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The Five Essential Supports for School Improvement: Mobilizing the Findings

Los cinco apoyos esenciales para el mejoramiento de los aprendizajes en la escuela: movilizando los resultados

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Abstract

In 2010, the University of Chicago Consortium on Chicago School Research (CCSR) released a book that established the importance of five organizational domains in improving student outcomes in public elementary schools. These "five essential supports" highlighted the combined importance of school leadership, professional capacity, parent-community ties, a student-centered learning environment, and instructional guidance. Schools strong on clusters of these supports were 10 times more likely to improve learning of reading and mathematics, compared to schools weak in these supports. Building on the original research, designers and researchers created a set of survey-based diagnostic tools that allow educators to assess the strengths and weaknesses of their own school in the five essential supports. Based on these results, principals, teachers, and parents can craft an evidence-based narrative and diagnosis about their school and develop action plans to strengthen these organizational practices. This paper details the underlying research, the creation of the diagnostic tools, and the use of the diagnostics to support school improvement.

Keywords: school improvement, urban schools, knowledge mobilization

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Resumen

En 2010, el Consorcio para la Investigación Escolar en Chicago de la Universidad de Chicago (*University of Chicago Consortium on Chicago School Research*, CCSR) publicó un libro en donde se establecía la importancia de cinco dominios organizativos para mejorar los resultados académicos de los estudiantes en escuelas públicas de educación primaria. Con estos "cinco apoyos esenciales" se hacía hincapié en la importancia combinada del liderazgo escolar, la capacidad profesional, los vínculos entre los padres y la comunidad, un entorno de aprendizaje orientado al estudiante, y pautas para la enseñanza. Las escuelas que estaban bien respaldadas por este conjunto de apoyos demostraron tener una probabilidad diez veces mayor de mejorar el aprendizaje en comprensión lectora y matemáticas, en comparación con escuelas cuyos apoyos era más débiles. A partir de la investigación original, los investigadores y diseñadores crearon un conjunto de herramientas de diagnóstico basadas en encuestas que permitió a los educadores evaluar las fortalezas y debilidades de sus propias escuelas respecto a estos cinco apoyos esenciales. Con los resultados obtenidos, los directores, docentes y apoderados pueden armar un diagnóstico narrativo basado en la evidencia sobre sus escuelas, y así, idear un plan de acción para fortalecer estas prácticas organizativas. En este artículo se detalla la investigación de trasfondo, la creación de las herramientas de diagnóstico y el uso de estos diagnósticos para respaldar el mejoramiento escolar.

Palabras claves: mejoramiento escolar, escuelas urbanas, movilización del conocimiento

In this article we travel a path from research to reformulation of findings to use of the findings by practitioners. Drawing on *Organizing Schools for Improvement: Lessons from Chicago* (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010), we begin with a summary of a longitudinal study of public elementary schools in Chicago that, during a 15-year period, identified the school organizational elements that differentiated substantially, improving schools from stagnating schools. We go on to discuss how researchers and designers worked together to mobilize these findings for practitioners by creating individual school reports that allowed educators to see their schools' relative strengths and weaknesses on the organizational elements. Lastly, we detail one school's experiences in examining its findings and developing an action plan to address weaknesses.

The research: Why some schools improved and others did not

By the middle of the 1990s, CCSR was beginning to see considerable variation in school achievement. Among the 118 schools with the most improved standardized reading scores, 37% scored at or above national norms in 1996, whereas in 1990 only 22% of these schools had done so. Among the 118 least improved schools, the trend was essentially flat —24% scored at or above national norms at the beginning of the decade and 24% in 1996. Trends in math scores displayed similar patterns. Together, these two sets of diverging schools served more than 150,000 students. What led some schools to improve dramatically, while others remained stagnant? This was the question that educators and policymakers in Chicago posed to researchers at CCSR (Bryk et al., 2010, Introduction).

Conceptual framework

This question emerged early in CCSR's history, at a time when, as a result of a new law, schools were taking advantage of new autonomy and resources to initiate improvements on their own.[1] This allowed CCSR to study a large, natural experiment to determine what kinds of school organizational changes would eventually lead to improved student outcomes. At about the same time —and at the invitation of the CPS superintendent— CCSR researchers joined educators and school reformers in Chicago to begin developing a system-wide guide for school improvement. Many of the ideas emanating from the research on school effectiveness shaped the guide (Edmonds, 1979; Good & Brophy, 1986; Purkey &

[1] The Illinois legislature passed Public Act 84-1418 in 1988. The law "radically decentralized the Chicago public school system, moving authority away from the central office to … individual schools." (Bryk et al., 2010, p. 15).

Smith, 1983). Out of these early discussions with Chicago educators, examinations of extant research, and mounting surveys and field studies of schools, we developed a grounded theory of school organization and its improvement, the framework of the Five Essential Supports for School Improvement and the Larger Community Context (Figure 1). We wanted the framework to serve as both a clinical guide to practitioners and as a theoretical guide for validation research.

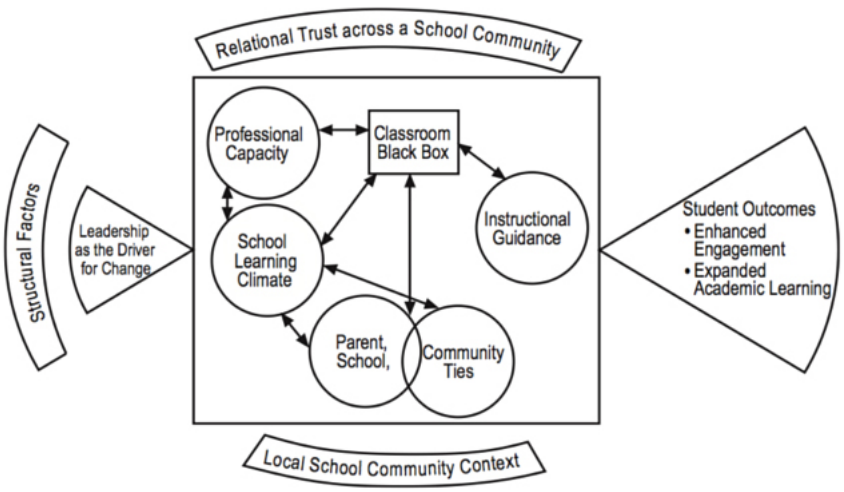

Figure 1. The Five Essential supports and the larger community context.

The framework asserts that local leadership, acting as a catalyst, is the first essential support for school improvement. Local leaders must stimulate and nourish the development of four additional core organizational supports: Professional capacity of the faculty and staff, parent and community ties, a student-centered learning climate, and the instructional core. While it is tempting to concentrate on each individual support, the value of these supports lies in their integration and mutual reinforcement.

The framework rests on the assumption that there is a vital connection between a school organization and what happens in the classroom. Indeed, research on school restructuring has demonstrated that the organization of a school influences the conditions under which teachers work and engage students in learning. While the teacher in his/her own classroom has the most direct responsibility for raising student achievement, the broader school organization also must be structured in a way that supports teachers in their efforts to enhance students' learning (Elmore, Peterson, & McCarthy,1996; Newmann & Associates, 1996). More recent literature on continuous school improvement also calls for this orientation to be applied to the whole school organization (Smylie, 2010, Chapter 2).

Effective leadership. Effective leadership requires taking a strategic approach toward enhancing performance of the four other domains, while simultaneously nurturing the social relationships embedded in the day-to-day work of schooling and its improvement. School leaders advance their objectives particularly with respect to improving instruction (Elmore, 2002), while at the same time seeking to develop supportive followers for change. In the process, they cultivate other leaders —teachers, parents, and community members— who can take responsibility for and help expand the reach of improvement efforts (Spillane, 2006).

Professional capacity. Professional capacity encompasses the quality of the human resources recruited and maintained in a school (Darling-Hammond, 1997), the quality of ongoing professional development focused on local improvement efforts (Smylie, Allensworth, Greenberg, Harris, & Luppescu, 2001), the base beliefs and values that reflect teacher responsibility for change (Rowan, 1990), and the presence of a school-based professional community focused on the core problems of improving teaching and learning (McLaughlin & Talbert, 2006). The four elements of professional capacity are mutually reinforcing and together promote both individual and collective growth.

Parent-community ties. Parent-community ties result from school staff reaching out to parents and community to engage them in the processes of strengthening student learning (Epstein, 2011). It also means that schools draw on a network of community organizations to expand services for students and their families.

Student-centered learning climate. Providing a student-centered learning climate requires a safe and orderly environment that is conducive to academic work. Clear, fair, and consistently enforced expectations for student behavior ensure that students receive maximum instructional time. A school environment must also press toward academic achievement and couple this with deep personal concern for students (Shouse, 1996).

Instructional guidance. Instructional guidance refers to the orientation, organization, and coordination of the curriculum within and across grades. Without such curriculum alignment, schools run the risk of weakening students' learning opportunities and achievement through delays, repetitions, and skips in core knowledge and skills (Smith, Smith, & Bryk, 1998). It is widely agreed that to prepare students for further schooling, specialized work, and responsible civic participation, teachers must move beyond the basic skills and ask students to do intellectually challenging work (Levy & Murnane, 2005).

The conceptual framework also recognizes that local leadership and the other four core supports exist within a broader context of a climate of mutual trust and a local community. Trust is a key social resource for school improvement. The essential supports are most likely to develop in schools where mutual trust suffuses the working relationships across the school community. The local community and its history also play a critical role in the development of the essential supports and students' opportunities to learn (Bryk et al., 2010, Chapter 2).

Data sources and methods

This study drew on an extensive longitudinal database about Chicago and its public schools, assembled by CCSR. The database includes a wealth of student-level information on the 477 schools that served students from kindergarten to 8th grade. The outcome measures for this study were created from annual individual student test scores in reading and mathematics on the Iowa Tests of Basic Skills (ITBS) and from school reports of average daily attendance. Supplementing these data were administrative records from the Chicago Public Schools (CPS) on students' birth date, race, gender, home address, school, and grade. The vast majority of explanatory variables came from a series of principal, student, and teacher surveys that CCSR conducted. In addition, we drew on the U.S. Census, public aid data, Chicago public housing data, Department of Children and Family Service records, and crime statistics from the Chicago Police Department (Bryk et al., 2010, Introduction). We also incorporated data from a community study conducted by the Project on Human Development in Chicago Neighborhoods (Sampson, Raudenbush, & Earls, 1997).

From test scores we constructed an academic productivity profile for each school that allowed us to determine whether students who attended each school were making learning gains each year and whether those gains were increasing over time (Bryk et al., 2010, Chapter 1). The surveys allowed us to measure practices in the school related to the five essential supports. Survey items were combined into scales or measures of particular constructs using Rasch analysis.[2] The measures captured aspects of each essential support domain. We will discuss these later in relation to the school report tool. Together, the test scores and the survey data permitted us to test the hypothesis that, compared to those schools without such strengths, schools stronger in the essential support practices were more likely to show substantial learning gains in reading and mathematics and improvements in attendance.

[2] Using Rasch analysis, we combined data from a set of questions conceptually related to each other. For details, go to http://ccsr.uchicago.edu/page/rasch-measurement-model-primers. Also see Wright and Masters (1982).

Findings

We consider a core set of five indicators, one each for school leadership, parent involvement, teachers' professional capacity, student learning climate, and instruction. We categorized schools as strong on an essential support if their core indicator ranked them among the top 25% of Chicago public elementary schools in the 1994 surveys. Similarly, schools ranked in the bottom quartile on a core indicator in 1994 were classified as weak on that essential support (Figure 2).

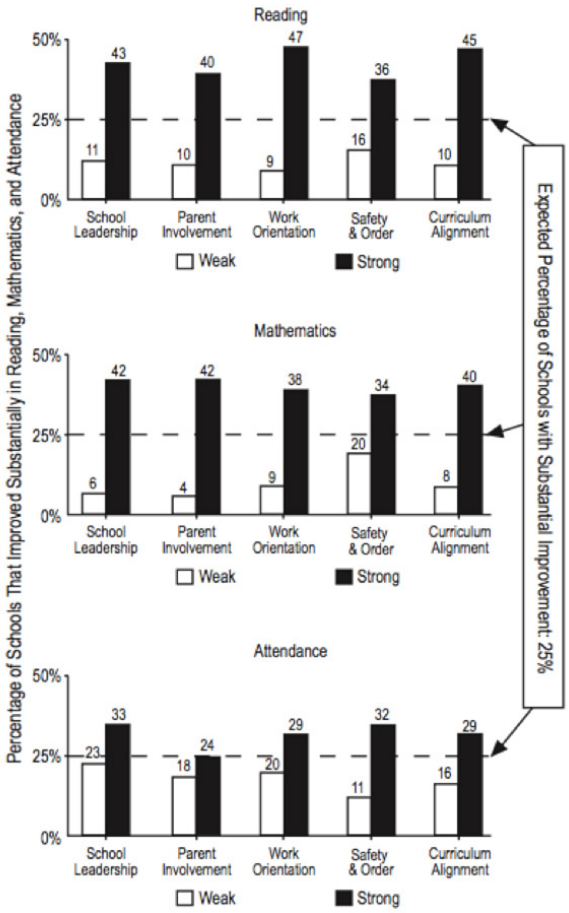

Figure 2. Likelihood of substantial improvement in reading, mathematics, and attendance, given weak or strong supports.

Strength in any single core support substantially elevated the probability of improvement in both reading and mathematics. For example, the probability of substantial improvement in math was seven times higher among schools with strong leadership than among schools with weak leadership (42% compared to 6%). While all five supports were strongly related to improvement in all three outcome indicators, the measure of student-centered learning climate (safety and order) was most closely related to attendance improvement, while the other four supports were more strongly associated with student gains in reading and mathematics.

We went on to examine the cumulative effects associated with being strong in three to five supports simultaneously. Schools strong in most supports were about 10 times more likely than schools weak in most supports to show substantial gains in both reading and mathematics. Not a single school weak

in three or more supports showed substantial improvements in mathematics. Furthermore, a material weakness in only one support sustained over time seemed to undermine reform efforts, as almost none of these schools showed improvements (Bryk et al., 2010, Chapter 3).

These findings counter arguments that narrow intervention efforts, such as a specific instructional program, can produce long-term school improvement. Schools with a robust professional community, vital leadership, and a climate centered on student learning, can make good use of innovative instructional programs. But simply introducing new interventions will not change the core functioning of the school, unless the school has positive social relationships and the organizational supports for improvement (Bryk et al., 2010, Chapter 3).

Relational trust is the foundation of the essential supports. There was also convincing evidence that trust is vital to the development of the essential supports. In schools where trust was high in 1991, improvements in the essential support practices between 1991 and 1994 were much greater than in the system as a whole. This included teachers' orientation toward innovation and commitment (professional capacity), parent involvement (parent-community ties), and safety and order (student-centered learning climate). The same held true for the period between 1994 and 1997. We also found that when trust levels were low, the essential support practices started to deteriorate. In particular, schools with low levels of trust in the base year declined by 0.4 to 0.8 standard deviations in levels of essential supports three years later. Hence, the state of relational trust in the school community conditions that school's capacity to enhance the functioning of the essential organizational practices. Building a healthy student-centered climate or establishing a coordinated curriculum requires close and sustained collaboration among the teachers and other staff. It is impossible to accomplish these things without respectful and trusting relationships among the people (Bryk et al., 2010, Chapter 5).

Local community context. As we asserted in our conceptual framework of the five essential supports, contextual resources for school improvement, or the social resources in the community, also underpin the development of the essential supports. Social capital in the community, or the ability of residents to work together toward common goals, establishes the conditions whereby a community can come together through its local school council[3] to recruit and work with the school principal, to forge a vital link to the parents, and to create a healthy climate for children.

Given variation across neighborhoods in the degree of social capital, one of the ultimate questions was, do the essential supports contribute to the improvement of student learning in schools across all types of communities, regardless of their social capital? To categorize communities within Chicago according to their social capital, we drew on a community study undertaken by the Project on Human Development in Chicago Neighborhoods that examined community, family, peer, and individual characteristics to offer a comprehensive understanding of human social behavior and the environments in which it plays out (Sampson, Raudenbush, & Earls, 1997). Communities with vital social capital were those where residents described strong community cohesion and regular participation in churches and other religious organizations. They were also communities with lower crime rates, which we found using data obtained separately from the Chicago Police Department.

The analyses showed that schools in both communities with strong social capital and communities with scant social capital benefited from strong essential supports in terms of improvements in reading, math, and attendance. While the essential supports were vital in all types of schools, the relationships were not identical. For schools in communities with weak social capital, very strong essential supports were crucial for achieving improvements. In schools located in communities with more plentiful social capital, even average levels of essential support practices were sufficient to improve student learning. They simply could not have weak supports. Thus, the school works in interaction with the community; if social resources are weak in the broader school context, the social organization inside the school must be strong enough to compensate. At the same time, schools with robust essential supports were rare in low-social capital communities (Bryk et al., 2010, Chapter 6).

[3] Most schools in Chicago have an elected local school council that hires and evaluates the principal and advises on the budget and school programs.

Replicating findings through 2005. Between 1997 and 2005, CCSR conducted surveys of all CPS schools every two years. In addition, we were able to develop a separate, value-added estimate for each school, each year. By linking together these year-by-year value-added estimates and the biennial school surveys, we were able to investigate how base levels on the essential supports, and changes in them over time, related to school change in their value-added measures of student learning.

There were 11 measures of essential support practices that were comparable between 1997 and 2005. Results of our analyses showed that for 10 of 11 essential support measures, the stronger the ratings of the practices, the higher the value-added results in subsequent years. In addition, for some measures, improvements in the essential support practices were also associated with increases in value-added results. The replication analyses further strengthened the validation of the framework of the essential supports practices. In essence, we had 15 years of data on Chicago public elementary schools that pointed to the value of the essential support practices (Bryk et al., 2010, Appendix G).

The five essential supports in high schools. In 2012, two CCSR researchers (Sebastian & Allensworth, 2012) published a nuanced analysis that teased out the ways that essential support practices are related to one another in Chicago high schools. They determined that four of the essential support domains were involved in enhancing instruction (the fifth domain) and were linked to producing more robust learning gains and higher grades.

Mobilizing the research

The framework of the Five Essential Supports that CCSR researchers have validated offers a ready, comprehensive blueprint for school practitioners to devise strategies to advance their schools. Equally important, the research yielded reliable measures of school performance on the elements of the framework. A comprehensive framework, plus associated measures, creates the opportunity for practitioners to apply research findings in their schools.

Historically, multiple barriers have inhibited the translation of research findings and the implementation of new and improved practices. That translation between research and practice is often called "knowledge mobilization" (Levin, 2011). From the standpoint of the knowledge mobilization field, university and other scholars generally do a poor job of sharing their findings and implications (Sin, 2008, as cited in Levin, 2011). In part, this is due to weak skills in conveying findings in accessible language and little incentive to take the extra time to make findings more straightforward. On the receiving end, school districts generally have very weak capacity to identify, share, understand, and apply research (Coburn, Honig, & Stein, 2009). Principals and teachers rarely have the skills to absorb and interpret quantitative data or time to dive into research literature. These issues would likely inhibit schools' abilities to act on the five essential supports research base.

Drawing upon prior experiences surveying and working with schools in Chicago, CCSR, and later UChicago Impact, began to design and build a set of diagnostic tools that would yield a report to each school on its performance, related to the five essential supports.[4] The diagnostic process draws on the research to create a replicable set of reports and practices that educators and stakeholders might use to foster school improvement. The tool suite consists of (a) a highly-scalable school survey administration tool, (b) a semi-automatic scoring system that converts raw data into school-level scores, and (c) an online school report of each school's survey results. The online school report—the focus of discussion in this paper—shows how students and teachers rate various essential support practices. Called *5Essentials*, the report makes it possible for school staff, parents, and stakeholders to understand, debate, and track their own progress in relation to what the research suggests is important. The design is intuitive and attractive, making it easy for practitioners to immediately grasp results and form a diagnosis.[5]

[4] The design and specifications for each of the tools were developed in-house, as was the semi-automated scoring system. We contracted with Inquirium (http://inquirium.net) and Caktus (http://caktusgroup.com) to perform the technical build of the survey reporting and administration tools.

[5] See https://demo.5-essentials.org for a fully featured site using anonymous data. Data on the Chicago Public Schools and public schools in Detroit are publically available at https://cps.5-essentials.org and https://detroit.5-esentials.org

As a diagnostic tool, the school survey report is somewhat analogous to a set of health indicators for an individual, such as blood pressure, weight, pulse, cholesterol, and bone density. We know, for example, that blood pressure must be maintained within a particular range. Yet without the means to measure blood pressure and report it to each person, knowledge of the risks of high blood pressure would have little practical value. Similarly, for school staff, knowledge of the importance of the five essential supports remains abstract, unless they are measured and monitored in their own school.

Using web-based technology, the 5Essentials report (a) visually represents the essential supports framework, (b) exhibits the performance of a school *relative to the research* benchmarks, (c) structures the evidence to encourage reflection on and interpretation of the results, and (d) accommodates the specific social context of a school (Sawyer, 2006, Introduction). We believe that providing practitioners with their school data explicitly framed by the conceptual framework, and relative to the original research results, is an innovative approach to data use. It strengthens practitioner understanding of research findings, grounded in a comprehensively validated theory of school improvement, and provides a common language and shared perception of school organizational practices. In turn, building a shared, nuanced understanding of the 5Essentials lays the groundwork for improvement of those essentials.

5Essentials methodology

Our goal was to follow as closely as possible the same methods of measurement and statistical analysis as those used by Bryk et al. (2010). As in the original study, we create a hierarchy of information. First, we report survey items, most of which are the same items as those used by Bryk et al.[6] Second, we provide measures or scales formed by the survey items; for example, four student survey items compose the measure of Safety. We rely on the same Rasch analysis process and the item anchors from the original study to combine survey item responses into 22 respondent survey measures (9 for students, 13 for teachers). Third, by combining scores from the relevant measures, the report provides an overall score for each essential support (i.e., student-centered learning environment).

Using an automated aggregation process, a school-level score ranging from 1-99 is created for each item, measure, and essential. The 1-99 scaled item and measure scores provide comparability across all measures, regardless of individual measure properties. The score also reflects the strength or weakness relative to our benchmark: All schools in Chicago in 2011. A score of 50 represents the average performance of the 2011 Chicago schools. A score of 99 is 2.5 standard deviations above that mean. For additional details on the techniques for creating item, measure, and essential scores, see Appendix A.

We have found that the items and measures have retained strong internal characteristics and give us confidence that the measurements are providing an accurate depiction of the school. For details on measure properties, see Appendix B.

The 5Essentials diagnostic tool: An illustration

To illustrate the 5Essentials diagnostic tool we will use the school report of one of the campuses of the University of Chicago Charter School (henceforth referred to as the Dewey Campus). The Dewey Campus serves 580 students, with a student body that is 98% African American and 80% low-income. Using the Dewey Campus permits us to explain the key elements of the diagnostic school report in the context of a school serving a high-need population. Further, this illustration highlights the findings that were of greatest concern to the leaders and faculty and the actions they took to address those concerns. This is also the school with which we have worked most closely to mobilize the research and iteratively improve the diagnostic tools.

In the spring of 2011, along with teachers and students across the city, 42 teachers and 346 students at the Dewey Campus completed the school surveys. Prior to 2011, the campus had undergone significant change. Opened in 2006, the campus had challenges in creating a safe and orderly climate. A new leader was hired in 2009. The new principal focused on changing the culture in the building toward celebrating

[6] Since the original 1994 surveys, some survey items have been improved or adapted to fit changes circumstances in schools. Once those changes were validated and published by CCSR, the changes were integrated into the 5Essentials survey.

the African roots of the student body and upholding high standards, so that students would be prepared to succeed in college.

Diagnosing overall performance. Figure 3 is the first display in the school report and in this case summarizes the overall performance of the Dewey Campus. Before discussing the colors and their meaning, it is worth noting that the names of the essential supports were changed from the original study. We called our diagnostic system 5Essentials, reducing the number of words and emphasizing "Essential" over "support." To make the labels for each domain more concise, we chose sets of adjective-noun pairs that conveyed which concepts existed under each Essential. These are the new labels with the language of the original research in parentheses:

- Effective Leaders (leadership as the driver for change)
- Collaborative Teachers (professional capacity)
- Involved Families (parent-community ties)[7]
- Supportive Environment (student-centered learning climate)
- Ambitious Instruction (instructional guidance)

We found that these adjective-noun pairs resonated with practitioners and could also be used in shorthand as Leaders, Teachers, Families, Environment, and Instruction.

Another intentional language element of the 5Essentials tool is the use of phrases providing an overall statement of the organizational character of the school (these are not shown in Figure 3). The phrases displayed within the diagnostic tool, "well organized for improvement," "moderately organized for improvement," "not yet organized for improvement" are references to the original body of research, *Organizing Schools for Improvement: Lessons from Chicago* (Bryk et al., 2010). These statements emphasize the tool's characteristics as a leading indicator of school improvement: The original research demonstrated that schools strong across the Essentials are much more likely to improve student learning because of their organizational robustness. Those that are weak across the Essentials are not likely to improve student outcomes.

In developing the primary diagram for the 5Essentials diagnostic school reports, we tried several versions of representing school performance and the research framework. The display we chose ultimately reinforced the findings that leadership is often the catalyst for change and that instruction had to be at the center of what schools deliver. Instruction is also represented as a circle (centered within the puzzle pieces) to convey that it is different from the other Essentials. With leadership in the top left corner, western readers would naturally see it first as they scan left to right and top to bottom. The placement of teachers at the top right of the diagram signaled that leaders work with and through teachers to influence the Essentials below. Supportive Environment and Involved Families also form the foundation upon which Ambitious Instruction rests. Finally, moving clockwise from Effective Leaders around to Involved Families reinforces that the adults (Leaders, Teachers, Families) work together to create a Supportive Environment and deliver Ambitious Instruction.

[7] The use of the term "Families" instead of "Parents" was intentional to avoid excluding children that might be cared for by non-parental guardians and to avoid excluding the community that shapes parents, families, and students.

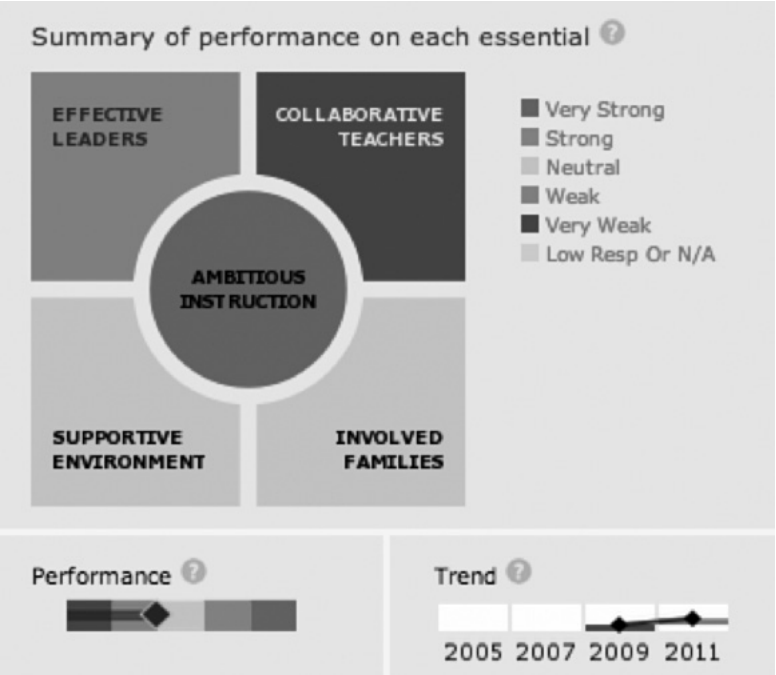

Figure 3. 2011 overall performance for the Dewey Campus.

The colors in Figure 3 capture performance across each of the Essentials, using red to highlight areas of weakness and green to highlight areas of strength. The color-coded performance on each Essential shows how the Dewey Campus performed relative to the CPS average. Areas represented as yellow are at or near the average. Areas represented as red are below the average, generally placing a school at the 25th percentile or lower on that essential. Essentials shaded green are considered strong and place a school near the 75th percentile. This scheme is consistent with the original research that defined very weak performance at the 25th percentile and strong performance at the 75th percentile (Bryk et al., 2010, Chapter 3).

The 5Essentials report also summarizes performance across the Essentials by summing the number of essentials that are strong (one in the case of the Dewey Campus in 2011) and subtracting the number of Essentials that are rated weak (two at the Dewey Campus in 2011). For the Dewey Campus, this resulted in an overall weakness on one Essential, and it is shown to be weak in the overall performance scale in the lower left corner of Figure 3. Change in overall performance over time is represented by the trend in the lower right corner of the figure.

Relative to other schools in CPS, the Dewey Campus was strong on Ambitious Instruction. The trend data (see Figure 4) showed that the student experience represented by Supportive Environment and Ambitious Instruction had improved from their 2009 scores, but Effective Leaders and Collaborative Teachers were stuck in the weak and very weak categories. These latter results were very troubling to school leaders. Thus, the Dewey Campus was strong on one Essential and weak on two, leaving it in a precarious position of "not yet organized for improvement."

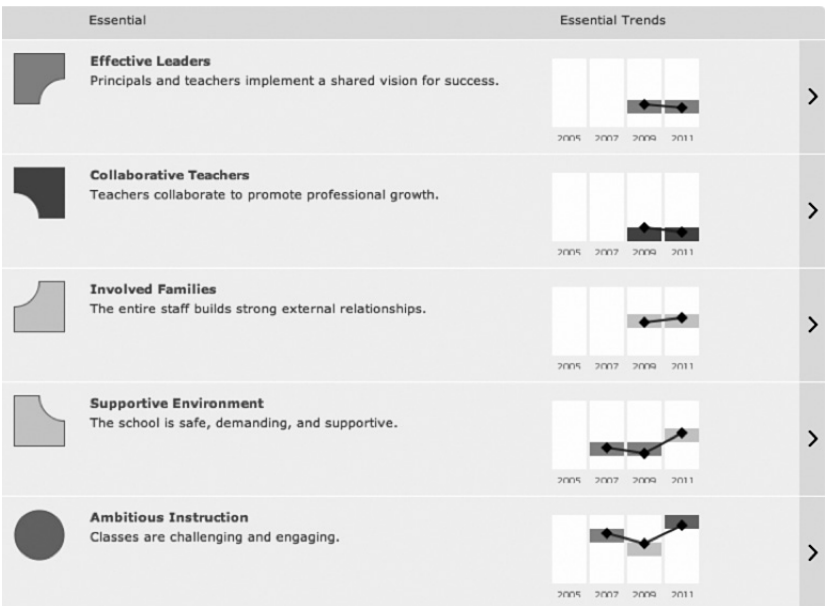

Figure 4. 2011 trends across the Essentials at the Dewey Campus.

Digging deeper. The 5Essentials diagnostic tool permits users to view, with one to two page clicks, the performance on the measures and survey items that comprise each essential, the performance of similar schools, and descriptions of each component. Figure 5 depicts the campus's performance on Effective Leaders and its component measures —Principal Instructional Leadership, Program Coherence, Teacher Influence, and Teacher-Principal Trust.[8] The measures are each displayed on a scale comparable to each other to facilitate appropriate comparisons.

Unpacking the results, Dewey Campus's leaders first focused on one of the weakest areas identified by their report and an area that directly related to their practice: Effective Leaders (Figure 5). On each measure related to Effective Leaders, the Dewey Campus was underperforming. In particular, Program Coherence was very weak, with a score of 6 (near the bottom of the 100 point scale, over 2 standard deviations below the CPS average).

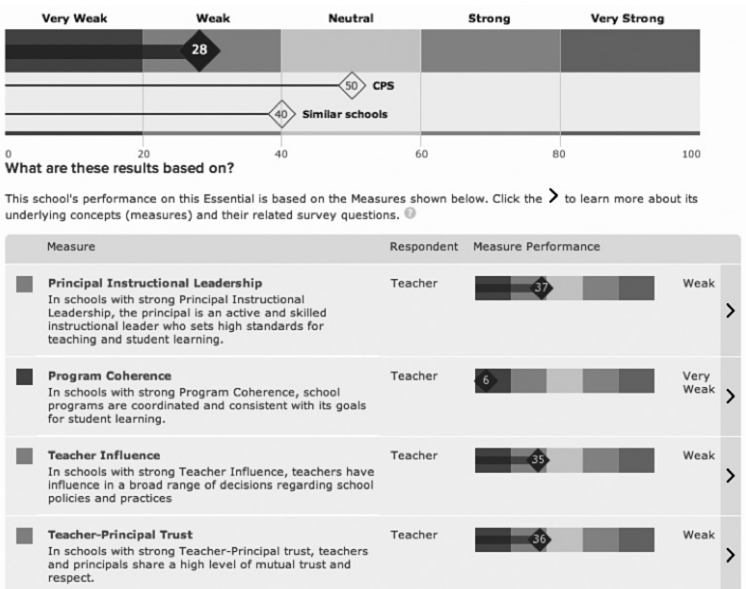

Figure 5. 2011 performance on effective leaders and component measures at the Dewey Campus.

Probing Program Coherence, we saw that the measure score had declined from a score of 19 in 2009 (not shown) to a score of 6 in 2011. Program Coherence, like the other measures, is formed from several related survey items (Figure 6). In particular, we zeroed in on the fact that 64% of teachers disagreed with the statement "Once we start a program we follow up to make sure that it's working" (Figure 7). Further, 79% of teachers agreed with the statement "We have so many different programs in this school that I can't keep track of them all." In conversations with the school leaders, we referred them to a specific study that CCSR had conducted on the Program Coherence (Newmann, Smith, Allensworth, & Bryk, 2001). That study highlighted how short-term, stand-alone initiatives can often distract students and teachers from the core instructional work within a school and decrease the likelihood a school will improve student-learning outcomes.

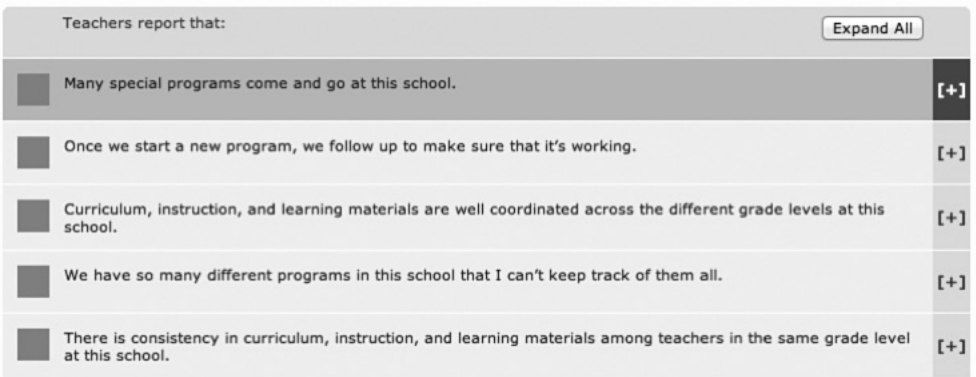

Figure 6. 2011 Performance on Items within program coherence at the Dewey Campus.

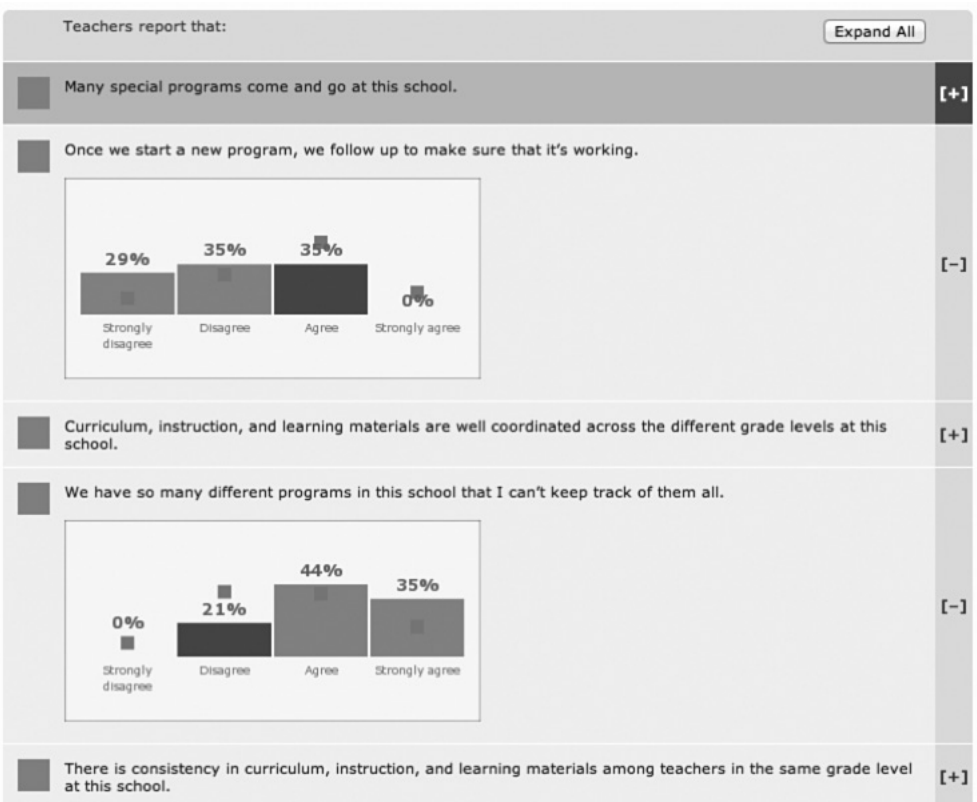

Figure 7. 2011 program coherence items expanded for Dewey Campus.

In view of the very low ratings for Program Coherence, we carried out an inventory of all school programs with Dewey Campus's leadership. School leaders were all surprised to discover that there were more than 80 programs. These included tutoring, block scheduling, mentoring, culture building, and many others. The school leadership then performed a rough analysis of the programs to gauge effectiveness and to associate programs with the different essentials. The process identified that many programs could be culled due to duplication or ineffectiveness. Leaders also concluded that most of the programs were associated with improving Supportive Environment, where they had been making improvements, but none were dedicated to their weakest Essential: Collaborative Teachers. This pattern of focusing on only one Essential is also consistent with our research: Many initiatives within schools will target one or two essentials, but rarely achieve the more difficult feat of coordinating efforts across Essentials (Newmann & Sconzert, 2000).

Regarding Collaborative Teachers, each of its constituent measures was either weak or very weak (Figure 8). In particular, Teacher-Teacher Trust and Quality Professional Development were at the bottom of the scale (1 and 3 respectively). Given that they had spent a lot of time on professional development with their teachers, school leaders were shocked at these results. Upon reflection, however, particularly challenging discussions of race, gender, and culture may have increased tensions among staff members. In addition, the professional development sessions may have focused on understanding differences but did not resolve how to address these differences with respect to instruction.

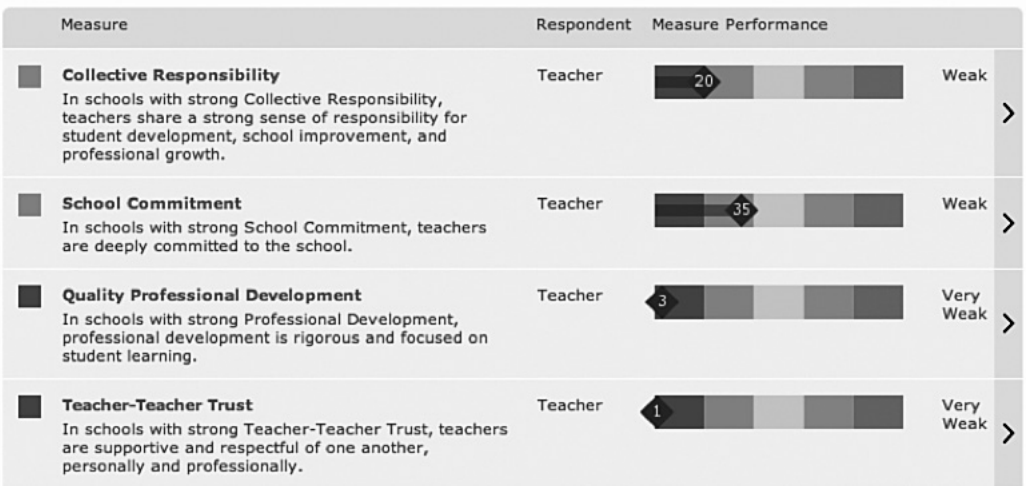

Figure 8. 2011 performance on collaborative teachers for Dewey Campus.

Moving forward. Building a narrative for themselves, school leaders believed that (a) they needed to increase the strategic focus of efforts and programs within the school, and (b) they needed to work with teachers to develop a foundation of collaboration and create more targeted and effective professional development. At that point, the leaders were energized. They decided to take the results to the teachers and ask them to craft solutions to the issues raised by survey results around Collaborative Teachers. School leaders used the diagnostic reports to co-create a professional development plan with teachers that would focus on improving collaboration and coherence within the campus.

At that point, the school's staff had a narrative about itself that was rooted in research, objective measurements, and professional experience. Over the course of the coming year they implemented the plan, constantly referencing why they undertook specific activities and how it related to their plans from the summer. In November 2011, the Dewey Campus completed an extra, interim 5Essentials survey (normally schools take the survey just once a year). It showed that the actions were making a difference in improving coherence, trust, and professional development. By no means had their scores moved out of the red/weak area, but they were headed in the right direction. This provided reinforcement that their practices were the right ones and that the survey was a valid measure of what was occurring in the school.

By the end of the 2013 school year, performance on the targeted essentials had improved substantially (Figure 9). Collaborative Teachers, previously the weakest Essential at the Dewey Campus, improved 37 points and two categories to a neutral rating at 52. Effective Leaders improved 33 points to a strong rating of 62.

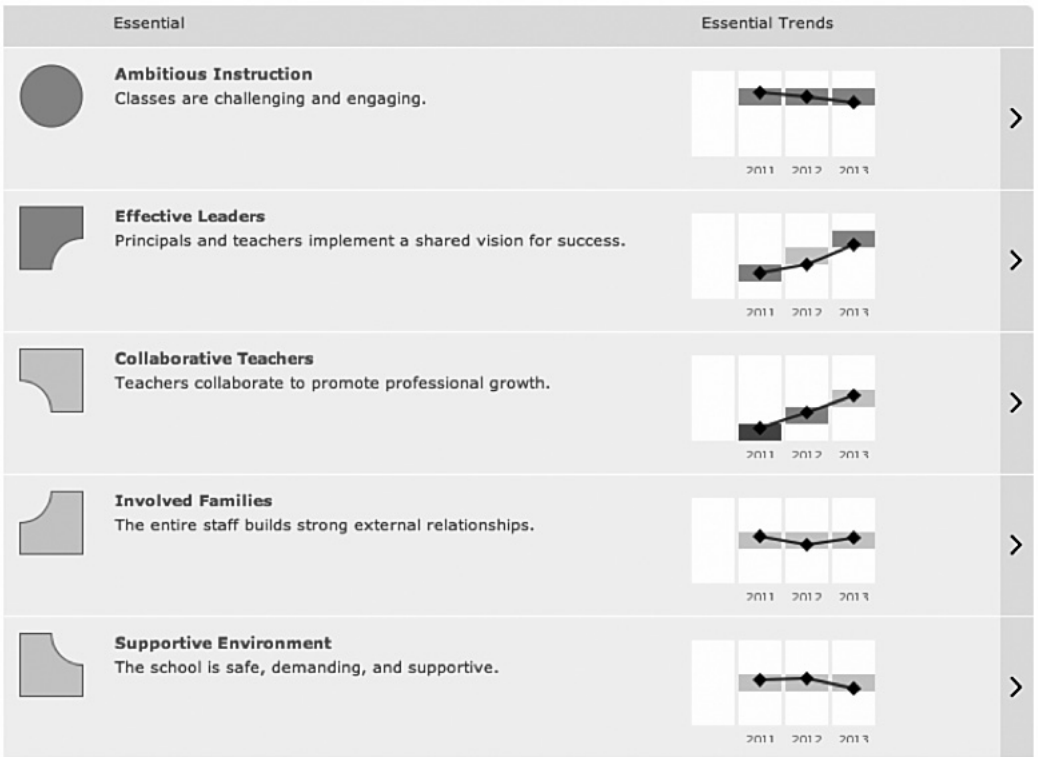

Figure 9. Trends in performance across Essentials at the Dewey Campus from 2011 to 2013.

Over two years, there also were notable patterns of improvement in several measures (not shown):

- Teacher-Teacher Trust improved fairly consistently in 2012 and 2013.
- Professional Development improved 50 points in 2012, but made negligible improvements in 2013.
- Teachers' sense of Collective Responsibility declined slightly in 2012, but rose 32 points to a neutral rating of 46 in 2013.
- Program Coherence improved 40 points to a neutral score of 46 and teachers no longer reported having so many programs they could not keep track of them.
- Teacher-Principal Trust and Teacher Influence also improved consistently each year.
- Principal Instructional Leadership only improved in 2013.

Because school leaders had worried about teacher collaboration and their own leadership, these results were heartening. The school had worked to establish new structures and processes. They changed their approach to professional development, cut programs significantly, and resisted adoption of new programs that were not clearly aligned to the school's improvement strategy. One of the authors (Montgomery) witnessed these activities on several occasions. Leaders also implemented new, cross-school professional development approaches that set aside common time for teachers to build community with a small network of schools with which they collaborated. Together, they worked on examining, aligning, and improving instructional practices. Leadership also limited interruptions to professional development periods and classroom time, ensuring teachers had time to focus on their core work.

While there were laudable improvements in Effective Leaders and Collaborative Teachers, Ambitious Instruction and Supportive Environment declined somewhat (though still staying within the same

categories of strong and neutral respectively). With the adult relationships within the school stabilized, the next stage of school improvement may turn the focus of teachers and leaders toward those latter Essentials, while trying to maintain the momentum of improvement in Effective Leaders and Collaborative Teachers.

The 5Essentials beyond Chicago

In 2011, UChicago Impact began offering the 5Essentials diagnostic tools beyond Chicago using a fee-for-service model, developing engagements with school districts in Michigan, Indiana, Minnesota, Massachusetts, Maryland, and New York. In the 2013 school year, UChicago Impact contracted with the State of Illinois to provide 5Essentials to every school in the state (4,413 schools; Illinois State Board of Education, 2013). The purposes for which the education agencies adopted 5Essentials ranged from providing the public with objective information about school quality to serving as a complement of a "school effectiveness review" framework. Some jurisdictions chose to use the information as part of a low-stakes "report card." Others attempted to determine appropriate means to use the reports to support the development and management of principals.

As indicated earlier, most schools and districts have only a weak capacity to take up research findings and act on them (Levin, 2011). Hence, training became an important component of the 5Essentials implementations. The literature suggests that training will be most effective if it allows individuals to process findings and collectively make sense of them (Spillane, Reiser, & Reimer, 2002). This is especially important because when educators examine evidence, they are profoundly influenced by their pre-existing beliefs and practices (Coburn, Honig, & Stein, 2009).

The experience of UChicago Impact in providing training on the 5Essentials is consistent with this literature. In most instances UChicago Impact provides district and school leaders with an orientation to the 5Essentials framework, a demonstration of the school report site features, and support for planning next steps, once schools have results. The training sequence was developed to increase buy-in among principals, garner higher response rates, and provide support to principals in integrating their results into their strategic planning processes. Principals consistently request that communication about the timing and purpose of 5Essentials begin well in advance of survey administration. The orientation session, typically offered prior to starting the student and teacher surveys, focuses educators on examining and reconciling the 5Essentials framework with their pre-existing frameworks and beginning to build common language across the district. We believe the orientation session, combined with frequent updates to principals about response rates, helps UChicago Impact garner 70-80% response rates among students and teachers.

The second and third parts of the training sequence guide participants through a deeper exploration and interpretation of a school report. The second session focuses on a generic report, which discourages school leaders from jumping to conclusions about particular weaknesses and helps them concentrate on learning to navigate and understand the information in a report. The third training session is designed to help school leaders make sense of their own results and craft a plan for sharing results with their teachers and other staff.

Beyond this kind of training, schools will need to work diligently over time, and perhaps with a partner, to address the issues raised by their data. The standardized supports do not yet approach the type of tailored support that we provided to the Dewey Campus and they do not provide supports throughout the school year. UChicago Impact is currently exploring mechanisms for supporting schools at a deeper level on a much larger scale. Considerations include building a consultant training force and developing partnerships. The consultant training that would be able to support individual schools and districts broadly beyond Chicago, but would require development and management of both staff and training structure. Partnerships would offer less control over the approach to supporting schools, while adding a larger base of experts that focus on coaching and developing leaders.

Discussion

Concluding remarks

We have summarized a major study of school organization and improvement in Chicago and subsequent efforts to mobilize these findings among practitioners. CCSR's 15-year study of improving and stagnating elementary schools validated the five essential supports framework: schools strong on 3-5 of the essential supports were 10 times more likely to improve than schools weak on 3-5 of the essential supports. The conceptual framework and findings greatly clarified for policymakers and practitioners the steps needed to accomplish school improvement in the urban context (see a review of *Organizing Schools for Improvement* by Scheurich, Goodard, Skrla, McKenzie, & Youngs, 2010).

The 5Essentials diagnostic tool, which mobilizes the five essential supports research, allows practitioners to interrogate their own school, take their own temperature so to speak, and develop a narrative and diagnosis about the strengths and weaknesses within their school organization. The 5Essentials diagnostic provides a strong visual display of survey results, comparing them both to similar schools and all other schools in the district. This invites reflection, analysis, synthesis, and the development of plans and action steps.

Dewey Campus exemplified how educators integrate the essential supports research into their practices via the 5Essentials diagnostic. The 5Essentials allowed the staff to go through a process of self-discovery, assessing how effective the school is in the five organizational domains —leadership, teacher collaboration, creating a supportive environment for students, involving families and providing ambitious instruction. The narrative led to actions, which in turn seem to have resulted in improvements in the Effective Leaders and Collaborative Teacher Essentials.

Broadly speaking, the process of analyzing school performance using a research-validated diagnostic oriented toward practical usage has improved school organization and research usage. Through this process, school staff members —and parents— begin to develop a common language, a narrative, or a nuanced diagnosis about what may be holding the school back. In the end, it is more powerful for the school community to confront its own vital signs, or its performance on the 5Essentials, than to simply learn about the five essential supports in the abstract. If school actors sustain the work to further build organizational capacity, they will align themselves with the research, thus forging the research-practice connection. More importantly, they will have raised the probability that their students will make larger learning gains in the future.

It is important to recognize that, while schools get the most direct benefit from receiving actionable data about themselves, there are also benefits for researchers in extending their work to practitioners. The more schools gain from the research, the more likely they are to agree to further studies. CCSR obtains cooperation from CPS every year in administering the surveys. They have come to value the surveys so much that they have institutionalized one of them. Under current arrangements, CPS owns the student data, and CCSR must request it from them (even though CCSR is the chief author of survey items). This is akin to the "shift in ownership" that Coburn (2003) describes as necessary to achieve deep and lasting change. It is a milestone of sorts for mobilizing the research.

We should also acknowledge that the direction of influence can go both ways. This paper has detailed how research can eventually influence school practice, but we recognize that this can and should go the other way as well. Working with practitioners provides researchers with valuable opportunities to further understand the school context and to hear practitioners' research questions.

Despite benefits of getting schools to participate in studies, the incentives for researchers to extend their work to create school-level indicators are less clear. Usually researchers at universities have little time or motivation to go beyond the investigation itself. Other than for a small amount of outreach, funding is not likely to cover translation or repackaging of findings. Furthermore, tenure decisions are heavily weighted toward publication in peer-reviewed journals —the more publications in prestigious journals and other arenas the better. Thus, there is little appetite for conducting studies in a manner that goes beyond research and publication. In order to make progress in bringing research and practice into closer alignment, it will be necessary to disrupt some of these disincentives for researchers.

Skill-sets and dispositions may also be a barrier to the development of tools as a means to mobilize research. In the case of the 5Essentials diagnostic tools, the creators collectively have extensive training and experience in education, statistics, computer science, design, and the learning sciences.[8] Traditionally trained researchers in a typical academic setting may have little access to similar skillsets.

A more specific challenge for school-level indicators is that school systems can decide to use them for accountability purposes. CCSR and UChicago Impact consistently argue that the real value of the 5Essentials is that they facilitate for a school staff a candid and neutral assessment and diagnosis of a school staff's own organization. If the results are used for accountability purposes, however, the findings may not have as much salience to the school staff. It also raises the possibility that in some schools the adults could start to game the system. This is something we may face in Chicago. An accountability plan approved by the Board of Education in 2013 incorporates the Essential scores into each school report card. For high schools, these scores count 5% toward the total, and for elementary school they account for 10%. CCSR will monitor the effects of this policy on future survey findings.

Another challenge is what schools do with the information they receive. While the survey report provides insight into the status of a school with respect to the five essential supports, it is silent on the specific strategies school leaders should engage in order to address weaknesses. For instance, at Dewey Campus, what are the best strategies to pursue in order to shore up collaboration among teachers? Strategies will vary greatly from one school to another, given the nuanced nature of school contexts. An important next step will be to undertake systematic case studies and quantitative analyses of how schools make use of the 5Essentials and the tactics they employ to tackle problems. Collecting such data, along with mining resources from the field of organizational development (such as the work of Senge, 2006), would help to inform the creation of a repertoire of case studies and training protocols that could be offered to schools beyond using the 5Essentials.

In the meantime, we hope that sharing the story of the research on the five essential supports and the development of the 5Essentials will stimulate others to make use of these findings and share their innovative solutions to bridging the gap between research and practice.

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[8] Nicholas Montgomery, Denise Nacu, and Inquirium were the principal designers and developers. Stuart Luppescu, Sue Sporte, Michelle Scott and other CCSR staff made significant contributions to the methodology and content.

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Appendix A

Calculating scores for the 5Essentials

School-level measure scores are calculated by taking the average of respondent-level scores, weighted by the inverse of the respondents' inflated standard error (to account for possible measurement error and potential item-skipping). Each school-level score is then converted to a standardized 1-99 scale. A score of 50 on the measure score represents the 2011 average for schools in Chicago. A 20-point increase/decrease is equivalent to one school-level standard deviation in Chicago 2011. Measure Scores are truncated at 1 and 99, representing 2.5 standard deviations above and below the mean. Schools also receive Item Scores that are calculated using the same process.

To create Essential Scores, we aggregate Measure Scores. Each measure is grouped into the categories defined by Bryk et al. (2010). Each standardized, school-level measure score is averaged to create a score for the Essential (i.e., Collaborative Teachers). Essential Scores of 40 and 60 roughly parallel the bottom and top 25% of schools in CPS (the classification used for strength vs. weakness in Bryk et al, 2010). The overall classification of school capacity is based on the number of Essential Scores that are "strong" (score > 60; top 25% of Chicago comparison) minus the number that are "weak". Schools with a net score of -5 to -3 are deemed the least likely to improve, particularly compared to schools with a net score of +3 to +5, considered most likely to improve.

Deviations from the Bryk et al. methodology

While we mostly used the methodology from Bryk et al. (2010) to create the 5Essentials Diagnostic, we made minor modifications to improve practitioner interpretability. First, we chose to use the simple weighted average of respondent measure scores rather than the more complex calculation used by Bryk et al., using Bayesian estimates created from a HLM model controlling for various school level characteristics. Though the Bayesian estimates increase precision for research purposes, a school's calculated score may shift, based on the schools in the population and the controls entered into the model. As the 5Essentials diagnostic is intended for both large and small school districts, we chose the slightly inferior, but entirely stable weighted-average approach.

The second deviation from the Bryk et al. methodology was to create Essential Scores using the arithmetic mean instead of an average based on factor-analysis loadings. We chose the simpler method, sacrificing a small amount of precision, to increase the ease of interpretation by practitioners. Correlations between factor-based averages and simple averages exceeded 0.9.

Appendix B

Survey measure properties

Table B1
Student survey measures

			Reliability			Measure response rate*
		Separation	Ind	School	ICC	
Academic-Personalism	Elementary	1.5	0.69	0.801	0.07	61500/67231
	High-School	1.49	0.69	0.843	0.032	71889/76701
Academic-Press	Elementary	1.77	0.76	0.825	0.089	62351/67231
	High-School	2.06	0.81	0.896	0.059	72682/76701
Course-Clarity	Elementary	1.88	0.78	0.783	0.054	61766/67231
	High-School	1.81	0.77	0.838	0.026	72102/76701
English-Instruction	Elementary	1.84	0.77	0.794	0.071	60451/67231
	High-School	2.04	0.81	0.907	0.074	69663/76701
Human-and-Social-Resources-in-the-Community	Elementary	1.43	0.67	0.891	0.208	62871/67231
	High-School	1.37	0.65	0.914	0.115	73144/76701
Math-Instruction	Elementary	1.62	0.72	0.791	0.077	59598/67231
	High-School	1.9	0.78	0.89	0.061	69064/76701
Peer-Support-for-Academic-Work	Elementary	1.69	0.74	0.784	0.065	62675/67231
Safety	Elementary	1.33	0.64	0.891	0.191	63664/67231
	High-School	1.33	0.64	0.949	0.215	74365/76701
School-Wide-Future-Orientation	High-School	1.92	0.79	0.932	0.114	69021/76701
Student-Teacher Trust	Elementary	1.52	0.7	0.862	0.123	63342/67231
	High-School	1.39	0.66	0.912	0.094	73743/76701

Note: For additional details including item frequencies, see https://ccsr.uchicago.edu/sites/default/files/uploads/survey/2012studentsurveymeasurestatistics.pdf

Table B2
Teacher survey measures

			Reliability			Measure
		Separation	Ind	School	ICC	Response Rate*
Collective-responsibility	Elementary	3.2	0.91	0.69	0.165	9732/10274
	High-School	3.2	0.91	0.847	0.241	5284/5566
Expectations-for-Postsecondary education	High-School	1.96	0.79	0.93	0.59	4314/5566
Outreach-to-parents	Elementary	2.26	0.84	0.709	0.192	9701/10274
Outreach-to-parents	High-School	2.47	0.86	0.765	0.153	5270/5566
Parent-involvement-in-school	Elementary	2.58	0.87	0.726	0.297	9494/10274
	High-School	2.68	0.88	0.794	0.252	5149/5566
Principal-Instructional-Leadership	Elementary	2.87	0.89	0.768	0.248	9516/10274
	High-School	3	0.9	0.819	0.205	5172/5566
Program-Coherence	Elementary	1.82	0.77	0.746	0.265	9361/10274
	High-School	1.87	0.78	0.816	0.247	5096/5566
Quality-of-Student-Discussion	Elementary	1.38	0.66	0.621	0.209	7832/10274
	High-School	1.57	0.71	0.765	0.223	4407/5566
Quality-Professional-Development	Elementary	1.76	0.76	0.691	0.196	9366/10274
	High-School	1.78	0.76	0.764	0.173	5079/5566
School-Commitment	Elementary	2.01	0.8	0.774	0.268	9580/10274
	High-School	2.09	0.81	0.853	0.272	5212/5566
Teacher-Influence	Elementary	2.13	0.82	0.804	0.362	9478/10274
	High-School	2	0.8	0.841	0.309	5159/5566
Teacher-Parent-Trust	Elementary	1.81	0.77	0.748	0.278	9680/10274
	High-School	1.92	0.79	0.853	0.318	5257/5566
Teacher-Principal-Trust	Elementary	2.81	0.89	0.756	0.231	9637/10274
	High-School	2.95	0.9	0.837	0.23	5234/5566
Teacher-Teacher-Trust	Elementary	1.72	0.75	0.667	0.173	9574/10274
	High-School	1.76	0.76	0.759	0.166	5213/5566

Note: For additional details including item frequencies, see https://ccsr.uchicago.edu/sites/default/files/uploads/survey/2012teachersurveymeasurestatistics.pdf