Data-Driven Instruction:
What Gets Measured Gets Done

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Guiding Questions

1. What is the meaning of Data-driven Decision Making (DDDM) Culture?

2. What are those things that need to be present within a district and school culture that promotes effective use of data and ultimately results in improved student learning?

3. What are the Road Blocks to building a DDDM culture?

4. What are some measurable benefits of making DDDM tools available to teachers and administrators?
Traditional Approach

Data Deficient
Traditionally . . . Data Deficient

- Schools of Education have not been collecting data systematically
- Infrastructure not set up
- Not able to access multiple sources of information
Traditionally . . . Data Dummies

- What data do we want to collect?
- How can we manage it?
- What do we do with data?
- How do we organize it?
- Access it?
- Make sense?
Current Approach  Data-Driven
Moving Beyond “a” Mandate

- Use data to transform teaching, learning and administration.

- Inform decisions about everything from class schedules to textbook reading levels to professional development budgets.

- Provide a rationale for decisions that parents, teachers, taxpayers, and students can understand.
Currently . . . Data-Driven

- Systematically collecting data
- Infusing into our district, school and classroom culture
- Meeting regularly to assess evidence
- Making decisions based upon evidence
How do we help create a Data-Driven Decision Making (DDDM) School and/or District?
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

1. Develop a Hypothesis
2. Gather Data to Assess Needs
3. Use Data
4. Develop a Data-Based Plan
5. Assist on Establishing a School Improvement Team
6. Monitor Progress and Document Success
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

• What is a school improvement team?

• How do we help establish a school improvement team, if one is not already in place?

• Who is a member of the school improvement team? What do they do?

• How does the school improvement team make time to do its work?
If . . .

Action Steps

If . . .

Action Steps

Then . . .

Expected Outcome
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

- What information does the school or district we serve need to make decisions that will improve student achievement?
- How is the school or district we serve doing compared to the standard?
Theory of Action

• If . . .

Action Steps:
1.
2.
3.

• Then . . .

MEASURABLE OUTCOME
Progress Monitoring:

Hypothesis:
If students interact with the Cognitive Tutor® software for at least 90 minutes per week, it is expected that students will "master the mathematics presented in the course of study". Thus, "mastering 5-10% of the mathematical goals for the year, each week"—which translates to about 1.5 units per week—will guarantee that students will be on target to achieve the established goal.
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

• What are the most useful sources of student data?

• Why use multiple measures?

• What are the most useful sources of direct and/or indirect student achievement data?

• What are the most useful sources of subgroup student achievement data?
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

• What are the most useful sources of demographic data?

• How do context variables impact the validity of our interpretation?

• What do we have? What do we need?
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

- How do we organize the data to help us answer important questions?
- What do different sources tell us?
- What do different displays tell us?
- How do we display the data?
- What patterns exist in the data?
- How do we present data to the school and examine it?
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

• What are the tests designed to measure?

• Is there confirmation across data?

• How should we present data and conclusions to the school community?

• How do we formulate data-based goals?

• Does our interpretation raise new questions?

• What is our level of confidence in our interpretation?
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

- What must be considered when setting data-based goals?
- How do we set data-based goals?
- How can additional data help us identify the interventions we need?
- How do we select interventions?
- How do we select interventions for targeted subgroups?
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

- How do we plan to include parents in interventions?
- What staff development and support are necessary?
- How does the plan impact the school and/or district budget?
- What is our timeline? What assignments are necessary?
PLAN OF ACTION
Six Steps to Creating a Data-Driven Decision Making (DDDM) Culture

• How do we monitor implementation of the plan?

• How do we use data to monitor progress toward our goals?

• How do we know if we made the right decisions?

• How do we use data to document success in meeting goals?

• What should we report to the public?
PROGRESS MONITORING
What is Valid Evidence?

• Are we measuring what we intended to measure?

• Are we sure that our evidence is pointing us in the right direction?

• How confident do we feel about the data we collected?
“Am I measuring what I think I am measuring?”
What is Reliable Evidence?

- Yields results that are accurate and stable
- Collected in a consistent way
- Confident that we are making the right decision.
IN SUMMARY
The Foundation of Data-Driven Instructional Decisions

- Assess and examine data first
- Emphasize what is important
- Set goals that can be assessed
- Focus on what is effective
- Align goals with instructional strategies
Halverson, Prichett, and Watson (2007), Herman and Gribbons (2001), Huffman and Kalnin (2003), and Fiarman (2007) outline these components (in varied order) in their case studies of how the inquiry process was implemented in some school and district settings. Similarly, Abbott (2008) discusses using data to assess, plan, implement, and evaluate instructional changes as part of a larger framework schools should use to achieve accountability. Further detail under each component is based on panelist expertise.

Abbott (2008); Brunner et al. (2005); Halverson, Prichett, and Watson (2007); Kerr et al. (2006); Liddle (2000); Mandinach et al. (2005).
A New Paradigm Shift

+ Sophisticated data collection
+ Dissemination technologies
+ Better understanding of how individuals learn
+ New assessments

= Transformation of Education
Components of a Data-Based Decision Making System

- **Reporting and Analysis Services**: Turning data into useful information
- **Dissemination**: Sharing data with the community (i.e.: report cards)
- **State and Federal Reporting**: Meeting reporting compliance
- **Training**: Learning how to use data to make informed decisions.

**Components**
- SIS
- Assessment
- Finance
- Instruction

**Outputs**
- Reports
- Personalized Instruction

What Can Data Show?
Ready or Not . . .
The World is Different!

- Work is different ...
- Tools are different ...
- Communication is different ...
- Information is different ...
- Students are different ...
- Learning is different …
- Teaching must be different ...

Thus, **LEADING** must be different!
Looking at Data from Different Heights

- **The Airplane View**
  - From 5,000 feet—for administrators/boards

- **The Helicopter View**
  - From 500 feet— for principals/coaches

- **The View from the 2\textsuperscript{nd} Floor**
  - From 10 feet—primarily for teachers

- **The View from the Ground**
  - Teacher and Student Interaction
SAMPLE

AIRPLANE VIEW
<table>
<thead>
<tr>
<th>Implementing School Site</th>
<th>Reporting Period of:</th>
<th>April 6 - 12, 2014</th>
<th>March 30 - April 5, 2014</th>
<th>Yearly Progress Monitoring</th>
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<tbody>
<tr>
<td></td>
<td># of ACTIVE Students*</td>
<td>EXPECTED Average weekly time in minutes per Active Student</td>
<td>ACTUAL Average # of UNITS to be completed per Active Student per week</td>
<td>ACTUAL Average # of UNITS completed by ALL ACTIVE Cognitive Tutor® Students during this week.</td>
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<tr>
<td>SCHOOL A</td>
<td>114</td>
<td>90</td>
<td>136.7</td>
<td>1.5</td>
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<tr>
<td>SCHOOL B</td>
<td>161</td>
<td>90</td>
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<td>1.5</td>
</tr>
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<td>SCHOOL C</td>
<td>169</td>
<td>90</td>
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</tr>
<tr>
<td>SCHOOL D</td>
<td>106</td>
<td>90</td>
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<td>1.5</td>
</tr>
<tr>
<td>SCHOOL E</td>
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</tr>
<tr>
<td>SCHOOL F</td>
<td>86</td>
<td>90</td>
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<td>697</td>
<td>540</td>
<td>1,192.5</td>
<td>9</td>
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<tr>
<td>DISTRICT WEEKLY AVERAGES:</td>
<td>116</td>
<td>90</td>
<td>198.8</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Actual INTERACTION TIME (in minutes):

| Optimum time = 90 minutes or more per week |
| Minimum Expected = 45 minutes per week    |
| Less than minimum = less than 45 minutes per week |

Actual Average Number of UNITS COMPLETED by Student:

| Optimum Number: 1.5 units per week |
| Minimum Expected: 0.75 units per week |
| Less than Minimum: less than 0.75 unit per week |
SAMPLE

HELI OPTER VIEW
<table>
<thead>
<tr>
<th>Instructor</th>
<th>Course</th>
<th>Period</th>
<th>Total Time (hrs.)</th>
<th>Enrolled Students</th>
<th>Active Students</th>
<th>Time (hrs.)</th>
<th>Units</th>
<th>Sections</th>
<th>Problems</th>
<th>Errors</th>
<th>Hints</th>
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<td>ALGEBRA I</td>
<td>A-Per 1</td>
<td>15.6</td>
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<td>0.7</td>
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<td>A-Per 7</td>
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<td>2.4</td>
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<td>1.9</td>
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<tr>
<td>B</td>
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<td>B-Per 5</td>
<td>35.8</td>
<td>24</td>
<td>12</td>
<td>3.0</td>
<td>1.2</td>
<td>1.8</td>
<td>33.2</td>
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</tr>
<tr>
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**SCHOOL TOTALS:**

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**SCHOOL AVERAGES:**

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SAMPLE

2\textsuperscript{ND} (BALCONY) FLOOR VIEW
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<tr>
<th>Instructor</th>
<th>Period</th>
<th>Student</th>
<th>Session start</th>
<th>Average of Duration (minutes)</th>
<th>Average of Number of problems</th>
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<tr>
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<td>Student 2</td>
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SAMPLE

GROUND VIEW
<table>
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<tr>
<th>Curricula</th>
<th>Instructor</th>
<th>Period</th>
<th>Student</th>
<th>Total Time (hrs.)</th>
<th>Complete Sections</th>
<th>Problems Solved</th>
<th>Partial Units</th>
<th>Complete Units</th>
<th>Avg. Hints per Problem</th>
<th>Avg. Errors per Problem</th>
<th>Exemplar Revie ws</th>
<th>Master ed Skills</th>
<th>Numb er of Tracked Skills</th>
<th>Last Position</th>
<th>Last Section Date</th>
<th>Avg. Hints/A vg. Errors</th>
<th>Master ed Skills/# of Tracked Skills</th>
<th>Percenta ge Points Earned</th>
<th>Grade Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra I</td>
<td>Teacher A</td>
<td>Per 2</td>
<td>Student A</td>
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<td>4/7/2014</td>
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<td>100.0%</td>
<td>103.0%</td>
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<tr>
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<td>Teacher A</td>
<td>Per 2</td>
<td>Student B</td>
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<td>Algebra I</td>
<td>Teacher A</td>
<td>Per 2</td>
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<td>6</td>
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**TEACHER TOTALS:** 36.5 25 180 17 1 61.4 172.7 1 137 164

**TEACHER AVERAGES:** 2.3 1.6 11.3 1.1 0.1 3.8 10.8 0.1 8.6 10.3

**TEACHER MODES:** 1 6 1 0 0 7 7

**TEACHER MEDIANS:** 1 6 1 0 0 7 7
A Continuous Improvement Process Is Recommended

- Assess Students
- Develop Instructional Strategies Based on the Data
- Have a Team of Teachers Analyze Data
- Apply the Strategies to the Students
- Reflect on Implementation of Strategies
The Rhyme of the School Administrator
(Borrowed from the Rhyme of the Ancient Mariner)

- Data, data everywhere—so much it’s hard to think;

- Data, data everywhere—if only it would link!
Implications

“Collecting data is only the first step toward wisdom. But sharing data is the first step toward community.”

IBM – On Demand Business Prodigy Advertisement
Making It Happen: Integrating Data Into the Equation

To consider:
✓ Implementation scale and scope
✓ What to gather
✓ Cleaning up the data
✓ Reporting out and user queries
✓ Professional development
✓ Collaboration and partnerships

NOTE:
• DO NOT ignore the data, particularly if it is unpleasant!!!
LAST WORDS

• To achieve its promise, data-based decision making requires that:
  1. Data be of high quality and readily accessible in real time to those who need it to make effective instructional decisions, and
  2. Teachers and principals be trained on how to use data to improve learning and teaching.
Professional Development Continuum

“What gets measured, gets done.”

Peters, 1987
Data Collection: An Iterative Process

Vision

- Standards
- Assessments
- Reports
- Instruction
The Power of Data

✓ **Assess** current and future needs of students
✓ **Decide** what to change
✓ **Determine** if goals are being met
✓ **Engage** in continuous school improvement
✓ **Identify** root causes of problems
✓ **Promote** accountability
Thank you for attending this webinar!

To continue the conversation:
Dr. Roger Isaac Blanco
rblanco@carnegielearning.com
1-888-851-7094 ext. 458