By the first decade of the 21st century, the idea of data use in education had swept into U.S. schooling from other fields, such as manufacturing, sports, and medicine. Its enthusiasts included funders, entrepreneurs, policymakers, and district leaders. They argued that data could drive accountability systems and provide signals about where schools needed to improve—and that this could be particularly game changing for schools that were impacted by poverty and generally low-performing.

In 2002, the passage of No Child Left Behind (NCLB) helped codify the idea of using data to improve educational outcomes. The law required states to test every student every year in math and literacy, grades 3 to 8, and at least once in high school, and to report on progress in meeting annual performance targets, with an emphasis on students in traditionally at-risk sub-groups (Black, Latino, economically disadvantaged, students with disabilities, and students with limited English proficiency). NCLB also specified a range of sanctions for schools that consistently missed their target for any group.

Yet how exactly teachers might use data within this scheme was left largely unspecified. A huge marketplace of data-focused consulting, materials, and technology emerged in subsequent years, but research on their impact remained scant, and little evidence emerged relative to the crucial question: What kinds of school and classroom organizations, cultures, materials, and practices would facilitate using data in ways that actually benefit learning? In 2014, the Research Alliance began a study, with support from the Spencer Foundation, that aimed to examine how teachers in nine New York City
elementary schools were using data to inform their classroom practice, how schools were supporting them in this effort, and to what effect. The study focused on schools that had high concentrations of students living in poverty and had been identified by their networks or community school districts as avid data users. We chose to look particularly at literacy instruction in 4th and 7th grades. Over the course of two years, we conducted extensive interviews and observations in each school, designed to help us understand how teachers used data of various kinds to make specific instructional decisions, and how the schools organized themselves to support this data use in teaching.

A full account of findings from the study is available in a book called *Data and Teaching: Moving beyond Magical Thinking to Effective Practice* by Joseph P. McDonald, Nora M. Isacoff, and Dana Karin (Teachers College Press). The book explores data use in teaching at all nine schools, and provides detailed images of this teaching, both inspiring and cautionary. It also includes in-depth portraits of four of the schools—two of which struggled to use data effectively, and two that succeeded in this complicated task.¹ The researchers defined success both quantitatively, in terms of test scores and other school quality indicators used by the New York City Department of Education, and also qualitatively, in terms of teachers’ and school leaders’ self-reports in interviews and the researchers’ observations of teacher and student productivity.

Drawing on the study’s findings, as well as dozens of additional resources that schools may find helpful, the book presents seven “New Directions” for schools that want to improve their data use in teaching. In this brief, we highlight several key findings from the study, as well as three of the book’s New Directions. Our goal is to provide teachers and school leaders, in New York City and beyond, with insights that may be helpful as they work to improve the use of data in their own classrooms.
KEYS TO SUCCESSFUL DATA USE IN TEACHING

A Broad View of Assessment Data, and Knowledge of Its Strengths and Limitations

Findings from our study suggest that successful use of data in teaching requires a schoolwide commitment to attend to different kinds of data—with sensitivity to the strengths and limitations of each kind. The most successful schools we studied toggled between “big-test” data (e.g., from annual New York State testing) and more intimate data that teachers collected themselves by listening to their students read, reading closely what they wrote, talking with them, and exploring what they offered in discussions. These schools used subject-focused and grade-level teams to plan teaching, using both kinds of data to inform their instruction. The less successful schools were more likely to think of big-test data as somehow magically predictive—able to tell teachers exactly what to teach next, to whom and how. These schools spent a lot of time analyzing test items answered correctly and not, and using this information to re-group students and re-teach specific material, which was not especially productive. Both the successful and unsuccessful schools had on-staff data expertise (for example, a data coach), but the successful ones also had strategies for spreading assessment expertise throughout the faculty, and for applying expertise to intimate as well as big-test data.

Strong Content Knowledge Among Teachers

Successful use of data in teaching requires substantial content knowledge by teachers and knowledge of how students typically learn this content (i.e., pedagogical content knowledge). In the schools we studied, student performance data proved useful only when interpreted by teachers who understood how literacy functions and develops. This did not mean, however, that the schools had to settle for the fact that some teachers know a lot about literacy and others don’t. In all the schools, content expertise varied across the faculty, but the more successful schools organized themselves to manage this variability. They found ways to help make the whole school as knowledgeable in these important dimensions of teaching as any of their individual
teachers might be. One of the ways they did this was to ensure that more experienced teachers coached less experienced ones. Another was to create teams that curated the vast market of available materials related to the subject area.

**Cultivating Student Ownership of Data**
Successful use of both “big test” data and intimate data in teaching requires methods that actively and continually instill in students a sense of ownership of their own learning, and of their own data. The more successful schools we studied featured this prominently in their teaching—for example, through self-growth tracking systems, and student-led conferences with families. Indeed, these schools made the pursuit of student agency and self-improvement a cultural feature of the whole school community.

**Building on Data Use to Improve Other Aspects of Schools’ Organizational Capacity**
As some of the schools in the study became more effective in their use of data in teaching, they cultivated collective ownership of the innovation, which led to a growing sense of progress and trust within the school community, and to an improved reputation externally. This, in turn, boosted available resources, including funding, ideas, materials, and talent. While data use alone is no magic bullet, this broader combination of improved capacities can be powerful in dealing with the impact of poverty on a school.  

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NEW DIRECTIONS FOR DATA USE IN SCHOOLS

The findings from our study underscore that simple solutions—such as hiring a data consultant, installing an online interim testing package, or the unfortunate plan we found in a number of schools to continually re-test and re-group for re-teaching—are not enough to improve learning, including big-test results. To use data in ways that actually help boost students’ learning, schools have to go in new directions across multiple dimensions of their operation.3 These include:

**New Direction 1: Build a “Data-Wise” Culture in Your School**

The reality is that standardized testing—whether the annual state test, the interim test supposed to predict the annual state test results, or the standardized testing embedded in an online program of some kind—cannot, on its own, direct a teacher’s teaching.4 Teaching and learning are too complex, and standardized testing too limited. This is not to say that standardized testing is not helpful to teachers. It certainly can be—for example, in offering clues to learning needs that can be further explored using other data sources, and in providing a basis of comparison with other students in other schools and cities, as well as sub-groups within their own school. But asking too much of standardized testing leads to much mischief—for instance, taking students to be equivalent to their test performance bands (“my 1s and my 2s,” as we heard from a number of teachers in our study), or displacing thoughtful teaching oriented to deep understanding of the subject with testing look-alikes—for example, test prep worksheets or test prep online programs.

The best way to avoid such mischief is to create a data-wise school—a concept that was popularized in the 2013 book, *Data Wise: A Step-by-Step Guide to Using Assessment Results to Improve Teaching and Learning*, by Kathryn Boudett, Elizabeth City, and Richard Murnane. As Jennifer Price and Daniel Koretz argue in that book, educators should understand several key assessment concepts, including validity, reliability, sampling and measurement error, and score inflation. A good way to help a whole school understand these concepts is to organize a faculty-wide book-club chain-read of this
book or other, similar resources (e.g., Koretz’s engaging 2008 book about standardized testing, *Measuring Up: What Educational Testing Really Tells Us*). In a book-club chain-read, one group of volunteers reads the book first and discusses it, then passes along copies of it plus notes and questions to a second volunteer group, and so on. Ultimately, the volunteers (or a subset) can plan a workshop for other colleagues throughout the school.

**New Direction 2: Learn to Curate Data Use Materials**

To curate is to select, organize, and oversee a focused collection drawn from multiple sources. In education, the word is sometimes used to refer to the task that every teacher, from preschool to graduate school, faces—namely to select, organize, and oversee material they draw on for teaching. But schools can be curators too. Two of the schools in our study had well developed data-use curating teams. These teams proved powerful in helping the schools navigate smartly an exploding market of materials aimed at supporting the use of data in teaching.

What does curating involve? It involves monitoring the market, searching for matches between colleagues’ stated needs and marketers’ claims about their products. It involves attending conference-based markets and visiting other schools to assess products in action. It involves working to integrate new tools and materials with other parts of the school’s data culture—asking, for example, who will own this product initially, try it out, and show the rest of us how it works? And, of course, it involves tracking the results of this integration—especially the difference it makes (or not) in student learning.

What distinguished the two curating teams we uncovered in our study was not just how they managed these tasks, but how much teaching
expertise the managers gained in the process, how well they passed along what they learned to their colleagues, and how their efforts made teaching in these schools more productive and easier to manage overall.

**New Direction 3: Encourage Student Agency**

Findings from our study suggest that when data use stops with the teacher, and fails to turn over data ownership to students, it forfeits a good share of its potential impact on learning. After all, the inherent power of student performance data is that it can illuminate learning. Why wouldn’t schools want learners themselves to use such a tool? Yet, in many schools and districts, the idea of engaging students in using their own data seems far-fetched or impossible.

Despite this, several of the schools we studied—encouraged by their own sense of possibility and by some products they found in an expanding market of materials—flipped some (and in two cases much) responsibility for overseeing student performance data to students themselves. And they were surprised and pleased by the results. Even students with low test scores and reading levels seemed encouraged to work harder when they could see, understand, and track their performance data themselves.

One tool to help make this shift is the 2014 book and companion DVD, *Leaders of Their Own Learning*, by Ron Berger, Leah Rugen, and Libby Woodfin. To promote what they call “student-engaged assessment,” the authors propose several key steps: (1) mapping out in “kid-friendly” language a set of content-focused learning targets; (2) making time and space for data ownership, including opportunities for students to work on projects of their own design, to self-assess and peer-assess, and to rehearse performances; (3) working within and across classrooms “to
make learning public” by means of hallway exhibits, authors’ nights, and other celebrations of learning; and (4) teaching students explicitly how to interpret their own performance data, and how to discuss it with others—including peers, teachers, and families.

Conclusion
This brief draws on the experiences and perspectives of educators in nine New York City schools working—some of them with great success—to overcome the drag of poverty on their students' learning. The findings from this work can inform larger-scale studies, which would provide additional evidence about the data-use strategies we observed, and how they play out in a wider variety of schools. We believe these findings can also inform educators who take the time to reflect on their own practices by the light of the cases we examined. The experiences we documented highlight the potential to use data as part of a hopeful and collegial tinkering toward the solution of complex problems.

Notes
1 Note that the identities of all the schools and all of the teachers and school leaders in the study have been concealed.
2 For evidence that a similar combination can help schools overcome the impact of poverty on students’ learning, see A.S. Bryk, P.A. Sebring, E. Allensworth, S. Lujesescu, & J.Q. Easton (2010), Organizing Schools for Improvement: Lessons from Chicago (Chicago, IL: University of Chicago Press).
3 The authors of Data and Teaching: Moving beyond Magical Thinking to Effective Practice recommend seven new directions for data use in schools. This brief presents abbreviated versions of three of these.
4 For more on this, see Koretz (2008).
Resources

Schools interested in providing their staff with books related to data use in teaching may refer to this abbreviated list:

**Data and Teaching: Moving beyond Magical Thinking to Effective Practice**, Joseph P. McDonald, Nora M. Isacoff, and Dana Karin (2018)


**Mastering Formative Assessment Moves: 7 High-Leverage Practices to Advance Student Learning**, Brent Duckor and Carrie Holmberg (2017)


**Strategic Inquiry: Starting Small for Big Results in Education**, Nell Panero and Joan Talbert (2013)


**Visible Learners: Promoting Reggio-Inspired Approaches in All Schools**, Mara Krechevsky, Ben Mardell, Melissa Rivard and David Wilson (2013)

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