From Data-Driven Dialogue to Instructional Improvement: Building High-Performing Data Teams

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Research for Better Teaching
Acton, Massachusetts, USA
CEESA Conference
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Participants Will Be Able to…

- Apply a framework, tools, and principles to increase the effectiveness of Data Teams
- Facilitate Data-Driven Dialogue
- Engage in Data-Driven Dialogue with student work

Agenda

- Engagement: What Challenges Do You Face?
- Overview of Framework for Collaborative Inquiry
- Build the Foundation: Consensogram and Data-Driven Dialogue
- Identify a Student-Learning Problem/Goal: Student Work Analysis
Essential Question

How can we unleash the power of data to improve teaching and learning? Transform school culture? Promote equity?

Synectics

• Introduce yourselves to your team members.
• Brainstorm several ways that the image on the card is like a challenge schools face in making effective use of school data.
• Select your favorite.
• Select a spokesperson to introduce your team and share the image and one comparison.

The Data Divide
We have one and only one problem: Do we truly will to see each and every child in this nation [world] develop to the peak of his or her capacities?

— Asa Hilliard, 1991

Building the Bridge Between Data and Results

Moral Resolve

Collaborative Inquiry

Leadership & Capacity

Structural Maturational

Incentive Data

Instructional Improvement

Results


54th Street Elementary School in Los Angeles Earns Distinguished Achievement Award
Assumption

Collaborative inquiry – school teams constructing meaning of student-learning problems and testing out solutions together through rigorous use of data and reflective dialogue – unleashes the resourcefulness of educators to continuously improve student learning.


Virtually All Education Researchers Agree: Collaboration Is Key

Deborah Ball  
Susan Lounsbury-Horsley
Roland Barth  
Karen Seashore Louis
Linda Darling-Hammond  
Milbrey McLaughlin
Rick DuFour  
Susan Mundry
David Dukes  
Fred Neumann
Robert Eaker  
Doug Reeves
Richard Elmore  
Jon Saphier
Michael Fullan  
Mike Schmoker
Carl Glickman  
William Sommers
James Hiebert  
Dennis Sparks
Asa Hilliard  
James Stigler
Gene Hall  
Katherine E. Stiles
Shirley Hord  
Jonathan Supovitz
Sharon Kruse  
J. E. Talbert
Anne Lieberman  
Gary Wehlage and more....
Judith Warren Little

Building the Bridge Between Data and Results

Moral imperative  
Collaborative inquiry

Leadership & Capacity  
Structured collaboration
Frequent data use  
Institutional improvement
School culture/trust/equity  
Results

Structured Collaboration: The Using Data Process

Data-Driven Dialogue Partners

Partner and Talk

What are your reactions to elements of the bridge? The Using Data Process? What validates your own practices or thinking? What new insights have you gained?
Consensogram and Data-Driven Dialogue

- Learn two tools
- Learn more about your context
- Demonstrate process for learning from any kind of data
- Illustrate principles for data use

Consensogram Directions

- Question #1: put your number on a BLUE Post-it.
- Question #2: put your number on a YELLOW Post-it.
- Question #3: put your number on a PINK Post-it.
- Question #4: put your number on a ORANGE Post-it.
- Question #5: put your number on a GREEN Post-it.
- Do not share responses.

Data-Driven Dialogue

Phase 1: Predict

- I predict…
- I assume…
- I wonder…
- I’m expecting to see…

Note: Assign recorder, facilitator, materials manager

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Phase 2: Go Visual

- Place Post-its in the appropriate column for each question
- Create a bar graph

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Phase 3: Observe

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Concept Attainment, Part 1

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>It’s 53 degrees out.</td>
<td>It’s cold.</td>
</tr>
<tr>
<td>75% of our fourth-graders scored below proficiency in mathematics problem-solving.</td>
<td>Our teachers are not comfortable with mathematics content.</td>
</tr>
<tr>
<td>This student diagrammed each trip across the river.</td>
<td>The student must have used the diagram to generate the rule.</td>
</tr>
</tbody>
</table>

Concept Attainment, Part 2

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>22% of our students answered item 15 “b.” The correct answer was “a.”</td>
<td>That’s because they don’t understand the vocabulary in the question.</td>
</tr>
<tr>
<td>This year we increased the percentage of students in the top quartile in science by 10% over last year.</td>
<td>Our new science program must be working.</td>
</tr>
<tr>
<td>25% more boys than girls meet the standard in 11th-grade science on our state test.</td>
<td>Boys are more interested in science than girls.</td>
</tr>
</tbody>
</table>

Concept Attainment Testers

- Our teachers aren’t emphasizing basic skills enough.
- 45% of our eighth-graders are not meeting the standard in computation.
- Teachers aren’t teaching inquiry-based science because they feel too much pressure to cover the curriculum.
- On a recent survey, a majority of elementary teachers reported that they needed more professional development in science content.
BECAUSE

Observation Reminders

- Made by the five senses
- Contain no explanations

Phase 3: Observe

I am struck by…
I observe…
I notice…
Phase 4: Infer/Question

A possible explanation…
That may be because…
A question I have now…

Reflecting on the Process

• What struck you about the process (Consensogram and Data-Driven Dialogue)?
• What principles of data use might be applicable to others kinds of data?
• How might you use or adapt these tools in your own setting?

Principles for Effective Use of Data

Pay attention to the process
Separate data from inference

It is a fatal fault to reason whilst observing, though so necessary beforehand and so useful afterwards.

— Charles Darwin

Multiple perspectives yield the richest analysis
Structured Collaboration:
The Using Data Process

Use Multiple Sources of Data and Drill Down Deep

Engage in Data-Driven Dialogue with Student Work
Uses and Purposes of Student Work Analysis

• Discuss with a partner:
  – For what purposes have you examined student work?
  – What protocols have you used?

Student Work Inquiry

• What evidence are we seeing of student mastery of the knowledge and skills required by the task?
• What errors are students making?
• What knowledge and skills seem to be missing?
• What additional insights into student thinking are we gaining?
Samples of Student Work

- Work related to weak items identified through item analysis (if multiple-choice, ask students to explain their answer)
- Samples from state exams, if available
- Samples from students targeted by Data Team
- Multiple randomly selected samples from different students
- Samples from one student over time
- Samples of low-, medium-, and high-quality work, a specific student misconception, or a confusion or question for the teacher

Agenda: Third-Grade Data Team

- Purpose: Inquire into students’ mastery of math concepts/skills on recent common formative assessment on graphing
- Group Roles/Norms
- Task Deconstruction
- Predict
- Go Visual
- Observe
- Infer
- Next Steps
- Reflections

Group Roles

- Data Coach
  - Facilitate process
  - Include everyone
- Dialogue Monitor
  - Use No-Because sign
  - Monitor four-phase process/group norms
- Materials Manager
- Recorder
  - Record team members’ words
  - Abbreviate
  - Write large so all group members can see
- Timekeeper
Ground Rules for Examining Student Work

• Be in the spirit of dialogue.
• Focus on the evidence, not on what you think the student knows or can do.
• Put your stake in the ground and be ready to move it.
• Be aware of personal biases.

Task Deconstruction and Student Work Analysis

Different than scoring work based on a rubric

Task Deconstruction

Task Deconstruction Procedure

• Step 1: Do the task, share solutions and strategies.
• Step 2: Brainstorm skills and concepts needed.
• Step 3: Refine to 3-6 key concepts and skills.

Task Deconstruction

Step 1: Do the Task & Share Solutions/Strategies

7. Sue is making the bar graph below to show the favorite art supplies of the students in her art class.

There are 25 students in Sue’s art class. All of the students chose crayons, paint, clay or markers as their favorite art supply.

Complete the bar graph to show the number of students who chose paint as their favorite art supply. Explain how you got your answer.

• I read the graph and determined that 3 students liked crayons, 4 liked clay and 10 liked markers.
• I added those up and got 17.
• That left 8 more for paint.
• I then added another bar to the graph to illustrate 8 students who liked paint.

Task Deconstruction: Sample Solution

7. Sue is making the bar graph below to show the favorite art supplies of the students in her art class.

There are 25 students in Sue’s art class. All of the students chose crayons, paint, clay or markers as their favorite art supply.

Complete the bar graph to show the number of students who chose paint as their favorite art supply. Explain how you got your answer.

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Task Deconstruction
Step 2: Brainstorm

- Brainstorm, drawing on your own experience doing the task: What do students need to know and be able to do to be successful at this task? Write each piece of knowledge and each skill on a large Post-it, one item per Post-it.

Task Deconstruction
Step 2: Brainstorm Skills and Concepts Needed

- I read the graph and determined that 3 students liked crayons, 4 liked clay and 10 liked markers. I added those up and got 17. That left 8 more for paint. I then added another bar to the graph to illustrate 8 students who liked paint.

Read a graph
Task Deconstruction
Step 3: Refine by...

• Consulting relevant standards and rubrics
• Focusing on 3-6 key concepts/skills in the content area
• Focusing on concepts/skills that will inform reteaching and extension

Task Deconstruction: Step 3 – Refine:
Consulting Relevant Standards and Rubrics

Standard: 3.D.3 Construct and draw conclusions from representations of data sets in the forms of tables, line plots, pictographs, tallies, and bar graphs.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 5</td>
<td>The student response demonstrates an exemplary understanding of the Data Analysis, Statistics, and Probability concepts involved in constructing and drawing conclusions from representations of data sets in the form of bar graphs. The response includes an explanation of the student’s reasoning.</td>
</tr>
<tr>
<td>3</td>
<td>The student response demonstrates a fair understanding of the Data Analysis, Statistics, and Probability concepts involved in constructing and drawing conclusions from representations of data sets in the form of bar graphs. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 1 point.</td>
</tr>
<tr>
<td>2</td>
<td>The student response contains insufficient evidence of an understanding of the Data Analysis, Statistics, and Probability concepts involved in constructing and drawing conclusions from representations of data sets in the form of bar graphs to merit any points.</td>
</tr>
</tbody>
</table>


Consulting Relevant Standards and Rubrics
Common Core: Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Consulting Relevant Standards and Rubrics, Common Core Mathematics

- Use place value understanding and properties of operation to perform multi-digit arithmetic: 2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Represent & interpret data: 3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.


Task Deconstruction and Student Work Analysis: Phase 1: Predict

I predict…
I assume…
I wonder…
I’m expecting to see…


Task Deconstruction and Student Work Analysis: Phase 1: Predict

- What would students need to know and be able to do to be successful at this task?
- How do you think your students performed?
- What do you think they had trouble with?
- What errors or misconceptions do you anticipate?
- Based on what assumptions?
- Record your predictions on chart paper.
Phase 2: Go Visual

Task Deconstruction and Student Work Analysis: Phase 2: Go Visual

- Recreate table on chart paper.
- Insert the knowledge and skills identified in task deconstruction in top row.
- Place a check if there is evidence that students have demonstrated the requisite knowledge or skill identified.
- Note student errors or misconceptions in the last row.

Phase 3: Observe

I am struck by...
I observe...
I notice...

Adapted from Research for Better Teaching, Studying Skillful Teaching Course Handouts, Acton, MA: Research for Better Teaching, 2008.
Exaining Student Work

Phase 3: Observe

• What patterns or trends do you observe across several pieces of work? Examine the table by columns. (E.g., 90% of students failed to ID a pattern.)
• What patterns in errors and misconceptions are emerging? (E.g., 3 students added instead of multiplying.)
• What do you notice about individual students? Examine the table by row. (E.g., student A missed 3 out of 4 of the key concepts/skills.)
• Record your observations on chart paper.

Note that this is a smaller sample size than teams might typically use for this task.

Phase 4: Infer/Question

• What new insights have you gained about the student-learning problem?
• What might be contributing to students’ lack of understanding or skill? Misconceptions or errors?
• What additional questions are raised by the student work?
• What additional data could be helpful?
• If relevant, consider if examination of student work confirms or refutes the tentative conclusions you drew from other data analysis.
• Record your inferences and questions on chart paper.
Looking for Love in All the Right Places

Possible Causes
- Curriculum
- Instruction
- Assessment
- Equity
- Critical Supports
- Teacher Preparation
- Other

Looking for Causes of Student-Learning Problems

- **Curriculum** – Did we teach it? In enough depth? Placed in the right sequence? Frequently enough?
- **Instruction** – Did we use a variety of research-based instructional approaches? Are we sharing successful practices? Did we reteach using a different approach to individuals or groups who didn’t get it? Did we align reteaching to errors?
- **Assessment** – Did we use ongoing formative assessment to explore student thinking and build on it in our instruction? Communicate to students how to improve? Help them self-assess?
- **Equity** – Did we examine attitudes or practices that might contribute to achievement/relationship/teaching gaps?
- **Individual Assistance** – Did we identify students who need additional help and provide them with it?
- **Teacher Preparation** – Do our teachers have what they need in order to be successful with our students?

Preparing for Your Data Team Meeting

- Review the checklist for analyzing student work:
  - Read silently – highlight important ideas.
  - Round-robin – share an idea from the checklist that is important to you.
- Choose a volunteer to play the role of the Data Coach.
- Assemble the tools you will need:
  - No-Because sign
  - Data-Driven Dialogue graphic
Data Team Meeting (35 Minutes)

Engage in Data-Driven Dialogue with either the Grade 6 Mathematics or Grade 4 Language Arts student work.

– Get Organized: norms, roles, agenda – 3 minutes
– Predict – 2 minutes
– Go Visual – 10 minutes
– Observe – 5 minutes
– Infer/Question – 5 minutes
– Next Steps – 5 minutes

Reflect on your team’s performance, using the checklist criteria – 5 minutes.

Criteria for Effective Data Team Meetings

• Did we follow protocols (e.g., Data-Driven Dialogue)?
• Did we observe our norm/s?
• Did we avoid blame and culturally blind or destructive behaviors?
• Did we “look for love in all the right places,” that is, look for possible explanations and actions in those areas that impact student learning: curriculum, instruction, assessment, equity practices, critical supports, and teacher preparation?
• Did we determine clear next steps that will impact students and their learning?

How can we improve our Data Team meetings in the future?

Essential Question

How can we unleash the power of data to improve teaching and learning? Transform school culture? Promote equity?
Reflect

- Discoveries about the data
- Discoveries about the process
- Next steps for you

Structured Collaboration: The Using Data Process


- Hypothesize
- Possible Cause
- Collect Additional Data, e.g.
  - student interviews
  - observations
  - additional work
  - research
- Generate Solutions
- Verify Causes
ReTEACH in Response to Data

- Teach in a different way.
- Engage learners in a different way.
- Align reteaching to the essence of the error or confusion.
- Challenge students with more complex tasks.
- Help students who aren’t there yet through tutoring before, during, or after class, more opportunities for practice, and all of the above.

ReTEACHing Practice

- Brainstorm several ideas for reTEACHing in response to the analysis of student work.
- Narrow down to one or two strategies that everyone on the team will try.