

Based on research investigating how school districts use education data, in this brief ACT recommends ten practical steps that school district leaders and state and local policymakers can take to improve their data use.

How School District Leaders Can Support the Use of Data to Improve Teaching and Learning

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Introduction

School districts are becoming increasingly data rich. Many districts have student information systems that provide electronic reports on student test scores, grades, attendance, discipline, course transcripts, program participation, academic interventions, and graduation (see table). As educators strive to use this windfall of data to

improve teaching and learning in their schools, school district leaders must take steps to promote effective data use.¹

In this report, we describe common uses of data in school districts. Next, we outline ten steps district leaders can take to improve the use of data in their school systems. We also describe ways that state and local policymakers can support these steps.

Data Used in School Districts

Ways to classify data	Categories of data
By information source	Data from student assessments state tests district benchmark assessments Data from other sources attendance records grades discipline reports surveys (of students, teachers, or parents) classroom observations transcripts dropout data graduation data
By time frame	Snapshot information collected at a moment in time Longitudinal information collected over multiple time periods (linking multiple snapshot collections)*
By confidentiality level and audience	Personally identifiable student information available to individuals who work with students Aggregate reports available to the general public

*Data Quality Campaign, "Creating Reports Using Longitudinal Data: How States Can Present Information to Support Student Learning and School System Improvement," November 1, 2010, <http://www.dataqualitycampaign.org/find-resources/creating-reports-using-longitudinal-data/>.

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Uses of Data in School Districts

Educators use data to support individual students and teachers and to guide the actions of district and school leaders in improving the system as a whole. More specifically, educators use data:

- *To identify individual student needs and place students in groups, interventions, programs, and classrooms.* Student assessment data may be used to monitor overall student progress, to customize learning opportunities for individual students, to place students in small learning groups or short-term intervention programs, to place students in classrooms or academic courses, and to assign them to or exit them from programs such as bilingual or special education programs and programs for gifted and talented students.²
- *To modify curriculum and instruction.* Data may be used to identify learning objectives that students didn't learn and that must therefore be retaught, to identify objectives students have mastered, to address gaps in students' prerequisite knowledge and skills, to modify the sequence of topics, to adjust the amount of time allocated to each topic, and to monitor whether the district's curriculum is being taught to the desired level of rigor.³
- *To motivate students and educators.* Data can be used to set goals for students, classrooms, and schools; to monitor whether these goals have been met; and to recognize individual and group success.⁴
- *To coach and supervise teachers and other school personnel.* Data may be used to guide discussions among educators, to inform educators of their strengths and assist them with their weaknesses, and to identify individuals for possible promotion or termination.⁵

- *To adopt and evaluate programs and management decisions.* Data can be used to pilot new programs or evaluate old ones; to adjust school routines, procedures, and schedules by troubleshooting difficulties with student attendance or behavior; and to examine whether past decisions have had the desired consequences.⁶
- *To communicate information to outside audiences.* Data can be used to communicate with parents when their children need additional academic or behavioral assistance and with parents and public audiences about school programs and performance.⁷

Ten Steps District Leaders Can Take to Improve Data Use

To identify ways district leaders can improve their use of data, we drew on the research literature on data use and on the critical actions described in the ACT Core Practice Framework.⁸ In addition, we conducted a case study in two Texas school districts with leadership teams that were known to be interested in promoting the effective use of data.⁹

From this analysis, we identified ten steps that district leaders can take to improve data use by teachers and principals. The steps are grouped into four categories: clarify school system goals, create infrastructure for data use, ensure adequate educator knowledge on how to interpret and use data, and support collaboration among educators.

Clarify School System Goals. Just as travelers find a GPS more useful once they have identified their destination, so educators will find data more valuable when they have clearly identified the learning and behavioral goals they want students to accomplish. Once the goals have been identified, the right data can provide feedback on student

progress toward the goals. In addition, having the goals clearly in mind can help educators determine what kinds of information they need in order to assess whether students are achieving the goals.

1. *Develop and refine a content-rich district curriculum that states clearly what students are expected to learn in each grade and subject.* State standards often provide only a partial description of these expectations. A written district curriculum can specify more clearly and in greater detail what is to be learned.¹⁰ Providing a coherent, sequenced curriculum is important because students' prior knowledge plays a vital role in enabling them to make sense of new information.¹¹ A well-designed curriculum can help ensure that what is taught in each grade prepares students well to learn the content in subsequent grades. The district curriculum should be content-rich in the early grades to give students the vocabulary and knowledge they will need to be good readers and learners in the upper grades.¹²

From a data use perspective, the district curriculum should be the starting point from which data indicators on student learning are selected and used. For example, district leaders should ensure that the state test has been mapped to the curriculum using test specifications and an item analysis, whichever is available, so it is clear what curricular objectives are addressed by the state test data. The same can be done for other assessments the district uses, such as district-developed benchmark assessments (see step 5). Referencing all student achievement data back to the curriculum can help school and district leaders identify gaps in the available information on student learning.

2. *Develop and refine student behavioral goals.* Academic and social behaviors are an important contributor to long-term student success.¹³ Instructional programs and interventions and teachers' classroom practices can help students improve those behaviors.¹⁴ Examples of behavioral goals for students might include avoidance of chronic absences, avoidance of disciplinary referrals, diligence in turning in assignments, persistence in challenging tasks, and development of reading habits outside of school. As is the case with academic goals, the behavioral goals that educators identify will help to determine the data they want to collect. In most cases, school districts already collect information on student attendance and discipline referrals. Surveys of students and teachers can be used to gather information on student attitudes and behavior that would not otherwise be collected.¹⁵

Create the Infrastructure for Data Use.

School district leaders need to ensure that the right information is available to the right users at the right time.

3. *Identify users' information needs.* To supply the right information, school district leaders need to identify what users need to know: the questions users would like to answer and the information the users need to answer the questions.¹⁶ For example, tracking individual students with chronic absences is a different problem from monitoring average daily attendance.¹⁷ A behavioral goal to reduce chronic absences could indicate the need for a report identifying chronically absent students. In one of the case study districts, educators in a school learned that some students were missing class to care for family members. In response, they created a Saturday camp where students could make up their missing assignments.

4. *Create an electronic data system that is readily accessible to teachers and school leaders.* These systems in turn can be used to produce user-friendly data displays and dashboards to help teachers and school leaders spot problems and opportunities for individual students and groups of students. The data system should allow easy linking of data from different assessments and of assessment and non-assessment data for the same student, and it should provide ready access to information on the same student from previous assessment periods and years to aid in monitoring student progress. School district leaders must pay attention not only to the design and features of the system, but also to the accurate collection of data at the front end by district personnel.¹⁸ In addition, leaders must ensure that ready access to data by educators is complemented by safeguards to ensure that unauthorized individuals cannot gain access to confidential student information.¹⁹

5. *Establish a system of frequent assessment of recently taught curriculum.* One common need is for timely information about whether students are learning the district's curriculum. Many school districts have addressed this need by developing interim or benchmark assessments to identify what students have learned cumulatively over a six- or nine-week grading period. Educators in the two case study districts took special care to ensure the assessments matched what had been taught during that period.²⁰ School leaders in the case study sites also encouraged teachers in each grade level to administer common assessments every two or three weeks to provide even more up-to-date information on the students. The timeliness of these assessments make them particularly

useful in identifying student needs, modifying instruction to meet those needs, placing students in short-term interventions, and setting and monitoring goals for students and teachers.

6. *Create timely and user-friendly reports.* Information is more likely to be used if it is timely, readily available, and easy to interpret.²¹ School system leaders must ensure that all of these requirements are met for their data. District leaders must also be cognizant of gaps in the information. If the information is of limited value in addressing important questions, that can show the need for the school system to collect additional data.²²

Ensure Adequate Educator Knowledge on How to Interpret and Use Data.

Educators must have the knowledge and skills needed to interpret the available information, decide what needs to be done in response to the information, and figure out when important information is missing and needs to be collected.

7. *Make knowledge of data use a criterion when hiring teachers and school leaders.* Sending a clear signal that job applicants need to be better informed in this area should lead over time to a more knowledgeable applicant pool. This entails publicly clarifying the knowledge and skills that applicants for teaching and school leadership positions should have.²³

8. *Embed data use training in an instructional coaching system for teachers.* Most people recognize the value of coaching in cases where improving performance is viewed as especially important—for example, in competitive sports. Because data use by teachers is part of an overall process of making instructional decisions, the two districts in our case study embedded data use training into their overall

system of instructional supervision and coaching.²⁴ The effectiveness of instructional coaching depends on the coach's knowledge and skill and the specific types of guidance he or she provides.²⁵ Because coaching often depends on a trust-building process, the main impact of coaching may not appear in the first year. For example, an academic coach in one of the case study districts described a yearlong process of gaining teachers' trust through listening. This paid off in increased collaboration and idea sharing in the second year.

Support Collaboration Among Educators.

Discussing data must be part of educators' normal routine, not something that happens only after events bring school-wide problems to their attention. Teachers need regularly scheduled time to discuss curriculum, data, instruction, and interventions with each other in an environment of collaboration and trust.

9. *Establish expectations for school leaders to support teacher collaboration around curriculum, instruction, and assessment.* School leaders can promote teacher collaboration in a number of ways: First, they can ensure that the school's master schedule includes regularly scheduled time in the workweek for teachers to participate in collaborative team meetings. Second, they can work with lead teachers to ensure that these meetings focus on monitoring and improving student learning. Third, they can help encourage a climate of trust among teachers around the use of data. To gain maximum benefit from information on student learning, teachers must be comfortable discussing their own problems and concerns, observing each other's lessons, and sharing suggestions on how to improve them.²⁶ Teachers are more likely to develop this comfort level if they view their colleagues as teammates, not competitors.²⁷

Fourth, they can meet with teachers to discuss their students' assessment data and encourage teachers to have their students set personal academic goals based on the information.

10. *Bring teachers in the same subject together across schools.* The districts in our case study regularly convened teachers of the same course- or grade-specific content in different schools—for example, Biology 1 or third-grade social studies—to review curriculum and assessments and to share instructional ideas. The timing of these meetings was based on the six- or nine-week grading periods in the district curriculum so teachers could look at results from the latest benchmark assessment. Less frequently, district leaders convened vertical teams of teachers from different grade levels—for example, elementary, middle, and high school teachers of US history. Interviewees in the study expressed a desire for increasing the frequency of these vertical team meetings.²⁸

How State and Local Policymakers Can Support Improvement in Educators' Data Use

State policymakers can ensure that an infrastructure of standards, data, research, and training are in place to support local educators' data use. Specifically, policymakers can:

- *Clarify state goals.* State leaders can ensure that their academic content and performance standards define a clear path to readiness for college, careers, and informed citizenship and that these standards provide a framework for local school districts to develop a content-rich curriculum not only in English language arts and mathematics, but also in science, history, geography, civics,

foreign language, and the arts. State accountability systems must recognize not only evidence of student academic growth in tested subjects, but also local efforts to prepare students for long-term success by strengthening the curriculum in untested grades and subjects.²⁹

- *Strengthen the state's data infrastructure.* State leaders can strengthen their statewide longitudinal student data systems and, with appropriate access restrictions to protect student privacy, make the data readily available in convenient reports to local educators.
- *Promote educators' knowledge.* One point of leverage for state policymakers is their jurisdiction over teacher and administrator certification requirements. Policymakers can require teachers and administrators to demonstrate the ability to interpret and use various kinds of data in order to be certified. Certified teachers, administrators, and counselors should also be familiar with applications of cognitive science to education, as this should give them better insights as they interpret student data.³⁰ To expand the knowledge available to educational practitioners, state leaders should also include funding to enable the state education agency to oversee a focused program of research using the state's longitudinal data system.³¹

Local policymakers, such as school board members and business and community leaders who influence school district policy, can ensure that school district leaders have the support and resources they need to take the ten steps described above. They can make implementation of the ten steps an explicit district priority, reflected in the school district budget, improvement plans, and discussions of the superintendent's job performance.

Conclusion

Educators can increase their effectiveness with students by improving their interpretation and use of data. To improve data use by teachers and school leaders, district leaders can clarify academic and behavioral goals, create the infrastructure for data use while protecting student privacy, ensure that educators across the district can interpret and use the information, and support collaboration as part of educators' normal routine. For their part, state and local policymakers can encourage and assist school district leaders in taking these necessary steps.

Improving educators' use of data should be approached in conjunction with other measures to strengthen the curriculum and improve the methods and interventions used to benefit students.³² By using data to identify student needs, guide changes in instruction, motivate students, coach educators, evaluate programs and decisions, and communicate with parents and the public, educators can help ensure that the other measures they take to improve student learning are more effective. ■

Notes

- 1 For an overview of ways that education leaders can promote effective data use, see Amanda Datnow, Vicki Park, and Priscilla Wohlstetter, *Achieving with Data: How High-Performing School Systems Use Data to Improve Instruction for Elementary Students* (Los Angeles: Center on Educational Governance, 2007), <http://www.newschools.org/files/AchievingWithData.pdf>; and Jeffrey Wayman, Stephen Spring, Melinda Lemke, and Meghan Lehr, "Using Data to Inform Practice: Effective Principal Leadership Strategies," paper presented annual meeting of the American Educational Research Association, Vancouver, British Columbia, April 2012, <http://edadmin.edb.utexas.edu/datause/papers/Wayman%20Spring%20Lemke%20Lehr%20Principal%20Data%20Use%20Strategies.pdf>.
- 2 Andreas Breiter and Daniel Light, "Data for School Improvement: Factors for Designing Effective Information Systems to Support Decision-Making in Schools," *Educational Technology & Society* 9, no. 3 (2006): 206–217; Cynthia Coburn and Joan Talbert, "Conceptions of Evidence Use in School Districts: Mapping the Terrain," *American Journal of Education* 112 (2006): 469–495; Daniel Light, Margaret Honey, Juliet Heinze, Cornelia Brunner, Dara Wexler, Ellen Mandinach, and Chad Fasca, *Linking Data and Learning—The Grow Network Study: Summary Report* (New York: Center for Children and Technology, 2005); Julie Marsh, John Pane, and Laura Hamilton, *Making Sense of Data-Driven Decision Making in Education: Evidence from Recent RAND Research* (Santa Monica, CA: RAND, 2006); Kim Schildkamp and Wilmad Kuiper, "Data-Informed Curriculum Reform: Which Data, What Purposes, and Promoting and Hindering Factors," *Teaching and Teacher Education* 26, no. 3 (2010): 482–496; Jeffrey Wayman, Vincent Cho, Jo Beth Jimerson, and Daniel Spikes, "District-Wide Effects on Data Use in the Classroom," *Education Policy Analysis Archives* 20, no. 25 (2012), doi: <http://dx.doi.org/10.14507/epaa.v20n25.2012>; Wayman et al., "Using Data to Inform Practice"; and Viki Young, "Teachers' Use of Data: Loose Coupling, Agenda Setting, and Team Norms," *American Journal of Education* 112 (2006): 521–548.
- 3 Breiter and Light, "Data for School Improvement"; Coburn and Talbert, "Conceptions of Evidence Use"; Datnow, Park, and Wohlstetter, *Achieving with Data*; Kerri Kerr, Julie Marsh, Gina Schuyler Ikemoto, Hilary Darilek, and Heather Barney, "Strategies to Promote Data Use for Instructional Improvement: Actions, Outcomes, and Lessons from Three Urban Districts," *American Journal of Education* 112 (2006): 496–520; Light et al., *Linking Data and Learning*; Marsh, Pane, and Hamilton, *Making Sense of Data-Driven Decision-Making*; Schildkamp and Kuiper, "Data-Informed Curriculum Reform"; Wayman et al., "District-Wide Effects on Data Use"; and Wayman et al., "Using Data to Inform Practice."
- 4 Breiter and Light, "Data for School Improvement"; Datnow, Park, and Wohlstetter, *Achieving with Data*; Laura Hamilton, Richard Halverson, Sharnell Jackson, Ellen Mandinach, Jonathan Supovitz, and Jeffrey Wayman, *Using Student Achievement Data to Support Instructional Decision Making*, NCEE 2009-4067 (Washington, DC: Institute of Education Sciences, 2009); Light et al., *Linking Data and Learning*; Marsh, Pane, and Hamilton, *Making Sense of Data-Driven Decision-Making*; Schildkamp and Kuiper, "Data-Informed Curriculum Reform"; Wayman et al., "District-Wide Effects on Data Use"; and Wayman et al., "Using Data to Inform Practice."
- 5 Breiter and Light, "Data for School Improvement"; Datnow, Park, and Wohlstetter, *Achieving with Data*; Light et al., *Linking Data and Learning*; and Schildkamp and Kuiper, "Data-Informed Curriculum Reform."
- 6 Coburn and Talbert, "Conceptions of Evidence Use"; Mingchu Luo, "Structural Equation Modeling for High School Principals' Data-Driven Decision Making: An Analysis of Information Use Environments," *Education Administration Quarterly* 44, no. 5 (2008); Marsh, Pane, and Hamilton, *Making Sense of Data-Driven Decision-Making*; and Schildkamp and Kuiper, "Data-Informed Curriculum Reform."
- 7 Coburn and Talbert, "Conceptions of Evidence Use"; Light et al., *Linking Data and Learning*; Luo, "Structural Equation Modeling"; Schildkamp and Kuiper, "Data-Informed Curriculum Reform"; Wayman et al., "District-Wide Effects on Data Use"; and Wayman et al., "Using Data to Inform Practice."
- 8 The ACT Core Practice Framework identifies actions to be taken by educators at the district, school, and classroom levels in five closely interrelated categories: (1) curriculum and academic goals; (2) staff selection, leadership, and capacity building; (3) instructional tools: programs and strategies; (4) monitoring performance and progress; and (5) intervention and adjustment. The specific actions recommended under these broad categories are based on case study research in over 550 higher and average performing schools over a ten-year period.
Because practices in these five areas interact and should be mutually reinforcing, changes in any one area are likely to require

complementary changes in the other four areas. For example, changes in a district's written curriculum should be accompanied by matching changes in staff development, instructional resources, assessment, and interventions. For a more complete discussion of many of the practices described in the Framework, see ACT, *Rising to the Challenge of College and Career Readiness* (Iowa City, IA: ACT, 2012), <http://www.act.org/research/policymakers/pdf/RisingToChallenge.pdf>.

9 See Chrys Dougherty, *Use of Data to Support Teaching and Learning: A Case Study of Two School Districts*, ACT Research Report 2015-1 (Iowa City, IA: ACT, 2015), <http://www.act.org/research/researchers/reports/>.

10 The Common Core State Standards for English language arts emphasize this point: "while the Standards make references to some particular forms of content, including mythology, foundational U.S. documents, and Shakespeare, they do not—indeed, cannot—enumerate all or even most of the content that students should learn. The Standards must therefore be complemented by a well-developed, content-rich curriculum consistent with the expectations laid out in this document." Common Core State Standards Initiative, *Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects* (Washington, DC: Common Core State Standards Initiative, 2010), 6.

By providing greater detail, the curriculum can align content across grade levels more precisely, so that what students learn in preceding grade levels prepares them to understand what is taught in subsequent grades. The curriculum can address the levels of student learning that are expected—for example, by the use of model student assignments and samples of student work. The curriculum can allocate learning time across topics in a given subject so that students are given enough time to learn each topic in sufficient depth and detail. The curriculum can also allocate learning time among subjects so that sufficient time is devoted to each subject in every grade. The curriculum can take advantage of connections across subjects, so that, for example, if the students are learning about volcanoes in science, they might read a story about Pompeii in language arts and

perform computations about volcanic activity in math class. ACT, *Rising to the Challenge*, 4.

11 See the discussion in chapters 1, 7, 13, 14, and 16 of John Hattie and Gregory Yates, *Visible Learning and the Science of How We Learn* (New York: Routledge, 2014).

12 See E.D. Hirsch, Jr., *The Knowledge Deficit: Closing the Shocking Education Gap for American Children* (Boston: Houghton Mifflin, 2006); and Chrys Dougherty, *College and Career Readiness: The Importance of Early Learning*, (Iowa City, IA: ACT, 2013), <http://www.act.org/research/policymakers/pdf/ImportanceofEarlyLearning.pdf>.

13 ACT, *Impact of Cognitive, Psychosocial, and Career Factors on Educational and Workplace Success* (Iowa City, IA: ACT, 2007), <http://www.act.org/research/policymakers/pdf/CognitiveNoncognitive.pdf>.

14 Programs that explicitly teach defined student behaviors through active learning (in which students act out or practice the behavior rather than just being told about it) have been found to be effective at improving both behavior and academic achievement. Joseph A. Durlak, Roger P. Weissberg, Allison B. Dymnicki, Rebecca D. Taylor, and Kriston B. Schellinger, "The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Early Interventions," *Child Development* 82 (2011): 405–432.

15 ACT, *Enhancing College and Career Readiness and Success: The Role of Academic Behaviors* (Iowa City, IA: ACT, n.d.), http://www.act.org/engage/pdf/ENGAGE_Issue_Brief.pdf; and Alex Casillas, Jeff Allen, Yi-Lung Kuo, Susan Pappas, Mary Ann Hanson, and Steve Robbins, *Development and Validation of ENGAGE Grades 6–9*, ACT Research Report Series 2011-1 (Iowa City, IA: ACT, 2011), http://www.act.org/research/researchers/reports/pdf/ACT_RR2011-1.pdf.

16 Identifying the questions to address is the first step in the "cycle of inquiry" discussed in Hamilton et al., *Using Student Achievement Data*.

17 See Robert Balfanz and Hedy Chang, "A Focus on Attendance is Key to Success," *National Association of School Administrators* (website), 2013, <http://www.nassp.org/tabid/3788/>

[default.aspx?topic=A_Focus_on_Attendance_Is_Key_to_Success](http://www.nassp.org/tabid/3788/default.aspx?topic=A_Focus_on_Attendance_Is_Key_to_Success); and Hedy Chang and Mariajosé Romero, *Present, Engaged, and Accounted For: The Critical Importance of Addressing Chronic Absence in the Early Grades* (New York: National Center for Children in Poverty, 2008).

18 See, for example, Jeffrey Wayman, Sam Stringfield, and Mary Yakimowski, *Software Enabling School Improvement through Analysis of Student Data*, Technical Report #67 (Baltimore, MD: Center for Research on the Education of Students Placed at Risk, Johns Hopkins University, 2004); Jeffrey Wayman and Sam Stringfield, "Technology-Supported Involvement of Entire Faculties in Examination of Student Data for Instructional Improvement," *American Journal of Education* 112, no. 4 (2006): 549–571; and Mary Ann Lachat and Stephen Smith, "Practices that Support Data Use in Urban High Schools," *Journal of Education for Students Placed at Risk* 10, no. 3 (2005): 333–349.

19 National Center for Educational Statistics, *Data Stewardship: Managing Personally Identifiable Information in Electronic Student Education Records*, SLDS Technical Brief #2 (Washington, DC: Institute of Educational Sciences, 2010).

20 As one case study interviewee explained:

The district specialist writes the district benchmark and ... all the Algebra I teachers get into a room with her. They all take the test together. That's our way of vetting the test. They take the test so they can see what's on the test. The test doesn't leave the room. That way we're not teaching the test. But they have an idea of where we're trying to go.

Then that happens at the beginning of each nine weeks. And then three weeks before we actually administer the test the teachers look at it again and they say to the district specialist ... "That week we had homecoming and a parade and a pep rally ... and we missed three days of instruction over this. And so we didn't get that far. So that test item needs to come out." So we're working really hard to keep those benchmarks to be a true reflection of what we've taught. Dougherty, *Use of Data to Support Teaching and Learning*, 10–11.

- 21 Data Quality Campaign, "Creating Reports Using Longitudinal Data."
- 22 Educators and policymakers must avoid the trap of limiting their discussions to questions which the existing data can readily answer, a practice reminiscent of the old joke about looking for lost car keys under the streetlight because that is where the searcher can see, not where the keys were lost.
- 23 In turn, educator preparation programs must ensure that their curricula prepare new teachers and administrators to meet these requirements. Ellen Mandinach and Edith Gummer, "A Systematic View of Implementing Data Literacy in Educator Preparation," *Educational Researcher* 42, no. 1 (2013): 30–37; and Ellen Mandinach, Edith Summer, and Robert Muller, *The Complexities of Integrating Data-Driven Decision Making into Professional Preparation in Schools of Education: It's Harder Than You Think* (Alexandria, VA: Wested, Education Northwest, and CNA, 2011).
- 24 Both case study districts employed academic coaches; one district employed them mainly to observe lessons and coach teachers, while the other district encouraged academic coaches to spend one-quarter of their time coaching teachers and three-quarters working directly with struggling students. In the latter district, school principals were expected to play a major role coaching teachers in how to interpret and use data.
- 25 Atul Gawande, "Personal Best: Top Athletes and Singers Have Coaches. Should You?" *New Yorker*, October 3, 2011. Studies have found mixed results on the impact of academic coaching on student achievement, possibly because the responsibilities of coaches and the quality of coaching have differed across sites.
- See Julie Marsh, Jennifer Sloan McCombs, and Francisco Martorell, "How Instructional Coaches Support Data-Driven Decision Making: Policy Implementation and Effects in Florida Middle Schools," *Educational Policy* 24, no. 6 (2010): 872–907; and Michael S. Garet et al., *The Impact of Two Professional Development Interventions on Early Reading Instruction and Achievement* (Washington, DC: Institute of Education Sciences, September 2008), <http://ies.ed.gov/ncee/pdf/20084030.pdf>.
- 26 As an example of this collaboration, ten Algebra I teachers at Wilson High School in Long Beach Unified School District reviewed results from one of their common assessments and identified the teacher whose students had been most successful on the unit's learning objectives. That teacher taught the same lesson to a group of students who had had trouble on those objectives, while the other teachers observed the lesson. This activity required teachers to view greater success on the part of any of their peers as a learning opportunity, not a source of shame. Jean Rutherford, "High School Roundtable: NCEA's Jean Rutherford Discusses America's High Schools at ECS," *High School Roundtable—ECS July 2005 Policy Forum* (2005), <http://www.ecs.org/html/Document.asp?chouseid=6303>.
- 27 For example, see the description of teacher collaboration in ACT, *Core Practices in Math and Science: An Investigation of Consistently Higher Performing School Systems in Five States* (Iowa City, IA: 2009), <http://www.act.org/research/policymakers/pdf/Core-Practices-in-Math-and-Science.pdf>.
- 28 Dougherty, *Use of Data to Support Teaching and Learning*, 20.
- 29 Dougherty, *College and Career Readiness: The Importance of Early Learning*, 3.
- 30 For some of these applications, see Dan Willingham, *Why Don't Students Like School? A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom* (San Francisco: Jossey-Bass, 2009), and Hattie and Yates, *Visible Learning*.
- 31 To the extent that the state allows third-party researchers access to the data under appropriate privacy protection, the great majority of the cost of this research can be borne by those third parties. The only state cost becomes that involved in maintaining the longitudinal data system, concluding and overseeing research agreements, and fulfilling requests for data under those agreements. "Overseeing a focused research program" means that the state agency works with stakeholders to identify a list of important research topics, and the highest priority is given to research projects addressing those topics.
- 32 For example, one study using a randomized controlled trial approach found that improving data use in combination with introducing better instructional programs led to improvement in student results; there was weaker evidence that standalone interventions aimed at improving data use improve student learning. Robert Slavin, GwenCarol Holmes, Nancy Madden, Anne Chamberlain, and Alan Cheung, "Effects of a Data-Driven District-Level Reform Model," *Best Evidence Encyclopedia* (February, 2010), www.bestevidence.org. See also Julie Marsh, "Interventions Promoting Educators' Use of Data: Research Insights and Gaps," *Teachers College Record* 114, no. 11 (2012); and Laura Hamilton et al., *Using Student Achievement Data*.