the district has collaborated on the development of a system that utilizes common word processing software programs as the question-creation interface and a wizard-type management interface that leads staff through an organized way to develop questions; align them to grade and course objectives; and create, administer, and scan assessments.

Assessing the Assessments

It is just as important to understand how the *assessment* performs as it is to know what the data say about student learning. The best assessments are ones that are closely tied to the curriculum. Student performance on such assessments is a reflection of how well the students are mastering the learning objectives of the curriculum. On poor assessments, the connection to the curriculum is less clear, and the results are fuzzy as well: did students do poorly because the questions were bad or because instruction was not connecting with students?

To understand how an assessment is performing, we use some statistics to describe each question. It is rare that an entire assessment is bad, but to assume that as a district we would never write a bad question is not realistic. To help in the analysis, we use statistics to describe the difficulty, design, and quality of the question. These are color coded to indicate whether the question did or did not perform according to a statistical expectation. There are many reasons a question may perform poorly; it might have been used on a pre-test, before students had been exposed to instruction, for example. The point of the display is to help start the analysis by focusing the questions.

Whatever the results of the statistical analyses, the data from assessments should lead directly to questions about curriculum and instruction. What is the

curriculum trying to accomplish (the learning objectives)? Are we putting students in a position to demonstrate their learning? If the instruction is not moving students to expectations, what part of instruction needs to be changed to meet the needs of the students? Getting answers to these questions is part curriculum development and review and part staff development.

Where We Are Going and Where We Are

Our ultimate vision is a system that tracks and predicts student learning with respect to the district and state objectives and standards. It is a repository of student artifacts that show the students' growth over time academically, as well as their social-emotional growth – all through the eyes of the district's mission. It is also a place where the student, parents, and staff can go to set goals and track their individual progress. We are making progress and learning as we go; we believe that in another four to five years we will be there. Of course, if in that time the ultimate objective changes, we are also ready to adapt.

This vision has created some unease in the community, particularly when we start talking about measuring growth, because these measures rely on predictions about improvements in student performance. Fortunately, most people understand that the prediction is a suggestion of what will happen if everything stays the same. The prediction helps show whether the student and the system are on track to meet their goals. This information is imperative for all students. It not only shows whether students are not meeting expectations, it also shows whether students who have met expectations are improving fast enough. We want

to identify those students, as well; as a system, we need to know that we are addressing the academic needs of each student.

The predictive path is based upon growth modeling. We are currently working with three organizations to build the data pool to create the equations that will encompass the district assessment data. This statistical work will help ensure the accuracy and timeliness of that information.

What Does It All Mean?

Data are used to help answer questions – and there should be a relationship between the effort extended to collect, analyze, and display the data and their utility. Our experience shows that shortchanging the data system in the short run limits its usefulness in improving the efficiency and effectiveness of instruction and student learning. On the other hand, waiting for the exact system to meet your district's needs means waiting forever.

The solution, we found, is to run a system we believe can grow with our needs or adapt to our needs. As technology continues to evolve and the common software tools we are all familiar with take on new analytical capabilities, our future orientation helps ensure that our data system can evolve to meet the needs of our continuous improvement efforts.

How Community Groups Use Data

Seema Shah

Data provide community organizing groups with powerful tools in their efforts to argue for educational equity and improvement.

Seema Shah is a research associate and study director at the Annenberg Institute for School Reform.

In the late 1990s, high school student members of South Central Youth Empowered thru Action (SC-YEA), a youth organizing group in Los Angeles, initiated a campaign to protest the dearth of college preparatory courses in their South Los Angeles high schools, a dynamic they called "penitentiary tracking." Indeed, when students from SC-YEA investigated the high school curricula, they discovered that many of their South Los Angeles high schools offered more "dead-end classes" in floor covering and cosmetology than courses in core subjects such as math and science.

These early organizing efforts led the Community Coalition, SC-YEA's parent organization, to co-convene a broad citywide coalition of more than twenty community groups. The coalition, Communities for Educational Equity (CEE), represented both African American and Latino neighborhoods in Los Angeles and showed that the problems of high school rigor and college access went far beyond the schools in South Los Angeles.[1] This was an issue neighborhoods and schools across the city were facing, with far-reaching implications for the social and economic livelihood of the city.

CEE's aim was ambitious – to fight for access to a college preparatory curriculum for *all* of Los Angeles Unified School District's high school students. Data analyses and research efforts, carried out with partners such as Education Trust West and UCLA, along with sustained community and political mobilization, were at the core of CEE's ultimate victory – a historic six-to-one school board vote in 2005 in favor of the resolution mandating a college preparatory curriculum. Explained Sandy Mendoza, director of community investment at United Way of Los Angeles and a member of CEE's steering committee:

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1 Community Coalition, a South Los Angeles community-based organization, co-convened CEE with Alliance for a Better Community, based in East Los Angeles. Inner City Struggle was also a lead organization in the coalition.

You didn't have students or parents just giving anecdotal evidence about why [college preparatory courses were] necessary and why kids aren't graduating. We had data and they couldn't argue against the data.

Community Organizing Groups: A Unique Kind of Community-Based Organization

Community organizing groups such as the Community Coalition represent a unique brand of community-based organization. Rather than providing direct services or playing an advocacy role, community organizing groups make use of professional staff organizers who work with community members to build grassroots youth and adult leadership. Community members are helped to build power to alter social, economic, and educational inequities in their communities. Though community organizing groups may vary in their particular methodologies, conducting research, particularly to identify and inform reform campaigns, is an important component of the organizing cycle (Mediratta 2004).

Despite the importance of research, the complexities inherent in obtaining, cleaning, analyzing, and interpreting data often make it difficult for community organizing groups to use research. One organizing group, for instance, was originally interested in developing "report cards" for its district's schools but, ultimately, abandoned the idea. The organizer explained, "It just became too daunting to do the data collection and to figure out exactly what we're trying to do. The more we pushed it, the fuzzier we became ourselves."

In addition to the limits of their own research capacity and expertise, organizing groups may find it difficult to access data from often-recalcitrant districts, obtain those data in a timely fashion, and get the data in an easy-to-analyze format. Despite these obstacles, community organizing groups across the country are becoming increasingly sophisticated in their use of data. Groups that have developed strong data analytic capacity use their analyses to illuminate educational problems and disparities, to identify programmatic and policy solutions to the problems they are surfacing, and, when necessary, to monitor implementation of enacted proposals.

How Community Organizing Groups Use Data Differently from Other Groups

While community organizing groups use data for many of the same purposes, described in the previous section, as other key constituencies such as district officials or academic researchers, three features distinguish community organizing groups from other educational stakeholders in their use of data. First, community organizing groups
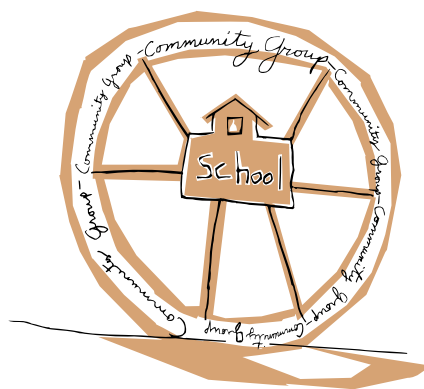
use data to build their credibility and political power. Second, because of their mission, community organizing groups are especially concerned with integrating data analyses with their on-the-ground knowledge of community issues. Third, community organizing groups are interested in data not "for data's sake," but to think strategically and specifically about the ways in which data can be used as a tool to generate tangible changes in schooling practices and policies.

Building Political Power

Data users such as school districts or educational researchers inherently possess power and credibility within policy and decision-making circles. In contrast, outside constituencies, particularly those representing poor neighborhoods and communities of color, often must fight to be viewed as valued participants in the educational decision-making process. Members of Mothers on the Move in the Bronx, for example, noticed that the education concerns they raised were often construed by educators as particular problems of individual students, teachers, or principals.

The group responded with data analyses of schooling outcomes. By showing disparities in schooling outcomes across schools serving low- and high-income neighborhoods, they were able to frame their concerns in systemic terms and, thus, were able to make explicitly political arguments about resource inequities (Mediratta & Karp 2003). As Michelle Renee (2006) notes in her research, community organizing groups' increasingly sophisticated use of data not only informs their campaign strategies and demands for educational change, but also provides groups with the cachet to establish

themselves as credible and legitimate stakeholders who have "done their homework."

In Chicago, for instance, ACORN used an analysis of teacher turnover and teacher quality in their target West Side neighborhoods to garner prominent media attention and to convince senior school district officials to work with the organization to address the problem. This work ultimately positioned ACORN as a lead partner in generating solutions to the crisis in teacher turnover and teacher quality. Chicago ACORN's lead organizer, Madeline Talbott, believes that ACORN's data reports

> legitimize[d] our campaign and [got] us in the door. Before we did this research, Chicago Public Schools and education reporters didn't call here. Now the editors of daily papers call us for comment whenever there is a story on teachers.... Our report got us on the inside.

Some organizing groups, including Chicago ACORN, have hired their own data analysts to carry out the analyses they need. Others partner with universities and established research organizations to conduct analyses collaboratively. Indeed, in a longitudinal study of eight community organizing groups that have long, successful histories of school reform organizing,[2] all of the groups in the study had worked with research partners to increase their capacity for data use and analyses.

Many of the district administrators and policy-makers interviewed for the longitudinal study identified local community organizing groups as legitimate power players in their school district, not only because their demands were rooted in data and research, but also because the groups were able to organize and mobilize grassroots constituencies to create the necessary political will to win the changes for which the data highlighted the need. A research partner of the Community Coalition describes this critical dynamic:

> When we began moving the policy [on a college preparatory curriculum], it was very, very clear to me that intellectual framing and research and data and analyses were hugely important to make this predominant in political and civic conversations, but that in order to be effective and loud with that intellectual framing and data and research, you needed community support behind you.... Community Coalition had the capacity to bring along the community.

Community organizing groups' increasingly sophisticated use of data not only informs their campaign strategies and demands for educational change, but also provides groups with the cachet to establish themselves as credible and legitimate stakeholders.

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2 The six-year study is being conducted by the Annenberg Institute for School Reform, with funding from the Charles Stewart Mott Foundation. Many of the quotes and examples provided in this article are drawn from the study. Additional details on the study can be found at <www.annenberginstitute.org/cip/mott.html>.

> Community organizing groups are often able to offer a unique perspective on the data they analyze and to present a more nuanced problem analysis.

In this way, the use of data, in tandem with other organizing strategies, allows groups to build and sustain their political power.

Grounding Data in Community Expertise

Whether working independently or in partnership with an outside research entity to analyze data, the role of community organizing groups is to ensure that research questions and analyses are rooted in the issues that community constituents are raising from their day-to-day experience with schools. Marqueece Harris-Dawson, executive director of the Community Coalition, explains:

> So, the youth are the ones who recognize, "Oh, there are always a lot less seniors than there are freshmen."… So, how does that happen? We would go get that data and figure it out.

This intimate knowledge of community conditions and dynamics positions organizing groups to ask qualitatively different questions that reflect the concerns of community members. Consequently, community organizing groups are often able to offer a unique

perspective on the data they analyze and to present a more nuanced problem analysis.

An especially potent example of this comes from the recent work of Austin Interfaith (Nichols 2007). Lisa Robertson, the principal of Travis Heights Elementary School, where Austin Interfaith has worked for many years to build parent and community engagement, observed that students from two nearby housing complexes seemed to be performing differently in school. Suspecting that this was due, in part, to the differential conditions of the respective housing developments, Robertson and members of Austin Interfaith examined a series of student success indicators that compared students from the two housing developments.

The hard data they gathered supported their instincts: students from the housing development with poor conditions had higher rates of discipline problems, a much higher rate of absences, and higher failure rates on the state TAKS exam. A more traditional analysis done by the district or by an outside researcher unfamiliar with the community would likely have examined the indicators of the entire

school in relation to other schools in the district, or might have disaggregated data by looking at subgroups by race or socio-economic status. However, Austin Interfaith's knowledge of the community and their relationship with the school allowed them to segment the data to demonstrate how poor conditions in the housing complex could be influencing student outcomes. Consequently, Austin Interfaith's recent organizing efforts have focused on pushing for greater accountability and better management of the housing complex from its managing agent – efforts they hope will ultimately improve the academic performance of students drawn from that community.
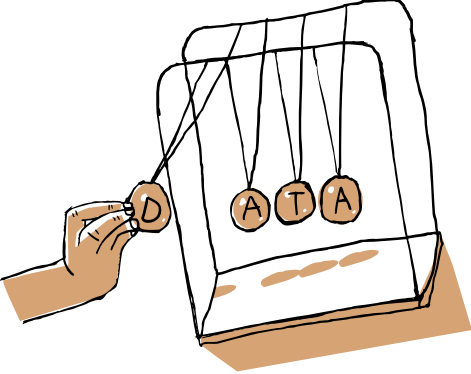
In the preceding example, Austin Interfaith raised questions drawn from its knowledge of the community that led to new ways of looking at existing data. Yet organizing groups often lack access to key data and, as one organizer indicated, must obtain the data "guerrilla style." While legislation such as No Child Left Behind and the Freedom of Information Act stipulate public access to data and have increased access to data for community-based constituencies, community organizing groups continue to report challenges in obtaining data, particularly if the district believes the data might be used "against them" in some way.

Other times, publicly reported data may be inconsistent with the experience of community members and may not accurately reflect the reality of schooling conditions. There are politically expedient ways of computing and reporting data, evidenced by the numerous controversies around the calculation of graduation rates (Carey 2007; Hall 2005). In other cases, dis-

crepancies between data and reality may exist simply because of a lack of clarity about reporting requirements. For instance, in Oakland, free-lunch data from some of the new small schools developed across the past decade were underreported because principals did not understand the paperwork that needed to be submitted. Other times, publicly available data may not provide enough nuanced information or may not provide the necessary insights to resolve the questions that are of deepest interest to community members.

For these reasons, community organizing groups often collect their own data. Alberto Retana, an organizer in Los Angeles, describes the dilemma:

> We could never find information in the format that we wanted – so somebody could dump a bunch of attendance statistics on you, and the only people who were really reading it and interpreting it were the people who had a direct interest… the school

spective on pressing issues. Oakland Community Organizations (OCO) identified overcrowding and its ripple effects as an issue, not just by looking at data on school utilization rates, but also by interviewing schoolteachers who complained of the difficulty of managing classrooms that were bursting at the seams and by interviewing school janitors who described the difficulty of keeping the school clean. By interviewing key stakeholders, community organizing groups are able to develop deeper and more sophisticated analyses that illuminate the consequences of common problems that might not otherwise be self-evident.

Organizing groups have also demonstrated their sophistication in using data and research to pinpoint solutions to the problems community members surface. Community organizing groups often reach out to experts in the field and conduct site visits to assess the appropriateness or viability of particular solutions for their community. Members of OCO, which pushed for and ultimately helped win a districtwide small–schools policy, visited New York City small schools with parent and school leaders as a part of its research and consulted with experts in the small-schools arena before advancing their model for small schools, which places parent and community engagement and local school autonomy at the center.

Ensuring That Data Analyses Lead to Action

Primary considerations vary for constituencies that use data. Academics may be interested in methodological issues and publishing findings in peer-reviewed journals. Districts might be concerned with demonstrating compliance through reporting frameworks. But community organizing groups

because they want to get money … and the teachers union because they want to use it for propaganda. So neither one of those really met our needs, or were driven by our interests … so we needed to do it ourselves.

When groups collect their own data, they use a variety of approaches to tap into the experiences of community constituents. Many groups – particularly youth organizations – conduct surveys. When high school students who were members of Youth United for Change in Philadelphia expressed concerns about testing-preparation practices at their high school, they conducted a survey of their fellow students to find out specific experiences around testing. Similarly, youth leaders in SC-YEA surveyed their fellow high school students about the issues that were most pressing to them, which ultimately led to their college access campaign.

In addition, groups are likely to arrange research meetings with key stakeholders – teachers, parents, or district officials – to gain their per-

use data specifically and strategically to focus attention on the educational issues facing neglected neighborhoods and populations and to demand the necessary changes. Community organizing groups use a variety of ways to ensure that data, in the end, serve as a tool to catalyze change.

By sharing data with constituents, allies, and targets, community organizing groups use data to build political and public will. For instance, the New York City Coalition for Educational Justice (CEJ), after hearing from several school reform experts, examining city-wide data on student performance and teacher quality, and sharing the experiences of their own children's schooling with one another, identified resource inequities, particularly around curriculum and instruction, in low-performing middle schools as a major concern.

With assistance from the Annenberg Institute's Community Involvement Program, CEJ (NYCCEJ 2007) produced the report *New York City's Middle-Grade Schools: Platforms for Success or Pathways to Failure?* The report established links between resource inequities in New York City's middle schools, resulting in low high school graduation rates and, ultimately, poor economic and social prospects. The report, which drew considerable media attention, set out several recommendations and led New York City Council Speaker Christine Quinn to convene the Middle Grades Task Force. The Task Force's report, released in August 2007, ultimately resulted in the allocation of new resources to improve education in the middle grades, including a $5 million fund set aside for fifty

of the city's lowest-performing middle-schools.[3] Additionally, New York City Mayor Michael Bloomberg agreed to hire a senior administrator to oversee middle school initiatives.

CEJ, like other community organizing groups across the country, uses data as a vehicle to argue more effectively and persuasively for the changes and reforms they are advocating. As illustrated by the CEJ story and the earlier description of Community Coalition's work, community organizing groups that have built the capacity to use data have significant policy victories to show for their efforts. Of course,

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districts respond in a variety of ways to the data, sometimes challenging the analyses. Notes one community organizer wryly, "We can get on any Web site and we can pull all of this data together, which [the district] tends not to agree with, but guess who posts it? *They* do – it's their data."

Other times, data analyses are accepted as evidence of the education problems that groups are raising but, due to political concerns or budget limitations, districts may balk at addressing the problem. In the best-case scenarios, analyses generated by organizing groups allow groups to

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3 CEJ's organizing efforts resulted in the addition of one more middle school to the pool, bringing the total number of schools benefiting from the fund to fifty-one.

initiate conversations about community concerns with district offices and other policy-makers that are rooted firmly in data. By grounding conversations in data, stakeholders can work toward a shared understanding of the problems facing urban schools and begin to develop meaningful collaborative relationships to solve those problems.

In Los Angeles, for instance, the passage of the school board's resolution to mandate a college preparatory curriculum for all of LAUSD's high school students led to the formation of a committee composed of community constituents and researchers from CEE, along with district administrators, to ensure the successful implementation of the resolution. Through this committee, CEE researchers and the district's research team began sharing data and discussing research questions with one another.

As both the community-based researchers and district-based researchers conducted analyses to assess what kind of supports would be necessary in each of LAUSD's high schools to implement the full college preparatory curriculum, they found they were getting disparate results because they were using different exclusion criteria in their analyses. In the end, after several weeks of trying to determine the best approach, the community-based and district-based researchers decided to report the data both ways and to discuss the implications of both sets of analyses. One community-based researcher on the committee observed:

> So that's an example of having both insiders and outsiders doing [the analysis]. The goal is to get [the district] to adopt a reasonable policy and strategy. Because one of the big worries in this is that there is no way the community groups can do the work of the district.

Conclusion

The inherently political landscape of education reform requires that both school districts and community groups use data to leverage their respective positions, frequently placing them at odds with one another and making it difficult to share data or to work collaboratively on analyses. However, as the example of collaboration in Los Angeles illustrates, under the right circumstances, the efforts of school districts and community groups to work together can promote a spirit of mutual accountability, ideally leading to better informed education practice and policy.

References

Carey, K. 2007. *The Pangloss Index: How States Game the No Child Left Behind Act.* Washington, DC: Education Sector.

Hall, D. 2005. *Getting Honest about Grad Rates: How States Play the Numbers and Students Lose.* Washington, DC: The Education Trust.

Mediratta, K. 2004. *Constituents of Change.* New York: New York University, Institute for Education and Social Policy.

Mediratta, K., and J. Karp. 2003. *Parent Power and Urban School Reform: The Story of Mothers on the Move.* New York: New York University, Institute for Education and Social Policy.

New York City Coalition for Educational Justice. 2007. *New York City's Middle-Grade Schools: Platforms for Success or Pathways to Failure?* New York: NYCCEJ. Available for download at <www.annenberginstitute.org/CIP/index.html>

Nichols, L. 2007. "Another Side of Travis Heights: Residents and Austin Interfaith Target Blighted Apartments," *Austin Chronicle* (October 19). Available online at <www.austinchronicle.com/gyrobase/Issue/story?oid=551931>

Renee, M. 2006. "Knowledge, Power, and Education Justice: How Social Movement Organizations Use Research to Influence Education Policy." Unpublished dissertation, doctor of philosophy in education program, University of California, Los Angeles.

Beyond Test Scores:
Leading Indicators for Education

Jacob Mishook, Ellen Foley, Joanne Thompson, and Michael Kubiak

A study of four leading–edge districts suggests what it might take to create a system that provides useful information about early signals of progress toward academic achievement.

Improving student outcomes and closing achievement gaps, both within a school and across a district, takes time – more time than is often allowed in typical big-city political environments. Education leaders and community members need a way of examining their schools and their school systems that allows them to understand when (and whether) progress is being made, before the results show up in indicators like student test scores.

Leading indicators – indicators that provide early signals of progress toward academic achievement – enable education leaders, especially at the central office level in a school district, to make more strategic and less reactive decisions about services and supports to improve student learning. The concept of leading indicators incorporates a way of viewing and using data to inform systemwide decisions about education. It builds on existing efforts by school districts to use "data-informed decision making."

This article examines how four districts that are at the forefront of the field in using data to inform decisions are developing and using leading indicators for education. By describing how these four districts – Hamilton County (Chattanooga, Tennessee),

Montgomery County (Maryland), Naperville (Illinois), and Philadelphia – have developed and used leading indicators within the context of a strong district "data culture," the Annenberg Institute for School Reform hopes both to catalog specific indicators that have been useful to these districts in increasing student achievement and to expand the notion of a leading indicator beyond easily identified testing data to more difficult-to-measure but crucially important measures such as student engagement and central office practice. As one district partner put it:

> At its best, data should be more than a number. It should tell stories. Measure capacity. Create, in a sense, a living picture in order to see the school and the system in a different way. Present "the everyday" in a precise and meaningful way.

What Makes an Indicator a Leading Indicator?

The most widely accepted and used indicators in education are scores on standardized tests that are given at the end of each school year. These and the other *lagging indicators* typically collected usually arrive too late to help

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> These measures do not tell us whether the types of practices, people, strategies, materials, or technologies that school districts are investing in are likely to lead to improved student achievement.

individual children or schools that are struggling. These measures do not tell us whether the types of practices, people, strategies, materials, or technologies that school districts are investing in are likely to lead to improved student achievement.

Leading indicators, on the other hand, are:

- *timely and actionable:* they are reported with enough time to change a course of action in order to improve lagging outcomes;
- *benchmarked:* users understand what constitutes improvement on leading indicators, whether through longitudinal comparison of the same data or through research-based criteria;
- *powerful and predictive:* they can offer targets for improvement and show progress – or a lack of progress – toward a desired outcome before that outcome can be expected to occur.

Common Indicators

Early Reading Proficiency

Early reading proficiency was the most common leading indicator examined by our study districts. It was often the first thing district leaders and partners mentioned when asked if they could identify any high-leverage indicators.

Algebra Mastered in Eighth Grade

All of our study districts had developed some kind of mathematics initiative to help students master algebra sooner in their academic careers. They monitor enrollment and performance in mathematics classes, striving to help students understand algebra by the end of eighth grade.

Over-Age Students

Two of our study districts work to identify students who are "over age" in each grade level. In high school that typically might mean a student who has only accumulated enough credits to qualify as a sophomore but is actually old enough to be a junior or a senior. In elementary school, over-age students are those who are a year or more older than their peers in the same grade.

Grade-to-Grade Transitions

One district, in particular, focused on data around student transitions, especially from fifth to sixth grade, eighth to ninth, and ninth to tenth and has established "transition goals" to ensure that middle school students are academically prepared for a rigorous high school curriculum. The district has also used these data to develop a new policy: based on data showing the difficulties that students encountered in the ninth-grade transition, the district created ninth-grade academies in some high schools, as well as "mid-high schools" to both ease the transition

and provide targeted support to keep students on a successful high school trajectory.

College Admission Test Scores

Two districts in our study have examined scores on college-entrance examinations (e.g., the SAT and the ACT) and their associated preparatory tests (e.g., the PSAT) and curricula (e.g., ACT PLAN and EXPLORE). They identify students who score high but are not enrolled in advanced courses or who are in danger of dropping out. One district is piloting the ACT's eighth- and tenth-grade college- and career-planning tests and is also utilizing a Web site that correlates state assessment scores to predict ACT scores and expected salary figures for future employment. Another district enrolls students, particularly students of color, in Advanced Placement courses if they score high on standardized tests.

Attendance and Suspension Rates

Districts have made headway collecting and sharing school- and district-level attendance rates with greater frequency. For example, in one district, attendance data reports had previously been delivered to schools each month and again at the end of each semester. Now, attendance data are shared on a ten-day cycle, allowing for principals to identify students and grades that have chronic attendance problems and to make necessary changes.

Multiple districts in the study have also improved the ways in which they attempt to correlate attendance data with suspension and "major incident" discipline rates. In this case, the key is to look not just at the overall percentages, but also at whether it tends to be
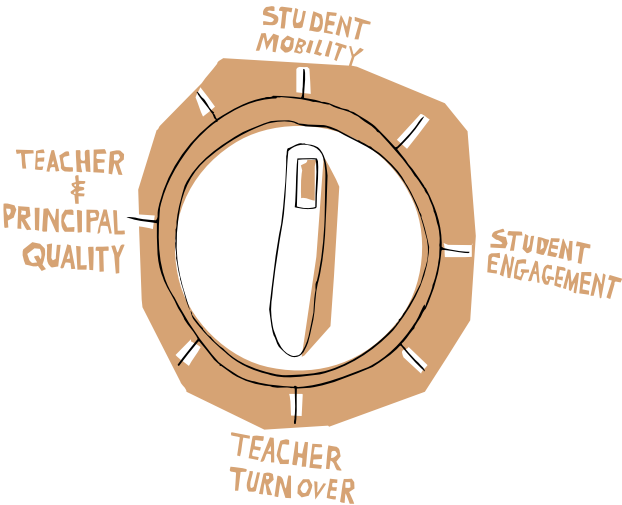
STUDENT MOBILITY

TEACHER & PRINCIPAL QUALITY

STUDENT ENGAGEMENT

TEACHER TURNOVER

Because of the often-elusive nature of the concept of teacher quality, districts have approached this issue from a variety of vantage points. Getting easily quantifiable and usable data on teacher quality is complex and difficult.

the same students that are chronically suspended – and to build a subsequent understanding of how many instructional hours these students are missing and the academic cost of those absences.

Harder-to-Measure Indicators

All of the indicators described above are relatively easy to measure and data related to them have, for the most part, been collected – if not analyzed – by most districts for years. But there were also some indicators that our districts examined that were more difficult to quantify and are not collected widely by most school districts. These indicators include student mobility, special education enrollment, student engagement, and teacher and principal quality, including teacher turnover.

Student Mobility

Particularly in urban areas, high rates of student mobility make it more challenging to sustain each student's academic growth. Not surprisingly, districts in this study have found that, controlling for other factors, schools with higher mobility rates have lower student-achievement levels. Given that mobility will continue to be a fact of life for urban districts, the solution may in some respects lie in better data collection. Using a universal student identifier and relying more on technology to collect data are two strategies our study districts are using to improve the accuracy of their data about student mobility.

Special Education Enrollment

Special education students, under No Child Left Behind, receive a great deal of attention due to the need to make adequate yearly progress with all subgroups. All four districts in this study tracked data on special education students, though sometimes these

data were not integrated. For example, interviewees in one district mentioned that information in special education students' Individualized Education Programs existed only on paper, not in the district's data warehouse, and that integrating these data was a priority.

Student Engagement

One district used "focus walks" to examine the level of student engagement in classrooms and benchmark "how we want students engaged in learning." Districts also reported that they did frequent student surveys on topics ranging from technology use to students' social-emotional needs. However, some admitted that student engagement is not easily quantifiable. Thus, there's a belief that student engagement, as defined in myriad ways (e.g., school climate, time on task), is important. But the means of measuring student engagement are limited. The challenge is to develop a richer indicator that is more easily measured and can be understood and acted upon by administrators and teachers.

Teacher and Principal Quality

Because of the often-elusive nature of the concept of teacher quality, districts have approached this issue from a variety of vantage points. At least one district is looking at teacher turnover. Another district has begun looking at measuring teaching practice through a coaching model that requires intensive examination of pedagogy. However, collecting data through this model has proved to be labor intensive, and it is difficult to use the information to train teachers to be more effective. Furthermore, like collecting data on student engagement, getting easily quantifiable and usable data on teacher and principal quality is complex and difficult in all four districts.

Another district has approached the measurement of teacher quality from several angles. The district has implemented a teacher evaluation system and reexamined surveys on teacher satisfaction to determine whether teacher satisfaction had any impact on student achievement. Another survey of teachers and administrators showed that supervisor ratings were meaningful to teachers. The district has also implemented an interview tool that scores teacher applicants and plans to determine whether this tool is, as a central office administrator put it, "actually sorting out who are the best teachers." The district also tracks teacher professional development and teachers who are released and, with the collaboration of the union, has developed an exit survey.
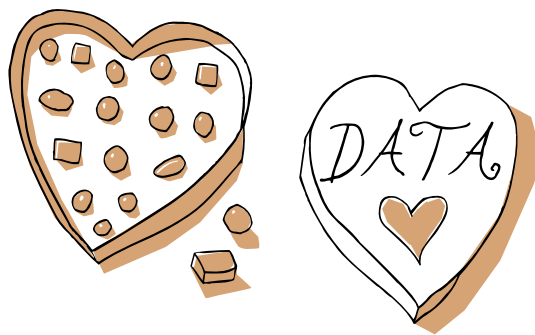
The Data Wish List

Like most districts, the four districts in our study collect a lot of data. Still, there are areas where the data are thin. We asked our respondents to highlight data that weren't available to them but that they would like to have. While the items on their wish lists are not all leading indicators, the statistics described below could all be a part of a robust system of leading and lagging indicators.

Post-secondary Outcomes

All of our districts were able to minutely dissect student outcomes through the twelfth grade. But as soon as their students graduated, they had limited ways to track them. The ultimate proof of the education that districts provide is neither the students' scores on standardized tests nor their grades, but their success after the end of high school in college or the world of work. It was extremely difficult for our districts to know what happened to their graduates.

Social-Emotional Data on Students

Several of our districts expressed an interest in examining data related to the emotional well-being of their students but had found limited ways to get to these data. Participants from one district almost universally commented on the importance of these data. The superintendent said,

> We have been struggling with issues around diversity – how to tackle it. Interesting question across the district: kids in this school are tolerant of kids different from them on the survey. The number was still high, but there was a drop from last time. What can we do at the district level to modify what we are trying to do with social-emotional learning?

A district administrator summed it up best, saying:

How to assess social-emotional data is an area where we tend to go by gut rather than data. We need training on what tools are out there, what really is going to inform how we help kids in that area. Lots of research shows that social-emotional concerns can affect achievement. We do have some; we introduced the Manners Matrix and are trying to tweak [it] with social-emotional learning goals, and a school perceptions survey [was] completed recently. [We] got some; we need to collect [data] in a systematic way that will inform our decisions around the social-emotional piece.

The desired social-emotional data are related to the student-engagement data described in the section Student Engagement. Efforts to understand student engagement are nascent attempts to get at the broader construct of students' social and emotional development.

Teacher Preparation and Training
Similarly to their interest in issues of teacher quality, the districts were particularly interested in gathering additional data about teacher preparation and training. For example, one district's vendor said:

I also wonder how good universities are doing with teacher preparation for training teachers on how to use data. I doubt [the local university] has very much of this. [A data specialist] is invited once in a while to speak to students, but other than that, I don't know. How do we help our teacher preparation programs and the universities prepare our teachers better to enter a data-driven system?

Several of our districts expressed an interest in examining data related to the emotional well-being of their students but had found limited ways to get to these data.

A district administrator from the same district said,

Another area we didn't talk about is K–16 – connecting with colleges around matriculation, training teachers. Going to the schools, sharing information, talking with teachers, and realizing in every building there is something you can learn.

Several district administrators were interested in gathering additional information from universities about student teachers and teachers coming from their programs:

I would like to gather data from student teachers. Talk to supervisors. What universities and colleges are they coming from? Are there areas where they are lacking? Areas where they excel?

[I would like] more data on the teacher. For example, what college they attended. Is it possible to use school codes like ACT does? Once we get that electronically, we can do more with the teacher piece.

Few school districts have the time, resources, or expertise to collect data on harder-to-measure concepts that reflect the kinds of rich learning environments we want our children to have.

Conclusions

The four districts in our study are among the most advanced in the country in using data to inform their decision making, and other school systems can learn a great deal from their successes and challenges. For us, at least, their experiences offer the following lessons.

- Though they might not be referred to as such, leading indicators for education exist and are being used to differentiate instruction and improve outcomes for students. In some cases these "leading indicators" are simply a prioritization of a few intermediate outcomes; in others, they are a synthesis of multiple indicators that describe typical student trajectories toward success or failure. Either way, they go far beyond simply examining test scores.

- Many of the leading indicators already in use, such as third-grade reading proficiency and student age compared with credit accumulation, are data sets that school districts have long collected and that are relatively easy to measure. But there are other indicators that are harder to measure and are essential to understanding student success. Examples of such indicators include student engagement and teacher quality.

- School district central offices play a critical role in developing leading indicators as one part of a broader data-informed decision-making system. Central office leaders do this by advocating for equity, especially in terms of outcomes by race and ethnicity; by providing time, infrastructure, and supports that align all the work of the district; and, perhaps most important, by establishing a data culture, where information is sought out, discussed, and acted upon.

- For all the emphasis on understanding school, student, and teacher performance, there was no comparable focus on measuring the efficacy of central office supports. Central office staff relied primarily on anecdotal evidence to assess whether they were adding value to the work of school-based educators. Central offices need better and more standardized feedback tools for understanding their own effectiveness.

Leading indicators are only one part of a data-informed decision-making system. In addition to the elements described in this article – a data warehouse, well-aligned and implemented curricula and formative and summative assessments, easy access to data, and support for using data – educators need not only good leading indicators, but also good lagging indicators.

For example, the desire of many of the respondents in our study districts to have more information about the performance of their students in college is an effort to understand the outcomes of the education they provide. While the trajectories and sophisticated statistical modeling techniques these districts are employing have as their endpoint high school graduation, high school graduation is not really the ultimate goal. Rather, it is that students graduate from high school with the requisite foundation to succeed later in life, whether that is in school or work.

But few school districts have the time, resources, or expertise to collect data on harder-to-measure concepts that reflect the kinds of rich learning environments we want our children to have. To do so will require much deeper collaboration with partners – higher-education institutions, community-based organizations, and local governments, to name three – through the sharing of data and resources. Some districts have begun that process with higher-education institutions and with some key external partners, but the breadth and use of the process so far is limited. This collaboration would more widely and deeply share accountability and responsibility for children throughout the community.

This goal is consistent with the Annenberg Institute's vision of "smart education systems." Smart education systems bring together schools, community organizations, and civic agencies and institutions to create a web of supports to develop a broad range of outcomes for children and youths. Using data differently is one of the key aspects of smart systems.

As we move forward with our work on data-informed decision making and leading indicators, we will focus on helping districts and communities think broadly about student engagement and figure out how to measure it. We will also collaborate with central offices to gather key information about their own services and more data about policy implementation. We will make efforts to link data, resources, and expertise both within and across specific communities as a kind of data network to advance our understanding of how educators can use and benefit from richer, more powerful, and more timely information.