

# SEDL Letter

SOUTHWEST EDUCATIONAL  
**SEDL**  
DEVELOPMENT LABORATORY  
Building Knowledge to Support Learning

Volume XVIII ■ Number 2 ■ November 2006



## A Culture *of* Data

Wesley A. Hoover, PhD  
President and CEO

Joyce S. Pollard, EdD  
Director, Office of Institutional  
Communications

Leslie Asher Blair, MA  
Editor

Debbie Ritenour, MA  
Contributing Editor

Nancy Reynolds, MLS  
Librarian

#### CREDITS

Jane Thurmond (Austin, Texas) designed *SEDL Letter*. The photos on page 14 were taken by SEDL staff; the photo on page 16 was taken by photographer Bret Brookshire (Austin, Texas). All other photos are ©Jupiter Images and Getty Images.

*SEDL Letter* complements and draws on work performed by the Southwest Educational Development Laboratory under a variety of funding sources, including the U.S. Department of Education and the U.S. government. The publication is not supported with direct program funds related to any SEDL programs or projects.

*SEDL Letter* does not necessarily reflect the views of the U.S. government or any other source. You are welcome to reproduce *SEDL Letter* and distribute copies at no cost to recipients; please credit the Southwest Educational Development Laboratory as publisher and respect the copyrights of designated illustrators, designers, and contributors. SEDL is an Equal Opportunity/Affirmative Action Employer and is committed to affording equal employment opportunities for all individuals in all employment matters. Available in alternative formats.



# Creating a Culture of Data

An experienced administrator who had just taken a job as principal of a suburban middle school told the story of the first staff meeting at her new school. She asked the teachers to bring to the next staff meeting their copies of a district-issued notebook. It contained standardized test scores and copies of the states standards for every subject. “Oh,” one teacher said, “you mean the book I use for a doorstop.”

You could say that teacher was using data—just not in the way intended. And so it is at many schools. Although education agencies, districts, and schools collect mountains of data, much of it is never analyzed or used.

Because of the growing pressures for accountability, a culture of data is beginning to develop in the field of education. In 2004, the National Forum on Education Statistics published the *Forum Guide to Building a Culture of Quality Data*. This report focused on helping districts and schools make sure that quality data were entered accurately and in a timely manner, that the data system was secure, and that the data collected were the right data for the needs.

Building a culture of quality data, however, encompasses even more. Administrators, teachers, and other staff members must know why and how data are collected. They must have access to the data they need, and they must know how to analyze and use that data to make decisions. In schools and districts, different types of data must be valued and discussed. Based on the anecdote about using data as a doorstop, it is clear that the previous principal at that middle school did not value the data or encourage discussion or use of the data—otherwise the notebook would have never reached doorstop status. Educators must also know how to apply the evidence presented through data to their practice—after all, the goal isn’t just to measure performance, but to improve it. All of this is easier said than done, of course.

In this issue, we want to get educators and policymakers thinking about data and how to create a culture of data in their states, schools, and districts. Former principal and school improvement consultant Mike Schmoker talks about taking those initial steps in analyzing data. School staffs must often start out small when learning to use data effectively and gradually develop competency and confidence in the data analysis process. We also present findings from a SEDL study that examined the education databases of four states to see what kind of data are available at the state level and how the data can best be used. Finally, our “Research Notes” column presents questions that readers may want to consider when reading research studies. Educators are commonly asked to adopt research-based strategies or engage in evidence-based practice, but before they can do either of those things, they must understand what the research says about a topic or issue.

On a final note, we would love to hear from you. What kinds of articles would you like to see in future issues of *SEDL Letter*? What topics would you like to see addressed? Please e-mail *SEDL Letter* editor Leslie Blair at [lblair@sedl.org](mailto:lblair@sedl.org) and let us know!



# Enhancing Data Use and Quality to Shape Education Policy

By Zena H. Rudo, PhD

**Editor's note:** Since SEDL conducted the study discussed here, all four states have upgraded their data systems.

**H**ow much should we spend on students to ensure they succeed in school? Who should teach our children to help them achieve? How should we allocate these monetary and staffing resources to be effective?

These questions are basic to providing children a good education, but answering them is not easy. The data policymakers use to make changes for improved student performance must be accessible, of high quality, and easily understood. The data must also be broad enough in scope to respond to the diversity of instructional policy issues, yet have ample detail to answer specific questions.

States now collect large amounts of data related to education, but can policymakers rely on existing state education databases to find the answers they need? Answering this question was the focus of a study conducted in 2003–2004 by the Southwest Educational Development Laboratory (SEDL).

## Background to State Education Data Systems

State data systems have changed since the early 1800s, when school administrative records contained only enrollment, attendance, and literacy figures (Goldin, 1999). Through the years data systems have evolved as the interest in student proficiency has grown and federal reporting requirements have increased.

Most of the current state data systems were established in the 1970s and 1980s, and were composed of distinct databases focused on one level of data (i.e., fiscal, student, teacher, or school data). Many systems remain this way. In addition, not all of the databases are necessarily housed or managed by the same department in the state education agency (SEA) or even within the agency itself. These separate databases are full of useful information, but many challenges exist to link the data.

Linking the data is essential if we want to meet current demands for high-quality data to answer education policy questions or to meet state and federal requirements. Some of the upsurge in data use reflects the federal No Child Left Behind (NCLB) legislation related to measuring adequate yearly progress, choosing academic programs, setting student improvement goals, and keeping parents informed via publicly available district and school report cards. Not only are boards of education, legislatures, and funding sources requesting more kinds of data, but school personnel and the general public are relying on data more for their decision making. School finance lawsuits have also necessitated increased use of state data. Nationally, 45 states have been, or are currently, engaged in court cases. The courts have asked pointed questions regarding equity and quality that require data-based answers. For example, a commonly asked question is: “What resources, fiscal and staffing, are needed to improve performance in all students?” This question, as well as questions on how to effectively allocate those resources, would best be answered with SEA data that links individual student data to staff, school, district, fiscal, and assessment data.

## Database, Data System, Data Warehouse What's the Difference?

**Database:** An organized collection of information or data elements, stored electronically, that can be searched, sorted, reorganized, and analyzed rapidly. The following are database models:

- **Flat file:** Data in one record that cannot be linked to other records (a single-table format)
- **Hierarchical:** Data in separate records that are attached to one root (one-to-one relationship)
- **Network:** Data in separate records that can be attached to multiple other records (many-to-many relationship)

**Data system:** A collection of computer programs that enable you to store, modify, and extract information from a database. One such data system is the Texas Public Education Information Resource.

**Data warehouse:** A combination of many different databases across an entire system to present an entire picture. Data are added but never removed. An example of a data warehouse is the Louisiana Educational Accountability System.

## SEDL Study on State Data Systems



In recent years, policymakers have discussed with SEDL staff the need for greater detail on instructional resources linked to student performance. To pursue this question, SEDL policy research staff members conducted a study titled *Investigation of Education Databases in Four States to Support Policy Research on Resource Allocation* (Pan et al., 2005). The study examined Arkansas, Louisiana, New Mexico, and Texas education data collected and managed by the four state education agencies to determine whether research can be conducted to find these links.

The goal was to understand the scope, quality, and availability of each state's data to support its instructional resource decisions. Specifically, we addressed the following question: Do state databases allow the investigation of the relationship between fiscal and staff instructional resources and student performance?

Four years of state instructional expenditure data, staff characteristic data, student performance data, and student, school, and district characteristic data were the focus of our study. We assessed how the four states utilize their data and determined state-specific policy concerns by

- examining public reports, summaries, and research;
- discussing data management with state education and other policymakers; and
- reviewing state policy.

After identifying key variables, we assembled and examined the data for its usability according to five criteria: (1) availability and accessibility, (2) completeness, (3) accuracy, (4) consistency, and (5) alignment.

Next we gauged commonalities across the state data and performed descriptive statistics to assess data quality. An important last step was to meet with state policymakers to discuss the findings and to formulate ideas for data system reform specific to their state.

*Linking data is essential if we want to meet current demands.*



## The State of State Education Data

We focused on instructional expenditure data, instructional and administrative staffing data, school and district demographic data, and student demographic and performance data. The four state data systems generally have separate databases for these different data. However, none were set up to link individual data directly to teacher and fiscal data. Since the initial investigation in 2003, Arkansas and Louisiana have moved toward connecting each student's data with his or her teacher's data.

### Instructional Expenditure Data

Instructional expenditures are funds spent to support teaching and learning that occur in the classroom, with the majority going to teacher compensation. All four states, similar to states nationwide, have detailed instructional expenditures for school districts. Texas also has school expenditure data. Arkansas has just begun to collect school-level fiscal data, and Louisiana uses a statistical method to estimate school expenditures based on district data.

Each of the instructional expenditure databases are set up with a limited number of functions (e.g., instruction and student support). In general, each state has similar instruction function categories; however, they are not necessarily named or defined the same way. The functions are divided into object categories, such as salaries, benefits, and supplies. Often additional subfunctions and subobjects are also designated. As shown in Table 1, several of the states also maintain instruction expenditure data by programs, such as special education and Title 1. We found that the states have been consistent over time in their categorization and collection of instructional expenditures, contributing to greater data reliability, accuracy, and completeness.

Salary data was of particular interest, and all four states document this data in both the state's fiscal and staff databases. The fiscal database has district or school salary averages, while the staff database records salaries for individuals. Using the individual data allows greater flexibility in looking at particular subgroups of staff, which may be beneficial in making policy decisions. Generally, the salary data is reliable; however, it is often impossible to discern incentives, bonuses, or other reimbursements staff may receive. This makes it difficult to get a complete compensation picture. To this same end, we also investigated staff benefits. As seen in Table 2, unlike salaries, actual benefit costs per individual are not recorded by three states. Rather they are prorated using district benefit data. This further complicates decision making regarding total teacher compensation.

Table 1. SEA Instructional Expenditure Data in Four Study States

	Arkansas	Louisiana	New Mexico	Texas
<b>Instruction-related function categories*</b>	<ul style="list-style-type: none"> <li>• Instruction</li> <li>• Student support</li> <li>• Instructional staff services</li> </ul>	<ul style="list-style-type: none"> <li>• Instruction</li> <li>• Student support</li> <li>• Instructional staff services</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Instructional support</li> </ul>	<ul style="list-style-type: none"> <li>• Instruction and instruction-related services</li> <li>• Instructional support and school leadership</li> <li>• Support services-student</li> </ul>
<b>Object of categories*</b>	<ul style="list-style-type: none"> <li>• Salaries</li> <li>• Benefits</li> <li>• Professional purchased services</li> <li>• Supplies and materials</li> <li>• Other objects</li> </ul>	<ul style="list-style-type: none"> <li>• Salaries</li> <li>• Benefits</li> <li>• Professional purchased services</li> <li>• Supplies and materials</li> <li>• Other objects</li> </ul>	<ul style="list-style-type: none"> <li>• Personnel services</li> <li>• Employee benefits</li> <li>• Supplies and materials</li> <li>• Travel and training</li> <li>• Capital outlay</li> </ul>	<ul style="list-style-type: none"> <li>• Payroll costs</li> <li>• Professional and payroll costs</li> <li>• Supplies and materials</li> <li>• Other operating costs</li> <li>• Debt service</li> <li>• Capital outlay</li> </ul>
<b>Unit of analysis</b>	<ul style="list-style-type: none"> <li>• Program (for instruction only)</li> <li>• District</li> </ul>	<ul style="list-style-type: none"> <li>• Program</li> <li>• District</li> </ul>	<ul style="list-style-type: none"> <li>• District</li> </ul>	<ul style="list-style-type: none"> <li>• Program</li> <li>• School</li> <li>• District</li> </ul>

\* Function and object categories align with federally defined functions and objects (Census form F-33).

Table 2. SEA Individual Salary Data in Four Study States

	Arkansas	Louisiana	New Mexico	Texas
<b>What salary measure(s) are available?</b>	<ul style="list-style-type: none"> <li>• Total salary</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay</li> <li>• Additional compensation (3 types)</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay</li> <li>• Supplemental pay</li> </ul>
<b>Can partial salaries be determined for part-time staff?</b>	Yes (since 2003)	Yes	Yes	Yes
<b>Do salary data align with actual expenditures?</b>	Yes (since 2003)	No	No	No
<b>Are individual benefit expenditures available?</b>	Yes	No	No	No

**Instructional and Administrative Staffing Data**

Data on teachers are more extensive than other staff data. In addition to the individual salary data in the staff databases, the following data are available on individual teachers:

- Basic demographics, such as gender and race/ethnicity
- Educational attainment
- Years of experience
- Certification
- Teacher test scores
- Position (e.g. role, school, district)
- Full-time equivalent (FTE) or percent time

When relying on these data for decision making, we faced several challenges. First, data managers across all four states report limited reliability with teacher experience data since they often depend on unverified self-reports from individual teachers or school districts. Crosschecking the data over a span of years would be beneficial. Second, certification databases, often housed and managed separate from other staff databases, are cumulative and not always easily aligned with other data. And last, not all states reliably document FTE or percent time data for each position a staff person holds.

### School and District Demographic Data

All four states have extensive school and district demographic databases. Much of the data in these databases are averages; therefore, some caution must be taken when using school versus district data to look at a particular characteristic. For example, if we wanted to know the percent of low-income students in a district, we could go directly to the district database and find the answer. We could also go to the school database, find all the schools in that district, and then average their student income data for the answer. The problem is that the two answers may be different. Still, the school and district databases offer information useful for school or district report cards, annual state education reports, descriptive research, and required funding reports.

School databases in the four states include the following data:

- School characteristics (e.g., type of school and grade range)
- Student population (e.g., number of low-income and minority-status students)
- Attendance, graduation or completion, and dropout rates
- Special program participation
- Per-pupil expenditures
- Accountability ranking

The district databases often included additional information about district wealth. It was relatively easy to access school and district databases because many are available and downloadable on SEA Web sites.

We also used the school and district SEA data to get a broader picture of the educational environment of students and staff. However, it was necessary to get additional data that states do not collect through federal databases such as the U.S. Census Bureau and the National Center for Education Statistics. For example, federal databases contain information about household characteristics of families in the school or district's vicinity, such as household income or parent level of education. In order to use these data with the SEA data, we had to find common identifiers on which they could be merged. This provided more detail for specific groupings or geographic areas.

### Student Demographic and Performance Data

Each state has different ways of complying with federal and state restrictions to ensure confidentiality of student information. Some have computerized methods to scramble student identities before providing the data. Others provide only aggregated student data at the grade or school level.

In each state a student's data record includes characteristics such as race/ethnicity, gender, and age. The student's participation in such programs as free and/or reduced-price lunch, preschool, afterschool, and special education is also available. Some states include family information, such as whether the student is in foster care or homeless. All states connect the student to his or her grade level, school, and district.

Data on each student also include performance measures. For this study, we sought only student achievement data. Other measures of student performance, such as attendance, graduation, and dropout rates, are also available. All four states have been improving their capacity to measure student performance through standardized tests. While this process has improved the quantity of these data regarding the number of tests offered and the grades tested, it also has resulted in inconsistency in the test scores available from year to year. In each of the four study states, changes were made to the tests administered, grades tested, or scoring standards during the study period. These changes hampered our getting a complete picture of student achievement over time.





## SEA Staff, School, and District Student Data

The four states in SEDL's study have a variety of useful staff, school, and district data. Much of the data are available on SEA Web sites, but some must be directly obtained from the SEA to ensure confidentiality. The SEA data include the following:



### Staff data

Data on individual teachers and other staff, such as basic demographics, education, experience, and certification



### School and district data

Data on individual schools and districts, such as student population, per-pupil expenditures, and accountability rankings



### Student data

Data on individual students, such as race/ethnicity, special program participation, grade, and student achievement scores

## Using the State Instructional Resource Data

After getting a better understanding of the data in the four states and assessing the relative quality of those data, we wanted to know if the data could be used to answer policy questions so prevalent today. How much should be spent on students to ensure they succeed? Who should teach children to help them achieve? How should these monetary and staffing resources be allocated to be effective?

The state data are both available and accessible to answer basic, but important, questions about the adequacy and equity of state funding formulas and compensation for teachers and other staff. Searching the data to find out about teacher characteristics can be done relatively easily. This can be followed by an investigation into what impact these characteristics may have on student success. It's possible to get a good grasp of what type of teachers might be allocated to different schools to impact student outcomes. That is, teachers with certain qualifications may be better placed at schools with high-need student populations or schools in particular locales.

### About Spending

How instructional dollars are spent and how the spending varies across districts can be studied using state fiscal data. To see if funds allocated are in any way connected to student achievement, the fiscal data needs to be merged with performance data. Specific questions that can be answered with the state data include the following:

- What are the differences in instructional spending across districts in the state?
- Do districts that perform well allocate more instructional dollars to salaries and benefits?
- How do districts of varying levels of performance allocate administrative versus instructional dollars?

More detailed questions about school and district spending on salaries can also be answered if individual staff data are merged with performance data. For instance, you can determine how teacher pay can impact student performance with merged data or learn whether salaries are distributed equitably between schools and districts. You can also see what effect salary has on the retention of qualified teachers. To answer this particular question, it would be necessary to have data on teacher mobility, which most of these states do not collect. However, it is not difficult to calculate mobility using existing state data on school and district teacher assignment over multiple years. Unfortunately, no current data in the state databases can tell us why teachers stay or leave.

District Data



Although answers to a number of important policy questions about instructional spending can be found with existing state data, additional data would increase our learning, especially regarding teacher compensation. It would be helpful to have better measures for all funds paid to staff, such as individual data on the cost of benefits, bonuses, and incentives. With this more accurate depiction of total compensation, it's feasible to ask about the influence of benefits and incentives on teacher recruitment and retention, particularly in shortage areas such as bilingual and special education.

Another instructional area where additional data would be helpful is professional development. States have little data on professional development, so it is impossible to know if their investments produce results. Each state collects data on the hours of professional development completed, but not data on actual or dollar-equivalent measures for teacher time, stipends, travel expenses, and costs for teacher substitutes. Information on the content would also be beneficial for addressing questions about the effectiveness of professional development, its relative costs, and the distribution of professional development resources across schools and districts.

### **About Teacher Quality**

Teacher quality has always been an important policy issue, but NCLB has heightened the need to use good data to determine the quality of teaching staff. We found only certain questions about teacher quality can be answered using the existing state data (i.e., data on teacher experience, education, and certification). Questions about other measures of quality, such as application of pedagogical techniques, teacher motivation, and classroom management skills, require information not collected in state databases. Changes are being made, however. For example, New Mexico has begun to collect data

on evaluations of teachers as one measure of teacher quality. By using all of the available teacher data and merging them with other databases, it is possible to find answers to questions about teacher quality, its relationship to teacher salary, and its relation to student performance.

Specific questions to ask using the data are as follows:

- How does teacher experience, education, and/or certification relate to student achievement?
- Do higher teacher salaries buy teachers with more experience, higher education levels, and advanced certification?
- How are teachers who are educated at different teacher education institutions distributed across the state?
- Do rural areas have a higher rate of uncertified teachers?
- What is the connection between teacher retention and route to certification?

Although you can use current teacher quality data to find answers to many policy questions, improving these data are important to ensure accurate answers. For instance, we found it would be important to help districts better understand definitions for reporting experience, especially for teachers who transfer between districts or from other states. Also, if data on teacher degree major were collected, questions on how many in-field teachers schools have and how these teachers are distributed across the state could be answered. Combining these data with performance data, it is also possible to seek information on the relationship between teacher field of study and student performance.

### **About Staffing Patterns**

We found that if you are a decision maker using existing state data, you can determine what staff resources comprise each school and how those resources differ across schools with varying levels of student performance. These staffing pattern profiles can be detailed for specific types of schools or teachers. For example, it's easy to see how beginning teachers or administrators in small, medium, or large schools are distributed across the state. You can also find out what teaching patterns exist for rural and urban schools, especially those that are low performing.

Another important education policy issue is class size (both its relative cost and its connection to student performance). Merging data from state databases, you can understand whether larger allocations of teachers, administrators, or aides are related to student achievement. Be aware, however, that using a ratio of the number of students in a



school to the number of teachers in that school is the least accurate measure of class size. It would be better to use data that directly link students to teachers and teachers to specific classes.

## Data System Reform: What Can Be Done?

Policymakers, state data managers, and researchers need to work together to expand the use and quality of state education data to learn more about instructional resource allocation and its relation to student performance. Specifically, policymakers and researchers should become more familiar with state data and regularly discuss, with state SEA managers, how the data could be improved to better answer policy questions. This would allow SEAs to expand the use of their data beyond traditional reports and monitoring purposes. Also, states should increasingly work with national data centers, such as the National Center for Education Statistics, to further establish and adopt national data standards that would enhance commonalities across states for a more complete picture of instructional resource allocation.

Some targeted improvements for SEAs and other education policymakers to consider include the following:

- Add school-level detail for instructional expenditures.
- Institute more accurate ways to get teacher years of experience data.
- Ensure teacher certification data can be easily aligned to teachers' subject areas and grade levels.
- Create databases that link individual teachers to their students and classrooms.
- Enhance collection of data on the costs, content, and quality of professional development.

This study also highlighted varying SEA data accessibility issues across the states. As a result the following recommendations are made:

- Combine separate databases in a centralized data warehouse housed and managed by one department.
- Establish clear procedures for data requests, including the time and cost to provide data.
- Find ways to share individual-level data while maintaining confidentiality.
- Have ample and knowledgeable staff in place to assist data users.
- Provide documentation explaining details of the data (i.e., definitions, calculations, and year-to-year changes). Post this documentation on agency Web sites.



We recognize that SEA data are collected for competing needs, such as federal reporting, tracking state accountability goals, and supporting state funding formulas. Consequently, reforming state education data systems takes careful planning and collaboration between those who manage the data and those who use the data. It is critical that SEAs balance the time and resource burdens that are created for schools, districts, and their own agency staff when implementing changes to their data systems. Continued work remains to be done to ensure high-quality, user-friendly data are accessible that can be used to answer important policy questions about education resources and student achievement. Such efforts would support the creation of more reliable information needed for more effective decision making on the resources needed to help children succeed.

## References

- Dorn, S. (2003). High-stakes testing and the history of graduation. *Education Policy Analysis Archives*, 11(1). Retrieved August 30, 2006, from <http://epaa.asu.edu/epaa/v11n1/>
- Goldin, C. (1999). *A brief history of education in the United States*. (Historical Working Paper 0119). Cambridge, MA: National Bureau of Economic Research. Retrieved August 30, 2006, from <http://ideas.repec.org/p/nbr/nberhi/0119.html>
- Pan, D., Smith-Hanson, H., Jones, D. H., Rudo, Z. H., Alexander, C., & Kahlert, R. (2005). *Investigation of education databases in four states to support policy research on resource allocation*. Austin, TX: Southwest Educational Development Laboratory.

Zena H. Rudo, PhD, is a SEDL program associate who worked on several policy research studies related to education resource allocation. You may contact Zena by e-mailing [zrudo@sedl.org](mailto:zrudo@sedl.org).

# High-Leverage Data Analysis in Schools: Keep it Simple

By Mike Schmoker



When I'm on a site visit, I often find educators knee-deep in data, surrounded by binders and spreadsheets. They commonly ask me, "What's the 'right way' to use or analyze this data?"

## Start with SMART Goals

My advice surprises these educators (they think it's too simple). Start, I tell them, by setting one or two annual "SMART" goals. SMART goals are Specific, Measurable, Achievable, Results-oriented, and Timebound (Conzemius & O'Neil, 2005).

To set such goals, I ask grade-level or common-course teams to look at state assessment scores or passing rates on common end-of-course assessments. As they review scores in reading, mathematics, U.S. history, or whatever the course is, they simply must ask, "Which subjects or courses have the lowest passing rates?" It takes mere minutes, for instance, to determine that your lowest success rate for reading or eighth-grade math is 68%.

These simple numbers become your baseline to set goals. That is, you and your eighth-grade team can now set a goal similar to the following:

- To increase the success rate in eighth-grade math from 68% at the end of 2006 to 72% at the end of 2007

If desired, teams may do the same for maybe one more subject area (e.g., increase the success rate from 73% to 77% in reading or science or social studies). But I strongly urge teams to set no more than two end-of-course or subject-area goals.

Pretty boring stuff, you may be thinking. Not so—this simple goal-setting process can have as much impact on achievement gains *as any action taken that school year* (Marzano, 2003; Little, 1990; Schmoker, 1999; Conzemius & O'Neil, 2005). And it takes mere minutes to complete.

There's a catch, however. Such SMART goals have an impact if teachers not only set such goals, but also *know them* and work actively to pursue them. Any teacher in your school, if tapped on the shoulder, should be able to tell you his or her annual improvement goal—to the number—at any point in the school year. Teachers have to know them by heart (one more reason to set very, very few of them). Why? Because if you don't *know* your goals, you don't *have* goals. The power of goals, with the urgency and focus they generate, only operate where people know and talk about them in teams. SMART goals can't be met unless we routinely analyze and improve our practices; they are the enemy of the status quo. They exert positive pressure for practitioners to scrutinize the quality (and alignment with essential standards)

of daily and weekly lessons, units, and assessments against intended results. Where necessary, SMART goals encourage the abandonment of cherished but ineffective practices. All these good things begin with using data to set measurable goals.

Unfortunately, I have found that when you ask the majority of staff members at the average school about their goals, they either don't know what their goals are or will answer with something completely unlike the measurable SMART goals so critical to improvement. On this *simple but pivotal element of improvement*, the majority of schools flunk outright. Here too, there is a simple solution: we need to talk about goals incessantly. We must routinely ask teachers, in the most friendly, positive fashion, what their goals are and then praise and reinforce the importance of knowing them by heart.

### Identify Lowest-Scoring Standards and “Subskills”

Goals have even more impact when we add one more equally simple layer to our annual data analysis.

Isn't it common sense that if we have a measurable, annual math goal, for example, we would want to concentrate more of our instructional improvement effort on the lowest-scoring areas? As teams use data to make a list of these areas, their first question might be, “Is our curriculum adequately aligned with the standards on the state test?” In order to answer this question, they may need to ask others the following questions:

- Are we devoting adequate time to whatever topic is covered by the relevant standards (e.g., “measurement” in mathematics or “reading for inference” in reading or “voice” in writing)?
- Are we carefully crafting lessons for these standards? Or, upon reflection, are we only covering them in a cursory way?

The next question should be “How are we teaching it?” Remember that the two most critical factors that affect learning are (1) what we teach and (2) how effectively we teach (Schmoker, 2002). The simplest kind of data help us identify those standards that either aren't being taught or are given short shrift; such simple data analysis can alert us to the “curricular chaos” that is all too common in our schools (Schmoker & Marzano, 1999).

Remember, we don't get points for analyzing the data. We get points for acting on the data, for using it to help us see that we have holes in our curriculum, that we don't truly provide a coherent or “guaranteed and viable curriculum” (Marzano, 2003). We get points for improving instruction in the areas of weakness, which data so helpfully and easily reveal.

Data help us see that what is taught isn't adequately aligned with what is tested. Data also help us see that there is enormous room for improvement of daily lessons, units, and their accompanying assessments (Wagner, 2004; Elmore, 2000; Schmoker, 2006). We don't need more complex data analysis; we need to use the data to identify low-scoring skills and then get right to work improving our instruction and assessment in those and other areas.

Like good coaches, we need to work on the whole game to attain a better win-loss record than last year. But then, from game to game, or in our case, from formative assessment to formative assessment, we must review the simplest kinds of data that reveal critical or game-changing opportunities—like strikeouts, passing completion rates, or turnovers. Those are the areas where good coaches change their teaching method. The same principles should operate in classrooms, but they usually don't. As with goals, very few teachers know the lowest-scoring areas of performance in the low-performing subject areas or courses (as a teacher, I sure didn't know). This is hardly their fault; the system we work within has never made it a priority.

### The Need to Lead

Leadership is needed to provide a positive, resounding insistence that all teachers, by team, analyze their data and then set and know both their goals and the areas where teaching must be improved. Teachers deserve a thorough explanation as to why these simple processes are so vital to achievement gains (Marzano, 2003; Schmoker, 1999). To facilitate these simple analyses, I use a form that looks like the one shown below (adapted from Tucson Unified Schools and several other successful districts):

In \_\_\_\_\_

(list appropriate subject) our team will improve from \_\_\_\_\_ % (end of 200\_)

to \_\_\_\_\_ % (end of 200\_)

The lowest-scoring standards/subskills where we will make adjustments to instruction:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



*Any teacher in your school should be able to tell you his or her annual improvement goal—to the number—at any point in the school year.*

Why don't we operate in this way? Because most schools don't have ironclad expectations and routines in place to ensure that these steps occur annually. We don't convey their importance by asking about or checking with teachers regularly to ensure that they know their subject-area goals and lowest-scoring subskills. No, we are too distracted by the multiple demands and duties of the latest strategic plan or program adoption (Schmoker, 2004; Reeves, 2006). As Richard Elmore (2000) writes, schools are "always a-boil with some kind of "change," but they are only rarely involved in any deliberate process of improvement, where progress is measured against a clearly specified instructional goal" (p. 7).

### Formative Assessment Data

SMART goals and the formal identification of areas of weakness are critical. But there is one more critical piece in this simple scheme: assessment data that are examined not annually, but frequently during the school year. This is the data we collect on individual lessons or units or other "interim" assessments. At its best, it is literally the proportion or percentage of students who succeeded on an assessment (e.g., 52%.) Though teachers and teams rarely do this, it is critical to gather and reflect on this data, which can be as simple as counting, in seconds, in one column of a grade-book, the number of students who receive a 3 or higher on a 4-point rubric. It becomes the basis for celebration of progress—or the basis for scrutinizing and then revising a lesson or future lessons and units. Formative data analysis can be informal: walking around the classroom to see if some or most or all of the students "get" something you just taught—and then using this data to move ahead or clarify (Chappuis, Stiggins, Arter, & Chappuis, 2005).

In brief, the primary purpose of gathering formative assessment data is to inform future adjustments to instruction. Assessment data from every lesson and unit we teach should be examined—even briefly—and inform future instruction. But the greatest benefits come when teams build and then analyze the results of common assessments, which Doug Reeves insightfully calls the "gold standard" of assessment (Reeves, 2006). (For a landmark report on how to construct and use formal interim assessments, see Marshall, 2006).

But here, too, I must point out that the majority of educators do not use assessments formatively; the system does not reinforce or require such simple practices. Even where common or interim assessments are in place, teachers do not typically examine the data—the results—to reflect on levels of success or failure; they do not work in teams to

identify and address patterns of difficulty. They may never ask, "Why did so many of our students bomb on these items or this section of an assessment?" or "What was effective or errant in this lesson or unit?" or "Where did kids get bogged down—and did we carefully or effectively enough explain this element of the rubric?" Swift, substantive improvements hinge on such mundane but continuous questions and practices. Even two focused, 45-minute team meetings a month, thus spent, will account for enormous increases in success rates.

But we won't enjoy these benefits until leaders—administrators, department heads, and teacher leaders—stop being shy about the issues they raise and until we insist that every teacher team in every school conducts such simple data analysis as matter of course.

There are many other wonderful ways to use data. We should use it to identify and learn from our most effective teachers and teams (Haycock, 2005). As we begin to more carefully and routinely craft more effective lessons and units, we can use data to identify and provide additional learning time for those students who still need help. We can use data to identify and assist students who don't respond even to the most carefully crafted lessons and units—and to gauge how effective lessons and units are *reducing the proportion* of such students.

We also need to gather and review disaggregated data to raise awareness and promote urgency to narrow our embarrassing achievement gap and to prevent our historic tendency to reduce expectations for certain socioeconomic groups.

The greatest benefits will accrue where we have (1) set simple, measurable team goals; (2) identified areas where instruction is most in need of improvement; and (3) instituted routines to review formative assessment data on individual and common interim assessments to inform ongoing improvement efforts.

These simple high-leverage practices ensure success. For this reason, they are the place to begin. Until we master them, other kinds of analysis, even for their merits, can easily divert us from the real work at hand: instructional improvement. I'm not sure we need more books or workshops on data analysis. We need, instead, to start with these simple procedures, confident that they will work a minor miracle with students and their learning. My advice: start tomorrow.



## Bibliography

- Chappuis, S., Stiggins, R., Arter, J., & Chappuis, J. (2005). *Assessment for learning: An action guide for school leaders* (2nd ed.). Bloomington, IN: Solution Tree.
- Conzemius, A., & O'Neill, J. (2005). *The power of SMART goals: Using goals to improve student learning*. Bloomington, IN: Solution Tree.
- Elmore, R. F. (2000). *Building a new structure for school leadership*. Washington, DC: The Albert Shanker Institute.
- Haycock, K. (2005, June). *Improving academic achievement and closing gaps between groups in the middle grades*. Presentation given at CASE Middle Level Summit, Keystone, CO. PowerPoint is available at <http://www2.edtrust.org/EdTrust/Product+Catalog/archivesII.htm>
- Little, J. W. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teachers College Record*, 91(4), 509–536.
- Marshall, K. (2006). *Interim assessments: Keys to successful implementation*. New York: New Leaders for New Schools.
- Reeves, D. (2006). *The learning leader: How to focus school improvement for better results*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Sanders, W. L., & Horn, S. P. (1994). The Tennessee Value-Added Assessment System. *Journal of Personnel Evaluation Education*, 8(3), 299–311.
- Schmoker, M. (1999). *Results: The key to continuous school improvement*. Alexandria, VA: Association of Supervision and Curriculum Development.
- Schmoker, M., & Marzano, R. J. (1999). Realizing the promise of standards-based education. *Educational Leadership*, 56(6), 17–21.
- Schmoker, M. (2002). The real causes of higher achievement. *SEDL Letter*, 14(2), 3–7.
- Schmoker, M. (2004). Tipping point: From feckless reform to substantive instructional improvement. *Phi Delta Kappan*, 85(6), 424–432.
- Schmoker, M. (2006) *Results now: How we can achieve unprecedented improvements in teaching and learning*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Stiggins, R. J. (1999). Assessment, student confidence and school success. *Phi Delta Kappan*, 81(3), 191–198.
- Wagner, T. (2004, October 27). The challenge of change leadership. *Education Week*, 24(9), 40–41.
- Mike Schmoker is an author, speaker, and consultant. He has written four books and numerous articles for educational publications, newspapers, and TIME Magazine. His most recent book is RESULTS NOW: How We Can Achieve Unprecedented Improvements in Teaching and Learning, published by ASCD. He lives in Flagstaff, Arizona.*

# Creating a “No Blame” Culture for Data Analysis

*In low-performing districts and schools, there were no discussions about data.*

SEDL program associates D’Ette Cowan and Ann Neeley are former principals who, for 5 years, assisted low-performing schools in using data systemically as part of their SEDL work. They both agree that the reasons districts and schools aren’t using data effectively are complex. But they found that in the low-performing schools and districts, there were no discussions about data or how to use it to inform instruction.

Key to creating a culture of data, say Cowan and Neeley, is creating a culture where you are not “blaming” but rather looking at the data and discussing it objectively. After all, until staff members give meaning to the data through conversation and dialogue, the data are mere numbers.

In some schools and districts, the SEDL staff found that convincing school and district staff that data were impersonal was difficult. Neeley gives an example of one superintendent who strongly believed that discussing the data by ethnicity was racist. She reports that after much coaching, the superintendent did share data by ethnicity—but only briefly in a PowerPoint presentation. “He showed the slide just a short time,” she says. “However, the data got out to the staff and was eventually used.”

## Suggested Readings

Bernhardt, V. (2004). *Data analysis for continuous school improvement*. Larchmont, NY: Eye on Education.

Boudette, K. P., City, E. A., Murnane, R. J. (2005). *Data wise: A step-by-step guide to using assessment results to improve teaching and learning*. Cambridge, MA: Harvard Education Press.

Wellman, B. & Lipton, L. (2004). *Data-driven dialogue: A facilitator’s guide to collaborative inquiry*. Sherman, CT: Mira Via.



Ann Neeley



D’Ette Cowan

Conversation is key to establishing the “no blame” culture, but here are some other suggestions:

- Staff should be prepared to examine data. Instead of just presenting data at a staff meeting, the principal should announce ahead of time that the staff will be looking at data to engage in conversation about an issue or help answer a question.
- Facilitators or administrators should be careful not to describe the data as “our data” or “your data,” but instead refer to “the” data in the beginning. Likewise, remove both staff and student names from data in the beginning.
- Review reasons for any “undesirable” data by starting with factors such as curriculum alignment, assessment data availability, or program alignment to the curriculum, assessment, and state standards.
- Do not begin by what or how a staff member is teaching.
- Begin establishing a collaborative work environment, one that supports time for collaboration and reviewing students’ work.



## Quick Guide to

# Interpreting Research Results

**M**ore and more, educators are being called on to use strategies and resources developed using scientifically based research. To find out if a strategy or a product is truly scientifically based, you often must refer to journal articles or reports of original studies. To those of us who are not researchers, however, the terminology, methodology, and findings can be confusing. It can also be tough to evaluate how good or rigorous the research is. In upcoming issues of *SEDL Letter*, we will take a more in-depth look at some of the statistical terms used in studies and other issues related to understanding and interpreting research studies.

This month we start with the basics. Here are a few general questions to help non-researchers begin to interpret or understand research studies:

**What was the research question?** The purpose of a research study is usually phrased as a research question or hypothesis and usually appears in the introduction of the research report. It is either descriptive or causal. For the study to be considered valid, it first must be designed to answer the research question. Examples of a descriptive research question include “What is happening?” and “How is something happening?” If a study is experimental, a causal research question will be posed asking, “Does this cause something else?”

True experimental studies, also known as randomized controlled trials, are the “gold standard” for research studies. In true experimental studies, there are two similar groups of participants who were randomly assigned to different “treatments.” One group receives an intervention while the other group does not. If the research study does not include random assignment to the different groups and manipulation of an intervention or treatment, then the research cannot isolate a causal relationship. At best it may detect a correlation among factors.

**How large was the sample and how was the sample selected?** The larger the sample, the more likely the study is valid. Put another way, the larger the sample, the more likely it represents the target population. Using a larger sample also makes it easier to distinguish individual differences that appear from actual trends. One of the difficulties in sampling

is to make certain the sample group represents the population but isn’t distorted by the sampling process.

**How were the data collected and analyzed?** Most education studies use a data collection tool or instrument such as a survey, interview, observation, or test. There are a number of questions related to how the data were collected: Was the instrument piloted before being used? Was the person collecting the data trained beforehand in how to use the instrument? Were data collected in a consistent manner throughout the study?

Some data need little processing to answer a research question, but most must be analyzed through a process of manipulation and examination. Statistics are used for quantitative data, whereas for qualitative data information is often coded so that it can be sorted into themes or categories that are useful in interpreting what the data mean.

**Are there any other explanations for the results?** The researchers should discuss somewhere in the report the possibility of other explanations for the results given and explain why or why not these other explanations are plausible or likely.

**Was the study replicated?** One study is insufficient to establish certainty. If a study is repeated and the results are consistent, then the results are more reliable. If the study is repeated but the results are mixed or very different, then there is good cause to be cautious in interpreting the results.

By answering these questions, the research novice can begin to thoughtfully analyze the research process for a certain study and determine what cautions to take in applying the findings.

## Bibliography

- Lauer, P. A. (2004). *A policymaker’s primer on education research: How to understand, evaluate and use it*. Retrieved August 1, 2006, from the Education Commission of the States Web site: <http://www.ecs.org/researchprimer>.
- Locke, L. F., Silverman, S. J., and Spirduso, W. W. (1998). *Reading and understanding research*. Thousand Oaks, CA: Sage Publications.

## RESEARCH NOTES



Wes Hoover,  
SEDL president  
and CEO, and  
Preston Kronkosky,  
former SEDL  
president and  
CEO, break ground  
for the new SEDL  
headquarters.

# SEDL Breaks New Ground

This year has been notable for SEDL. We are celebrating our 40th anniversary, and recently we broke ground on a new headquarters facility.

The new headquarters will be located northeast of downtown Austin, Texas, in an exciting new area that is being developed at the site of Austin's old Robert Mueller Municipal Airport. The building has been designed to support the collaborative work style of SEDL's staff and includes multiple workrooms, community space, a 35-person boardroom, and 5,200 square feet of conference space. It will include a 965-square-foot demonstration science and technology classroom and laboratory and an outdoor classroom and xeriscaped garden. The three-story facility will receive a silver-level Leadership in Energy and Environmental Design (LEED) certification.

The 711-acre Mueller community where SEDL will be located uses both the new urbanism and green building approaches to design. The Mueller master plan calls for a pedestrian-friendly design that includes retail, commercial, and residential areas along with nearly 140 acres of public green space.

The Dell Children's Medical Center of Central Texas and the Dell Pediatric Research Institute of the University of Texas will also call the new Mueller community home. Facilities for those two organizations are now under construction. SEDL is looking forward to becoming involved with these neighbors.

"We think there are some natural connections to be made between SEDL and these organizations," says SEDL president and CEO Wes Hoover. "Our organization works to benefit children nationwide, and our experience suggests great overlap in education and health issues, both of which are better addressed together rather than separately."

SOUTHWEST EDUCATIONAL  
**SEDL**  
DEVELOPMENT LABORATORY  
Building Knowledge to Support Learning

211 E. 7th St., Suite 200, Austin, TX 78701-3253

#### Inside this issue

Enhancing Data Use and Quality to Shape Education Policy, PAGE 3

High-Leverage Data Analysis in Schools, PAGE 10

Creating a "No Blame" Culture for Data Analysis, PAGE 14

Quick Guide to Interpreting Research Results, PAGE 15

NONPROFIT  
ORGANIZATION  
U.S. POSTAGE PAID  
DALLAS, TEXAS  
PERMIT NO. 584

