LEARNING POINT Associates™
North Central Regional Educational Laboratory

No. 16 | June 2004

Research-Based Analysis of Education Policy

POLICY ISSUES

STATE EDUCATION DATA SYSTEMS THAT INCREASE LEARNING AND IMPROVE ACCOUNTABILITY

By Robert M. Palaich, Ph.D., Dixie Griffin Good, and Arie van der Ploeg

Every state in the nation is taking a long, hard look at education data and how it can be collected, housed, analyzed, accessed, and used better than ever before.

Since the advent of the accountability movement in education reform, state education agencies (SEAs) have encountered significant data-collection and data-management issues. Most states have tried to meet these challenges head on, but, more often than not, demands have outstripped capacity as data needs continue to evolve and grow more complex. Policymakers will want to protect and improve their state's information infrastructure in order to realize the full benefits of standards-based reform.

Future data management will require not only making the best use of current data but also tailoring student-performance data for district, school, teacher, parent, and student use. Further investments in the technology and human infrastructure underpinning education accountability and improvement efforts will be necessary. However, most elected officials will not have the expertise to grasp the technical and operational trade-offs associated with these investments, and it is not reasonable to expect information technology professionals to mobilize the political coalitions necessary to support these critical investments.

Nevertheless, states need thoughtful mechanisms for meeting evolving education data needs. As state and federal accountability and reporting requirements grow in scope—and as decisions about how, when, and where to allocate new education resources are increasingly being determined on the basis of the best available data—states can no longer afford to wait with building high-quality data systems. In addition, the integration of various social services into schools, the extension of the school day, and the lengthening of the K–12 education system to include prekindergarten and postsecondary transitions require state education data systems to have the flexibility to work with other

ISSUE OVERVIEW

Driven by growing accountability pressures, states and districts have invested in a variety of computerized systems for data storage, analysis, and reporting. As accountability policies demand access to more transparent and accurate data about every aspect of the education process, developing linkages among historically disparate systems is becoming more critical.

This edition of Policy Issues *reviews the current condition of state data systems by looking critically at the past, present, and future of education data use to help build an understanding of an ideal data system. This paper examines the components needed to address system improvements and provides policy recommendations to help states create efficient and useful data systems that commit to advancing accountability systems to improve student learning.*

—Jill Shively, Learning Point Associates

Address the key tasks associated with effective use of education data. *(See p. 9 for complete list of five tasks.)*

Create an education data oversight commission in each state.

Adopt common data standards, data-collection guidelines, and data-management practices.

POLICY RECOMMENDATIONS

comparable state databases. This paper reviews past, present, and future uses of education data and addresses why state education leaders should take action to build and maintain optimal education data systems. Finally, recommendations and specific strategies for getting there are presented.

EDUCATION DATA: WHO NEEDS WHAT

First, a look at the consumers of education data and the types of data they need is in order. Each level of governance, implementation, and participation has its own uses for student results data. From the U.S. Department of Education to the classroom teacher in each school building, the right data at the right time can play an important role in effective decision making. Table 1 shows some of the education data needs of various audiences, and how such data can be used to improve education results.

The No Child Left Behind (NCLB) Act of 2001 required states to disaggregate test-score data in order to track the progress of all students and student groups (NCLB, 2002). Many states were already doing this when the NCLB legislation was passed. Furthermore, this requirement was not new: The 1994 Elementary and Secondary Education Act (ESEA) had requested this type of accountability information. The difference lies in the consequences that the NCLB Act attaches to the results of this data. Schools *now* need to study and interpret the data, and they need to ensure that underperforming groups make progress.

The Maryland school improvement Web site (www.mdk12.org) broke new ground when it went public in May 2000. Begun as an Office of Educational Research and Improvement (OERI) funded grant to the Maryland State Department of Education in the late 1990s, mdk12.org was the first large-scale instantiation of a Web-based, data-driven process to school improvement. From the beginning, it has featured interactive graphical data disaggregation, down to the building level. Longitudinal patterns are an important aspect of the data reporting. Particularly significant is the fact that the data tools are always paired with a focus on state standards and resources for improving instructional practice.

In 1999, the North Central Regional Educational Laboratory (NCREL) negotiated with the new state superintendent in Illinois to build a similar capacity

TABLE 1. EDUCATION DATA USERS AND USES

Primary Audience	*Type of Data*	*Current and Potential Uses*
U.S. Department of Education	• Disaggregated achievement results by subgroup • Adequate yearly progress (AYP) for each school and district • Teacher qualifications • School report cards • Program expenditures • Program enrollments	• Ensure No Child Left Behind (NCLB) compliance • Conduct research and inform improvement efforts

TABLE 1. EDUCATION DATA USERS AND USES (continued)

Primary Audience	Type of Data	Current and Potential Uses
State Policymakers and Education Agencies	• Standardized state test scores • Percentages of students achieving proficiency • School report cards	• Confirm state standards are being met • Recognize achievement • Provide rewards or sanctions • Provide technical assistance to districts and schools • Develop program design • Inform school choice
District Leaders	• Percentages of students achieving proficiency—by building, by subgroup • Aggregated longitudinal student-achievement data • School report cards	• Help parents and community focus on student achievement • Provide technical assistance to schools • Prepare for NCLB and AYP consequences • Inform school choice • Make districtwide curriculum decisions
School Leaders	• Percentages of students achieving proficiency—by grade, by program, by teacher, by subgroup • School report cards • Disaggregated longitudinal student-achievement records • Attendance data • Graduation rates • Individual student-performance records	• Help school community focus on student achievement • Focus staff use of time • Inform school choice • Flag students in need of assistance • Make schoolwide curriculum decisions
Classroom Teachers	• Percentages of student subgroups achieving proficiency • Individual student subtest scores • School report cards • Individual longitudinal student-achievement trends • Attendance • Student performance in prior and subsequent grades • Diagnostic information on students' learning needs	• Help students focus on achievement • Focus staff use of time • Flag students in need of assistance • Make classroom curriculum decisions • Create additional assessment items
Students and Parents	• Grades on assignments and tests • Portfolio work • Individual longitudinal achievement record • Diagnostic information on students' learning needs • School report cards	• Help students focus on achievement • Inform progress against proficiency standards • Inform school choice
Community and Business and Industry	• Percentages of students and subgroups achieving proficiency • School report cards	• Help parents and community to focus on student achievement • Provide assistance to needy schools

This table specifically targets student data, but it is understood that student data is not the only important education data.

for that state. The *Illinois School Improvement* Web site (ilsi.isbe.net) went live in November 2001. NCREL also collaborated with the Department of Public Instruction in Wisconsin, which led to *Wisconsin's Information Network for Successful Schools* (WINSS) Web site (www.dpi.state.wi.us/sig) going public in December 2001. Minnesota's *School & District Information/Analysis* (education.state.mn.us/html/intro_mde_analysis.htm) followed in January 2002; it too was a joint effort with NCREL. By the summer of 2002, the *Indiana Accountability System for Academic Progress* (ASAP) Web site was accessible (www.doe.state.in.us/asap/welcome.html). In 2003, ASAP received strong praise from President George W. Bush and Secretary of Education Rod Paige.

Education data can inform policy and practice decisions and lead to continuous improvement of the kind espoused by Baldrige (Illinois Business Roundtable, 2002), Bernhardt (1998; 2004), Fullan (1991), Senge (Senge, Kleiner, Roberts, Ross, & Smith, 1994), and others. Educators and policymakers need systematic analysis of the data collected on the effectiveness of various interventions and pilot programs designed to improve student performance. Although education leaders should be able to search for scientifically based research from their state as well as from other states, this search often occurs on a broader level and can be a very time-consuming and arduous process. While national research programs such as the What Works Clearinghouse (www.w-w-c.org) will soon provide policymakers and practitioners with a growing research base from which to build effective reforms (and comply with NCLB regulations for federal funding), only close inspection of state and district data will find the patterns and relationships that support and enable effective local decisions and consistent data-driven growth.

Data-informed decision making is only beginning to emerge in education practice. States can certainly use targeted data collection and analysis to inform education policy and practice. Furthermore, states must play a role in making this data analysis available and useful to schools and districts that lack the resources to do it themselves. This latter role has increased sharply in emphasis and is one for which information technology professionals are poorly prepared.

UPGRADING THE SYSTEM: PAST, PRESENT, AND FUTURE USES OF EDUCATION DATA

Every time a policymaker is confronted with the prospect of another technology expenditure, no doubt he or she is tempted to ask, "Again? Didn't we just deal with this a few years back? When will we get this fixed once and for all?" And, no doubt, the technical data managers are tempted to reply, "Yes, again. Yes, we did," and "We won't—costs for data system maintenance and upgrades are ongoing." The questions are valid, and the answers are accurate, if oversimplified.

The factors driving today's need for investing anew in education data systems are many, ranging from continuing the contribution of legacy systems to emerging data consumers to new kinds of performance measures and data standards. A closer look at some of the forces driving change in this area follows.

The Roots of Education Data Systems

First, it is useful to review how state data systems came into being. Most early data systems were created to manage SEA financial and budgeting information and personnel records. Tracking district compliance came next, followed only relatively recently by tracking student-assessment data. These discrete databases often resided in hardware or applications that were proprietary and incompatible with others. As a result, vast stores of data may either be inaccessible for new or different uses or of only limited value, resulting in gross inefficiencies: redundant data entry, higher support costs, and inability to access pertinent data for decision making.

Past well-intentioned decisions frequently limit future options. For example, confidentiality of student records is a major concern of SEAs, and appropriately so. To ensure that SEAs themselves could not be responsible for inadvertent release of individual records, some states, by law or by procedure, refused to store such records in their own databases. Test publishers held the source files (e.g., until very recently in Wisconsin), or intermediate units were created to store and process student-performance data files (e.g., in Ohio). As a consequence, building data structures that link at the student level—to provide the detailed analyses now expected—has proven exceedingly difficult.

Even as new demands and various uses for data arise, legacy systems command the attention of data managers. They deal with multiple platforms, multiple programming languages, hardware limitations, and idiosyncratic codes and tags.

States look to vendors for turnkey solutions. Proprietary solutions, though relatively quick to implement, may lead to new sets of problems in sharing data. Hardware and applications vary considerably from state to state: Java™-centric systems in some states, Microsoft® in others, aging hardware running COBOL in more places than preferred, and a smorgasbord of commercial partners in still others. This fragmentation hinders efforts at connecting disparate data sources, not to mention moving standards-based curriculum and learning objects, such as test items and other chunks of reusable instructional content, between education levels and agencies.

Same Data, New Uses and Users

Many of today's state data systems are organized by "events" (e.g., "official" enrollment dates, state tests) cataloged by district and school. This snapshot view affords policymakers and education leaders cross-sectional views of how schools and districts are doing, that is, the aggregated performance of students at different points in time. Organizing the data by events, however, offers little actionable information to the leader looking to improve student performance, and typically there is no view of individual student progress. Consequently, states are under pressure to transition from an event-driven data system to one organized by individual student records. Such a system, which states are currently transitioning to, allows tracking variables over students' learning careers and enables analysis of longitudinal data for further insight. Table 2 shows various aspects of the transition to a more responsive data system.

Implicit in (although not required by) the NCLB Act is a call for state capacity to track individual student achievement, a significant step for many states. Some states, Michigan, for example, built their statewide student-level databases several years ago. Indiana assigned unique identification numbers to all its students in 2003 and is building a single database in 2004. Illinois and Wisconsin have awarded bids to build similar capacity. A few states cite smaller districts' difficulty to comply with the reporting. Others mention student-privacy concerns, based on the fact that the Family Educational Rights and Privacy Act gives parents certain rights with respect to their children's education records (U.S. Department of Education, n.d.). Regardless of the decision made about individual student records, states at this juncture are wise to consider which other related upgrades are desirable—and doable.

Still, for local practitioners, standardized test scores cannot provide data at the depth and frequency necessary to inform decisions about instructional practice. Districts and schools need more insight into aligning instructional content to standards, strategies for teaching to individual student differences, and guidance on resources for meeting goals. A tool that several SEAs are testing to link assessment, standards, and classroom practice is the Surveys of Enacted Curriculum (SEC). Porter (in press) describes well the possibilities for the SEC. Several states have made inroads into providing systems that support a "smart desktop" level (see Palaich, Good, Stout, & Vickery, 2000) of decision making for teachers, notably the Massachusetts *Virtual Education Space* (ves.mass.edu/). Other vari-

TABLE 2. TRANSITIONING TO A MORE FLEXIBLE DATA SYSTEM

From	*To*
Data organized by events	Data organized by individual student records
Static, aggregated records	Atomistic records, relational in time and hierarchy
Data in discrete sets or "silos"	Records fully relational by field and data set
Data and reports concentrated in hands of few	Access to data and reporting capability at SEA, district, school, and classroom levels
Expertise required to use	User-friendly access routines; continuous user training
Numerical, canned, and columnar reports	Graphical, interactive displays

ations include Web-based resource connections such as *Ohio's Instructional Management System* (ims.ode.state.oh.us/ODE/IMS/default.asp?bhcp=1) and the *Curriculum Resource Center*, a system built by Wisconsin (www2.dpi.state.wi.us/sig/practices/high_2.asp). We have focused on states. However, district-level examples are also relevant. Chicago, for instance, has maintained relational student-level databases since the 1970s, with online school access to near real-time results. The Cleveland Municipal School District is building diagnostic "testlets" aligned to Ohio standards and making detailed, longitudinal, and real-time performance patterns visible to teachers.

Finally, there exist international examples worth a closer look. At the University of Durham, for instance, a grassroots data system has grown to serve 5,000 British schools, providing detailed within-school, within-subject data disaggregations. (Fitz-Gibbon & Tymms, 2002).

Clearly, the student-performance data picture is complex, but there is more. States track education fiscal data, student poverty statistics, English-language learners, technology equipment, and so on. The system should be viewed as part of a larger state data infrastructure, with data moving among departments, back down to districts and schools, potentially between states, and, of course, to federal summary databases. State data strategists, therefore, need to consider functionality within and data exchange across these contexts. To be fair, information technology staff in most states recognize the need for making data accessible and presentable to various users, but policy priorities and limited state budgets preclude them from addressing these needs more fully. Keeping the focus on end-user utility and affordability is difficult when the end user is not in the conversation.

New Kinds of Performance Measures

The NCLB Act requires states to collect and report on new performance measures, and some districts are interested in yet other kinds of data. Just as academic standards vary from state to state, there are multiple views on which performance measures offer the best views on student learning. While the NCLB Act and some state accountability systems emphasize yearly grade or school improvement, some researchers argue that year-over-year test scores are subject to too much volatility to serve as reliable measures of school performance (Kane & Staiger, 2002; Linn & Haug, 2002; Rogosa, 2002). Data signposts for state and federal policy targets may not align with local needs, spurring inappropriate or ineffective action. For instance, almost every state now identifies a few former "flagship" schools as in need of improvement. Whether and how to reallocate resources in such instances is not a simple decision.

The point is often made that local leaders need finer-grained data on student performance, and they need it more frequently. Some see the required NCLB statistic—percentage of students above proficient—as insensitive to variations within buildings and across time. Nor does it yield insight into whether value is being added rapidly enough. Reporting, and thereby inferences drawn from the data, are affected by which scores are used and how they are analyzed (Seltzer, Frank, & Bryk, 1994; Wainer, Hambleton, & Meara, 1999). A stronger focus on patterns of individual student growth over time rather than proportions of students meeting standards is strongly advocated by a variety of researchers (Sanders & Horn, 1994; Seltzer, Choi, & Thum, 2003). The answers data provide are also strongly influenced by the questions asked. A more principled approach to thinking about teaching and learning, *and* learning about data, is needed (Herman, Baker & Linn, 2004).

Demand for alternatives to standardized tests (e.g., performance and portfolio-type assessments) means states must develop more sophisticated strategies for recording and analyzing these kinds of assessment data, in addition to other reporting requirements. The bottom line: As data use increases, so will the demand on states to manage more data and more types of data.

Sharing Data and Accountability

As mentioned, data resided in discrete domains in the early days of electronic data gathering. Further, data tended to flow upstream, from schools and districts toward the state and federal levels. Compliance reporting needs drove (and continue to drive) much of the state investment in data systems. Today, educators and researchers want these databases integrated in such a way that data can be

shared between domains and across levels of users. This is not yet a reality in most states.

Districts that use data effectively for decision making and school improvement give frequent informal tests between high-stakes state testings (Armstrong & Anthes, 2001). This gives instructors data that can be used to diagnose gaps in student learning, which allows them to design interventions to close the gaps (Smith, Smith, & DeLisi, 2000). States rethinking and redesigning education data systems then have an opportunity to empower local educators and distribute accountability throughout the system (Cromey & Hanson, 2000; Massell, 2001). Once states have data systems with the appropriate level of detail to aid in improving instruction, they can begin to create a system of support for schools struggling to meet adequate yearly progress goals, using scientifically based research data.

Interstate efforts can also facilitate the flow of data for comparison and decision making. Just for the Kids, a Texas-based nonprofit organization, uses data provided by SEAs from 17 participating states to identify how well schools are doing and to provide information on the best practices of high-performing schools. In 2003, Standard & Poor's School Evaluation Services (SES) provided Michigan and Pennsylvania with school-level data disaggregation, with particular focus on student performance and operating cost, calculating a variety of indices to estimate educational productivity. Recently, SES and Just for the Kids jointly received funding from the Broad Foundation and the U.S. Department of Education to provide disaggregated student achievement data and data analysis tools to states. This public-private collaboration, the School Information Partnership, is focused on the data being reported for NCLB requirements, and its online tools (at www.schoolresults.org) currently provide analyses for a growing number of states.

The growing market for data tools and support services for data use attests to the desire of schools and educators to use data effectively for improvement. For example, six states, including Illinois, Indiana, and Ohio, participate in the Baldrige in Education Initiative, aimed at giving educators a framework and tools for implementing continuous improvement strategies. In Ohio, Battelle for Kids provides a similar focus. Connecting these strategies and data into state systems will be a challenge, and a necessity. It is unlikely that any SEA system can fully provide for the data needs of all participants in the education enterprise—and even the most ambitious SEA technical staff should accept this.

Toward Data Standards

The trends toward open computing and common protocols made Internet communication possible and made business computing much easier and more efficient. A parallel effort is currently underway to make education data sharing easier. Partners in the quest for data-sharing solutions span industry, government agencies, and education organizations. For example, Schools Interoperability Framework (SIF, 2004) and Common Object Request Broker Architecture (CORBA) (Object Management Group, 2004) establish conventions that smooth the way for the task of liberating data from legacy or foreign systems. Several organizations link information on state standards, helping to bridge stand-alone data sets.

From a national perspective, state solutions to data management have tended toward the iconoclastic, leaving little room for economies of scale or sharing good applications. In 2002, the U.S. Department of Education funded the United States Open e-Learning Consortium (USOeC), a 14-state consortium to explore the use of statewide, interoperable e-learning and decision-support platforms (Center for Teaching, Learning, and Technology, 2001–2002). If the USOeC reaches its goals, states could more easily share data, learning objects (e.g., test items and lesson plans), and tools to support standards-based, curriculum-aligned education. However, creating such an open platform takes time and interstate cooperation, two commodities that are not in abundant supply.

Another U.S. Department of Education program is the Performance Based Data Management Initiative (PBDMI). (Although this program is an initiative of the department's Office of the Chief Information Officer, the most detailed information about this effort resides on the Web site [evalsoft07.evalsoft.com/pbdmi] of principal contractor Evaluation Software, Inc.) PBDMI seeks to set standards, guidelines, and policy on data collection and information management practices, while moving the focus of data collection away from compliance and toward performance. The work is expected to result in the creation of the Education Data Exchange Network (EDEN).

Learning Point Associates offers Data Retreats to schools and districts nationally. These retreats provide a comprehensive professional development framework that (1) addresses collection and analysis of data; (2) enables educators to analyze the data, using a generic and supportive process to identify and prioritize goals and strategies; and (3) allows evaluation of solutions to sustain and build a data culture.

The National Center for Education Statistics (NCES) has supported the National Forum on Education Statistics for over a decade. The forum brings together data-system specialists from all 50 state agencies once or twice each year. These meetings have produced a valuable series of working papers and standards documents (see www.nces.ed.gov/forum). A core piece has been a set of data handbooks and support tools that focus on the needs of school-, district-, and state-level administrators. Examples of these publications include the *Student Data Handbook for Elementary, Secondary, and Early Childhood Education: 2001 Update* (NCES, 2001); *Building an Automated Student Record System* (NCES, 2000); and *Protecting the Privacy of Student Records* (Cheung, Clements, & Pechman, 1997). In 2002, the forum piloted an exchange of standards-based, curriculum-aligned assessment objects for use in formative assessments. It continues to develop a classification system for sharing and retrieving learning objects based on each state's curriculum standards. Since 2000, the Council of Chief State School Officers has been convening various states to develop and improve state data systems. About 15 states participate in this Accountability Systems and Reporting (ASR) project. The ASR project provides guidance around data systems and has published criteria for high-quality state reports, examples of state plans for adequate yearly progress (AYP), and strategies to address critical issues related to AYP.

Clearly, progress is being made in two areas: creating standards for data exchange and interoperability, and building the will to adhere to these standards. Sharing of data and data findings should also be part of the thinking about data systems. States and districts need not all repeat the same experiments; more efficient replications are possible, and common learning will accelerate progress. While copyrights and patents assure intellectual rights and profit, scientists continue to construct methods to share research and research data efficiently. As states construct new and better data systems, they would be wise to study the approaches researchers have developed (Arzberger et al., 2004).

IMPLEMENTATION CHALLENGES FOR GOVERNMENT

The previous section examined the multifold and ongoing factors that strain state data-system capacity. However, good command of data promises big payoffs in student achievement and school success. At least that is what the current clarion call for data-driven decision making implies (Massell, 2001; Serim, 2003; Streifer, 2002). While the call sounds sensible, strong evidence for it in education is difficult to come by. Case studies abound, but only recently has credible research begun to make the point.

Martin Carnoy and Susanna Loeb (2002), researchers at Stanford University, studied states' accountability policies and changes in state average National Assessment of Educational Progress (NAEP) scores and found that states with stronger accountability systems showed greater improvement in student performance. Harvard's Brian Jacob (2004) conducted a finer-grain analysis, linking changes in the accountability structures of the Chicago Public Schools to student performance and teacher behavior. Improved math and reading scores followed heightened accountability.

Chrispeels, Brown, and Castillo (2000) have documented that data use predicts more effective school improvement teams. Stronger accountability and better data engender improved performance. But the path that links data and performance remains murky: The decisions local actors will make are not readily predictable, and sometimes those decisions contravene good educational practice as short-term tactics "out-elbow" long-term strategy.

This situation demands thoughtful action combined with expert guidance. The complexity of technology-based innovation, coupled with the political realities of adopting and implementing new programs, is daunting for even the most well-intentioned reformers. Very few legislators or elected officials feel they have sufficient knowledge about technology to

make important investment decisions. In fact, policymakers report finding little research about technology that is relevant to their policy questions and deliberations (Education Commission of the States, 1998). Furthermore, political bodies are not designed to sort out the technical details of an integrated and robust state education data system.

On the other hand, state agency technical staff and managers lack the time, sometimes the vision, and most often the political know-how to guide the oversight and governance of technology investments. Despite the broader vision of chief information officers (CIOs)—for those state agencies that have appointed them—even CIOs may not be well equipped to deal with multiple legislators on thorny technical issues. And, most CIOs are not trained in the complexities of education data analysis and data utilization, because most mastered their craft in business environments. These professionals need to be at the decision-making table, but it is not clear that they should lead the process.

For other complicated and technical issues such as utilities, transportation, and energy, legislators vote on policy based on the recommendations of commissions or boards appointed for their expertise and varied perspectives. These boards listen to the concerns and advice of stakeholders from across the state and political spectrum, as well as the needs and concerns of consumers. They consider multiple options, work out compromises, and present legislators with plans on which to vote.

States need a similar body to recommend action across the full spectrum of a state's education data system. Rather than requiring a task force, data systems require an ongoing commission, appointed by the legislature and the governor, with SEA representation, and with a clear agenda. The commission should oversee five key data tasks that states must perform. Thorn (2001) identifies three of those tasks: define and prioritize what to study and/or measure, manage the data (infrastructure, security, access), and measure performance meaningfully. States must also report the data in useful and timely ways and build the technical and human capacity to use the data effectively.

The commission would conduct conversations with the education agency, the legislature, and other agencies dealing with children to ensure that the five aforementioned tasks are meeting stakeholder needs. The commission should have the capacity to make decisions, develop a comprehensive plan, and present recommendations to the legislature for vote. The scope of the commission's work should encompass K–12 public education. Each state should decide for itself whether to include representatives at other levels of education (preschool, higher education, nonpublic education) on the commission.

Despite the broader vision of chief information officers (CIOs)...most CIOs are not trained in the complexities of education data analysis and data utilization, because most mastered their craft in business environments.

POLICY RECOMMENDATIONS

State by state, SEAs have been moving forward along the road to data sophistication—if in fits and starts. Given states' fiscal uncertainties, it is tempting to delay a comprehensive examination of data infrastructure and management until state coffers are full. Mistakes are costly, so too is inaction. Incremental measures can extend the lifespan of an existing system, but states run the risk of spending more to get less in the long run. It is more prudent to develop a coherent data systems plan and a mechanism for overseeing its implementation.

The following recommendations summarize this report's findings and provide options for policymakers to consider.

- **Address the key tasks associated with effective use of education data.** There are five such responsibilities:
  - Define and prioritize what to study and measure.
  - Ensure that student, school, and system performance are measured meaningfully.
  - Manage and integrate disparate data sources (infrastructure, security, access).
  - Report the data in useful and timely ways.
  - Build the technical and human capacity to use the data effectively in the schools and centrally.
- **Create an education data oversight commission in each state.** These permanent commissions would manage each state's education data system—regulating and overseeing its development—and recommend policy, planning, and investment deci-

sions to the legislature. The individual state commissions should themselves have opportunity to coordinate with each other and with federal data leadership.

- **Develop common data standards, data-collection guidelines, and data-management practices.** Representatives from the SEA or the newly created commission should participate in this multistate effort.

CONCLUSION

Ever since states committed to standards-based reform, they have been confronting data-capacity issues. States manage data about standards implementation (accountability measures); they manage test-score data on how much students are learning (performance measures); and they manage data about the test takers and their schools (context and demographic data). Outside pressures also point to data mastery. ESEA encouraged data management practices in the name of accountability; NCLB legislation in effect requires it.

States need to adopt a proactive, comprehensive approach to building and maintaining the education data system. Key policymakers need to agree that building a robust data system is essential to making progress on education reform. In each state, a coalition, led by the governor, the state superintendent or key legislators, or some combination thereof, must initiate the effort. The coalition must appoint a commission with a clear agenda and the authority to ensure that states accomplish key data tasks.

Efforts to establish data standards and conventions will facilitate data use for decision making and will reduce inefficiencies. Data, and the costs of managing it, can be shared. Several such efforts already exist (e.g., SIF in the private sector, PBDMI and the NCES data forum in the public sector). However, their sense of urgency needs to grow, and other voices need to join. Strong support from political actors will help force the agendas.

These efforts should also be coordinated with the work of the What Works Clearninghouse and other efforts to make educational knowledge more rigorous and more evidence based. The administrative and performance data sytems, standards, and conventions that state systems design and implement should in the long term also simplify the collection of data for research purposes.

Robert M. Palaich, Ph.D., *currently vice president of Augenblick, Palaich and Associates, previously worked for the Education Commission of the States (ECS), most recently as vice president of the Policy, Studies and Programs Division. With over 25 years service at ECS, Dr. Palaich has worked with state policymakers regarding standards-based reform, at-risk youth, teacher policy, and school restructuring issues.*

Dixie Griffin Good *is president of The Public Good, Inc., an education policy and communications consulting firm. She has done extensive research and writing on education technology for leading policy organizations, as well as evaluation studies at the state, district, and school levels.*

Arie van der Ploeg, *senior researcher at Learning Point Associates, has extensive experience in and knowledge of data analysis and education policy issues. He provides conceptual leadership in designing data tools for schools and in building capacity for data-driven decision making and school improvement.*

POLICY ISSUES

CEO
Gina Burkhardt

Executive Director
Cathy Gunn

Executive Editor
Gail Lieberman

Art Director
Ann Christianson

Editor
Linda Schuch

Graphic Designer
Lindsey Jones

Contributors
Jill Shively
Sabrina Laine, Ph.D.
Ginger Reynolds, Ph.D.

Reviewers
Christopher A. Thorn, Ph.D.. Wisconsin Center for Education Research

Barbara Clements, Ph.D.. ESP Solutions Group

Chrys Dougherty, Ph.D. Just for the Kids

For more information, contact:

LEARNING POINT Associates™

1120 East Diehl Road, Suite 200
Naperville, IL 60563-1486
800-356-2735 • 630-649-6500
www.learningpt.org

REFERENCES

Armstrong, J., & Anthes, K. (2001). *Identifying the factors, conditions and policies that support schools' use of data for decisionmaking and school improvement: Summary of findings* (Policy Brief). Retrieved May 19, 2004, from http://www.ecs.org/clearinghouse/30/69/3069.htm

Arzberger, P., Schroeder, P., Beaulieu, A., Bowker, G., Casey, K., Laaksonen, L., et al. (2004, March 19). Policy forum: An international framework to promote access to data. *Science, 303*(5665), 1777–1778.

Bernhardt, V. (1998). *Data analysis for comprehensive schoolwide improvement.* Larchmont, NY: Eye on Education.

Berhardt, V (2004). *Data analysis for comprehensive schoolwide improvement* (2nd ed.). Larchmont, NY: Eye on Education.

Carnoy, M., & Loeb, S. (2002). Does external accountability affect student outcomes? A cross-state analysis. *Educational Evaluation and Policy Analysis*, *24*(4), 305–331.

Center for Teaching, Learning, and Technology. (2001–2002). *United States Open e-Learning Consortium.* Retrieved from May 19, 2004, from http://www.ctlt.org/projects/us_open_e_learning

Cheung, O., Clements, B., & Pechman, E. (1997). *Protecting the privacy of student records* (NCES 97-527). Washington, DC: National Center for Education Statistics.

Chrispeels, J. H., Brown, J. H., & Castillo, S. (2000). School leadership teams: Factors that influence their development and effectiveness. In *Understanding schools as intelligent systems* (pp. 39–73). (Vol. 4 in series, *Advances in research and theories of school management and educational policy*). Stamford, CT: JAI Press.

Cromey, A., & Hanson, M. (2000). *An exploratory analysis of school-based student assessment systems.* Oak Brook, IL: North Central Regional Educational Laboratory.

Cross, R. W., Rebarber, T., & Torres, J. (Eds.). (2004). *Grading the systems: The guide to state standards, tests, and accountability policies.* Washington, DC: Thomas B. Fordham Foundation & AccountabilityWorks. Retrieved May 18, 2004, from http://www.edexcellence.net/doc/GradingtheSystems.pdf

Education Commission of the States. (1998). *Learning and technology: Integrating policy perspectives and research.* Denver, CO: Author.

Family Educational Rights and Privacy Act. (n.d.). *General information.* Retrieved May 18, 2004, from http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html

Fitz-Gibbon, C. T., & Tymms, P. (2002). Technical and ethical issues in indicator systems: Doing things right and doing wrong things. *Education Policy Analysis Archives, 10*(6). Retrieved May 18, 2004, from http://epaa.asu.edu/epaa/v10n6/

Fullan, M. (with Stiegelbauer, S.). (1991). *The new meaning of education change* (2nd ed.). New York: Teachers College Press.

Herman, J. L., Baker, E. L., & Linn, R. L. (2004, Spring). Accountability systems in support of student learning: Moving to the next generation. *CRESST Line*, pp. 1-7. Retrieved May 18, 2004, from http://www.cse.ucla.edu/products/newsletters/CLspring2004.pdf

Illinois Business Roundtable. (2002). *Baldrige in education: A journey worth beginning.* Retrieved May 18, 2004, from http://www.baldrigeineducation.org/overview.html

Jacob, B. (2004). *Accountability, incentives, and behavior: The impact of high-stakes testing in the Chicago Public Schools* (National Bureau of Economic Research Working Paper 8968). Retrieved May 19, 2004, from http://ksghome.harvard.edu/~.bjacob.academic.ksg/highstakes16.pdf

Kane, T. J., & Staiger, D. O. (2002). Volatility in school test scores: Implications for test-based accountability systems. In D. Ravitch (Ed.), *Brookings papers on education policy: 2002* (pp. 235–269). Washington, DC: Brookings Institution Press.

Linn, R. L. & Haug, C. (2002). Stability of school-building accountability scores and gains. *Educational Evaluation and Policy Analysis*, *24*(1), 29–36.

Massell, D. (2001, April). *The data driven theory of change: Effects and implications.* Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA.

National Center for Education Statistics. (2000). *Building an automated student record system (*NCES 2000-324). Washington, DC: Author. Retrieved May 19, 2004, from http://nces.ed.gov/pubs2000/2000324.pdf

National Center for Education Statistics. (2001). *Student data handbook: Elementary, secondary, and early childhood education: 2001 update* (Rev. ed., NCES 2000-343). Washington, DC: Author. Retrieved May 19, 2004, from http://nces.ed.gov/pubs2000/2000343.pdf

No Child Left Behind Act of 2001, Pub. L. No. 107-110,115 Stat. 1425 (2002). Retrieved May 18, 2004, from http://www.ed.gov/policy/elsec/leg/esea02/index.html

Object Management Group. (2004). *CORBA corner.* Retrieved May 19, 2004, from http://www.omg.org/#corba_corner

Palaich, R. M., Good, D. G., Stout, C., & Vickery, E. (2000). *Smart desktops for teachers* (ECS Issue Paper: Technology). Retrieved May 18, 2004, from http://www.ecs.org/clearinghouse/18/47/1847.htm

Porter, A. (in press). Curriculum assessment. In J. Green, G. Camilli, & P. Elmore (Eds.), *Complementary methods for research in education.* Washington, DC: American Educational Research Association. Prepublication draft retrieved May 24, 2004, from http://www.secsupport.org/pdf/curricassess.pdf

Rogosa, D. (2002). *Irrelevance of reliability coefficients to accountability systems: Statistical disconnect in Kane-Staiger "Volatility in School Test Scores."* Retrieved May 18, 2004, from http://www-stat.stanford.edu/%7Erag/api/kscresst.pdf

Sanders, W., & Horn, S. (1994). The Tennessee value-added assessment system (TVAAS): Mixed-model methodology in educational assessment. *Journal of Personnel Evaluation in Education, 8*(3), 299–311.

Schools Interoperability Framework. (2004). *About SIF: General overview.* Retrieved May 19, 2004, from http://www.sifinfo.org/about_sif/general_overview.asp

Seltzer, M. H., Choi, K., & Thum, Y. M. (2003). Examining relationships between where students start and how rapidly they progress: Using new developments in growth modeling to gain insights into the distribution of achievement within schools. *Educational Evaluation and Policy Analysis*, *25*(3), 263-286.

Seltzer, M. H., Frank, K. A., & Bryk, A. S. (1994). The metric matters: The sensitivity of conclusions about growth in student achievement to choice of metric. *Educational Evaluation and Policy Analysis*, *16*(1), 41–49.

Senge, P., Kleiner, A., Roberts, C., Ross, R. B., & Smith, B. J. (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization.* New York: Doubleday.

Serim, F. (2003). *No more flying blind: Using data-driven decision-making to guide student learning.* Washington, DC: Consortium for School Networking.

Smith, J. K., Smith, L., & De Lisi, R. (2000). *Natural classroom assessment: Designing seamless instruction and assessment.* Thousand Oaks, CA: Corwin Press.

Streifer, P. (2002). *Using data to make better educational decisions.* Lanham, MD: Scarecrow Education & American Association of School Administrators.

Thorn, C. A. (2001). Knowledge management for educational information systems: What is the state of the field? *Education Policy Analysis Archives*, *9*(47). Retrieved May 25, 2004, from http://epaa.asu.edu/epaa/v9n47/

U.S. Department of Education. (n.d.). *General: Family Educational Rights and Privacy Act.* Retrieved May 18, 2004, from http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html

Wainer, H., Hambleton, R., & Meara, K. (1999). Alternative displays for communicating NAEP results: A redesign and validity study. *Journal of Educational Measurement*, *36*(4), 301–335.

About Learning Point Associates

Building on almost 20 years of research and development conducted by the North Central Regional Educational Laboratory (NCREL), Learning Point Associates now offers a complementary menu of products and services that reflect the same high-quality research base that you know and trust. Our expertise is demonstrated in the following areas:

- Technology integration
- Curriculum, instruction, and assessment
- Data identification, analysis, and application
- After-school programming and evaluation
- School change and improvement
- Educator quality and professional development

The Research & Development Group conducts activities and develops products with a focus on educational technology, literacy, and data use. These activities and products serve as the foundation of Learning Point Associates work, providing educators and policymakers with evidence-based resources that meet their existing needs and anticipate future challenges.

The Professional Services Group delivers a variety of professional development workshops and training programs based on the Learning Point Associates areas of expertise. These workshops and programs are designed to help clients learn new approaches to enhance their professional growth and build capacity to improve educational practice.

The Evaluation & Policy Research Group provides independent, stand-alone services or coordinated services that support strategy development and organization objectives over time, according to each client's specific needs. The variety of services includes evaluation for planning, implementation evaluation, impact evaluation, and policy research.

LEARNING POINT Associates™

Knowledge. Strategies. Results.

To order products and services, call **800-252-0283**. For general information, call **800-356-2735**. Visit our Web site at **www.learningpt.org**.

POLICY ISSUES | No. 16, June 2004

State Education Data Systems That Increase Learning and Improve Accountability

LEARNING POINT Associates™
1120 East Diehl Road, Suite 200
Naperville, IL 60563-1486

Non-Profit Org.
U.S. Postage
PAID
Mt. Prospect IL
Permit No. 23