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The Numbers Game

Measure progress by analyzing data

By Joan Richardson

If a district or a single school has a vision of what it wants to be, the use of data can be a powerful tool to measure its progress along the way.

Sylvie Hale has seen the power of using data in that way. "Schools have to collect data to make sure they're on target. Data do not lie," she said.

Ask Hale, senior research associate at West Ed, for an example of how using data guided a school to fulfill its vision and she's ready with a handful of stories. This is one of her favorites:

A rural California school district had a goal of ensuring that all children would read at grade level by 3rd grade. Teachers in one school were quite discouraged because many 1st and 2nd graders were reading below grade level. How could they meet the district goal if children were falling behind so early?

Teachers quickly decided that the school needed a new reading program.

Hale and other consultants from a regional assistance center urged the school to look over its data very closely. Perhaps the school would dis-

cover that the curriculum wasn't the only reason students were struggling with reading.

After receiving some preliminary school data, teachers discovered that a majority of kindergartners had been absent for more than half the year. That must mean that parents don't care enough about education to get them to school, teachers concluded.

The consultants pushed them to look at other possible explanations for missing school.

The teachers talked with parents of students with

high absenteeism and learned that these children rode a bus to school but that the district provided no bus transportation to take them home at the end of their half-day in school. The buses were needed to transport high school students and the district did not want to mix high schoolers with kindergartners. Working parents or parents who relied on others for after-school transportation frequently kept children home rather than deal with the transportation hassle.

Clearly, the reading curriculum was not at fault. When providing transportation for these kindergartners turned out to be financially unfeasible, the teachers explored other options.

By the next school year, the school created an

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Measure progress by analyzing data

Continued from Page One

extended day kindergarten. Money for a remedial reading program was diverted to pay for extra teacher hours. At last report, the reading of these students was improving.

What's the lesson? "Check your assumptions at the door," said Hale.

"I don't think that's an uncommon story. We all make quick assumptions. Instead, we need to look at data, generate questions and find answers. Data keep you honest," she said.

A DATA PLAN

Let's assume that district's vision includes a statement that all children will read at grade level by 3rd grade and remain at grade level every year thereafter. How could you use data to measure your progress towards achieving that vision?

1 Collect basic information. Every school should maintain basic data on student demographics and achievement. See the Student Data Checklist on Page 3 for a guide to collecting information that will give you a snapshot of students in your school.

Break down this information by grade. Keep the original data available so you can cross-reference it with other data in later steps.

2 Identify additional data. To check on students' reading ability in your school, what data will you need to collect?

To measure academic performance, a school would probably collect, at a minimum, standardized test scores, grades, and classroom assessments. You should always collect at least three types of data for any study.

Identify who will be responsible for collecting this data and set a date for finishing this task.

3 Disaggregate the data. Assemble the academic performance data and disaggregate it according to the character-

istics collected under Step One. At a minimum, you should break down each type of data by gender, race, socio-economic factors, attendance, mobility, discipline issues, and English language ability.

Use the Data Summary Sheet on Page 5 for this process. Prepare one sheet for each type of data you collect.

4 Analyze the data. After you've filled out the Data Summary Sheets, begin to ask questions about that data.

What is the lowest performing group? What is the highest performing group? Are boys and girls performing equally well in reading? Are there dips in reading achievement between different grades? If so, which grades? What are the reading levels of various language groups? Do different socio-economic groups have different reading levels? Are reading levels similar between various racial and ethnic groups?

5 Summarize the data. Describe in a statement what the data tells you. These statements can be called either data summary statements or needs statements. See sample statements on Page 4.

In this step, the school team is trying to identify the problem, not solve it. This forces individuals to spell out what they see and not fall back on assumptions, Hale said. Write one statement or write a dozen summary statements, depending on your observations.

At this stage, avoid the urge to brainstorm solutions. That step will come later. For now, concentrate on simply describing your observations.

6 Brainstorm causes. Once a school team has objectively evaluated the data, the next step is to suggest possible explanations.

What's going on instructionally? What's going on with the curriculum? Where are the gaps? Why do these gaps exist?

"If you're not getting the results you want, there's dissonance someplace. Where is the dissonance?" Hale asks.

For example, a staff may suggest that

the curriculum is not aligned with the assessment or that teachers lack sufficient training to implement the curriculum appropriately.

7 Collect more data. After the team has suggested explanations for blips in the data, the next step is to collect more data to determine which explanations are most accurate.

For example, if the team hypothesizes that the curriculum has not been implemented completely, the team might survey teachers about their practices as well as observe relevant classes.

8 Analyze and summarize data. As it did with the student data, the team now analyzes the data it has collected regarding instruction and curriculum.

The team repeats the process of writing objective statements about the data it has collected.

9 Identify a goal. After the data has been analyzed and summarized, the team now needs to identify its goals. See Page 6 for a tool to help with this.

Write a specific, measurable and attainable goal. What would you consider success? How will you measure that? When will you measure that?

10 Repeat the process. Once the goal has been identified, the process has not ended. The team needs to establish a timetable for repeating the process of collecting and analyzing the data. This forces the team to stay focused on measuring its progress.

But Hale cautions teams against focusing too narrowly on certain areas because of the potential to ignore other areas. "You have to collect data to make sure you're on target but you also have to look at data to make sure other things aren't falling through the cracks," Hale said.

"Data collection and analysis is a continuing process. It never ends. Once you begin asking questions and looking for answers, you find that you have more answers and more questions," Hale said.

Student data checklist

STUDENT DATA CHECKLIST	GRADE LEVEL				
ENROLLMENT					
Total number of registered students.					
Number of students in special programs (e.g., Title I, LEP, gifted and talented) broken down by category.					
Number of students broken down by ethnicity, language group or other meaningful categories.					
DAILY ATTENDANCE					
Average daily attendance of students by grade, grade span, whole school, or other enrollment category.					
Percent of students tardy for classes.					
Number of students who have been absent from school 21 days or more.					
MOBILITY/STABILITY					
Mobility rate: percent of children who move in and out of a school during a year.					
Stability rate: the percent of students who remain in the same building for the entire year.					
SOCIOECONOMIC STATUS (SES)					
Percent of students receiving free or reduced-price lunch.					
Average level of parents' education and/or household income.					
Unemployment rates in the attendance area.					
STUDENT BEHAVIOR					
Number or percentage of discipline referrals or incidents.					
Number or percentage of student suspensions and expulsions.					
Frequency of gang-related, substance abuse, or other at-risk behavior.					
LIMITED ENGLISH PROFICIENCY					
Percent of students with limited English proficiency.					
Percent of families who speak English as a second language.					

Tools For Schools

EXAMPLE**Data summary statement:**

Fourth-grade Vietnamese immigrant boys are underachieving in science.

Evidence:

Achievement scores, teacher observation, and chapter (textbook) tests.

Why questions:

Q: Why do 4th grade Vietnamese immigrant boys underachieve in science?

A: They have difficulty with English language. (Supporting data or facts: language assessment.)

Q: Why does the fact that Vietnamese boys have difficulty with English contribute to low performance in science?

A: They have difficulty understanding the concepts and applying them in practice. (Supporting data or facts: observation and student input.)

Q: Why do 4th grade Vietnamese immigrant boys underachieve in science?

A: Curriculum does not match assessment. (Supporting data or facts: Curriculum is based on 1985 framework, assessment is based on 1995 framework.)

Q: Why does the mismatch between curriculum and assessment contribute to the low performance in boys?

A: There is mis-alignment between what is taught and what is being assessed. (Supporting data or facts: comparison of 1985 and 1995 frameworks.) Upon further examination, all students are having some difficulty in science.

Crafting data summary statements

Comments to facilitator: This activity will assist the team in focusing on what it has learned from the data it has collected about the school. As the team compares this data to its vision for the school, it should be able to identify the steps the school needs to take to reach identified goals.

Materials: Several copies of the data summary sheet, various data sources, chart paper, markers, pens.

Directions

1. Complete the Data Summary Sheet (see Page 5) for each of your data sources. Be as complete as possible. Think about other possible summary tables that might also be created. For example, after completing the sample data summary sheet, you may notice that girls in 4th through 6th grades are underachieving in mathematics. You could create another data summary table in which you break out the girls by ethnicity to see if a pattern emerges.
2. Summarize the data by writing a statement based on the data. As you review the data, consider:
 - Which student sub-groups appear to need priority assistance, as determined by test scores, grades, or other assessments? Consider sub-groups by grade level, ethnicity, gender, language background (proficiency and/or home language), categorical programs (e.g., migrant, special education), economic status, classroom assignment, years at our school, attendance.
 - In which subject areas do students appear to need the most improvement? Also, consider English language development.
 - In which subject areas do the “below proficient” student sub-groups need the most assistance?
 - What evidence supports your findings?
3. For each data summary statement, brainstorm all the possible reasons why the data show what they do. For each reason, identify data or facts that support that assertion. If no data exist, determine how to locate data that would support the assertion. Continue asking “why” until the root cause of the problem or need has been identified.

Data summaries

Data type: _____
 (e.g., enrollment, student achievement, total, attendance, student achievement reading)

Data source/measure: _____
 (e.g., SAT9, school records, staff survey)

What the numbers represent: _____
 (e.g., percentage of students below grade-level; number of students higher than 4 on district math assessment; percentage of students who say they like to read)

STUDENT CHARACTERISTIC	Grade Level												Total
ETHNICITY													
African-American													
Asian/Pacific Islander													
Caucasian													
Hispanic													
Native American													
Other													
GENDER													
Male													
Female													
INCOME													
Low-income													
Not low-income													
LANGUAGE ABILITY													
Fully proficient													
Limited proficient													
Non-proficient													
English only													
SPECIAL POPULATIONS													
Migrant													
Title I Target Assist													
Special education													
Preschool													
After-school													
Other													
Other													

Write a statement summarizing the data collected above. A data summary statement or need statement does not offer a solution nor does it describe a cause or lay blame.

Moving from needs to goals

Comments to the facilitator: This activity will aid you in developing goals based on your identified needs.

Materials: Poster paper, sentence strips, masking tape, markers. The list of data summary statements developed using the Crafting Data Summary Statements tool on Page 4 or other method.

Preparation: Prepare a sheet of poster paper with your vision and post that in the room where you are working. Write each data summary statement on a separate sentence strip and post on the wall. Write the model statements listed below on chart paper and be prepared to post those on the wall as you begin your work.

Directions

1. Depending on the size of the group and the number of data summary statements, the facilitator may want to break a larger group into several smaller groups of three or four persons.
2. Each group should transform one statement into a student/program goal. The group should include an objective, outcome indicator, baseline, timeframe, target standard or performance, and target instructional practice. Refer to your vision often as you write these goals.

STUDENT GOAL MODEL

Students in grades 2 through 5 will OBJECTIVE as measured by OUTCOME INDICATOR. Current results indicate that BASELINE. At the end of TIME FRAME, students in these grades will perform at TARGET STANDARD OR PERFORMANCE, and at the end of two years, they will perform at TARGET STANDARD OR PERFORMANCE.

EXAMPLE

Data summary statement: Most of our upper-elementary students are under-performing in language arts.

Student goal: Our upper-elementary students will improve their language arts skills (OBJECTIVE) as measured by the district assessment and standardized test (OUTCOME INDICATOR). Current results indicate that 67% of students in grades 4-6 are “below proficient” (BASELINE). By spring 2001 (TIMEFRAME), 25% of students currently under-achieving in language arts — particularly those in upper elementary — will improve their literacy skills by moving from “below proficient” to “proficient” (TARGET STANDARD OR PERFORMANCE).

PROGRAM GOAL MODEL

Current records show that BASELINE teachers participated in professional development activities offered by our school this year. By TIMEFRAME, our school will OBJECTIVE as measured by OUTCOME INDICATOR. As a result, teachers will offer TARGET INSTRUCTIONAL PRACTICE to these students. At the end of the second year, staff will OBJECTIVE as measured by OUTCOME INDICATOR. As a result, students will perform at TARGET STANDARD OR PERFORMANCE.

EXAMPLE

Data summary statement: Our lowest-performing students in language arts are African-American, particularly males.

Program goal: By the end of the 2000-2001 school year (TIMEFRAME), all staff will have learned about effective instructional practices that accelerate the academic achievement of African-American males (OBJECTIVE). Currently, only 5% of staff have these skills (BASELINE). The following year (TIMEFRAME), all staff will have implemented new strategies (TARGET INSTRUCTIONAL PRACTICE) as measured by peer coaching and classroom observations (OUTCOME INDICATOR).

Learning about **using data**

■ *Comprehensive School Reform Research-Based Strategies to Achieve High Standards* by WestEd. Offers a coherent framework for planning schoolwide improvements. Describes the context and key elements of comprehensive school reform and offers a process for conducting comprehensive data analysis, planning, and implementation. Includes numerous tools and activities to facilitate planning and implementation, profiles of successful schools, and lists of additional resources. The entire guidebook can be downloaded at no charge as a PDF file at www.wested.org/csrd/guidebook. A complete set of resources (the guidebook plus two videos) also is available for \$59.95. For information about ordering, visit the WestEd web site at www.wested.org/wested/news.shtml.

■ *Data Analysis for Comprehensive Schoolwide Improvement* by Victoria Bernhardt. Larchmont, NY: Eye on Education, 1998. Targeted for non-statisticians. Shows schools how to gather and use data, clarifies what data are important for various purposes, and demonstrates how to communicate and report results. Available through NSDC's Online Bookstore, www.nsd.org/bookstore.htm. Item #B89. Price: \$37, non-members; \$29.60, members.

■ *How to Conduct Surveys* (2nd ed.) by A. Fink and J. Kosecoff. Thousand Oaks, Calif.: Sage, 1998. Covers the process of doing surveys from planning to designing to conducting, analyzing to presenting findings. Includes overview of how to do statistical analyses of survey data. To order, call (805) 499-9774, fax (805) 375-1700, e-mail: order@corwin.sagepub.com. Price: \$29.95.

■ *Journal of Staff Development*, Winter 2000 (Vol. 21, No. 1). Entire issue devoted to data and its use in building a foundation for pursuing and evaluating initiatives. Several articles available online in the NSDC Online Library at www.nsd.org/library.htm.

on the web

www.nsd.org/library/data.html

Look in the NSDC Online Library for more resources on data-based decision making. This library is updated regularly with new materials. Comprehensive members of NSDC also have access to full text of every NSDC publication. To learn more about that membership option, contact the NSDC Main Business Office at (800) 727-7288.

■ *The School Portfolio: A Comprehensive Framework for School Improvement*, by Victoria Bernhardt. Princeton, N.J.: Eye on Education, 1994. Guidebook for creating and using a school profile for sharing information about progress towards goals. Available through NSDC's Online Bookstore, www.nsd.org/bookstore.htm. Item #B90. Price: \$37, non-members; \$29.60, members.

■ *Tracking your school's success: A guide to sensible evaluation* by J.L. Herman and L. Winters. Thousand Oaks, Calif.: Corwin, 1992. Focuses on providing educators with guidance and tools to help them answer questions such as How are we doing? How can we improve? How can we share our successes? To order, call (805) 499-9774, fax (805) 375-1700, e-mail: order@corwin.sagepub.com. Price: \$29.95.

■ "Translating school improvement into numbers," by Joan Richardson, *School Team Innovator*, February 1997. Describes a cycle for data-based decision making and can be used as a guide for implementing vision. Available in NSDC's Online Library, www.nsd.org/library. To order a back copy, calling the NSDC Main Business Office at (800) 727-7288.

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MAIN BUSINESS OFFICE

P.O. Box 240, Oxford, Ohio 45056
(513) 523-6029
(800) 727-7288
(513) 523-0638 (fax)
E-mail: NSDCoffice@aol.com
Web site: www.nsd.org

Editor: Joan Richardson

Designer: Susan M. Chevalier

NSDC STAFF

Executive director

Dennis Sparks (SparksNSDC@aol.com)

Deputy executive director

Stephanie Hirsh (NSDCHirsh@aol.com)

Director of publications

Joan Richardson (NSDCJoan@aol.com)

Director of programs

Mike Murphy (NSDCMurphy@aol.com)

Director of special projects

Joellen Killion (NSDCKillio@aol.com)

Business manager

Shirley Havens (NSDCHavens@aol.com)

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Ask Dr. Developer



Dr. Developer has all the answers to questions that staff developers ask. (At least he thinks he does!)

Principals need to learn about data

Q *I'm a school principal and I'm intrigued by everything I'm hearing about using data in schools. But, frankly, I don't have a clue about where to begin and I'm a little embarrassed about trying to muddle through this with my staff without having more background. I know many other principals who feel the same way. Do you have any suggestions for us?*

A You've actually identified one of the reasons why so many schools still haven't moved into using data. Principals don't have the background or skills they need to lead a data analysis effort. They feel uncomfortable admitting what they don't know and few districts have helped by providing them with the learning opportunities they need.

First, I would suggest talking with other principals in your district about assembling a group of principals to learn more about data. Principals in your district could create their own data study group that focuses on districtwide issues.

Then, ask the district office to help provide you with the staff development you need to learn the necessary skills. In

many districts, the administrator in charge of assessment already has much of the knowledge that you need to have. If that's not the right person for your group, then find someone you respect to teach you about various sorts of data that the district already collects and teach you how to interpret that data. You may be surprised to learn the kind of information that the district has available — and doesn't even realize would help or interest schools.

If your district is unable to support you in this effort, consider tapping the resources at a nearby university or regional educational service center. That would also offer the advantage of being able to connect with principals outside your district.

Having that experience would prepare you to return to your school as a facilitator for your school-based data process.

Finally, although it's beneficial for you to learn about the process before you work with your staff, muddling through it with your staff isn't such a bad plan. When principals and staffs learn a new skill together, it demonstrates their willingness to be a learner alongside their teachers. Who said principals have to know everything?

Tools may be copied and used in workshops.

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