DATA-DRIVEN DECISION MAKING

At A Glance

The federal No Child Left Behind Act and its mandate for adequate yearly progress has placed unprecedented demands on districts to use evidence to support their school improvement efforts. Research has not yet determined if data-driven decision making leads to improvements in teaching and learning since most outcomes reported to date are based on case studies offering anecdotal evidence. This information capsule discusses the use of data-driven decision making in the nation's schools, research findings on the effects of data-driven decision making, including factors that may facilitate the data-driven decision making process, and the challenges associated with implementing data-driven decision making. A summary of some of Miami-Dade County Public Schools' initiatives that utilize data-driven decision making, professional development opportunities offered by the district, and online systems that provide staff with access to data is also included.

One consequence of the standards and accountability movement is that district and school administrators are being asked to think differently about educational decision-making and to use data to provide information for a range of activities, from resource allocation to instructional practice. The federal No Child Left Behind Act and its mandate for adequate yearly progress has placed unprecedented demands on districts to use evidence to support their school improvement efforts. As a result, administrators and teachers are confronted with complex and diverse data sets upon which they must base their decisions. Teachers in struggling schools are told that only results matter, usually in the form of reading and mathematics achievement test scores, and are asked to examine stacks of performance data to target needed areas of improvement (Coburn & Talbert, 2006; Consortium for School Networking, 2006; Shirley & Hargreaves, 2006; Mandinach et al., 2005).

Data-driven decision making is the process of making choices based on appropriate analysis of relevant information (Consortium for School Networking, 2006). Data can be a compelling force for improving schools, but the value associated with data comes from being able to recognize the quality of data, organize it, think about what it means, and use it to make decisions (Earl & Katz, 2002). Educators' beliefs of how research should influence practice vary across school districts and the same data may be interpreted differently and suggest different courses of action depending on who is engaged in the decision making (Knapp et al., 2006).

Districts that do not use data to develop policy are less likely to identify problems and appropriate interventions. The use of data enables district leaders to make mid-course corrections and continually improve instruction. Districts that engage in data-driven decision making have the information that enables them to assess the needs of students, staff, parents and engage in continuous school improvement (Technology Alliance, n.d.).

Use of Data-Driven Decision Making in the Nation's Schools

Preliminary research suggests that school districts are beginning to accept evidence-based educational improvement. Although teachers have often been cited as critical of accountability systems, early evidence suggests they will accept a data initiative when they believe it is soundly implemented and responds to the learning needs of their students (Chen et al., 2005; Lachat & Smith, 2005; Massell, 2001).

A national survey of 813 school district superintendents, commissioned by *Education Week,* found districts throughout the country are building up their technical systems and professional development so educators can better use student performance data to drive instruction (Archer, 2005). Ninety-three percent of district superintendents reported using data-driven decision making as a systemwide strategy for school improvement. Fifty-six percent of superintendents reported having data management systems that allow school site educators to access individual student achievement information.

Results of *Education Week's* survey also indicated that data analysis has become a common part of school districts' annual planning. Eighty-one percent of all superintendents, and 98 percent of those in larger districts (over 10,000 students) said they had a standardized process for drafting school improvement plans. Superintendents of larger districts believed the use of instructional practices such as data-driven decision making would have a positive impact on student achievement. For example, 81 percent said basing school improvement plans on performance data would affect student achievement a "great deal" and 78 percent agreed that using online data management systems to analyze student performance would affect student achievement a "great deal."

Research Findings

Research has not yet determined empirically if data-driven decision making leads to improvements in teaching and learning since most outcomes reported to date are based on case studies offering only anecdotal evidence. Studies are needed that systematically track outcomes and link data-driven decision making to teacher practice and student achievement. Specifically, research must determine how and to what degree data-driven decision

making activities translate into changed practice at the classroom level as a result of data use and to what effect (Kerr et al., 2006).

Blank, Smithson, Porter, Nunnaley, and Osthoff (2006) conducted a study to determine if the Data on Enacted Curriculum (DEC) model for instructional improvement would significantly improve instruction in mathematics and science at the middle school level, as measured by increased alignment of instruction with standards. The longitudinal study, carried out from 2001 to 2004, consisted of randomized trials in 50 middle schools from five large urban districts (including Miami-Dade County Public Schools). The DEC model emphasizes the collection of critical indicators of instructional practices and content for a full year's curriculum. The model provides data to teachers on their instructional practices, then delivers 18 months of training, assistance, and ongoing staff support to improve effectiveness based on teachers' own school-level analyses. Results of Blank et al.'s study indicated that mathematics, but not science, teachers in DEC model schools showed significant improvement in the alignment of instruction with standards, compared to teachers in control schools. Therefore, in this study, the data-driven improvement model was shown to be effective for improving mathematics instruction.

Based on interviews with teachers at three schools, Wayman and Stringfield (2006a) concluded the following changes in faculty practice and attitudes resulted from the use of data-driven decision making:

- Many teachers reported an increased sense of efficiency. They stated that data-driven decision making allowed them to gain more knowledge and helped them determine which instructional strategies would be most effective.

- The ability to better respond to student learning needs was cited by participants as a benefit provided by data-driven decision making. Most teachers believed they gained an overall sense of students' needs, then refined this information as necessary. Better instructional grouping of students was also cited as a common outcome.

- Educators stated that data-driven decision making enabled them to examine their own practice and make changes that provided better learning experiences for their students.

Many teachers felt they were better able to tailor instruction because they had more specific information.

- Teachers reported that professional collaboration had increased because data created more opportunities for interaction. Teachers spoke of collaboration that was more academic and professional than before. In all schools, informal support networks had formed to help teachers understand data better.

Wayman and Stringfield (2006b) stated that, faced with increasing accountability requirements, school districts "are implementing a variety of methods for gathering, storing, analyzing, and reporting . . . data, but are moving forward with strikingly little guidance from any quarter." In a survey conducted for the Consortium for School Networking in 2004, educators identified lack of training and the inability of systems to share or exchange data as the major barriers to utilizing data-driven decision making (see table below) (Consortium for School Networking, 2006).

Identified Barriers to Use of Data-Driven Decision Making

Lack of training	50%
Inability of systems to share or exchange data	42%
Lack of understanding of what to do with the data	39%
Absence of clear priorities on what data should be collected	36%
Failure to collect data in a uniform manner	35%
Outdated technology systems	31%
Low quality data (inaccurate or incomplete)	24%
Timing of data collection	24%
Data reports are too complicated	22%

*Responses do not sum to 100 because respondents were able to select more than one barrier.

Armstrong and Anthes (2001) conducted interviews in six school districts from five different states that had reputations as exemplary data users. They concluded that the most difficult aspect of using data was linking it to appropriate intervention. Based on their review of the literature, Knapp, Swinnerton, Copland, and Monpas-Huber (2006) concluded there are a number of conditions likely to discourage continual data use, including fears

about the consequences of using data; the belief that what matters most in education can't be measured; uncertainty about changes in practice that might be suggested by the data; limited knowledge of what to do with the data; inability to manipulate and interpret data; and lack of resources to invest in data-based inquiry.

Case studies conducted to date suggest that the effective use of data-driven decision making may depend on several enabling factors, including:

- **Planning for Data Use.** Up-front planning has been found to increase the efficiency of data collection. Planning should include a calibration process, where stakeholders develop consensus about shared standards, definitions, and goals. Before implementing data-driven decision making, district leaders should decide what types of data are needed and the procedures they will follow to ensure that appropriate data collection techniques are used. They should also determine how multiple sources of data will be integrated, how data will be stored, and how confidentiality will be protected (Kerr et al., 2006; Wayman et al., 2005; Lachat, 2001; Keeney, 1998).

- **Beginning With A Small, Balanced Set of Data.** Most school districts are data rich and routinely gather more data than they can use. They have too much information in too many places to be used effectively. Districts typically collect data on student demographics, student assessment, transportation services, food service, human resources, student health, special education, and curriculum and instruction, to name a few (Consortium for School Networking, 2006). Wiegers (1997) suggested that districts begin growing their "measurement culture" by selecting a fairly small, balanced set of data. As team members become familiar with the data-driven decision making process and how the data will be used, the types of data collected can be gradually expanded.

- **Providing Leadership.** Case studies have consistently reported that strong district and school leadership are necessary factors for successful

implementation of data-based decision making systems. In the districts classified as exemplary data users by Armstrong and Anthes (2001), the superintendent, central office, and school board were committed to collecting and using data for decision making and improvement. In order to build a culture that supported inquiry, educational leaders faced the challenge of convincing school faculties of the merits of using data for productive change and creating the conditions under which data were an integral part of school decision making.

Kerr, Marsh, Ikemoto, Darilek, and Barney (2006) reported that school leaders who effectively used data for inquiry and decision making were knowledgeable about and committed to data use and built a strong vision for data use in their schools. In Wayman and Stringfield's (2006a) case study of three schools, teachers reported that their principal's leadership was key in promoting widespread faculty use of data systems. The principal at each school believed data should be used to support decisions in their schools and these expectations were communicated to their faculties.

Leadership has been found to be especially important in combating low staff buy-in, which has been identified as a significant challenge to the successful implementation of data-based decision making (Kerr et al., 2006). In Wayman and Stringfield's (2006a) case study, principals reported encountering some teacher resistance due to unfamiliarity with the data-driven decision making process. To address this resistance, the principals made efforts to build teacher capacity and help teachers see the benefits of using data. Principals provided guidance to teachers, focusing their initiatives on measurable goals that offered concrete results. Principals also reported some of the initial resistance was alleviated by encouraging teachers to work in groups. The formation of groups provided teachers with a support network and offered opportunities for them to observe other teachers' success in similar situations.

Wayman and Stringfield (2006a) also emphasized the importance of district staff support. They suggested that district staff provide school-level educators with frequent opportunities to use data systems for educational improvement. The expectation that all teachers and principals would become involved in the data-driven decision making process was found to facilitate the widespread use of data to inform practice.

Armstrong and Anthes (2002) reported that districts classified as exemplary data users had a strong service orientation toward principals and teachers. These districts made curriculum specialists available to schools to provide assistance and additional data analysis, as needed. District leaders often met with principals to review their schools' results and offer support in helping them meet their goals.

- **Ensuring Teacher Buy-In.** Teacher involvement is a key element in successful data-driven decision making. Teachers must understand why the requested data are valuable before they fully accept the process. They should recognize what they can do differently if they have the data and believe that the data being collected clearly relate to the school improvement process (Kerr et al., 2006; Johnson, 2002; Wiegers, 1997).

Studies have found obstacles to teacher's use of data include difficulties with the management information system, lack of quantitative ability, and hesitance to accept policies and practices yielding data not perceived to be useful (Wayman & Stringfield, 2006a; Choppin, 2002; Watson, 2002). A study of school leaders from districts in Washington state found that resistance was encountered when district staff provided the interpretation of data, without input from school staff (Technology Alliance, n.d.). Ingram, Louis, and Schroeder (2004) identified a number of widely held teacher attitudes and beliefs that were incompatible with data-driven decision making. For example, teachers often rejected the validity of assessment data because they had developed their own standards for measuring progress that had little to do with their students' test scores. Teachers who did not believe they had influence on their students' achievement data were also unlikely to buy into the data-based decision making process.

Kerr et al.'s (2006) case study of three urban school districts revealed that principals' and

teachers' opinions differed on the types of data they believed were most effective for measuring improvement. The authors therefore recommended that in order to increase teacher acceptance, school districts should involve a broad group of stakeholders in the development of the data-driven decision making process and create clear expectations about the purpose of data.

- **Using multiple sources of data.** Effective evidence-based district reform should support access to different kinds of data for different purposes at different levels of the system. Although performance indicators vary across schools and districts, depending on their unique goals and challenges, a broad range of data capable of answering different kinds of questions should be available to educators (Coburn & Talbert, 2006; Supovitz & Klein, 2003; Johnson, 2002).

  Researchers recommend that districts use multiple sources of test-based and non-test-based data in the school improvement process (Kerr et al., 2006; Shirley & Hargreaves, 2006). In Wayman and Stringfield's (2006a) case study, teachers reported that working with multiple measures helped them view each separate source of data as a piece of an overall puzzle.

- **Building Data Literacy.** While teachers and administrators do not need to be experts in data collection and analysis, they should be familiar with some basic techniques that will help them engage in the data-driven decision making process (Kerr et al., 2006; Mandinach et al., 2006; Webb, 2002; Terkla & Armstrong, 1997; Technology Alliance, n.d.). Administrators and teachers should be trained to analyze and interpret data and to identify strategies for addressing diagnosed problems (Consortium for School Networking, 2006; North Central Regional Educational Laboratory, 2004).

  Kerr et al. (2006) concluded that district capacity to assist school-level staff with the examination of data and the identification of appropriate interventions was an important factor in the successful use of data-based decision making. Knapp et al. (2006) reported that data literate educational leaders must be competent in a number of areas, including the ability to interpret data; negotiate support for education in political, professional, and community settings; and understand what data can and cannot tell about students.

One way to enhance the skills needed to use data effectively is to provide school-level staff with professional development opportunities. Training that uses educators' real-life data and school challenges, rather than hypothetical examples, has been found to be especially helpful. Wayman and Stringfield (2006a) suggested using faculty meeting time to explain data methods and staff development days to help teachers learn about data-driven decision making. Support can also include the assignment of knowledgeable staff to work with teachers on data interpretation and the formation of teacher planning teams (Kerr et al., 2006).

Most districts classified as exemplary data users in Armstrong and Anthes' (2001) study had a person in every school whose job was to collect, analyze, and report student achievement data back to principals and teachers. Most districts also had central office staff members, frequently supported by state resources earmarked for low-performing schools, serving as liaisons to schools.

Districts may also choose to provide staff with a data collection guidebook. The guidebook can include basic instruction in areas such as formulating research questions, the difference between quantitative and qualitative research, and the interpretation of data. Guidebooks are often limited, however, by a lack of specific explanations about how to gather and interpret data. The absence of detail is due to the unique characteristics of every indicator (and the data needed to address that indicator) that require a distinct approach to the research design and subsequent data collection (Terkla & Armstrong, 1997).

- **Providing Teachers Time to Examine Data.** Teachers have consistently stated they don't have enough time to analyze and interpret data and in some cases have indicated they faced a trade-off between data-driven inquiry work and teaching (Kerr et al., 2006; Ingram et al., 2004; Feldman & Tung, 2001). In Wayman and Stringfield's (2006a) case study, teachers

stressed the importance of having time during the work week to examine student data. In interviews, district and school administrators noted the difficulty of finding time to give teachers for data use, but agreed it was important to do so.

- **Designing User-Friendly Reports and Ensuring Easy Access to Data.** Data presentations must be timely, tied to objectives, and available to people with the responsibility and ability to act on them. Reports should be presented in concise, user-friendly formats and limited only to results relevant to the research problem. Additional information derived from the data can then be requested, as needed. Data reports that present data in different ways, such as tables, charts, and graphs, allow more people to understand the information. If possible, reports should include longitudinal data so results can be compared over time (Consortium for School Networking, 2006; Kerr et al., 2006; Terkla & Armstrong, 1997).

Education has historically produced an abundance of data, but these data have typically been stored in systems that are inaccessible to most educators. District and school staff must have access to data through computer systems with user-friendly interfaces. Districts must have a process in place for getting the data to the right decision maker at the right time with the power and resources to act on the information (Consortium for School Networking, 2006; Wayman & Stringfield, 2006b).

A case study in Washington state found that a lack of online databases limited principals' ability to analyze data flexibly and make timely decisions (Technology Alliance, n.d.). Interviews conducted with staff at three schools implementing data-driven decision making found that data access was important to educators, with respondents citing factors such as user friendliness, system speed and updates, timely data, and longitudinal data as most essential (Wayman & Stringfield, 2006a).

Challenges of Data-Driven Decision Making

In their article entitled *Data-Driven to Distraction*, Shirley and Hargreaves (2006) contend that data-driven instruction is just another in a long list of unproven educational reform slogans. These reforms, which include shared decision making and total quality management, have received a lot of attention in education circles but have shown very little in the way of verifiable results in the form of improved learning. Shirley and Hargreaves state that data-driven decision making provides simplistic solutions driven by test scores and creates pressure to apply instant solutions to students' problems. This alternative position may grow stronger as time goes on and can be clarified by the following:

> "Once performance problems have been exposed, instead of rushing to judgment about what must be done, we need more evidence, deeper reflection, and further inquiry before we act. Our instructional choices should be based on all kinds of evidence and experience, processed together in professional learning communities that help us identify common problems, swap ideas and strategies, and develop and deploy our own school-based assessment instruments. Mindful teaching needs to be evidence-informed, not data-driven."

Shirley and Hargreaves (2006) also argue that test results rarely present self-evident instructional strategies to address the needs of struggling students. Rather, they believe data are often ambiguous, and do not reflect the diversity of learning styles displayed by students. Holt (1993) expressed concern that too much emphasis on measurable performance factors may inhibit creativity and that factors such as the desire to learn and the enhancement of curiosity, considered by many to be the most important outcomes of education, are not measurable.

As districts collect different types of data to make decisions, data overload can very quickly become a problem. Often, in an attempt to "see the entire picture" by utilizing all available data, districts lose sight of the actionable pieces of data because they become buried in a mountain of information. The challenge is to integrate these diverse sources of data and make the information available in timely, easy-to-understand reports so decisions makers can affect student performance (Consortium for School Networking, 2006; Burby, 2005; Mandinach et al., 2005; Technology Alliance, n.d.).

Terkla and Armstrong (1997), in their study of one university's experience, found that staff were often overwhelmed by the sheer magnitude of the data. They concluded that the extensive volume of information actually impeded the data-driven decision making process. Wiegers (1997) reported that those receiving data reports were often confused by the large amounts of information and tended to overlook their importance.

Wiegers (1997) also found that although most educators collect and report data as required, they often do not see evidence that the data are being used for school improvement efforts. He suggested that administrators clearly explain the benefits of having the data available and describe how the information will help staff make informed decisions.

Many of the standardized test data used in school improvement efforts were not originally intended for diagnostic purposes (Schmoker, 2000, Popham, 1999). Kerr et al. (2006) reported that school staff in their case study felt state assessment data were not adequately aligned with daily instruction, were limited in subject and content coverage, often reflected what teachers already knew about their students based on in-class performance, and were received too late to be useful. Choppin (2002) concluded that teachers are often hesitant to base decisions that affect students on data they do not believe are reliable and accurate.

Some educators have difficulty understanding, analyzing, and using data, but accountability pressures have caused many districts to quickly implement data-driven decision making, without providing adequate support for principal and teacher skill building (Wayman & Stringfield, 2006a; Mason, 2002; Herman & Gribbons, 2001). Research has shown that many school-level staff lack the capacity to successfully use data, both in terms of technical ability and the skills needed to appropriately ask and answer research questions. Kerr et al.'s (2006) case study found that just 19 percent of teachers and administrators believed they had the skills to manipulate data to answer research questions, even though the schools observed in the case study were known for their ability to use data.

On A Local Note

The data-driven decision making process is used throughout Miami-Dade County Public Schools (M-DCPS). Some of the district initiatives that utilize data-driven decision making are listed below.

The reader should note that this is not an exhaustive list of all the ways data-driven decision making is used in the district, but a sampling of initiatives.

- **District Strategic Plan**. The District Strategic Plan outlines M-DCPS' vision, mission, core values, and goals. Each district goal has objectives and corresponding measures that identify progress. Every major department, or function area, within the district plays an integral role in achievement of the district's goals. Departments conduct needs assessments, determine the district initiatives and strategies their unit supports, and identify critical issues. The Strategic Plan outlines key strategies for each department, as well as expected future outcomes, and the primary focus for the upcoming school year. The district continually monitors the Strategic Plan to assess progress made, identify needed course corrections, and make adjustments as needed.

- **Superintendent's Goals and Annual Performance Objectives.** The performance objectives included in the Superintendent's evaluation are reflective of the strategic goals and reform initiatives delineated in the District Strategic Plan. Performance indicators include FCAT scores, advanced placement course enrollment, student absences, parent participation, and the implementation of teacher recruitment and succession management plans.

- **ComSTAT.** Cabinet staff and regional superintendents analyze school level data on a monthly basis. Problem areas are flagged and interventions are designed and implemented based on the data presented. Progress updates are provided at subsequent ComSTAT meetings. Data elements include student achievement; student attendance, suspensions, and withdrawals; staff absences and vacancies; and parent and community involvement. Schools can be grouped for analysis by the following categories: corrective action schools, Zone schools, region break-down, decreased achievement, flat achievement, new principals, more than 25 percent of early career teachers, and other achievement issues.

- **School Improvement Plan (SIP).** All schools develop a SIP containing specific measurable objectives. SIPs serve as the basis for region and district level priorities and are coordinated with the performance planning and appraisal process. The SIP serves as a blueprint of the actions and processes needed to produce school improvement, guiding resource allocation, staff development, instructional content and practice, and assessment. Each SIP is based on a needs assessment. The plans include a goal statement; measurable objectives, aligned to Florida's Education Priorities and the District Strategic Plan; action steps, or activities, that will be implemented to meet the objectives; and an evaluation that is directly connected to the school's objectives.

- **Managerial Exempt Personnel (MEP) Performance Management System.** The MEP Performance Management System, currently being piloted in the district, uses performance planning, assessment, and evaluation to promote performance excellence. The system aligns directly with employees' unit plan or School Improvement Plan and the District Strategic Plan. In addition to the evaluation of employees' administrative competencies and professional growth, the system utilizes a scorecard to track the performance of each MEP administrator.

  The scorecard contains a list of objectives, mutually developed by the MEP administrator and his or her immediate supervisor. School site administrators' objectives are organized across themes that include increased student performance; improved student health, safety, and attendance; and parent engagement. Non-school site administrators' objectives are organized across overall district performance; function level metrics; and employee development and satisfaction. Measures are established for each objective and are weighted by a percent representing their relative importance.

  Performance against targets is tracked during the performance period. At the conclusion of the performance period, actual performance is calculated and indicated as a percent of the target accomplished. Administrators whose performance assessment points determine their performance "substantially exceeds standards" or "exceeds standards" receive a bonus, based on a percent of their salary, in addition to a cost of living increase. Administrators who meet standards receive only a cost of living increase and administrators who do not meet standards do not receive a bonus or a cost of living increase.

- **Special Teachers Are Rewarded (STAR).** Florida Statute requires that each district have a performance pay plan based primarily on student learning gains that rewards teachers identified as outstanding. Awards of at least five percent of the base pay will be distributed to the best performing 25 percent of instructional personnel. All instructional personnel in the district's K-12 schools will be eligible for the award. The awarding of bonuses will be based on two criteria: student achievement performance and a satisfactory performance evaluation/summative assessment.

  M-DCPS is in the process of preparing a STAR proposal for submission to the Florida Department of Education. The district is proposing FCAT pre and post data be used to determine awards for core academic teachers tied to FCAT data, including science and social studies teachers. Bonus determinations for teachers not linked by course number to instruction in reading and mathematics will be based on schoolwide FCAT scores, although the district is currently working with other Florida districts to identify alternate assessment options for these teachers. DIBELS (elementary reading) and MAZE (secondary reading) data will be used to determine awards for teachers of students in kindergarten to grade 3 and grades 11 to 12, respectively.

Professional development opportunities to assist district employees in the use of data-driven decision making include:

- **Aligning Instruction with Assessment.** Data analysis meetings, coordinated by Curriculum and Instruction, are taking place throughout the district to show staff how to analyze DIBELS data, using Florida's Progress Monitoring and Reporting Network (PMRN). PMRN is a web-based data management system that provides a place to enter and organize results of the DIBELS assessment. The PMRN system is a tool for analyzing data, planning instruction, and communicating student progress. Educators are provided with step-by-step instructions on

analyzing DIBELS scores so they can focus on specific instructional strategies, determine which students need extra support, form groups for differentiated instruction, and decide which skills to emphasize. The Aligning Instruction with Assessment presentation is also available on the Division of Instructional Technology's web site.

- **Continuous Improvement Model (CIM) Training.** The CIM is a performance-driven method for tracking student performance. A key component of CIM training is the monitoring of student progress at regular intervals. Educators then make informed instructional decisions based on their analysis of the data. Teachers are provided with tools for assessing how much students learn, such as lists of critical benchmarks and instructional focus calendars, that enable them to deliver instruction in targeted critical skills and identify students in need of additional instruction. Teachers and school-site administrators throughout the district have been trained in the CIM process through the Office of Professional Development. Training for non-school site administrators, to be conducted by Accountability and Systemwide Performance, is scheduled for the current school year.

- **Data-Driven Decision Making Reference Guides.** Two guides (one for school site staff and one for non-school site staff) are produced by Accountability and Systemwide Performance and are available on their web site. The guides include a brief definition of data-driven decision making, explain the purpose of data-driven analysis, and summarize how data-driven decision making relates to performance excellence. The guides give examples of graphical representations (such as histograms, scatter plots, fishbone diagrams, and flow charts) that can be used to analyze data, explain when specific representations should be used, and demonstrate how to construct each analytical tool.

- **Edusoft Training.** Edusoft helps school districts, administrators, teachers, and parents track student performance on state standards and allows teachers to use student results to adjust their lesson plans. The Edusoft system is a paper-to-web student scoring assessment platform that automatically scans and scores tests and provides reports to monitor student achievement and improve classroom instruction. The system can be used with the district's Interim Assessment (reading and mathematics, with science to be added in the 2007-08 school year), DIBELS (elementary reading), and MAZE (secondary reading).

The Division of Instructional Technology offers professional development in the use of Edusoft for both teachers and administrators. Professional development sessions show teachers how to access timely information that will have a direct impact on intervention strategies, resource allocation, and best practices on using data analysis to increase student achievement. Administrators learn to use Edusoft's reporting tools to analyze student performance data and determine ways to differentiate instruction to target an increase in student proficiency levels. The Division of Instructional Technology also offers professional development sessions for administrators and teachers in DIBELS and the Riverdeep reading, mathematics, and science systems.

- **Interim Assessment Training.** Professional development on the district's Interim Assessment, conducted by Assessment, Research, and Data Analysis in the fall of 2006 (with additional sessions planned for spring 2007), showed teachers how to use data produced by the assessment and how to debrief with other teachers and their students. Professional development sessions also train teachers to read Interim Assessment reports and build customized reports. Benchmark Item Banks for the Interim Assessment are currently being developed so teachers can construct and administer their own tests.

Student data is available to administrators and teachers through several online systems. Examples include:

- **Cognos 8 Business Intelligence (BI) Performance Management System.** Cognos is an online analytical processing tool that allows principals to look at individual student data in real time, identify problem areas, and reduce intervention times. M-DCPS uses the Cognos system to monitor school and student performance and deliver critical information from the district's data warehouse. Cognos enables the district to

manage, analyze, and report on student performance in areas such as assessments, grades, attendance, and suspension rates. The system is available to principals via the district's online education portal and will soon be accessible to teachers, students, parents, and community members.

- **Education Portals.** The district's web site contains education portals for principals, teachers, students, and parents. One feature of the teachers' portal is the access to data on students in their classrooms. By clicking on the class title, teachers can see a roster of all students in that class, including FCAT Achievement Level and attendance. By clicking on a student's name, the teacher can see information related to that student, including academic grades, free/reduced lunch status, and attendance. The education portal for principals includes access to Cognos reports.

- **Edusoft.** Educators are provided with access to student assessment data through the Edusoft system, available on the Division of Instructional Technology's web site. The web site provides instructions for creating and customizing reports, creating item response reports (to help teachers assess both the usefulness of test items and students' performance on specific items), and creating student performance reports (to see how a single student is performing across multiple assessments). The web site also includes instructions for viewing, printing, and scoring MAZE and the district's Interim Assessment.

- **Student Performance Indicators (SPI) System.** M-DCPS' Information Technology Services developed the Student Performance Indicators (SPI) System to provide educators with access to individual student performance data based on FCAT results. The SPI System provides FCAT scores and content area scores, as well as demographic information, by class, for all students in a school. Data can be downloaded, by class or entire school, into spreadsheets, and printable FCAT summary reports can be generated by class or section. The system allows administrators and other authorized staff to view all classes and perform a schoolwide download, region center staff to view information for any school in their regional center, and district staff to view information for all schools in all regional centers. Administrators

and teachers can access the SPI System by logging onto the district's Intranet Applications menu.

Summary

Data-driven decision making is the process of making choices based on appropriate analysis of relevant information. The federal No Child Left Behind Act and its mandate for adequate yearly progress has placed unprecedented demands on districts to use evidence to support their school improvement efforts.

An increasing number of school districts nationwide report using data-driven decision making to drive instruction and guide the school improvement process. Researchers have identified barriers to utilizing data-driven decision making, including lack of training, inability of data systems to share or exchange information, the difficulty of linking data to appropriate interventions, and the belief that what matters most in education can't be measured. Research has not yet determined if data-driven decision making leads to improvements in teaching and learning since most outcomes reported to date are based on case studies offering only anecdotal evidence. Case studies have pointed to a set of factors that may enhance the success of the data-driven decision making process, such as beginning with a small, balanced set of data, ensuring teacher buy-in, using multiple sources of data, and building data literacy. Challenges districts face when implementing data-driven decision making include data overload, teachers' hesitance to base decisions that affect students on data they believe are unreliable or inaccurate, and staff difficulties understanding and analyzing data.

Initiatives that use the data-driven decision making process in M-DCPS include the District Strategic Plan, Superintendent's Goals and Annual Performance Objectives, ComSTAT, and School Improvement Plans. Professional development opportunities are offered to assist M-DCPS educators in the use of data-driven decision making, such as Aligning Instruction with Assessment data analysis meetings, Continuous Improvement Model training, and training on the Edusoft system. Student data is available to the district's educators through several online systems, including the Cognos Performance Management System, education portals, and the Student Performance Indicators System.

Online Resources

Best Evidence Encyclopedia (BEE) (http://www.bestevidence.org). BEE was created by the federally funded Center for Data-Driven Reform in Education at Johns Hopkins University. The web site presents evidence from different research groups on promising practices and interventions in education.

Child Trends (http://www.childtrends.org). Child Trends is a non-profit research organization that collects and analyzes data; disseminates research; designs and evaluates programs; and develops and tests promising approaches to research in the field. The web site summarizes research conducted on educational programs linked to major policy issues.

Comprehensive School Reform Quality Center (http://www.csrq.org). The center, created and operated by the American Institutes for Research, provides tools and technical assistance to support educators in choosing a high quality school reform model that meets their locally defined needs. The web site posts research reviews on school improvement efforts and educational service providers.

International Campbell Collaboration (http://www.campbellcollaboration.org). This web site provides reviews of research evidence from around the world on social, behavioral, and educational interventions.

Promising Practices Network (http://www.promisingpractices.net). The network is operated by the RAND Corporation. The web site offers summaries of research-based programs and practices shown to improve outcomes for children, youth, and families.

Social Programs That Work (http://www.evidencebasedprograms.org). This web site was created by the Coalition for Evidence-Based Policy, a non-profit organization established to promote government policymaking based on rigorous evidence of program effectiveness. A listing of interventions in education and social science that have been evaluated through randomized studies is provided.

What Works Clearinghouse (http://www.whatworks.ed.gov). The clearinghouse, funded by the United States Department of Education and operated by the American Institutes for Research, was established to provide educators, policymakers, researchers, and the public with a central source of scientific evidence on what works in education. The web site contains research reviews and effectiveness ratings on a wide range of educational programs and practices.

All reports distributed by Research Services can be accessed at http://drs.dadeschools.net by selecting "Research Briefs" or "Information Capsules" under the "Current Publications" menu.

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