Misconception 3: Data Collection Is Limited to Quantitative Data

Although it is wise to begin student-engaged data practices with things that are easy to count (e.g., mistakes in math assignments, minutes spent on independent reading), there is also a great deal of qualitative data that can help student growth. Rubrics, which are composed of qualitative descriptions of student work, are filled with this kind of data. Many recording forms, such as journals, note catchers, and entrance and exit tickets can be powerful data sources to track the why and how of student thinking. These kinds of forms are opportunities for students to back up their ideas with evidence, an essential skill for meeting Common Core standards.

Common Core Connections

• Engaging students with data analysis enhances their ability to make evidence-based claims, a skill that permeates the standards.
• Using data reflectively (e.g., engaging in error or success analyses) helps students meet the Common Core’s more rigorous (and often complex) standards. Noting trends focuses students’ attention on how to improve.
• Understanding data about one’s own progress toward meeting standards is a key to developing the independence and self-direction emphasized by the Common Core. If data tracking about progress remains solely in the possession of the teacher, students are deprived of the opportunity to actively work toward standards. Their partnership in the process increases their engagement and motivation along with the likelihood they will meet with success.

GETTING STARTED

Creating a Culture of Safety for Data Investigation

There are many different ways that teachers, teams, and whole schools can use data with students. It is important to start by developing a classroom culture that supports students to assess their progress, and to take small steps that enable them to build their skills analyzing data.

It can be intimidating to look at data of one’s own performance and analyze strengths and weaknesses. A critical first step is to develop a classroom culture where it is safe to make mistakes and where a guiding belief is that effort leads to learning. Creating such a classroom culture is a foundation of all student-engaged
assessment practices. It begins with building a growth mindset and creating strong group norms and being careful to model them and follow up on their use.

Students should not be in competition with each other. Data use in the classroom should not result in a zero-sum game in which one student’s “win” necessitates another student’s “loss.” Rather, students should compete against themselves to achieve their own goals at a sufficient level of challenge. Student data use should also stay focused on students learning how to compare their work and progress against clear standards. It is not about identifying the top 10 percent of students. Students will want to know where they stand in relation to their peers, but it is important to bring them back to their own progress and goals. Understanding that everyone has a unique learning profile made up of strengths and weaknesses is a key part of building a safe data culture.

Building structures for students to collect, analyze, and share data about habits of scholarship (e.g., participation in class, persistence with revision) is an important part of creating a healthy data culture. This kind of data collection should not be presented as a short-term strategy to “fix” their problems. It is a long-term—we hope lifelong—disposition and skill that will empower them to better understand their personal behavioral and learning patterns. Moreover, understanding how data about habits of scholarship connects to data about academic achievement builds critical-thinking skills in students—this metacognition is a college- and career-ready skill that can affect positive change in students’ lives. For example, a student who knows that she consistently locates only 20 percent of the grammatical errors in her essays is more likely to seek out a peer editor or a tutor at the campus writing center when she attempts to revise her college papers.

**Snapshot: Introducing Students to Data with “Mini-Me”**

Before students can understand how to use data to inform their own academic goals, they must first learn about data and how to collect, sort, analyze, and represent data in its various forms. In Amanda Locke’s seventh-grade math and science class at Four Rivers Charter Public School in Greenfield, Massachusetts, students are introduced to data collection and analysis by participating in an activity called *mini-me* (adapted from a similar activity at King Middle School in Portland, Maine). Students collect data on themselves (e.g., age, height, weight, eye color) and create mini-scale drawings, write mini-narratives, and look for whole-class patterns across all of the mini-me projects of their classmates. Students learn the difference between qualitative and quantitative data and the vocabulary of data (e.g., mean, median, mode, outlier).
“It really helps them see the pieces, parts, and groups and how all these data fit together,” says Locke, who helps the students craft a survey to get at what makes the group similar as well as what makes each individual unique. From the data they collect, students create frequency charts, stem-and-leaf plots, and other visualizations that make data patterns more apparent. Although it may seem like “just math” to the students, Locke is creating the intellectual infrastructure her class will need to use data about their own academic performance. The skills they learn through the mini-me project help them make sense of how their teachers are reporting their performance within a standards-based grading system, something most of them are unfamiliar with.

**Foster a Growth Mindset in Students**

Just as adults in the school must buy in to the use of data to inform instruction and move students forward, students also need to be shown the power of data. For too long, data have been used to define students with little chance to move beyond the label they’ve “earned.” As cognitive scientists have discovered, biology is not destiny, and intelligence is in fact malleable. Making students aware of this provides them with the opportunity to not only acknowledge that growth is possible but also that creating goals based on data puts them in the driver’s seat.

Using data with students begins with assessing current levels of performance and determining what level of performance will demonstrate that the goal has been reached. Establishing a clear target or goal ensures that data use will help to build the “I want to succeed” ethic and growth mindset in students. Far too many students (and teachers) believe that certain people are born “smart” and others are not. Teachers can help to dispel this myth through the intentional use of data.

**Explicitly Teach Students about Data**

Define data and describe the ways in which data can be used to increase performance. Given the prevalence of data analysis, there are many accessible examples from popular culture that show how data are used to increase performance. An examination of the sports page shows how understanding data is a matter-of-fact part of the culture. Statistics and other data are collected on athletes and coaches and players pore over box scores, game tapes, and other evidence to identify patterns in the data that will enable athletes to set goals and improve. Retailers collect data to track sales and determine marketing strategies. Scientists and doctors collaborate to analyze data from clinical trials to assess the efficacy of new medicines.
A mathematical profile like this is a good way to get students in the practice of collecting data about their performance.
Look for everyday, authentic opportunities to see how examining data can make a difference in our lives (e.g., number of students tardy, pieces of trash on the cafeteria floor, amount of paper recycled).

**Use Collective Data: Everyone Must Scale the Mountain**
Starting with a collective classwide goal for data analysis fosters a spirit of collaboration—students shift their mindsets from working toward their own goals to working to ensure that all of their classmates are also successful. A third-grade class may identify a goal for proficiency in their multiplication tables—everyone completing a set number of random problems in a limited time—and work as a team to see if they can reach it. Ninth-grade students may recognize that their transitions need to be more efficient and set a class goal that all students will be in their seats before the bell rings at the start of class. Each of these goals sets challenges for the whole group but require individual accountability. It is a low-stakes way to introduce data use in a classroom, but it bears repeating that although individuals are accountable for the goal, their individual scores should not be made public.

**Ensure Early Wins**
For skeptical or wary students it is critical that early work with data yields results. Student investment comes when they see the return and observe meaningful growth. Although there are many ambitious ways to use data, in a novice classroom it is important to achieve the early win. Choose a data source in which you know students can show rapid improvement. Publicly celebrate the win before establishing more ambitious and long-term goals.

**Focusing the Data Inquiry**
Integrating student use of data into classroom routines is a long-term process. It is important to start small. Rather than flooding the classroom with data, teachers should design a focused data routine that can be expanded and supplemented over time. Figure 3.1 represents a typical data-inquiry cycle in the classroom. Teachers will need to develop an approach that best suits their students’ needs. Choosing what data to investigate is one of the key questions facing teachers invested in using data with students. Not all data are equally suited to inquiry with students.
The following guidelines will help teachers ensure that the data they use with students are useful:

- Keep standards at the forefront—data collection should be in service of meeting standards.

- Begin with quantifiable data—for teachers new to this practice, a simple maxim applies: find something to count. What you count should be something you care about improving (e.g., how many students can solve multistep word problems, the percentage of students turning in lab reports with all criteria complete). Qualitative data sources, such as journals or reflection forms from student portfolios, may be used more frequently as teachers gain confidence with these practices.

- Choose a recurrent data source—effective data investigation involves comparison between where students start and where they are at different intervals, so it’s important to choose a data source that can be measured multiple times.
• Make the data matter—ensure that what you count is worthy of being counted. Students should be asked to collect and analyze data that will help them to set and achieve goals. For example, data mined from students’ habits of scholarship (such as percentage of homework assignments completed) can be useful to change study habits, whereas data points gathered from ongoing numeracy drills can prove to students that their practice is making a difference. Helping students make the connection between these data points is powerful self-knowledge and a key to building critical thinking skills. In the accompanying video, sixth-grade students review data from their Developmental Reading Assessments and use the information to check in on their goals.

Watch video: “Goal Setting for Achievement in Reading—Using Data with Students”

Case Study

Using Data with Students to Build Geography Skills at Washington Heights Expeditionary Learning School (WHEELS) in New York City

Sixth-grade social studies teacher Stephanie Aberger was concerned about her new students’ lack of basic geography skills. Almost all of them were performing on average two grade levels below where they should have been. She was also concerned that many seemed to lack basic concepts about the world necessary for the study of history. She needed to find a way to prepare students for the rest of their social studies experience at WHEELS. Aberger decided to use the following data-inquiry process with the class:

• Where are we now?—preassessment, diagnostic of current performance
• Where are we going?—goal setting (determined by teacher or in conjunction with students and informed by grade-level standards)
• Measurement through data—monitoring the gap between current performance and the goal
• Reflecting on growth and establishing a new goal

She started by collecting data to address the following diagnostic questions: What geographic skills do students have? What do they know about world geography and historical events?

(continued)
Next, she shared the data (diagnostic results) with students. She made the data anonymous by aggregating results by class and grade level. Students then set individual and class goals for improvement.

The third step in the process involved a series of assessments. Planning for quick, data-driven wins, the teacher made deliberate choices of skills and lesson design to ensure mastery for all and organized assessments by learning target. The class engaged in an atlas challenge every two weeks, and she shared the results publicly (e.g., 82 percent of the class can correctly identify, spell, and provide key information about Pakistan, but only 58 percent can do the same for Ecuador). The students’ long-term goal was to identify, correctly spell, and provide key facts about forty countries. In the end, 95 percent of the eighty students met the goal. They were then ready to set more challenging goals related to the history of those countries.

Communicate with Families

The goal of using data with students is to have students identify their own strengths and needs, create attainable goals based on standards and learning targets, draft specific action plans, and—with teacher and parent support—achieve the goals. It is important to take time to bring parents up to speed regarding the data-inquiry process. Letters to families, conferences, and more formal presentations are all vehicles for educating parents about what the data-inquiry cycle is and what the key forms of data are for tracking student learning.

In many schools, reports on data come out at student-led conferences and portfolio presentations (see chapters 5 and 7 for more information). With the consistent and purposeful use of data, students and their families should know at any given point in time how a student is faring. Although students’ reflections and perceptions of their progress based on data are not always communicated on formal progress reports, there should be a seamless connection between students’ self-assessment and standards-based grades (see chapter 8 for more information). Data kept by students and data kept by teachers should be consistent. Teachers can check their grade books against student learning target trackers, work folders, or

“Involve parents in the follow-through of the goals. Give them something specific to do, whether it’s flash card drills, learning sight words, or listening as their child reads aloud. Parents want to feel a part of the process.”

—Jean Hurst, third-grade teacher, Genesee Community Charter School, Rochester, New York
other assemblages of student work for accuracy and reliability. This coherence will enable students and families to experience the connection between grades and the students’ own understanding of their progress.

**IN PRACTICE**

**Developing the Systems to Support and Deepen Using Data with Students**

For any new routine to flourish in the classroom, teachers must create good systems to collect and store student data. Whether using simple forms, work folders, or computer-generated spreadsheets, teachers must provide a vehicle for students to collect data and make the time and space for them to make sense of this information. No matter the system, the outcomes are the same—students are prepared to become reflective learners, they can identify strengths and challenges, and they can set goals that enable them to meet standards.

**Forms**

Teacher-created forms can serve as data collection tools for students. Ongoing and predictable use of forms—such as learning target trackers, item or error analysis sheets, reflection sheets, and rubrics—helps students get in the practice of collecting data about their progress. Over time, they internalize the importance of having a record and become careful observers of patterns and trends. Forms help them organize their work and talk about their progress at student-led conferences or passage presentations. Figure 3.2 shows error analysis forms for math and writing and a preschool letter identification tracker. Figure 3.3 shows a learning target tracker.

“We try to be transparent in naming how the learning target is valuable in terms of the students’ progress with skills and knowledge, and habits of scholarship. For example, the Common Core mathematical practice standards emphasize persevering in solving challenging math problems (MP1). Students can use a learning target tracker to identify growth not only in their capacity to use different strategies and make connections to other problems they have seen and solved before, but [also] to their character in overcoming challenges and seeking solutions.”

—Chris Dolgos, sixth-grade teacher, Genesee Community Charter School, Rochester, New York