Introduction

Continuous improvement in schools is predicated upon analyzing and responding to data. Staff and student learning is the goal of continuous improvement. School improvement plans and the work of professional learning communities (PLCs) both focus on the identification of data needed to assess results, data collection, analysis, and action planning. Research on PLCs substantiates the claim that in schools where professional colleagues work together to study, analyze, and respond to data, learning soars.

USING THIS BOOK ■

This book may be used in a variety of ways. For example, it may be used for a professional "book talk." In this context, all staff members read the book and reflect together about its content. Staff members may select a favorite tool they read about and share it along with their vision for how it may be used. Questions could be developed such as "What tool(s) would be best to use to determine how to increase the use of higher order thinking skills?" Staff members could then participate in a scavenger hunt through the book to identify the most appropriate tools. In a faculty, team, or department meeting, faculty members can examine one or two tools per meeting and practice using them with site-level data.

The chapters are written so that they may be read in any order with the broad goal of increasing the repertoire of practical tools that data teams possess to examine and analyze data. Each chapter includes

- a description of a data analysis tool,
- an explanation of the conditions under which this particular tool might be used,
- the steps to using the tool,
- a graphic depicting what the tool looks like when it is used,
- stories about how school staff members have used the tool,
- education theory and philosophy that supports the use of the tool, and
- reflections/insights on using the tool.

THE DATA TOOLS ■

These tools were developed over the last several years by working collaboratively with principals and teachers with their data in school settings. Educators were constantly looking for ways to make meaning from their data, and found these particular tools extremely helpful. These tools actually increased educators'

data fluency, a term used to describe what happens when people actually begin to use the mass of data that surrounds them in such a way that instruction is adjusted and improved. Some of these tools have their foundation in Edward Deming's (1986) work around quality and continuous improvement, which has been impacting practices in the industry for over 50 years. These tools have been simplified and tailored for use in educational settings. Some of these tools are new to the field, based on the work of the authors, and others have been adapted from university settings, research studies, work within data teams, and teachers looking to use and learn from data in their classrooms. All of the tools embody best practices regarding the use of data. This book and these tools facilitate thinking and conversation about using data so that teams of administrators and teachers can collaborate in solving problems and generate school improvement at the classroom, school, and district level.

■ CHAPTER OVERVIEW

In the paragraphs that follow, the focus of each chapter's content is summarized as a quick reference for the reader.

Chapter 1: Build Your Team

Effective work with data is done in teams. Forming a team is a critical component of the work. This chapter addresses what you need to think about in forming data teams and what structures are necessary to ensure that a team is functioning well. Great teams need dedicated time to work and structures that ensure everyone is involved, engaged, and take responsibility for the work.

Chapter 2: Identify the Problem

Understanding your data and knowing what data tool to use begins by being able to define the problem you are seeking to solve. This chapter emphasizes the importance of reflection when approaching a problem and provides helpful reflection tools for getting started. The process of reflection helps staff members to address tough issues through conversations and realize that success often comes as a result of analyzing failure.

Chapter 3: The Three Guiding Questions

Collecting data begins with defining what you are going to teach and how you will know that your students have learned the knowledge and skills you have identified as outcomes. Many staff members look beyond this critical step in the process by looking immediately at summative data before they understand and agree on the learning targets. Unpacking standards to identify learning targets is step number one followed closely by determining what assessments you will use to measure progress toward those learning targets. Using this tool on a regular basis will help staff members understand and own the data they are gathering.

Chapter 4: Analyze Your Students

Data that drive change must drill down to the individual-student level. It is only when we analyze our data through a lens that focuses upon the individual student that we can begin planning for action with the specificity required to produce results. This chapter presents a simple tool and framework to put students into blue, green, yellow, and red zones based upon a given data set. For example, if the instruction (prevention and intervention strategies) is effective, 80% of the students will be in the green (meeting) and blue (exceeding) zones. These students do not need additional instruction or support. Another 10% to 15% of the students are in the yellow zone, which means they need an additional dose of instruction at their rate and level to be successful.

We know from research and experience that the best solution for increasing learning is tailored instruction and additional time. Students most at risk (5%) require another dose of instruction tailored to their needs. Helping teachers see their students in terms of need by placing them into these four categories is the purpose of the Analyze Your Students tool. After doing this activity, there is profound clarity about what each student needs and ideas emerge through collaboration about how to meet those needs.

Chapter 5: Four Quadrants

The Four Quadrants tool enables teams of teachers to compare two sets of data and graph that data into quadrants so that decisions can be made regarding which intervention to use and when to use it. Teachers choose sets of data that are related to one another such as reading fluency and reading comprehension so that they can see the relationship these data points have to each other. For instance, a student who understands what he reads but reads slowly (lack of fluency) needs a different intervention than a student who is fluent but doesn't understand what she is reading. This tool is powerful for providing clear direction regarding what intervention a student needs in order to reach his or her full potential as a learner.

Chapter 6: Wagon Wheel

The last of the quantitative tools, the Wagon Wheel enables educators to compare and contrast multiple data sets by placing corresponding data points along the spokes of a wheel. For example, if one is comparing writing scores across schools or the reading scores of different subgroups, this compare and contrast tool exposes patterns that can lead to strategic actions that generate improvement and help teams achieve intended results as opposed to unintended consequences. Whereas the previous tools are best suited for individual classrooms or grade levels, this quantitative tool is best used to analyze data at the school or district level.

Chapter 7: Five Whys

Developed by Toyota engineers who were trained to ask five *why* questions for every problem they encountered, this tool helps educators see and understand

that every problem is connected to other problems and that solving complex problems only occurs when we get to the root cause of the problem and address it. The Five Whys is a systems-thinking tool that helps teachers and administrators think outside the box for solutions and identify actions that have a powerful impact on results. This qualitative tool helps educators explore the relationship between causes and helps identify strategies to address complex and persistent problems.

Chapter 8: Relations Diagram

When staff members or teams are faced with entrenched, complex, persistent problems, the Relations Diagram can be used to determine the key drivers of a particular problem so that interventions can be targeted, strategic, and effective. This tool begins by having staff members identify and agree on the problem to be solved. Once agreement is reached, all of the possible causes are brainstormed and presented in a circle around the problem. From there, each cause is individually analyzed to determine its impact on other causes as well as the problem. Through the Relations Diagram, a team can address a problem and get to the root cause of that problem so that an effective strategy can be developed. Through this process, the team discovers one or more causes that influence many others. Once the driving causes are determined, team members can propose, agree on, and eventually implement strategies that lead to effective solutions. A Relations Diagram process greatly increases stakeholder commitment and ownership to solve persistent problems together.

Chapter 9: The Fishbone

The Fishbone tool has been used in business settings for some time to analyze cause and effect data. With this tool, teachers can choose an outstanding result or cause for concern and examine specific reasons that led to those results. By taking the time to reflect and rate the effectiveness of each reason, staff members can identify key drivers in their data that led to an outstanding result or eliminate factors that detract from their success. In many ways, the Fishbone tool combines the quantitative and qualitative elements of the previous six tools because it takes into account both numbers and causes to determine a solid course of action.

Chapter 10: School Improvement Mapping

Similar to the Five Whys, School Improvement Mapping (SIM) helps data teams chart their improvement efforts and keep track of what they are doing strategically to take action. This tool is best used in conjunction with other tools because it helps crystallize team efforts so that interventions and actions will have a lasting impact. SIM adds a measure of accountability to the work of data teams.

We invite you to begin your learning journey, exploring the tools and stories that have been tucked into the pages that follow. May your journey be productive and may it add to your collective knowledge base to enhance teaching and learning for all students.