Data Uses for School Improvement
To do and not to do

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presented by

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If they do not know how to interpret data and student work accurately, they can jump to flawed and even damaging conclusions.

(Confrey & Makar, 2005; Love, 2004)

Data is an important piece of the puzzle.

Indicators

ID10: The school's Leadership Team regularly looks at school **performance data** and aggregated classroom observation data and uses that data to make decisions about school improvement and professional development needs.

IF02: The principal compiles reports from **classroom observations**, showing aggregate areas of strength and areas that need improvement without revealing the identify of individual teachers.

IF02: The Leadership Team reviews the **principal's summary** reports of classroom observations and takes them into account in planning professional development.

IIB01-03: Units of instruction include **pre-tests and post-tests** to assess mastery of standards-based objectives, administered to all students in the grade level and subject covered by the unit of instruction, reviewed by the Instruction Team.

Indicators

IIB04: Teachers **individualize instruction** based on pre-test results to provide support for some students and enhanced learning opportunities for others.

IID02: The school **tests** each student at least 3 times each year to determine progress toward standards-based objectives.

IID08-11 Instructional Teams use student learning data and the results of unit pre-post tests to assess strengths and weaknesses of the **curriculum** and **instructional strategies/plans**, to plan **instruction**, to identify **students in need** of enhanced learning opportunities, instructional support or enhancement.

IIIA06: All teachers test frequently using a **variety of evaluation** methods and maintain a record of the results.

IIIA07 All teachers **differentiate** assignments (individualize instruction) in response to individual student performance on pre-tests and other methods of assessment.

IIIB06: All teachers systematically **report to parents** the student's mastery of spec standards-based objectives.

Moving Towards a High Performing School by Using Data Culture emphasis:

Love, N. (2008). The Data Coach's Guide. Corwin Press: Sage.

- Widespread data literacy among **ALL** staff;
- Data Driven Dialogue with time to collaborate to obtain shared norms and values (collaborative not competitive);
- Using data as feedback for continuous improvements;
- Aligning learning goals/questions, instruction and assessments with research and best practices;
- Focusing on learning for **ALL** students since they are **ALL** capable of high levels of achievement;
- Discussions based on trust, candid talk, and openness.

Building the Data Team Structure

- Launch the Data Team
  - Select, prepare and empower data coaches who are literate in statistics/data analysis or confer with outside experts
- Reflect on your school
  - Identify trends over time (longitudinal data)
  - Distinguish between observation and inference (intraocular test of accuracy)
  - Disaggregate data to indicate specific areas of weakness
- Raise awareness of cultural/statistical proficiency
  - Develop a system to help teachers understand and use data (meetings, etc)
- Commit to shared values, standards, and vision
  - Use the data to build a better program and improve student learning through instruction

Just what do Data Teams do?

- **Collect and analyze** a variety of types of school data
- Develop and adapt **common assessment instruments**
- Commit to norms of **collaboration and equity** standards
- Identify **student learning problems**, verify **causes**, generate **solutions**, and **monitor** and achieve results
- Develop and **communicate findings** and data supported **action plans**
- Oversee **plan implementation** and instructional **improvements**
- **Share** successes and challenges
- **Coordinate** with other school or district initiatives/leaders
- Develop their **knowledge and skills** in data literacy and collaborative inquiry
- Assist teachers in **analyzing student performance** and work samples
- Formulate events such as **Parent Data Nights** to demystify the reports and offer tips for improvement
- Engage **stakeholders** for input

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Achieving School Improvement Results:

Identifying Causes, Generating Solutions, and Implementing/ Monitoring

- Conduct a Cause-and-Effect Analysis based on a question
- Verify Causes through research and local data by using the right statistical method. *(The Right Tool for the Job)*
- Build your own logic model with refined outcomes and strategies (what will it look like fully implemented?) and progress monitoring
- Take action and monitor the results
- Celebrate success, modify efforts, and/or renew collaborative inquiry towards next steps

1: What's the question?

- ***Have "A" question in mind that aligns with the district's mission and/or recommendations.***
  - How do we improve math/literacy performance across the school?
  - How effective are our initiatives/innovations?
  - How effective is the leadership structure?
  - How rigorous is our curriculum?
  - How can we improve instruction?
  - What are our professional development needs?
  - What is the community/stakeholders position?
  - What is the student/teacher voice?
  - How healthy/safe is our school environment?
- ***Develop an objective leading towards full implementation***

2: What's the data you need to collect in order to answer your question?

Possible tasks to examine but not limited to……

- Student achievement data
- Needs assessment data
- Survey data
- Useful demographic data
- Useful aggregated data (GAP)
- Teacher evaluation data
- Qualitative data / Perceptual

3: What data analysis method do you need to collect evidence that you met the objective?

Ask yourself what you are planning to do with the data:

- **Describe** something?
- **Classify** or identify an entity?
- **Compare** or test groups of data?
- **Predict** measurements/outcomes?
- **Explain** aspects of a phenomena?

3a: What's your method of data analysis?

- **Describe** — characterizing populations and samples using descriptive statistics, statistical intervals, correlation coefficients, graphics, and maps.
- **Identify or Classify** — classifying and identifying a known or hypothesized entity or group of entities using descriptive statistics; statistical intervals and tests, graphics, and multivariate techniques such as cluster analysis.

https://statswithcats.wordpress.com/2010/08/22/the-five-pursuits-you-meet-in-statistics/

3b: What's your method of data analysis?

- **Compare or Test** — detecting differences between statistical populations or reference values using simple hypothesis tests, and analysis of variance and covariance.
- **Predict** — predicting measurements using regression and neural networks, forecasting using time-series modeling techniques, and interpolating spatial data.
- **Explain** — Explaining latent aspects of phenomena using regression, cluster analysis, discriminant analysis, factor analysis, and other data mining techniques.

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4: From the findings, what's the actions?

- **Discuss the findings/results with visuals as needed**
  - Was the question answered?
  - Do we need more data analysis?
  - Have we determined a cause/effect or correlation?
- **Research best practices to find next steps**
  - Wise ways, Research of programs/initiatives
- **Decide on actions/next steps**
  - Measurable objective, timeline, resources needed, person's assigned the task
- **Develop the monitoring plan for next steps**
  - Timeline, questions to ask, data to collect, analysis method

5: How will you Implement and Monitor?

- **Resource allocation of innovation**
  - Extended time, Embedded professional Development, External providers, funds
- **Collect data on program/action effectiveness**
  - Align data collected to get at the question
- **Analyze the data using the right tools**
  - Select the data analysis to align to the question
- **Continue/modify the plan with ongoing monitoring**

REPEAT THE PROCESS

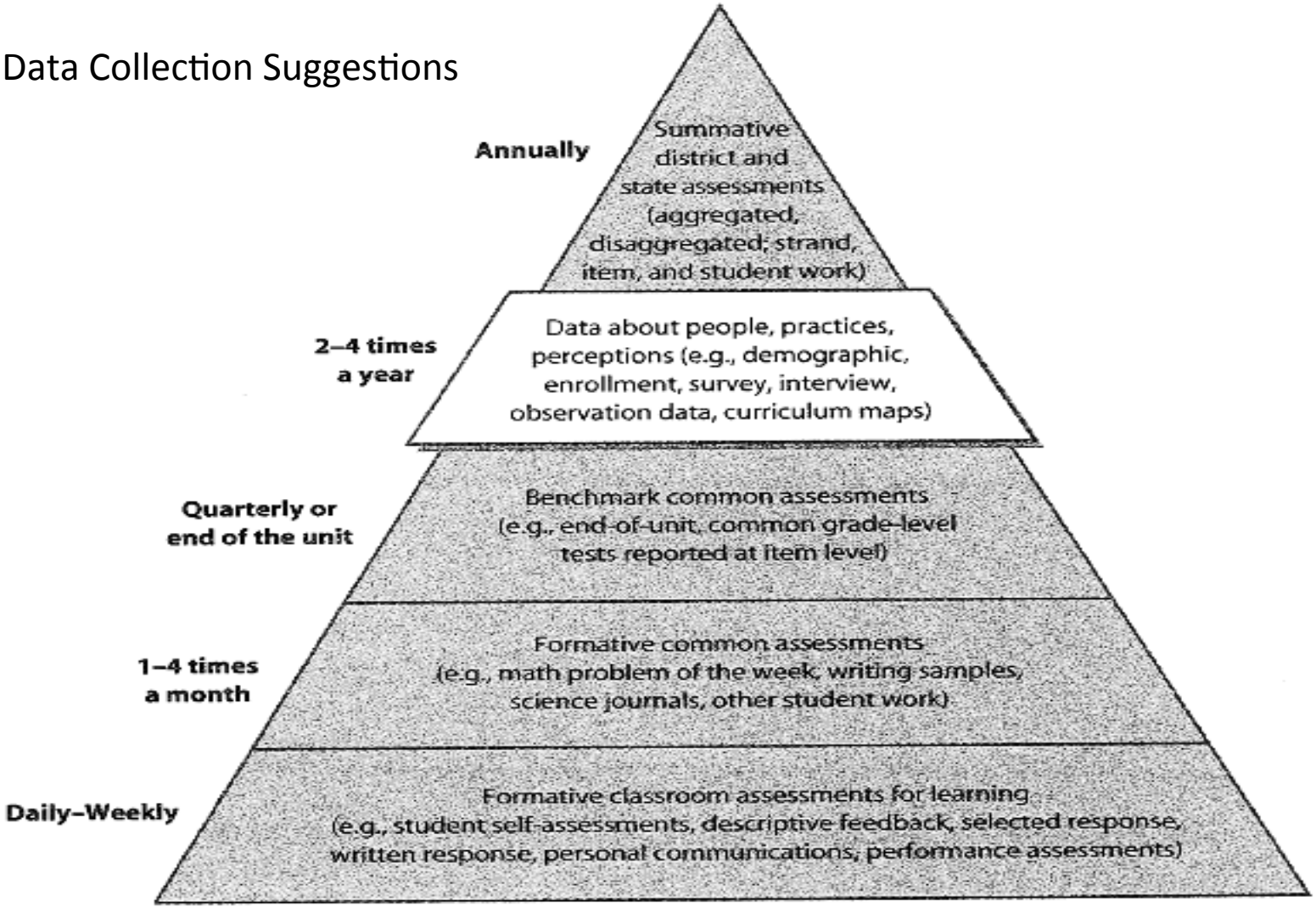
Program Evaluation / Monitoring

- Identify one issue/initiative/innovation to consider
- Describe what it would look like **fully implemented**
- Identify measurable **objectives** needed
- Identify the **data to collect** to measure the objective tasks
- Determine a **timeline**
- **Collect** the appropriate data
- **Analyze** the data for findings
- **Modify or accept** the initiative/innovation as being appropriately effective or not.

Student Learning Problem Analysis

- Drill down into **State CRT** data:
  - Aggregate level analysis, Disaggregate level analysis, Strand level - Item level analysis
- Examine **student work** using specific scoring criteria
- Drill down into **Common Assessments** and other local student learning data
- Formulate **observational data** collection methods
- Examine **student files** (proper placement, grades, concerns)
- Identify student learning problems **longitudinally**
- Identify **goals/methods** to address the problems
- Share **results** and set **obtainable goals** with students/parents
- **Monitor** progress – adjust as needed

Data Collection Suggestions



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Existing Data Sources:
ESEA Accountability Report & School Letter Grades

- Accountability report for State CRT assessment
  - Demographics: breakdown of sub groups
  - Achievement percentages in Math & Literacy for one year and yearly growth over three year for all and sub groups
- School Letter Grade
  - Demographics: Grades, enrollment, percent proficient/advanced for school/ district/state stats
  - Weighted performance (BB = +0, B = +0.25, P = 1, A = 1.25)
  - School improvement with ESEA option (targets)
  - Graduation rates
  - GAPS in achievement and graduation rate

Existing Data Sources: The School Report Card, eschool, & GPS dashboard

- Demographics: Enrollment, avg class size, avg yrs teaching, EL, LI, SPED %
- Achievement (aggregate and disaggregated) by grades over years for sub groups: All, TAGG, AA, His, Cauc, ED, SPED, LEP, Gender
- Achievement Data: ACT, SAT, AP, College going
- Performance Data: Attendance, Graduation (Aggregated and disaggregated), grade inflation and college remediation
- School Environment: Incidences, retention
- Teacher quality: Degree breakdown and HQ teachers
- School Funding: expenditures, $ / student, and F/R meals
- Individual yearly progress in classes, on assessments, etc

Data Analysis concerns

- "Death by Data" - collecting a plethora of unanalyzed data for compliance purposes without starting with a question in mind
  - Demographics without analysis or purpose
  - Student test scores/growth scores lacking curriculum connection
- Not aligning/collecting/analyzing the data matched to the question
  - Looking at tutoring extended time, but lacking names of participants
- Reporting data without the data analysis / explanation
  - Lists of raw student scores
  - 84% of parents said they were satisfied.
- Misunderstanding findings and the implications
  - Bottom 25% across the state means the school is failing all the students
  - Data should be scrubbed of errors, missing data, replicates, and outliers
- Setting grandiose, immeasurable goals
  - Set small goals you can measure monthly, quarterly, annually

Data Analysis concerns

- Using the wrong analysis tool to assess
  - Test provides a grade level analysis but you are using the test stating that it aligns with the curriculum / benchmarks
  - Using mean scores when pair wise score testing is needed
    - T1: student 1 - 5, student 2 -5, student 3 -5, student 4 +25 (+10)
    - T2: student 1 +5, student 2 +5, students 3 & 4 stayed the same (+10)
- Using a single assessment to determine the effectiveness of multiple initiatives.
- Using data walls to show you're looking at data without meaning
  - Too little --- too late
- Using Likert scale surveys without aligning points to questions or simply counting the number of 1, 2, 3, 4, or 5 you obtained and obtaining a small rate of return.
- Enough is enough (More is NOT better)
  - Excessive sampling, torrents of tests, large n sizes
- Correlation doesn't imply causation, and significance doesn't always imply meaningfulness. ***Data is just a piece of the picture.***

Inappropriate Data Analysis

- Comparing school performance data from year to year % without other info
- Comparing percentiles without needed info 40%, 51%, 62%
- Comparing grades incorrectly (ex 2014 data for 6 (47%), 7 (42%), 8 (51%))
- Comparing teachers within a grade/subject (class to class)
- Comparing a teachers year to year results (2012 55% 2013 49.5%)
- Comparing quarter to quarter, but the standards (tests) aren't the same
- Comparing schools without similar demographics
- Comparing means alone EX: X1 = 125 SD1 = 15 : X1 = 150 SD2= 50
- Comparing pre and post test with means & medians EX: x1 =145, median 1 = 150 : x2 = 160, median 2 = 140
- Stating a 10% increase in ability without ensuring the standards / content is similar from test to test

Scenario 1

The Leadership Team has been handed the last four year's School Report Cards and the directive to identify patterns of strengths and weaknesses.

1. What is your question?
2. What data should you collect? u use
3. What data collection method will yo?
4. What type of analysis will you need?
5. What would your plan of action look like?
6. How will you monitor your progress?

Scenario 2

Your PLC Data Team has been handed the ESEA reports for the past three years along with the benchmark scores for Algebra students. You have been assigned the directive to improve student achievement scores in mathematics.

1. What is your question?
2. What data should you collect?
3. What data collection method will you use?
4. What type of analysis will you need?
5. What would your plan of action look like?
6. How will you monitor your progress?

Scenario 3

Your Instructional Team has been handed a sheet of pre and post test scores and the directive to determine the effectiveness of the initiative that was implemented.

1. What is your question?
2. What data should you collect?
3. What data collection method will you use?
4. What type of analysis will you need?
5. What would your plan of action look like?
6. How will you monitor your progress?

Scenario 4

Your Literacy Content Team has been handed a sheet of start and end grade levels scores and the directive to identify student growth and the number of standards achieved. You are to identify any students in need of interventions.

1. What is your question?
2. What data should you collect?
3. What data collection method will you use?
4. What type of analysis will you need?
5. What would your plan of action look like?
6. How will you monitor your progress?

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