How to Survive Data Overload

By Ronald S. Thomas

SUFFERING FROM DATA OVERLOAD? Many schools are. Although schools have lacked sufficient student achievement data to make good instructional decisions in the past, many are now snowed under with data. They are data rich but analysis poor. How can content, vertical, or interdisciplinary school teams make sense of all their data? How can principals structure data dialogues so that faculty members get the most from their data?

Here are six steps to help your teams mine their data. Using this protocol will result in more specific and concrete conversations by school teams and, more important, lead to data-based action that will increase achievement.
Begin With a Question

The goal of every data analysis should be to answer one or more essential questions. Teams should not begin their data work without asking such questions. Here are a few overarch-ing questions that data analyses could address:

- How well did our students perform in the recent districtwide assessment?
- What instructional changes could we make to increase student achievement on the upcoming No Child Left Behind Act (NCLB) assessment?
- What knowledge and skills do our students have?
- What are our students’ strengths and weaknesses, as shown on a variety of assessments?
- What can we learn about our students to help us with instructional planning?
- How can data help us know our students better?

The Data Source

There are three major sources of student achievement data: external data, schoolwide and districtwide benchmark data, and classroom data (Supovitz & Klein, 2003).

- External data come from standardized, norm- or criterion-referenced assessments that originate and are scored outside the school, such as Terra Nova, SAT, and Stanford 10. Results from external assessments can provide an initial focus for the school’s attention, but they are not administered frequently enough to provide precise guidance for instruction.
- Schoolwide or districtwide benchmark data are collected frequently and systematically across an entire grade, content area, or course. Benchmark assessments are administered to an entire school or district several times a year at about the same time. These assessments can provide guidance for instructional adjustments, interventions, and professional development throughout the year. Most important, if scored collaboratively by teachers, their analysis helps to reinforce a culture of data-based inquiry among the faculty.
- Classroom data are collected by individual teachers from their own assessments, such as quizzes, unit tests, essays, performance assessments, and personal communications.

Each source of data serves a different purpose, and reports on student achievement from the three may vary significantly in how they portray data. Before jumping into an analysis, ensure that teams take time to understand the nature of the assessment being reported on, which students took the assessment, and the meaning of each of the terms included on the data report. Such questions as the following should be considered:

- What assessment is being described in the data report?
- Why was the assessment given? Was it administered for accountability purposes (i.e., to prove that education is working), or was the assessment administered for instructional decision-making purposes (i.e., to improve education)?
- What specific standards (knowledge and skills) did the assessment measure?
- Which students participated in the assessment? Who did not? Why?
- How are the scores reported (e.g., in percentiles; stanines; grade equivalences; or percentages of students at advanced, proficient, and basic levels)?
- What do the terms in the report mean?

This second step of the dialogue is an excellent opportunity to build the assessment literacy of faculty members. For example, some external standardized assessments report student scores in percentiles, while districtwide benchmark tests may show performance as the percentage of students whose scores meet standards. Results from the two reports will mean very different things, and unless everyone on the team is clear about their meaning before beginning the analysis process, tremendous confusion can result and wrong conclusions can be drawn.

The Big Picture

Next, teams should get the big picture of the data through dialogue on such questions as:

- What do we see in the data?
- What pops out at us from the data?
- How far from meeting standards was the school? How far were the various groups of students?
- To what extent have the gaps between student performance and the standards changed over time?
- For NCLB tests, did performance levels meet adequate yearly progress for the school as a whole and for each disaggregated group (e.g., special education and English language learners)?

Teams should be careful not to jump to conclusions or attribute causality to the data at this stage of the analysis. That will come later. Instead, team members should attempt to maintain what Wellman and Lipton (2004) call “purposeful uncertainty” or “intellectual hang time.”
# Team Dialogue Guide: Moving From Data to Classroom Instructional Improvement

**Course or Subject Area:** __________________________________________ **Last Update:** ____________________

**Questions for Study:** __________________________________________________________________________
_____________________________________________________________________________________________

## OVERALL OBSERVATIONS ABOUT THE DATA

<table>
<thead>
<tr>
<th>Source #1: External Assessment Data</th>
<th>Source #2: Coursewide Assessment Data</th>
<th>Source #3: Classroom Assessment Data</th>
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<tbody>
<tr>
<td><strong>STRENGTHS</strong></td>
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<td>(Concepts/skills mastered)</td>
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## Overall Conclusions From More Than One Data Source

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Uncertainties/Questions</th>
<th>Areas Needing Growth</th>
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## Reflect on Reasons for Students' Performance

<table>
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<tr>
<th>Students Who Excelled</th>
<th>Enrichments to Be Put in Place (Examples)</th>
<th>Instructional Changes to be Implemented</th>
<th>Students Needing Further Work</th>
<th>Interventions to Be Put in Place (Examples)</th>
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**Time for next data review:** ____________________
Patterns in the Data
During the fourth step, team members describe what they see repeated in the data. Patterns should be discerned first within one data source and then by triangulating (bringing together) conclusions from multiple sources.

When looking at one data source, such as NCLB or benchmark results, these two simple questions should be used:
• What patterns do we see in the strengths of students according to the data?
• What patterns do we see in the weaknesses of students according to the data?

A second, more powerful, conversation can follow if teams are able to triangulate the results of multiple assessments, such as from an external test, a benchmark assessment, and several classroom assessments. By combining multiple results, teams can help overcome the weaknesses of individual data sources and generate insights that are not available from one source. Here are some key questions to include in this part of the analysis:
• What patterns of strength do we see from more than one source?
• What patterns of weaknesses do we see from more than one source?
• Are these the results we expected? Why or why not?

This dialogue also gives school teams the opportunity to consider puzzles or uncertainties that arise in relation to the data, using questions such as:
• What is puzzling about the data?
• What conflicting results emerge when multiple data sources are considered?

Data Patterns for Students
To make the data analysis a worthwhile experience, teams need to explore the implications of the data patterns for individual students as well as for instructional improvement.

The areas of student strength identified by team members in step four become the basis for discourse about enrichments that will encourage continued learning at a high level by more students. Such questions as these can help focus step five of the conversation:
• Which students have mastered the targeted knowledge and skills at a high level of proficiency?
• To what might the success of these students be attributed?
• What type of enrichment will we put in place for each student who is excelling? Consider such possibilities as asking students to solve fuzzier or more complex problems; skipping more practice; and adding more abstract, open-ended, and multifaceted situations in which high-flying students can apply concepts.
• What classroom differentiations will be implemented to encourage learning at a high level by more students?
• What data will be collected to determine the success of the enrichments?
• What assistance and resources will be needed to implement the enrichments?

Identifying areas for student growth can lead the team to explore questions that relate to interventions, such as:
• Which students will require additional in- or out-of-class assistance to master the targeted standards?
• To what might we attribute student weaknesses on the assessments?
• What interventions have been tried before? How successful were they?
• How can the observed data patterns help determine the types of interventions to implement and the content focus of the interventions?
• What data will be collected to determine the success of the interventions?
• What assistance and resources will be needed to implement the interventions?

Unless the team emerges from the data analysis process with a clear plan of action for identified students and for classroom instruction, it has wasted its time.
Reflection Guide

As we planned instruction, how well did we:

- Consult state standards or district curriculum documents for direction about the sequence and pacing of the unit?
- Ensure that we had a clear understanding of the knowledge and skills that students needed to master in this unit?
- Understand the level of rigor that students need to demonstrate to show proficiency on the unit’s knowledge and skills?
- Assemble the necessary resources for the unit?
- Allocate sufficient time for the unit?
- Use the results of the pre-assessment to build on existing student knowledge?
- (Add additional instructional strategies important for planning in your grade, school, or subject area.)

At the beginning of instruction, how well did we:

- Share essential outcomes with the class in student-friendly terms?
- Involve students in setting their own learning goals for the unit?
- (Add additional instructional strategies important at the beginning of instruction in your grade, school, or subject area.)

During instruction, how well did we:

- Design lessons that would build on students’ background knowledge?
- Focus lessons on the essential knowledge and skills from the state standards or district curriculum guides?
- Correct misconceptions that students may have or that occurred during the unit?
- Assign work that is mostly on grade level, with appropriate scaffolding where needed?
- Base assignments on real-world, authentic tasks?
- Vary instructional activities to meet individual student needs?
- Use graphic organizers and other nonlinguistic methods of representing content in symbolic form?
- Use cooperative learning activities where appropriate?
- Provide multiple opportunities for student writing?
- Assign purposeful homework and vary the approaches to providing feedback on the homework?
- Provide students specific and timely feedback on their assignments?
- Ask students to respond to higher-level questions that require them to analyze, synthesize, and evaluate?
- Provide multiple opportunities for students to practice, review, and apply their new knowledge?
- Use results of ongoing classroom assessments to guide instruction?
- Include strategies for involving students in monitoring their own progress toward goals?
- Reinforce students’ efforts and provide recognition of success?
- (Add additional instructional strategies important during instruction in your grade, school, or subject area.)

At the end of each part of instruction, how well did we:

- Use the most appropriate type of assessment for the knowledge and skills that were assessed?
- Use a variety of assessment formats?
- Use classroom assessments that mirror the NCLB assessments in content and format?
- Mirror the level of rigor used in scoring external assessments when scoring classroom assessments?
- Involve students in monitoring their own progress toward learning goals?
- (Add additional instructional strategies important at the end of instruction in your grade, school, or subject area.)
Data Patterns for Instruction
The most important conversations about the implications of the data relate to the instructional strategies teachers use. The big question at this final step is, How will classroom curriculum, instruction, and assessment change in the next unit to increase the learning of all students?

Marzano’s research into what works in schools (Marzano, 2003) and Stiggins’ notion of assessment for learning (Stiggins, Artur, Chappuis, & Chappuis, 2004) might form the basis of a structured look at instructional practices that are based on the data analysis. The reflection guide included in this article is a helpful tool for team members to analyze the current status of curriculum, instruction, and assessment and to identify instructional changes for the next unit.

Unless the team emerges from the data analysis process with a clear plan of action for identified students and for classroom instruction, it has wasted its time. The final step in the data analysis process is for the team to implement the enrichments and interventions within a definitive time frame, modify instructional or assessment practices, and collect data to determine the effectiveness of the changes.

These are difficult conversations to have, mainly because the culture in most schools does not lend itself to specific and concrete talk about student achievement. An established protocol that includes questions like these, however, will help infuse data dialogues into the ongoing work of teams. Educators will be able to move beyond overload and get the most from their data.

References