From Vision to Action:

How School Districts Use Data to Improve Performance

CoSN
ADVANCING K-12 TECHNOLOGY LEADERSHIP

The following presentations and panel discussions highlighted *Vision to Know and Do*:

3rd Annual K-12 Education, Technology and Curriculum Summit at Teacher's College, *From Data to Decisions*, New York, NY, May 15, 2003

2003 No Child Left Behind Summit, Performance Institute, *Using Data-driven Decision Making: Accountability and Assessment,* Washington, DC, September 24, 2003

Tech Forum: Strategies, Solutions and Innovations for Technology Leaders, Produced by Technology & Learning, Roundtable discussion on *Data-driven Decision Making* and *Vision to Know and Do*, New York, NY, September 30, 2003

National School Boards Association T+L^2 Conference, *The Data Is Telling You Something: Do You Know What It's Saying?*, Anaheim, CA, October 23, 2003

Fall 2003 CUE Conference, *Data-Driven Decision Making; The Vision to Know and Do,* Santa Clara, CA, October 24, 2003

TCEA Conference, *3D: Data-driven Decision Making,* Austin, TX, February 4, 2004

CoSN 9th Annual K-12 School Networking Conference, *Using Data as a Tool in Education: Assessment, Accountability and Improving Student Achievement,* Arlington, VA, March 2, 2004

Secretary's No Child Left Behind Leadership Summit, *Malcolm Baldrige National Quality Award Winners: A Framework for Achieving Continuous Improvement*, St. Louis, MO, March 10, 2004

STAT-DC 2004, NCES FORUM & Summer Data Conference *Vision to Know and Do: A Data-driven Decision Making Partnership*, Washington, D.C., July 29, 2004.

Florida Educational Technology Conference, *Vision to Know and Do: A Data-Driven Decision Making Partnership*, Orlando, FLA, January 28, 2005.

***Vision to Know and Do* was covered in the following leading publications and e-newsletters read by policymakers and Ed Tech leaders:**

AEP Online: The Newsletter of Educational Publishers
District Administration
DistrictAdministration.com
District Daily
EdNET Week Headlines
Ed Review
eSchool News
eSN Technology Alert
Library Media Connection
LRP Publications
MultiMedia Schools
MultiMediaSchools.com
NSBA Technology Leadership News
Scholastic Administr@tor
School Business Affairs
Tech Daily PM Edition
Technology & Learning
T.H.E. Newsletter

From Vision to Action:

How School Districts Use Data to Improve Performance

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ACKNOWLEDGMENTS

CoSN launched the Data-driven Decision Making initiative, *Vision to Know and Do*, early in 2003. This initiative is a **highly-respected source of up-to-date, unbiased information for educators** on collecting, understanding and using data effectively; an **easy to use mechanism for educating school leaders** about data-driven decision making and its applications in elementary and secondary education; and a **nationally-recognized framework** for sharing knowledge among educators and transferring knowledge between the educational and vendor communities.

Vision to Know and Do is made possible through the financial support of our three founding partners, ETS, IBM and SAS. with additional support from Co-nect, Dell, Pearson School Systems, Plato Learning, PowerSchool, SchoolNet and Texas Instruments. Scholastic Administr@tor is the media partner for the initiative. However, CoSN is responsible for creating all the materials associated with the initiative and retains editorial control over them. Our partners provide input and feedback, but the ultimate responsibility for project materials remains with CoSN.

This paper was authored by Karen Greenwood Henke, a writer and speaker specializing in network technology and K-12 education. She also authored *Vision to Know and Do: The Power of Data as a Tool in Educational Decision Making*. She founded Nimble Press in 1998 and the Education Network Manager's User Group (ENMUG) in San Jose in 1997. She co-produced the TechForum annual conference from 1998 to 2002. She presents as a technology expert at education conferences and has been interviewed by the *San Jose Mercury News, San Francisco Chronicle,* EduVentures, *eSchool News,* and other media.

Irene K. Spero, Vice President, CoSN, served as the project director. She also serves as Director of External Relations and Outreach Services for NetDay, an organization dedicated to expanding the technology opportunities of students. Previously she worked with the SchoolTone Alliance, a global consortium of education technology and service provider companies, as its first executive director. As a staff member of the Web-based Education Commission, she was responsible for organizing its public hearings and managing its public relations and communications efforts. The Commission submitted its report, *The Power of the Internet for Learning: Moving from Promise to Practice*, to Congress and the President in December 2000. She served as Executive Director for Federal and State Relations at the College Board from 1984–1999.

Related materials continue to be updated, improved and posted on CoSN's Data-driven Decision Making Web site, **3d2know.cosn.org**.

Additional copies of *From Vision to Action* can be ordered at www.cosn.org/catalog/index.cfm. For more information, contact CoSN, 1710 Rhode Island Avenue, NW, Suite 900, Washington, DC 20036. Phone: 202-861-2676, **www.cosn.org**.

ABOUT COSN

Founded in 1992, the Consortium for School Networking (CoSN), a national non-profit organization, is the premier voice in education technology leadership. CoSN's mission is to advance the K-12 education community's capacity to effectively use technology to improve teaching and learning through advocacy, policy and leadership development.

CoSN's members represent school districts, state and local education agencies, nonprofits, companies and individuals who share our vision. CoSN could not continue to do important work on behalf of district technology decision makers without the active support of the community through membership and participation. All who support CoSN's mission are invited to join. Visit www.cosn.org or phone 202-861-2676 to find out more about CoSN's programs and activities supporting leadership development to ensure that information technology has a direct and positive impact on student learning in elementary and secondary schools.

CoSN—Your voice in the future of education technology

MAJOR COSN INITIATIVES

Accessible Technologies for All Students, increased achievement and success for all students through effective use of accessible technologies. (www.accessibletech4all.org)

Annual K-12 School Networking Conference, the premier national technology leadership conference. (www.k12schoolnetworking.org)

CoSN Compendium, a series of eight monographs exploring timely issues of importance to K-12 technology decision-makers. (www.cosn.org/resources/compendium/index.cfm)

CoSN's Emerging Technologies, reports on future technologies. (www. cosn.org/resources/emerging_technologies/index.cfm)

CoSN's School District Chief Technology Officers (CTO) Council, professional development for district-level technology directors. (www. cosn.org/resources/cto_council/index.cfm)

Cyber Security for the Digital District, ensuring the security of school networks. (www. securedistrict.cosn.org)

Data-Driven Decision Making, helping educators use data effectively to improve learning. (3d2know.cosn.org)

Ed Tech Action Network, a grassroots network of education technology advocates. (www.edtechactionnetwork.org)

Internet & Education Webcast, a series of 60 minute interactive professional development focusing on key issues. (www.cosn.org/events/index.cfm)

Safeguarding the Wired Schoolhouse, offering guidance for school leaders on options for Internet safety in schools. (www. safewiredschools.cosn.org)

Taking Total Cost of Ownership to the Classroom, providing tools for smart budgeting of technology resources. (www.classroomtco.cosn.org)

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Executive Summary

With the passage of *No Child Left Behind* in 2001, schools are expected to provide a standards based curriculum for students to attain math and reading proficiency and demonstrate progress each year. NCLB requires more frequent student testing with publicly reported results in an effort to close the achievement gap and to inform parents, teachers, administrators of student progress. Meeting these ambitious accountability goals requires transparency in the workings of the organization and the cooperation of everyone involved in the education of each student.

These mandates have accelerated change already underway in the nation's schools and in the teaching profession. Leading school districts have developed advanced technological systems and professional expertise for analyzing data to deliver timely information for the improvement of operations and instruction. They have embarked upon a process of using data in decision making at all levels of the organization, borrowing management models from business and from each other.

Published in 2003, *Vision to Know and Do: The Power of Data as a Tool in Educational Decision Making* defined a vision for continuous improvement, identified leadership districts creating a climate for change, and reviewed the implementation of systems and processes to enable data-driven decision making (DDDM). *From Vision to Action: How School Districts Use Data to Improve Performance* moves beyond the vision and visits districts that are acting on their data, testing the process, and seeing improvement in student learning.

DATA-DRIVEN DECISION MAKING
A process of making choices based on appropriate analysis of relevant information.

The paper draws from interviews with more than 30 experts in the field, including teachers, principals, district administrators, entrepreneurs, consultants, researchers, and other professionals. Additional interviews were conducted with multiple stakeholders from three school districts to better understand how data-driven decision making is used throughout the organization. Profiles of Lemon Grove School District (CA), Fulton County Schools (GA), and Cleveland Municipal School District (OH) at the end of the paper show how different school districts use data throughout their organizations.

School Districts Using DDDM and Described in This Report

DISTRICT	SCHOOLS	GRADES	POP.
Pearl River School District, NY	5	K-12	2,591
Lemon Grove School District, CA	8	K-8	*4,588
Palo Alto Unified School District, CA	17	K-12	*10,341
Consolidated Community School District 15, IL	20	K-8	*13,057
Beaufort County School District, SC	26	K-12	18,500
Grossmont Union High School District, CA	18	9-12	*24,447
Plano Independent School District, TX	65	K-12	52,063
Cleveland Municipal School District, OH	125	K-12	*69,000
Fulton County Schools, GA	88	K-12	75,188
Montgomery County Public Schools, MD	192	K-12	140,492
Clark County School District, NV	301	K-12	280,600

*Indicates 2003-2004 enrollment.
Other enrollment statistics are projections for 2004-05.

These school districts have proven the value of data as an asset to the learning organization and paved the road for more districts to pursue data-driven decision making. They have developed processes to use objective data measures to determine resource allocations, instructional strategies, and professional development. District and school teams define goals and objectives based on standards, measures, and community needs, then use data to test their assumptions and track progress throughout the year.

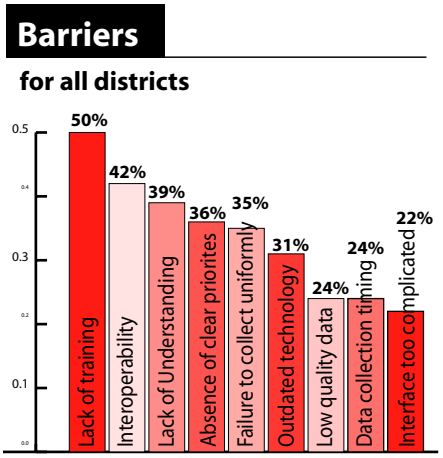
As data-driven decision making becomes integral to the educational institution, it is transforming the role of the teacher. The doors to the classroom have opened. Assessments throughout the year monitor all students' progress. Teachers team together to share strategies, goals, and student plans with principals, site support staff, and district administrators as well as students themselves and their parents. The best instructors have always held themselves accountable. Now they have the tools and information to share their success with the whole organization.

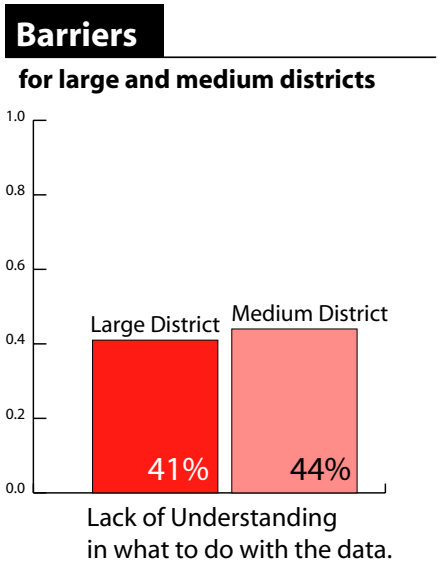
From Vision to Action: How School Districts Use Data to Improve Performance is written for school district leaders and K-12 educators who are seeking ways to implement a data-driven decision making process. All districts can benefit from the efforts of these leading school districts. DDDM is not a one-time implementation, but a commitment to continuous improvement. Each year instructional and administrative teams become more sophisticated in what they want to know and more expert in how they use their knowledge. Data-driven decision making frames a vision for what is possible and creates a plan for action: the vision to know and do.

Introduction

State and federal accountability mandates require widespread data collection and reporting. However, the real power of data is its local use. Data has the potential for improving school effectiveness, solving educational challenges and positively affecting the people involved in the process. (Wayman, Stringfield, Yakimowski, 2004)

Barriers to the effective and complete use of data for continuous improvement are both technological and human. The top two barriers to effective use of data for decision making were lack of training (50%) and interoperability (42%) according to a Grunwald Associates and CoSN survey of district-level decision makers. For large and medium sized districts (more than 7500 students), lack of understanding about what to do with the data also ranked high (41% and 44%). (Grunwald, 2004)





Districts seem to be making progress in capturing data to meet reporting requirements, but lag in their internal use of the data. Based on the response of nearly 600 school districts to an online Self Assessment Tool (3d2know.cosn.org), 40% rank themselves as "developing" and 20% as "proficient" in capturing data to meet reporting requirements. Yet only 31% describe themselves as "developing" and 15% as "proficient" in their ability to extract data for analysis and decision making. Even these numbers may over-estimate district proficiency. The assessments come from self-selected school districts, curious enough about data-driven decision making to be using the CoSN Data-Driven Decision Making Initiative Web site.

Districts that have developed systems and processes for data analysis provide a model for others. They have different approaches based on their goals, needs and resources, but their stories are instructive for all. Districts pioneering data-driven decision making use data to make the process of education visible, not in a single year or for students as a whole, but over time and for each individual. Leadership and team-work combined with effective processes, training, and data systems have transformed these educational institutions into learning organizations.

To understand how pioneer school districts have met the technological and human challenges of DDDM, *From Vision to Action* focuses on three areas of development and action:

- Leading in a learning organization;
- Moving from data collection to analysis to action; and
- Sustaining data-driven decision making.

Leadership in a Learning Organization

Leaders establish a climate of acceptance based on a shared responsibility for change rather than on a system of punishment and reward. Leadership is essential for promoting data-driven decision making, setting goals, defining terms, building teams, and managing through change.

"The most aggressive data users are fearless. They are willing to look at the data as an asset rather than something to be embarrassed about and stored away. They see data as an opportunity to improve performance, increase self-confidence, and regard for the organization."

Dennis P. Doyle,
Co-founder and CAO, SchoolNet

GOALS OF A LEARNING ORGANIZATION

In referring to an organization as a "learning organization," we do not simply mean an institution devoted to learning (such as a school or a university) but, rather, an organization that learns about itself in order to change and become better or more efficient at what it does. A learning organization identifies successful practice to encourage its spread and seeks out the root cause of poor performance in order to improve.

School districts effectively using DDDM have become learning organizations. The school board, superintendent, and principals set goals and manage expectations. Administrators, site specialists and teachers have permission to ask questions, make mistakes, share them, and learn from them.

Dr. Catherine McCaslin, supervisor of research program evaluation and assessment, Beaufort County (SC) School District points out that test scores and traditional data are no longer enough for today's learning organizations. Beaufort County district leaders engage in targeted analysis of both input and outcome data to direct goals, strategies, and evaluation. Teaching teams review frequent and relevant assessment data to identify why performances differ and what to do about it. Teams create graphs for each teacher and each class to present a clear, visual display of progress. Most schools have "data walls" to display classroom assessment data.

Learning Organization: An organization that changes based on feedback to become better or more efficient at what it does.

COMMON LANGUAGE AND COMMON PURPOSE

Transparency is a function of language as well as numbers. Shared terms and words become shorthand for a mindset, an approach, or a plan. On the other hand, terms that are not clearly explained and accepted may mean something different to everyone who hears them. Phrases such as high-stakes testing, vouchers, underachieving, interventions, and achievement gaps become politicized, obscuring more than they reveal. By explaining processes and methods captured by these terms, leaders create a commonly understood and accepted language of change.

The terms: "data" and "assessment" are used throughout this document and surface in almost every conversation about accountability. Data, as used by these districts, includes much more than standardized test scores. District data systems may include test scores, attendance, demographics, opinion surveys, teacher experience levels, teacher qualifications, class schedules, bus schedules, lunch menus—anything relevant to student performance.

Assessment requires explanation within the school district and to the community. End-of-year test scores are increasingly used by parents and the community to evaluate school quality. It is up to the district to educate the community, the media, parents, and students about what those scores mean and to give a frame of reference to them. Assessments used during the year may be formative assessments used for

instructional interventions or benchmark assessments to determine progress against an external measure. It is essential for teachers, principals and others to know what kind of assessment they are using and the proper method of analysis based on the reliability and validity of the measure.

Montgomery County (MD) Public Schools adopted the Baldrige framework to give everyone a common language and process for data-driven decision making. They began using DDDM with the principals and have begun to see DDDM move out of the principal's office into the classroom. "The vocabulary, the focus, has changed in just two years," said John Burke, director of the division of information services. "They are speaking about data in all kinds of meetings."

The Malcolm Baldrige Performance Framework:
Malcolm Baldrige National Quality Awards recognize organizational excellence based on a framework for assessing and measuring performance indicators with regard to providing value and satisfaction to customers. www.quality.nist.gov/

The language also makes its way beyond the school yard into the community where support for school bonds and initiatives is critical. "We need to operate on a political level that often has to do with perception rather than data," said Peter Robertson, former chief information officer, Cleveland (OH) Municipal School District. The district is responsible for educating the public about what the results mean. Beaufort County (SC) has found that releasing bad news with good news gives the community greater confidence in the district's accountability. They understand why resources and initiatives are needed.

THE TEAM APPROACH TO SUCCESS

Data-driven decision making relies on the involvement of all stakeholders in the learning organization. At the district level, the design and implementation of systems involves the IT department, curriculum and instruction, assessment and evaluation, and professional development with oversight by the superintendent. The integration of the systems into classroom practice requires the buy-in of teachers, principals and site-based support staff.

As part of the district strategic planning process in Fulton County (GA), each school creates a strategic plan under the direction of the principal and the area superintendent. Teachers add content area input to the district plan. A school-wide cross-functional team works on requirements for disaggregation and determines interim measures. Experts from the district planning and evaluation division meet with the area superintendent to discuss specific data and develop performance measures and strategies based upon identified strengths and weaknesses. The district's comprehensive data warehouse and information system gives teams access to the statistical information they need for planning.

Leaders engage stakeholders in a dynamic process that moves beyond accountability to continuous improvement by valuing data, using it, and celebrating success to generate more use. As data becomes integrated into the decision-making process, typical district roles may change to include more analysis and different kinds of leadership. How districts define roles, distribute responsibilities and use technology varies, depending on their resources, skills sets, and the evolution of the team.

In the pages that follow we look more closely at the different players involved in building an effective DDDM team, with examples from successful districts.

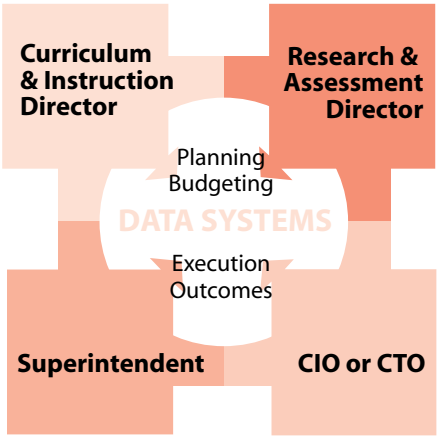
AT THE DISTRICT LEVEL

Superintendent

DDDM starts with the superintendent who determines the systems and process for achieving the goals set by the school board. The superintendent provides leadership, models accountability, and presents the district's achievements to the community.

- When L. McLean King became superintendent of Lemon Grove (CA) School District, 7 of the 8 district schools were underachieving schools. Using data analysis of state achievement tests, his team identified achievement gaps among groups of students according to ethnicity, language, and socioeconomic factors. District and school plans set curriculum priorities and channeled resources based on student need to increase achievement for all students.
- As superintendent of Pearl River School District (NY), Frank Auriemma oversaw the evolution of DDDM from planning to operational in the district's five schools. He set achievable goals to address the most critical needs of the district, such as improving student achievement on the state Regent's exam for high school students.
- Jim Conyers, retired Superintendent of Community Consolidated School District 15 in Palatine (IL), created a district advisory committee including private sector partners. The committee helped Conyers identify types of data to measure organizational effectiveness beyond "results" data or lagging indicators. The district now tracks and analyses more than 250 variables using an advanced data warehousing and reporting system.

District Collaboration



CIO or CTO

The Chief Information Officer or Chief Technology Officer is responsible for managing the technology infrastructure, coordinating system planning and development, and providing access tools. Many CIOs find they have to do more with less, increasing reliability on and availability of technology systems with stagnant or declining technology budgets. They also have to plan for the future and stay current with new technology. They often play the role of advisor and consensus builder to get the go-ahead for information initiatives. In some districts, the CIO or another director-level member is responsible for the process of managing data. This person prescribes the guidelines, policies and tools that everyone in the department uses to manage their data.

- In the Cleveland Municipal District, the most recent CIO had experience with both technology and instruction to help people who are responsible for systems understand the needs of administrators and teachers who use data for instructional decisions.
- The Fulton County Schools CIO is a cabinet member who works with all divisions to develop procedures and systems to reach strategic goals as well as show members what's possible with new tools. For example, help desk data provides valuable measures of system needs and performance levels across the large school district.

Research and Assessment

Many districts have established research and assessment divisions to oversee testing, reporting, and evaluation. This group provides analysis to help principals and teachers use the data and develop assessment tools that are aligned to standards. They may evaluate commercial assessment systems or help the district develop their own tools.

- At Palo Alto (CA) Unified School District, the research and assessment department is the only group permitted access to raw student information data as a security precaution. They disaggregate and correlate data to provide electronic access to reports for appropriate personnel. This structure helps the district comply with important federal privacy legislation.

Curriculum and Instruction

The curriculum and instruction department plays a critical role during the development of data systems to make sure that assessment and evaluation reports are aligned to both the standards and the district curriculum. Administrators in this department often provide the training necessary for teachers and principals to use data reports for intervention and planning.

- At Plano (TX) Independent School District, the curriculum department designs the curriculum and instructional strategies. The research and assessment department tracks testing, files reports, and runs the operations. The IT department ensures an available and reliable resource to collect and access the information. All three partner to provide professional development.
- The Grossmont (CA) Union High School District Educational Services Department conducts professional development with personnel to help them ask questions and query the data for answers to inform action plans.

AT THE SITE LEVEL

Principals

Principals are often the change agents for DDDM. Without their commitment, it will be difficult for data to become an integral part of instruction. Principals provide leadership to integrate data into the practice of teachers. They arrange and coordinate professional development to sustain success and monitor progress with a focus on student achievement. As the curriculum becomes centralized and increasingly prescriptive, the principal's role also becomes prescriptive—telling teachers what to teach and when to teach it.

- Martha Greenway, chief planning and evaluation officer, Fulton County Schools, describes the principal's role in her district as "a leader in understanding the strengths and opportunities within the building for developing coherent strategies for improvement."

Instructional or Technology Specialists

Site-based specialists or support teams assist principals and teachers with data mining and analysis. They may have special expertise or training to query the data systems and produce reports needed to inform decisions.

- The Beaufort County School District education technology development specialist helps teachers use technology to communicate what they find through visual displays of the data and easy-to-understand reports for parents.
- In Clark County (NV), teachers, counselors, librarians, and district specialists form leadership teams to review data.
- As the liaison between the teaching staff and the district administration, the curriculum support teacher at Bethune Elementary School in Fulton County provides coaching, monitors curriculum delivery, and offers training workshops.
- The technology professional developer in some Cleveland schools supports the principal and teachers by mining data and delivering information in easy-to-use formats.

Teachers

Involving classroom teachers during the design and testing of DDDM systems builds support from the people who will use it to reach students. How much analysis teachers do themselves depends on the availability of tools, support, and training.

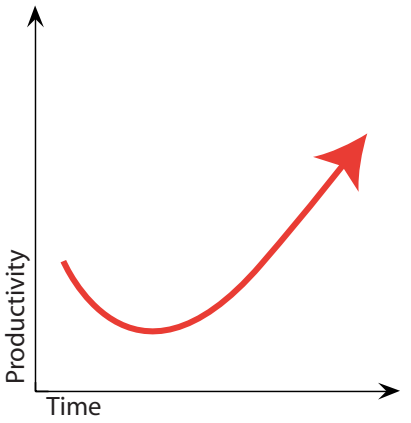
- When Grossmont Union High School District developed interim assessments based on the California STAR test and the high school exit exam, they involved teachers during the design process.
- Beaufort County made use of formal teacher teams based on student groups (by grade level or content) to create data teams. The groups develop assessments, share results, and discuss instructional practices.

- Principal Steve Curry in Fulton County finds that as teachers work together with data, they become more analytical and want more information to apply to the classroom. During staff meetings, they show each other how to pull up a report, view grade-level student information and determine interventions.

MANAGING THROUGH THE J-CURVE

As districts begin to extract and analyze data to change practice, participants experience a j-curve in productivity. Mastering a new discipline generally takes time and effort with disappointing or limited results at first. To manage their teams through the dip of the curve, leaders focus on high-priority data, easy wins, and ways to celebrate success.

Productivity J-curve



According to Conyers from CCSD 15, "When you are getting started, it's hard to say feedback is your friend. You look bad. You are reporting how students did that year, and you can't show that you made the difference and you know you made it."

"When the program starts, you are at a steady state, but want a different kind of steady state. When you alter performance, usually you decrease performance. If you want a j-curve with a narrow dip and a sharp upturn, collect data and help teachers move performance."

Jim Schnitz, Education Strategy Executive, IBM

No district or organization gets data-driven decision making right the first time. As a learning organization, district staff members need to be open and honest about results and have the freedom and responsibility to test and try new strategies for improvement. Leadership teams create a system for feedback and continuous improvement. The result is a common understanding of what goes into the aggregate data and a process for helping each student meet the same standard for success.

Warren Williams, Assistant Superintendent, Grossmont Union High School District, explained that most people in the district went through a common learning curve: "This is too much to deal with; this is really interesting; I wish I had known this before." As DDDM becomes part of the conversation and the process, users become more sophisticated and effective in their use of it.

From Data Collection to Analysis to Action

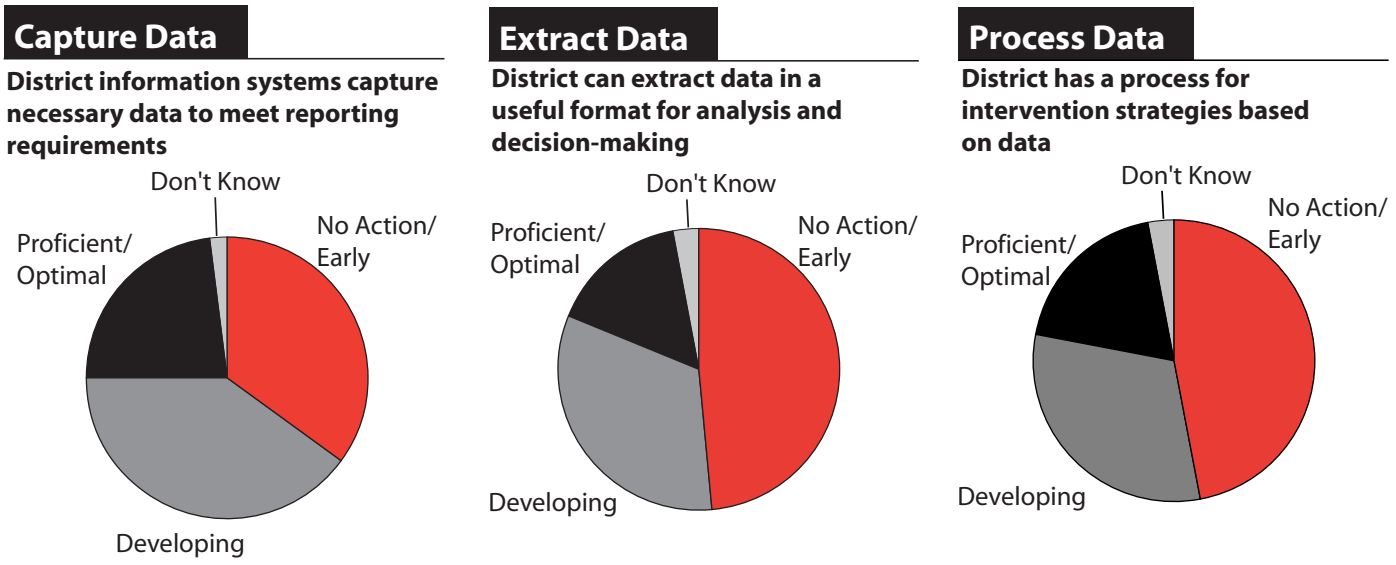
For data-driven decision making to take hold, a district must be prepared with the technology to collect, analyze, and report out data and with the skills and human resources to understand and act on the information. Some surveys indicate that access and interoperability of technology are the barriers to integration. (Grunwald, 2004) Other experts suggest that the technology exists, but schools do not have the structures in place to integrate data into practice. (Wayman, interview, 2004) Perhaps both are true. With close to 14,000 public school districts and 50 different state requirements, districts engaged in data-driven decision making have taken many different paths and achieved different levels of success.

Whether a district pursues a full technological solution or a combination of technology tools and hands-on staff support, the goal is more direct instruction in the classroom to help every student progress toward standards and increase achievement. The real power of technology and the use of data is the ability to personalize the educational experience for each and every student. Rather than grouping students generally or expecting to provide one-to-one instruction, real-time, relevant data helps teachers create flexible groups based on changing needs of students.

Data-driven decision making can be divided into three functional areas:

- collection, integration and dissemination of data;
- analysis and reporting of data, and;
- process and procedures for acting on the data.

Most districts have made progress in the first area and are developing the second. In the third area, districts cite operational changes such as adjusted schedules, reallocated budgets, and refined professional development offerings. However, the most challenging task remains to provide teachers with data and proven strategies for targeted interventions in the classroom.



Source: CoSN Self Assessment Tool for School Districts, 2004. 3d2know.cosn.org/assessment/survey.cfm

FULL VISIBILITY: DATA COLLECTION AND INTEGRATION

School districts are finding value in the collection and integration of all types of data: student information systems, assessment and evaluation, human resources, finance, and even facilities. They have made fundamental changes in operations as a result of the information. The real power of data, however, is in the ways in which it can directly and positively affect student performance and increase levels of achievement. [For more information about operational change, please see *Vision to Know and Do: The Power of Data as a Tool in Educational Decision Making*.]

Data Warehouse Development
To manage information about every student over time requires sophisticated data warehouse systems with integrated student information and assessment systems. The availability and flexibility of the information in data warehouses makes it possible to disaggregate information and identify trends and gaps.

"We gather the information from the state test and other measures throughout the year," said Darryl LaGace, Lemon Grove School District, "and combine it in a data warehouse to easily access the information. Having all the data is one thing but being able to use it is a big difference."

Data Warehouse: Electronic system that consolidates and stores data sets from many sources over time in formats that can be accessed.

Data warehouse systems combined with technology to create, score, and distribute test items enables more frequent and more consistent assessment. These test items might be designed as benchmarks to indicate mastery on standards and in preparation for evaluative tests at the end of the year or they may be more formative to give teachers quick feedback on the effectiveness of instruction and the challenges for each student.

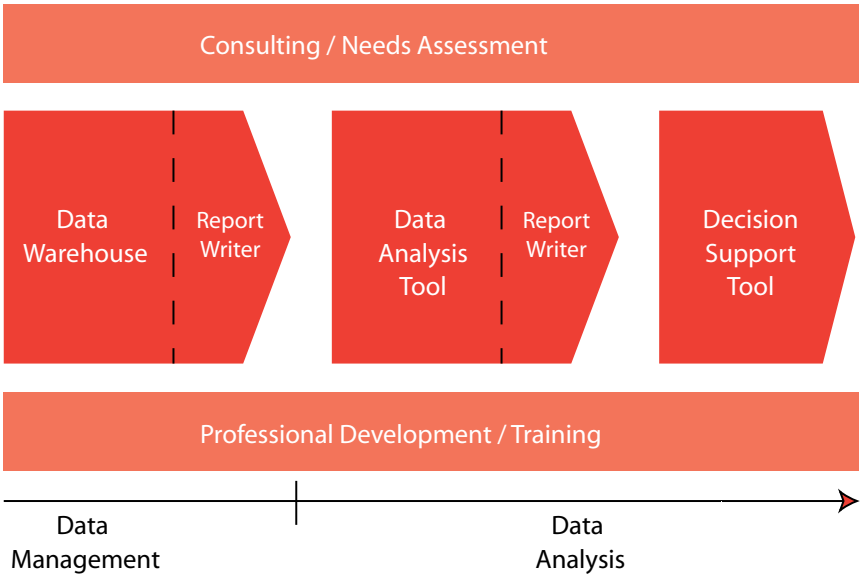
Collecting and storing the data is only one part of the data warehouse system. Districts must also adopt methods for authenticating and validating data, safeguards and security to comply with privacy legislation and protect data, and business continuity plans in case of loss or system failure. The Family Educational Rights and Privacy Act (FERPA, http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html) and the Health Insurance Portability and Accountability Act (HIPAA, http://www.hhs.gov/ocr/hipaa/) are two laws that specify what can and cannot be shared. Palo Alto Unified School District provides training for teachers and administrators on the implications of these laws for student privacy and rights.

Integration and Dissemination
While 90% of districts use Student Information Systems to prepare reports, only 20% of districts have data management and analysis systems deployed to use data and reports within the organization, estimates Matthew Stein, analyst with Eduventures. Many districts do not have the internal resources to develop and maintain a data analysis and management system that both meets reporting requirements and provides data tools for the classroom. And yet, with NCLB requiring every school to show Adequate Yearly Progress (AYP) or allow students to transfer, school districts must plan to meet these mandates quickly.

For districts that have not developed their own data systems in-house, there are an increasing number of commercially available systems worth considering. At their most comprehensive, these integrated instructional system combine standards-based instructional resources with multiple assessment tools, data management and analysis systems, and professional development. In SuperTECH News, Elliot Levinson describes the combination of these functions in a single system as "the education killer app," the convergence of "written, taught, and tested curriculum" with data reporting and actions. (Levinson, 2004) Another option is to outsource the analysis component to commercial organizations or partner with nonprofit groups. Whatever approach is chosen, systems to integrate and disseminate data for meaningful use in a timely manner require an investment of time and money.

Eduventures Framework

for Data Management and Analysis Systems



Leading school districts have established a combination of technical and human support tools to move data from the state and district warehouses to the schoolhouse. There is a spectrum of technology solutions for gathering, managing and analyzing data that reduce staff time required but that can also create new staff positions and demands for existing staff. (Eduventures, 2003)

- Rick Rozzelle, technology and management consultant for Tech-knowledge Consulting, Inc., suggests that districts begin their development by looking at the core processes in each area. Once the process is understood, technology tools can be determined and applied.
- Darryl LaGace at Lemon Grove School District recommends that districts spend time reviewing systems, look at customer references, visit or call districts using the tools, check the district's state reports, and have teachers test the system.
- The Idaho State Department of Education has launched a state-wide system for data management, analysis, and instructional support. The state hosts regional DDDM workshops to show data teams how to use curriculum guides with lessons, activities, and end of course assessments.

(For more information on integrated solutions and individual components see articles by Wayman, Stringfield, Yakimowski; Levinson, DeMark; Stein.)

Assessments

The immediate challenge for most school districts with data reporting is showing AYP. Technical capacity and analytic tools to conduct assessments throughout the year give districts and schools a way to spot check progress and make adjustments before the end of the year. Peter Robertson, the former Cleveland MSD Chief Information Officer, compares yearly progress to losing weight: "How do you drive a weight loss program? The data from your scale does not help you lose weight. It's the data about what you ate and your exercise program that matter. That's the equivalent of formative assessment data and that's how you monitor and change behaviors."

Districts are providing teachers with interim, benchmark assessments tied to state and district standards, as well as formative assessment tools. These tools provide quick snapshots of where students are with regard to the progress they are expected to make. Although teachers have always used tests and quizzes to track student progress, these measures did not necessarily relate to standards or the assessment systems did not provide results in a timely manner.

"We distinguish the *breadth* of the assessment (how much content it is sampling) from the *depth* of the assessment (how much it is telling about a student's ability in a particularly area of content)," said Robertson. "Benchmark assessments are usually broad, not deep. Short-cycle assessments, by contrast, ask enough questions to give a detailed picture of the student in that area."

Assessment technology collects and grades questions, returning results shortly after tests are taken, when targeted interventions and changes in teaching approaches are most appropriate and likely to result in improvement for students. Depending on the system, a specialist may help teachers analyze results or a team of teachers will analyze and discuss the data within the context of school goals.

"We do a little more each month," said Sally Ahern, third grade teacher, San Miguel Elementary School in Lemon Grove. "Last year, our district-wide SAM and SALLI test results [a 30-question math test and 30-question language arts test developed by the San Diego County Office of Education] became available online. We give the test, get the results in 24 hours, and see areas of weakness based on standards. We group students and re-teach as needed. We could not have done it before with paper and pencil."

Alignment Required

When school districts create assessment systems to provide tools for feedback and reporting to instructors and students, they need to clearly define the type of assessment used and the purpose. Is the assessment summative or formative? Is it intended for diagnosis, intervention, or evaluation? If assessment tools and curriculum are not aligned to the standards measured in year-end tests or valid for the type of analysis used, the data can be misleading and even counterproductive.

Before teachers rely on assessments to drive instruction, district or curriculum specialists need to audit the curriculum for alignment to standards, set benchmarks for progress, and then assign assessment tools to measure progress. Many districts focus on alignment in a particular area for improvement, such as literacy or math and science, to begin the process.

NCLB and the standards-based movement has not only identified the achievement gap among students, but has also identified the gap which often exists between district curriculum and the curriculum that is tested. "Before introducing assessment data and other kinds of data to the decision making process," said Leslie Pulliam, vice president, ETS-Pulliam, "district administrators need to take the time to understand the alignment issue."

For example, a district buys a state-approved textbook, confident that it will cover the state standards. Teachers use end of chapter tests to guide instruction and pace. However, the test questions may be below grade level or not related to the standards. The teacher then uses the faulty data to re-teach concepts students missed and spends valuable class time on subjects unrelated to the standards. Or teachers use their own assessments based on their instructional content rather than state standards. In both cases, students progress without learning what they need to know to master the next level of standards and they fare poorly on end-of-the-year exams.

Through aligned assessments, pacing guides, and support for intervention, districts help teachers use appropriate measures to track students' progress.

- Grossmont USD struggled with developing an effective math curriculum. The curriculum department introduced new math classes to address standards at different paces to meet different student needs, but they could not measure which strategies worked. By aligning the curriculum and assessment to standards, they consolidated courses and created a district-wide measure for achievement.
- Lemon Grove School District has developed pacing guides aligned to multiple measures to assess student, teacher, or school progress toward specific goals measured on high-stakes tests.
- Charlotte-Mecklenburg Schools (NC) has taken a centralized, prescriptive approach. The district has documented the curriculum for each grade level and made it available online, identifying what material to use and what to teach each week. Administrators review quarterly assessments, and intervention teams help teachers get back on track.

Data Collection and Integration Checklist

- √ Is a data warehouse in place to collect, validate, and authenticate data with appropriate security and backup protections?
- √ Are the technical and human support tools in place to move data from the warehouse to the schoolhouse?
- √ Are systems developed to integrate data into the instructional process?
- √ Are teachers using common interim or benchmark assessments to measure progress?
- √ Are curriculum and assessments aligned to standards?

TO KNOW: DATA ANALYSIS

Numbers are open to interpretation, and most staff members have neither the training nor the time to perform analysis on data. For many school districts "the data checks in, but it doesn't check out," according to Jeff Wayman, Johns Hopkins University.

When Beaufort County introduced a laptop program, they tracked student time on task as a measure of the program's success. After initial gains, student time began to decline. What happened? Had the "wow" factor of the new technology worn off? Were the laptops failing to motivate students to engage in their studies? Further study showed that students had developed skills to work more quickly and more efficiently. They produced more documents with better results in less time than when the program began.

To promote the regular use of data for decision making, Wayman notes that necessary conditions:

- Information must be easy to use for teachers and scalable across the district.
- The district must recognize that teachers will advance on a continuum of adoption from simple data use to more sophisticated inquiry and analysis.
- Although the goal of the system is comprehensive, districts should start by addressing a specific, critical need with data-driven decision making.

Easy-To-Use, Real-Time Data

For data to become part of a teacher's tool kit, reports must be in an easy-to-use format with a fast turn around. Teachers need access to tools that allow them to ask questions of the data and test the results. Districts may choose from off-the-shelf products, have customized tools built by experts, or develop the tools in-house.

- Cleveland Municipal School District is in the process of rolling out an Academic Standards and Assessment System to give schools direct access to curricular material and assessment items. Donna Snodgrass, Director of Classroom Assessment, developed several rules to customize the data delivery tool for presenting information to principals:
  - organize the data numerically (not alphabetically),
  - describe the data objectively,
  - interpret data based on users' questions, and
  - provide visual displays of information.
- Grossmont Union High School District has developed a web-based Performance Profile for each student. The snapshot combines student course history, grades, and graduation requirements with standardized test scores for teachers, administrators, parents, and students to use.
- Teachers working with Appalachia Educational Laboratory (AEL) receive three reports per year showing whether students have mastery, partial mastery or non-mastery of each standard. The visual display and the connection to the standards make it easy for teachers to use the information and make decisions.
- To help principals complete school improvement plans required by the state, Clark County had a query created to pull all of the required data from the data warehouse with one push of a button. The easy access helped teachers and administrators accomplish their work more quickly, and see the benefits of using data.

Confidence in the Process

When a team of teachers, a principal, and support staff first sit down with reports and numbers, they often need guidance to understand the information. They bring experience and knowledge of their students that should be acknowledged and leveraged to make better sense of the data. Many districts have created staff positions within the district or at the school site to provide analysis and training. The hands-on support helps decision makers become more sophisticated in their use of data, and as analytic and instructional tools come online, they are ready to use them.

- Some Cleveland principals rely on technology professional developers to provide data mining and analysis. At the start of the school year, Patrick Henry Middle School Technology Professional Developer Mark Quinn analyzes incoming students from feeder elementary schools to help the principal and teachers know what to expect of students and how to group them to address specific learning needs.
- The Fulton County Schools Curriculum Support Teacher collects test scores and interim data, dissects the information according to the strategic plan and adds it to the year's report. When school team members review the report, they have their plans as well as the results to discuss curriculum, programs, and teacher assignments.

Item Analysis: Data in Context

Item analysis is the process of looking at the results of a particular test item to determine whether or not students have met a particular standard. Rather than place blame on the student for failing the question or on the teacher for failing to teach the standard, item analysis is used to diagnose the problem. Teachers, principals, and other decision makers review all factors: How did all students answer? Which groups or individuals missed the question? What other measures tested the concept and how do those results compare? Is the pacing correct? Was the question valid? Is the curriculum aligned?

Item Analysis: The process of reviewing specific test item results to determine whether or not students learned a specific standard.

Teachers have access to a wealth of instructional content from textbooks, print and electronic sources, as well as their own materials. Item analysis of interim assessments helps teachers zero in on the materials and instruction that works.

- When the California STAR data is released, Lemon Grove teachers look for cluster scores to review particular items and identify the mismatch between teaching and assessment of a standard.
- Alisha Lyas-Jones, curriculum support teacher at Bethune Elementary in Georgia, helps teachers use item analysis to understand why students missed the questions. "We look at it as a team," she said. "We look at programming, do we need to move teachers? We look at the curriculum that was being taught. Sometimes there are errors in the guide. If every child missed number 17. I would pull the test, assess the question. If the question is incorrect, I report it."
- AEL trains math and science teachers in underperforming West Virginia schools to use item analysis to improve student outcomes. When a team of teachers looked at test items, they found that aggregate 5th grade math scores masked a problem of persistent weakness in students understanding fractions. Targeted professional development helped improve instruction in fractions and benchmark assessments confirmed that the changes worked.

"A team of teachers discovering a problem together by going through the data is more powerful than someone telling them what to do," said Kimberly Hambrick, Director of Assessment, AEL, Inc.

Data Analysis Checklist

- √ Do teachers have access to data in an easy-to-use format soon after assessment?
- √ Does the district support the process with analytical tools and trained staff to give decision makers confidence in the data and tools?
- √ Are teachers trained to use item analysis to understand student outcomes and instructional effectiveness?

AND DO: USING THE DATA

Data-driven decision making takes the numbers out of the file cabinet and puts them on the table for discussion. By integrating student information systems with standards-based instructional resources and multiple measure assessments, districts turn data reports from a "passive repository" into a "stockpile" of powerful, dynamic knowledge about how and what students are learning and whether or not they will achieve mastery. (Grulich, 2004)

"Teachers have responded to the taste of data with a voracious appetite for more and better information. The availability of data has called into question the veracity of a number of long-held assumptions; including everything from how students are placed in courses, to how well instruction aligns to standard."

Alan Grulich
Director of Assessment and Evaluation
Grossmont Union High School District

When the data comes back to the school in a format that principals and teachers can use to test hunches and evaluate strategies, principals and teachers become learners as well. To enable meaningful discussions and action, districts provide schools with tools for:

- interpreting the data and querying relations;
- identifying, recommending and implementing intervention based on data; and
- supporting teachers to use targeted interventions.

Interpreting Data and Querying Relations

School site teams use data to start discussions about what the information means and what they can do about it. Working with professional analysts and analytic tools to query the data and test their assumptions, the goal is to uncover the root cause of a weakness or identify a successful strategy.

- John Conyers, CCSD 15, sees many districts take data, brainstorm solutions and then launch new programs without really knowing if they will work. His district adopted the technique of asking "why" at least five times to find the root cause of a problem. Using this method, the CCSD 15 curriculum team found that they could drop 30 percent of the skills they were teaching and achieve the same level of excellence with more focus.
- Principal Donn Griffiths, San Altos Elementary School in Lemon Grove, hired a retired reading instructor to meet with teachers to review assessment profiles—a record of results on different tests the school collected and filed for years. Teachers then used analysis to identify at-risk students and address their weaknesses.
- Battelle for Kids in Ohio sponsors a web delivery of easily understandable school and student reporting from a series of rigorous statistical analyses. The application uses the testing required by NCLB proactively to help educators address individual student need. Users drill from value-added reporting of schooling influence to historical student test scores, plus student projections to future academic milestones. The approach combines the best of technology and statistical methods to empower educators in decision making Jim Mahoney, executive director, Battelle for Kids, finds that as teachers experience the power of the information, they begin to request more reports. The role of the specialist or advisor shifts from showing teams the data to helping them design their own research for real-time answers to their questions.

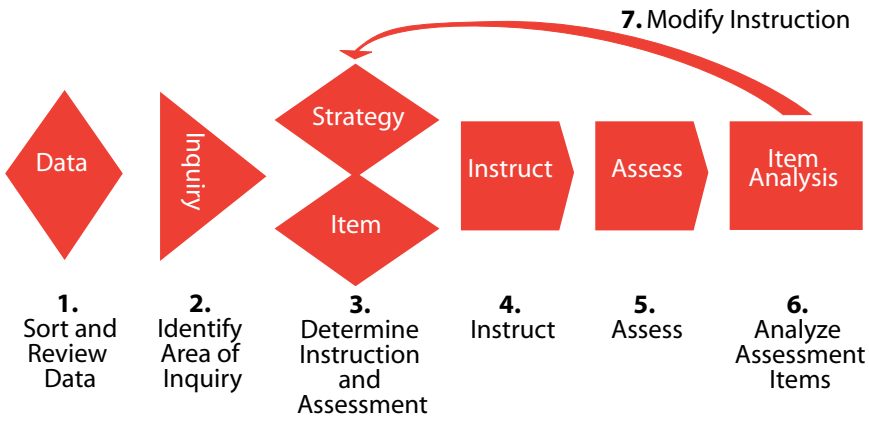
Intervention
Action to change instructional delivery to improve student achievement.

Intervention Based on Data

Interventions used by educators include reemphasizing skills, utilizing additional diagnostics to get at the root cause, changing instructional materials, and creating cohort groups within schools and classrooms of students who have a similar achievement gap or pattern to apply instructional strategies.

Karlene McCormick-Lee, Assistant Superintendent, Clark County (NV), describes the process as: sort and review data, identify an area for inquiry, determine instruction, develop an item for assessment, instruct, assess, and use item analysis to determine whether it worked.

Instructional Intervention



Interventions help teachers offer more targeted, direct instruction at a standard level through flexible grouping. Unlike tracking, all groups are expected to achieve the same standards, but different students may require instruction at different paces or through different methods. Grouping and other interventions recover the child who has fallen into a cycle of low expectations and poor results.

To third grade teacher Sally Ahern, intervention is the most powerful use of data in education. Her second language learners are not low-achieving students; they have weak and strong areas. Multiple measures results (from assessment data) that she used at her desktop helped her pinpoint instruction and build on those strengths to achieve standards without blame. If her students struggle with a 2nd grade standard in 3rd grade, Ahern has to address the 2nd grade standard before expecting her students to achieve the 3rd grade standard.

Leslie Pulliam describes the process of determining intervention as unwrapping the data to "find the teachable moment and teach from the student's ability level up. If a common reading standard at a 3rd grade level requires a student to read a fictional passage and identify character, plot, and setting, the data from the assessment must help educators determine what the student can and cannot do. Can the student actually read? Can the student comprehend what they read? Do they not know what character, plot, or setting is?" If a student does not achieve the standard, the teacher needs to know why in order to apply an intervention.

Support for Teachers

Once again, the burden of data-driven decision making to improve student achievement lands on the shoulders of the teacher. After all the mining, grouping, and strategizing, the teacher has only so many hours in the day. Districts that give teachers time and resources to work together as well as specific, achievable goals to meet create a cooperative climate for change. They present data as a guide for instruction rather than a method of evaluation. Principals model data use and encourage it. They talk about the benefits and share successes. They organize schedules so that teams have time to meet, plan, train, and conduct evaluation.

As Plano ISD makes more kinds of data more easily available to teachers, they also support professional development and teacher involvement in the process. Plano transitioned from a disparate collection of data to an integrated data warehouse with a web-based delivery system to the teacher's desktop system. Principals and teachers agree on what to gather and its relevance, becoming comfortable correlating data. Teachers and curriculum coordinators use item analysis to align curriculum. Professional development at the campus level focuses on appropriate data use to prevent inappropriate conclusions. "They lead themselves to ask questions, and map scores in relation to state scores," according to Jim Hirsch, assistant superintendent for technology.

"We use the data to raise the questions and allow the answers and solutions to come from the group of principals or teachers," said Alan Grulich, director of assessment and evaluation, Grossmont Union High School District. "The district facilitator brings a comprehensive analysis to the data and is there as a resource to make sure that perceptions of the data are accurate. The team thinks about the issues and lets them simmer. Someone comes up with a solution. Having an objective basis to talk about performance or an intervention helps bring everyone to the same place."

The goal of the AEL Intensive Sites program is to increase capacity for DDDM throughout under-performing schools. Consultants start with middle school math or science teachers. Each school has a data mentor who receives intensive training. From this foundation, DDDM moves across grade levels, through content areas, and down to feeder schools. Because schools experience turnover, DDDM has to become system-wide to be persistent. An AEL study of their three-year intensive site program for mathematics and science shows that teachers are changing instructional practices by increasing strategies and using assessment results. However, they are challenged by the amount of time required to change instructional practice. (Bradley, April 2004)

Most practitioners agree that DDDM does not expect to turn teachers into statisticians. In fact, eager teachers without adequate training run the risk of misusing data and drawing the wrong conclusions from their analysis. The role that data will play in the daily activities of the teacher is still being defined and most likely will vary by the teacher's affinity for data use as well as classroom support. Districts that have successfully implemented DDDM in the classroom offer teachers some combination of one-to-one on-site support, electronic reporting and analysis tools, and planning teams. Successful districts have invested years in their personnel through professional development, coaching, mentoring, and encouragement. The results can be profound.

"Teachers pull me aside and show me the kids' vision statements and show me their growth charts," said John Conyers, retired superintendent of CCSD15. "It took a long time to get there. We have more people empowered to do the right thing with the data. I was proud to be associated with all my employees."

Building Momentum

Planning for DDDM can become an all-consuming process with perpetual refinement of processes and adjustment to the technology. At some point, district leaders need to choose an area for improvement and begin the process. Staff members will have different levels of experience and interest in changing their practice to incorporate data. Leaders need to choose specific areas to build early success toward long-term change. The choice may be based on easy access to the results of an existing assessment tool or a district or state priority for change.

"After a while, everyone has a hand in the data and improving student performance. When the fly wheel starts going, it has a life of its own."

John Conyers, retired Superintendent Community Consolidated School District 15, Illinois

Using Data Checklist

- √ Does the district provide the tools and training to interpret and query data?
- √ Have data teams developed a process for identifying, recommending and implementing intervention based on data?
- √ Do district and school-site change agents support teachers and their use of targeted interventions?

Sustainable Data-Driven Decision Making

Schools districts using data-driven decision making come in all sizes, from all parts of the country, and with varied student demographics. What they share is a commitment to improve student achievement, a willingness to question everything, and a district-wide vision. Because DDDM creates an environment of continuous improvement, these districts always see ways to improve and enhance their systems and processes. The following profiles highlight the success and efforts of three pioneer school districts.

FULTON COUNTY SCHOOLS, ATLANTA, GEORGIA

www.fultonschools.org/
Elementary Schools: 52
Middle Schools: 18
High Schools: 12
Alternative high schools and charter schools: 6
Enrollment: 75,188

Fulton County Schools, a large school district outside of Atlanta, Georgia, has adopted data-driven decision as part of a comprehensive strategic planning process with everyone involved – from classroom teachers to principals to district administrators. The district data management and analysis systems provide increasingly customized and more frequent information to decision makers.

About Fulton County Schools

Fulton County Schools is the fourth largest school district in Georgia with more than 75,000 students and 9,900 full-time employees. The district is growing with the addition of 19 new schools since 1999 and plans for 10 more schools, bringing the total up to 98. Located outside of Atlanta, the district serves the cities of Alpharetta, Roswell, and Mountain Park in the north, and College Park, East Point, Fairburn, Hapeville, Union City, Palmetto, and unincorporated portions of Fulton County in the south.

Data-Driven Decision Making: Starting the Process

At the heart of Fulton County Schools DDDM is the district-wide strategic planning process. Each school creates a strategic plan under the direction of the principal with assistance from the curriculum support teacher. “We don’t just have an opinion that something is a good idea, we make program decisions based on data and strategy,” said Principal Steve Curry.

Teachers provide content area input to the district plan. The school team meets with a cross-functional district team to define requirements for disaggregation and determine interim measures. Experts from the district planning and evaluation division meet with the area superintendent and members of the school planning team to discuss the specific data and help school teams understand it within the context of their school. The district sets benchmarks to help area superintendents and principals set goals and meet expectations.

The strategic planning process provides the framework for data-driven decision making with expectations focused on student achievement. The district data warehouse generates customized reports for specific teachers and populations to support their planning process. Standardized, system-level interim assessments create a common way to look at student achievement in real time across the district.

Data-Driven Decision Making: Implementation
For the first two years, the district experienced push-back from principals and teachers according to Martha Greenway, chief planning and evaluation officer. Principals did not expect the district to return their reports with questions and suggestions. They expected to file their plan as in previous years without comment. The school personnel felt criticized and frustrated.

Cross-functional district teams went to the school site to help principals, teachers, and site specialists understand the data and what they could do to change it. Legitimate concerns about assessment tools, data, and curriculum were acknowledged and addressed as the district refined the DDDM process. As school staff became comfortable and began to see results, they wanted to learn more. Principal Steve Curry uses his school's strategic plan as a touchstone for all activities. Because everyone knows the plan and helps create it, they act on it each day. "Everything we do, the plan reflects or is reflected by the plan," he said.

Professional development in Fulton County focuses on differentiated instruction, assessment, and questioning techniques with targeted emphasis to address weaknesses. Rather than offer A to Z staff development, the district clusters training into areas where teachers need more help. If a school has a weakness in a curriculum area, the district sends a team to work with subject area teachers or department chairs to look at alternative strategies. New staff members attend workshops to learn the planning framework and the district's language for measurement, evaluation, and assessment.

Data-Driven Decision Making: Real Results
By showcasing the best strategic plans, the school board identified and celebrated excellence, raising the standard and communicating it to everyone in the school and the community. When NCLB and state accountability requirements became mandatory, Fulton County Schools were ready. In 2003-04, all elementary schools and all but one new middle school met their AYP targets. Teachers know where students fall into performance categories and know how to differentiate instruction to meet their needs. The district's next target are the high schools where lack of frequent, course-level data has made DDDM adoption more challenging.

LEMON GROVE SCHOOL DISTRICT, LEMON GROVE, CALIFORNIA

www.lgsd.k12.ca.us
Elementary Schools: 6
Middle Schools: 2
Enrollment: 4,441

Lemon Grove School District turned underperforming schools around by holding all students to high standards and using disaggregated data to target resources. Ubiquitous access to technology resources gives everyone in the district access to the tools they need to make better decisions and improve direct instruction.

About Lemon Grove School District
Lemon Grove is a small, elementary school district located in a community of retirees and working-class families, six miles east of San Diego, California. The six elementary and two middle schools serve approximately 4,600 students. The year that L. McLean King became superintendent, seven of the district schools were ranked as underachieving by the California Academic Performance Index. Given the diversity and economic status of the community, many people did not believe that the students could reach the standards achieved in neighboring schools.

Data-Driven Decision Making: Starting the Process

King and his leadership team created three broad initiatives to address the achievement gap:

- Technology integration to provide ubiquitous access to applications and resources for all students and teachers.
- A literacy program of early intervention and reading recovery with teachers trained to provide direct intervention in alignment with state and national goals.
- An equity program to address the achievement gap between African American or Hispanic/Latino students and white students.

With ubiquitous access to technology and electronic resources, teachers had access to tools and resources for intervention and improvement. The district's data analysis system consolidates data across the district with multiple measures, criterion assessments and state testing. Principals and teachers have used paper reports to identify achievement gaps and areas of need since 1999. In 2002, the district rolled out online reports that are easy to understand and query.

Every school presents a strategic plan based on their data and district-wide goals. The goals determine priority areas and the data helps identify strategic groups of students to focus intervention and resources. At the beginning of the year, teachers use the system to look at each child in their classroom and break down student needs for instruction. Interim assessments help teachers monitor the progress of student achievement for correction and refinement throughout the school year.

"Our principals and teachers have information on last year's students to assess programs," said Barbara Allen, project director for LemonLINK. "They bring up student scores to look at data as far back as the student has been in the district. Now, they have lots of information to use to determine instruction."

Data-Driven Decision Making: Implementation

The transition from paper to electronic formatting for multiple measure reports has transformed the way that data is used in schools. Teachers and principals used to go through the paper reports with a highlighter to identify achievement gaps and needs. They spent valuable time organizing and reviewing reports rather than analyzing the data. The new data system gives teachers and principals easy access with cross tab options, historical data, and custom data views. These electronic tools combined with the data warehouse gives them more information in more depth than ever before.

Teachers and administrators are learning to use data to test their assumptions about instruction and identify areas for intervention to meet their literacy and equity goals. "We all have our bias about what a good classroom looks like. I walk into a classroom and the kids are engaged, and the teacher seems on target. But results show that students aren't learning as much," said Jere McInerney, director of educational services at the district. "We've been working with a consultant on our reading program with direct instruction—really targeted. Kids are learning and feeling good about it. It's not the creative part of teaching. We're not used to teaching that way."

Before Lemon Grove launched their multiple measures matrix, they asked teachers to test the system's usability and found the input was difficult and clumsy. Even though they had invested significant resources in the first system, they realized that it would never be used by teachers. They switched to a more teacher-friendly system that has achieved widespread acceptance in the classroom.

Data-Driven Decision Making: Results

"Consistent and direct intervention based on targeted data analysis brings positive results in academic achievement," said Principal Donn Griffiths. "Data helped us decide where to put one three-hour support aide into our school." After analyzing state and district assessments, he found that a large percentage of fifth-grade students were performing below proficiency in vocabulary and reading comprehension. The intervention plan included corrective reading during the school day, after-school guided reading and readers' workshop, as well as the support aid.

In 2001, six Lemon Grove schools were eligible for the California governor's awards program, and three of the four Title I schools in the district were declared High Achieving Title I Schools by the State of California. Even with this success, the district still expects schools and students to do better and close remaining achievement gaps. "The culture of the district is that we can get better in our classrooms," said McInerney. "We've taken giant steps. As we get closer, it is harder to make leaps."

CLEVELAND MUNICIPAL SCHOOL DISTRICT, OHIO

www.cleveland.k12.oh.us/
Schools: 125
Enrollment (2003-2004): 72,199

Cleveland Municipal School District has turned around the quality of education in the district by focusing on fiscal responsibility and improving education at the elementary and middle schools using frequent, relevant data for more direct instruction.

About Cleveland Municipal School District

Cleveland Municipal School District is a large urban district with more than 120 schools over 69,000 students, and approximately 8,500 full-time employees. In 1998, under the leadership of district CEO Barbara Byrd Bennett, the district launched the "Educating Cleveland's Children" initiative to transform the troubled school system. The first step was financial order followed by a transformation of elementary and middle schools into more effective, personalized K-8 neighborhood schools. The district also launched a building campaign to update facilities and build new schools. The final piece, a high school re-design, began in 2003 with a $2 million grant from the Bill & Melinda Gates Foundation and KnowledgeWorks Foundation.

Data-Driven Decision Making: Starting the Process

In 1999, the district had plenty of test data on mainframes without access for school and district decision makers. They moved data to a compatible data warehouse and made it available to schools in common productivity software applications. In some Cleveland schools a technology professional developer supports the principal and teachers by mining data and delivering information in easy-to-use formats.

However, the district soon realized providing schools with standardized test scores and strand data was of limited use. Teachers needed better classroom assessments available in shorter time frames and in more useful formats. They began developing short-cycle assessments and reporting tools. Expert teachers unpacked the standards into a group of implied assessment items based on the level of thinking the standard measured. They came up with a variety of items that are examples of what students should know and be able to do.

Diagnostic assessments used during the instructional cycle with standards-based reporting tools show teachers which children have achieved the standard and which ones have trouble. Flexible group and instructional activities give teachers opportunities to bring lagging children up to speed.

Data-Driven Decision Making: Implementation

"The data just tells you what happened," said Snodgrass, "teachers and principals have discussions and hypothesize about why and what to try. They test again. The richest information comes from open-ended questions, listening and making thinking public."

Teachers have discussions and hypothesize about what happened and what to try. They test again to determine whether or not interventions worked. Teachers and students regard the information as descriptive feedback rather than evaluative feedback. The district also uses benchmarks as evaluative feedback to confirm that children are making progress, even if they do not reach a grade-level standard.

Data-Driven Decision Making: Results

Data-driven decision making drives change at all levels of the school district. As systems have been rolled out to the schools, teachers and principals have begun to change behaviors and fix persistent problems. Sometimes simply having the information makes all the difference.

When Patrick Henry Elementary School set reducing unexcused absences as a goal for the year, Mark Quinn created a weekly data report and mailed it as a pdf file to every teacher in the school. It showed every unexcused absence by grade, homeroom, and student. Teachers had the information they needed to contact parents. If the absence was excused it dropped off the list. A breakdown by percent of attendance identified students with significant attendance problems and escalated their cases to the school attendance liaison. By the end of the year, the school had reduced unexcused absences from 9% of attendance to just 2%.

	Getting Started	**Implementation**	**Results**
Fulton County	District-wide strategic planning in place	Cross-functional teams help school site with data use and analysis	All elementary schools met AYP targets in 2003-04
Lemon Grove	Ubiquitous access to technology and focus on literacy	Easy-to-use reports of multiple measures	3 out of 4 Title I schools declared high achieving
Cleveland Municipal	Data warehouse developed with site specialist access	Data teams discuss and analyze results to apply interventions	Reduced unexcused absences in one school from 9% to 2%

What the Future Holds for DDDM

Data-driven decision making gives districts a constructive model for examining what they know about student achievement and instruction to promote best practices and address weaknesses. Districts with a solid foundation for discussion and research have the flexibility to respond to changing requirements from federal, state, and even local agencies. As technology evolves and leadership models develop, opportunities for data-driven decision making will become more sophisticated and more widespread.

New digital technology will make it faster and easier for educators to collect, assess, and evaluate students and their own organizations. Powerful data management and analysis systems will integrate, sort, and disseminate reports as alphanumeric, visual, or aural information based on user profiles. Data will become a core asset of the school district with years of information available to show long-term trends. Decision makers will become more sophisticated in their use of the information to measure resource utilization, research instructional strategies, and determine operational effectiveness.

As computing access devices become smaller, more powerful, and less expensive, school districts will have increasing ways to tap into data. Networked devices will allow everyone in the organization to retrieve, analyze, and communicate results quickly.

Perhaps the most significant change will come as students and parents realize that they have access to more than the end-of-term grade. Children today have more affinity with technology than any other generation before them, and they have become effective communicators. The loss of Internet access would have an impact on the schoolwork of 83% of secondary grade students, according to the NetDay Speak Up Day survey, and 79% of students responding said the loss would impact their personal life. (Evans, 2004) It is no small leap to expect them to want to know more about what is expected of them. Through the power of data, students will have more access to knowledge.

APPENDIX

Interviews

Sally Ahern, Third Grade Teacher, San Miguel Elementary School, CA

Barbara Allen, Project Director for LemonLINK, Lemon Grove School District, CA

Frank Auriemma, Superintendent, Pearl River School District, NY

Amy Barger, Coordinator, Talented and Gifted Program, Fulton County Schools, GA

John Burke, Director, Division of Information Services, Montgomery County Public Schools, MD

Barbara Catenaci, Educational Technology Development Specialist, Beaufort County School District, SC

John Conyers, retired Superintendent, Community Consolidated School District 15, IL

Steve Curry, Principal, Findley Oaks Elementary School, GA

Dennis P. Doyle, Co-founder and Chief Administration Officer, SchoolNet

Sergio Garcia, Vice President, Software Development, PLATO Learning, Inc.

Martha Greenway, Chief Planning and Evaluation Officer, Fulton County Schools, GA

Donn Griffiths, Principal, San Altos Elementary, CA

Alan Grulich, Director of Assessment and Evaluation, Grossmont Union High School District, CA

Kimberly Hambrick, Director of Assessment, Institute for the Advancement of Research in Education, AEL, Inc.

Jim Hirsch, Associate Superintendent for Technology, Plano Independent School District, TX

Dr. L. McLean King, Superintendent, Lemon Grove School District, CA

Darryl LaGace, Lemon Grove School District, CA

Katie Lovett, Chief Information Officer, Fulton County Schools, GA

Alisha Lyas-Jones, Curriculum Support Teacher, Bethune Elementary School, GA

Dr. Catherine McCaslin, Supervisor of Research Program Evaluation and Assessment, Beaufort County School District, SC

Jim Mahoney, Executive Director, Battelle For Kids

Karlene McCormick-Lee, Assistant Superintendent, Clark County, NV

Jere McInerney, Director of Educational Services, Lemon Grove School District, CA

Tawana D. Miller, Chief Curriculum Officer, Fulton County Schools, GA

John Q. Porter, Esq., Chief Information Officer, Office of Global Access Technology, Montgomery County Public Schools, MD

Lou Pugliese, President and CEO, ETS-Pulliam

Leslie Pulliam, Vice President, ETS-Pulliam

Mark Quinn, Technology Professional Developer, Patrick Henry Middle School, OH

Peter A. Robertson, former Chief Information Officer, Cleveland Municipal School District, OH

Rick Rozzelle, Technology and Management Consultant, Tech-knowledge Consulting, Inc.

Joy Runyan, Intensive Sites, Institute for the Advancement of Research in Education, AEL, Inc.

Jim Schnitz, Education Strategy Executive, IBM

Marie Scigliano, Director, Education Technology and Information Technology, Palo Alto Unified School District, CA

Donna Snodgrass, Director of Classroom Assessment, Cleveland Municipal School District, OH

Matthew Stein, Analyst, Research Services, Eduventures

Jeffrey C. Wayman, Center for Social Organization of Schools, Johns Hopkins University

Warren Williams Assistant Superintendent, Grossmont Union High School District, CA

Dawn Wilson, Educational Technology Coordinator, Bureau of Technology Services, Idaho State Department of Education

Resources

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School District Web Sites

We encourage you to look at the Web sites of the school districts contributing to this report. They show how districts create a community dialogue with their data and strategic plans.

Pearl River School District, NY	www.pearlriver.k12.ny.us/
Lemon Grove School District, CA	www.lgsd.k12.ca.us
Palo Alto Unified School District, CA	www.pausd.palo-alto.ca.us/
Consolidated Community School District 15, IL	www.pausd.palo-alto.ca.us/
Beaufort County School District, SC	www.beaufort.schoolnet.com
Grossmont Union High School District, CA	www.grossmont.k12.ca.us/
Plano Independent School District, TX	www.pisd.edu/
Cleveland Municipal School District, OH	www.cmsdnet.net/
Fulton County Schools, GA	www.fultonschools.org/
Montgomery County Public Schools, MD	www.mcps.k12.md.us/
Clark County School District, NV	www.ccsd.net/

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