Large-Scale Reform in the Era of Accountability: The System Role in Supporting Data-Driven Decision Making

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The contemporary education policy marks a shift away from the idea that change happens organically, one school at a time. Instead, there is a focus on creating a systematic infrastructure to support change across a large number of schools at once. Within this decade, we have witnessed several types of large-scale reform efforts in the United States and across other Western countries, including state and federal systems of standards and accountability and system-wide implementations of literacy and numeracy programs, among others.

In the United States, the shift to large-scale reform was crystallized in the No Child Left Behind Act (NCLB) of 2001 which instituted a new accountability system based on assessments and standards. As the reauthorization of the Elementary and Secondary Education Act (ESEA), NCLB followed up on the ideas laid forth in governmental plans and policies beginning in the 1990s. However, this new policy gave the federal government unprecedented authority in several ways by "crea[ting] stern directives regarding test use and consequence; put[ting] federal bureaucrats in charge of approving state standards and accountability plans; set[ting] a single nationwide timetable for boosting achievement; and prescrib[ing] specific remedies for under-performing schools" (Finn & Hess, 2002, p. 2).

NCLB is the first federal comprehensive educational framework consisting of standards, assessments, and accountability. NCLB is particularly noteworthy because it moves past the traditional focus on schooling "inputs" and holds educators responsible for student performance results (Dembosky, Pane, Barney, & Christina, 2005; Ingram, Louis, & Schroder, 2004; Lafee, 2002). Under this system, the mechanisms for accomplishing these goals emphasize data-driven decision making (i.e., test scores, yearly progress reports), the implementation of evidence-based practices, and increased school choice for parents. NCLB requires states to have standards detailing content for student learning. Testing is also mandatory for students in most grades, and results are intended to be used to drive instruction and teaching practices. In addition, student performance data must be disaggregated

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based on major demographic classifications such as race/ethnicity, socioeconomic status, gender, disability, and language. Systematic testing is also coupled with prescriptive intervention remedies for schools not meeting Adequate Yearly Progress (AYP). Schools are pushed to improve under threat of sanctions that ultimately allow parents to opt out of low-performing schools. Additionally, guidelines for enhancing teacher quality are laid out.

Thus, the current era of large-scale educational reform is marked by standards, assessments, and accountability. These policy tools are held together by assumptions of the need for policy coherence, system alignment, and coordination among various education agencies. Standards, tests aligned to standards, and accountability systems are stronger policy instruments because they attempt to directly influence instruction and student outcomes. However, the instruments are still relatively weak because the how and why of teaching and learning remain unaddressed. Standards provide guidance on classroom content but do not assist teachers in translating standards into effective instructional practices. Given the flexibility that states have in determining standards and proficiency levels, metrics of student performance can also be misleading, since some states opt for less rigorous standards and minimum competency measures of learning rather than the world-class standards touted by NCLB (NCES, 2007).

Even in the era of large-scale educational reform ushered in by NCLB, determining effective instructional practices and measuring learning remain elusive goals. Moreover, capacity building for the core technology of education (Spillane, Reiser, & Reimer, 2002) – teaching and learning – has not been apparent in NCLB. Thus, the work of changing practices to meet more stringent accountability demands has been left to educators at the school and district levels, hence setting the stage for system-wide movements toward data-driven decision making (DDDM).

In this chapter, our purpose is to open up the "black box" of large-scale educational change, specifically focusing on a reform movement that results from the current era of accountability: data-driven decision making. We first present the "co-construction" framework as a way to understand large-scale reform and then examine research and theories of action behind DDDM. Our focus here is on the system, or school district level, where large-scale efforts to engage educators in the use of data often are initiated. We summarize with conclusions and implications for further research.

Understanding Large-Scale Educational Reform Through the Co-construction Framework

In our earlier work (e.g., Datnow, Hubbard, & Mehan, 2002; Datnow, Lasky, Stringfield, & Teddlie, 2006), we have found the "co-construction" perspective to be a useful heuristic for examining the dynamics involved in the implementation of large-scale educational change. The co-construction perspective extends the mutual adaptation theory coined in the Rand Change Agent study (Berman & McLaughlin, 1978) and elaborates on how the interconnections between actors and the wider

social and political sphere shape policy implementation (Datnow et al., 2002). Co-construction draws upon the socio-cultural tradition which identifies personal, interpersonal, and community "levels" or "planes" of interaction (Rogoff, 1995; Tharp, 1997). Furthermore, co-construction, like mutual adaptation, views organizations as embedded within successively contextualized layers (McLaughlin & Talbert, 1993), but it extends the context to include the broader social system and political economy.

The co-construction approach has a number of specific dimensions. Most important is the idea of a relational sense of context (Datnow et al., 2002). By this we mean that people's actions cannot be understood apart from the setting in which the actions are situated; reciprocally, the setting cannot be understood without understanding the actions of the people within. A relational sense of context does not privilege any one context; rather it highlights the reciprocal relations among the social contexts in the policy chain (Hall & McGinty, 1997). Because contexts are inevitably connected (Sarason, 1997), multiple layers of the social system must be considered (Datnow et al., 2002). Of course, at a given point in time, a researcher will foreground interactions among social actors in one context and locate others in the background; but in order to allow for complete analysis, the interconnections among contexts throughout the system need to be described (Hall & McGinty, 1997; McLaughlin & Talbert, 1993; Sarason, 1997).

The relational sense of context builds on but also moves beyond the embedded sense of context notion that has dominated many analyses up to now. While definitions vary, embedded context typically refers to classroom as nested in broader system layers (Fullan, 1991) or interactional "planes" (Rogoff, 1995). This conception is important because it calls attention to the fact that face-to-face interaction occurs within wider dimensions of social life. However, it often puts only one site in the center. Furthermore, the embedded sense of context can be susceptible to the conceptual traps of structural determinism and uni-directionality, implying that policy only travels in one direction, usually from the top to down (Datnow, Hubbard, & Mehan, 2002). By contrast, the relational sense of context does not automatically assign a sense of importance to any one context but rather highlights relationships among contexts as key focus for analysis. As Cohen, Moffitt, and Goldin (2007) noted, implementation of policy is a complex process; policy aims, instruments, implementers' capabilities, and the environment of practice all interact to produce policy outcomes (p. 71).

Accordingly, the co-construction perspective rests on the premise of multi-directionality: that multiple levels of educational systems may constrain or enable policy implementation and that implementation may affect those broader levels. In this view, political and cultural differences do not simply constrain reform in a top–down fashion. Rather, the causal arrow of change travels in multiple directions among active participants in all domains of the system and over time. This grammar makes the reform process "flexible" and enables people who have "different intentions/interests and interpretations [to] enter into the process at different points along the [reform] course. Thus many actors negotiate with and adjust to one another within and across contexts" (Hall & McGinty, 1997, p. 4).

Given that it takes into consideration political and cultural differences, co-construction also acknowledges the role of power (Datnow et al., 2002). The co-construction perspective recognizes that people in organizations at all levels contribute to the policy-making process and that process is characterized by continuous interaction among agents and actors within and between levels of the system. However, differential access and use of power are affected by a person's position in the system (Firestone, Fitz, & Broadfoot, 1999). For example, unlike policymakers whose main role is to help design policy, implementers (whether they are situated at the state, district, or school levels) are simultaneously the object of reform and the agents of change. Consequently, implementers tend to carry the bulk of the weight in adjusting or conforming to policy mandates.

Most studies that look across contextual levels take an embedded sense of context. If we were to take an embedded sense of context, we would assume that events at higher levels of the context occur first and are more important analytically. We might also assume that policies originating in "higher" levels of context cause or determine actions at lower levels. However, this may limit our understanding of educational reform, as we will explain. This conceptualization makes the reform process flexible, with people who have "different intentions/interests and interpretations [and who] enter into the process at different points along the [reform] course. Thus many actors negotiate with and adjust to one another within and across contexts" (Hall & McGinty, 1997, p. 4). As with Elmore's (1979–1980), "backward mapping" concept, we also do not assume that policy is the only, or even major, influence on people's behavior. Individuals at the local level do indeed make decisions that affect not only policy implementation, but sometimes also the policy itself. This emphasis upon multi-dimensionality marks the co-construction perspective of reform implementation and departs from the technically driven, uni-directional conceptions of educational change.

We believe that formulating implementation as a co-constructed process coupled with qualitative research is helpful in making sense of the complex, and often messy, process of large-scale educational reform. Even when policies are seemingly straightforward, they are implemented very differently across localities, schools, and classrooms (Elmore & Sykes, 1992). We will call up the co-construction framework as we discuss DDDM.

District Level Reform and Data-Driven Decision Making

In the current policy environment, districts have emerged as key players in educational reform. More than ever before, districts are helping schools to focus on student achievement and quality of instruction (McIver & Farley, 2003; Togneri & Anderson, 2003). They have done so by learning to strategically engage with state reform policies and resources, with DDDM being a key ingredient.

When the term data-driven decision making is raised, people often ask, exactly, "what data are you referring to?" When using the phrase data-driven decision making, we refer to the process by which individuals or groups think about and

use data. Some scholars make delineations between concepts such as data, information, and knowledge (Mandinach, Honey, & LIght, 2006). In these cases, data are defined as "raw" pieces of facts while information and evidence are described as an interpretation of data. Since all data, including those collected from formal research projects, are designed and gathered based on theoretical and methodological perspectives, this distinction narrowly defines data and ignores the importance of data collection methods. In contrast to these narrow definitions, Earl and Katz (2002) adopt a broader view on what constitutes data. They argue that data are "summaries that result from collection of information through systematic measurement or observation or analysis about some phenomenon of interest, using quantitative and/or qualitative methods" (p. 4). Data are not characterized based on their visual representation (e.g., whether they are numbers or words or "raw facts") but by the quality of their collection and synthesis. Furthermore, evidence refers to the interpretation arising out of data synthesis and analysis that is then used as a justification for specific purposes such as supporting a course of action or confirming or disconfirming assumptions (Lincoln, 2002).

When referring to data use by individuals in schools and districts, we specifically refer to broad categories of information including (Bernhardt, 1998):

1. Demographic data, including attendance and discipline records;
2. Student achievement data, which encompasses not only standardized data but also formative assessments, teacher developed assessments, writing portfolios, and running records;
3. Instructional data, which focuses on activities such as teachers' use of time, the pattern of course enrollment, and the quality of the curriculum; and
4. Perception data, which provides insights regarding values, beliefs, and views of individuals or groups (e.g., surveys, focus groups).

As noted above, with the advent of No Child Left Behind, many districts are relying on these kinds of data (though often primarily those listed in number two, student achievement data) to inform decisions. A recent national study of the impact of NCLB reveals that most districts are allocating resources to increase the use of student achievement data to inform instruction in schools identified as needing improvement (Center on Education Policy, 2004). Similarly, summarizing findings across several major recent studies of high-performing school districts, Anderson (2003) writes:

> Successful districts in the current era of standards, standardized testing, and demands for evidence of the quality of performance invest considerable human, financial and technical resources in developing their capacity to assess the performance of students, teachers and schools, and to utilize these assessments to inform decision-making about needs and strategies for improvement, and progress towards goals at the classroom, school, and district levels (p. 9).

Supporters of data-driven decision making practices argue that effective data use enables school systems to learn more about their school, pinpoint successes and

challenges, identify areas of improvement, and help evaluate the effectiveness of programs and practices (Mason, 2002).

Previous research, though largely without comparison groups, suggests that DDDM has the potential to increase student performance (Alwin, 2002; Doyle, 2003; Johnson, 1999, 2000; Lafee, 2002; McIntire, 2002). Student achievement data can be used for various purposes including evaluating progress toward state and district standards, monitoring student progress, evaluating where assessments converge and diverge, and judging the efficacy of local curriculum and instructional practices (Cromey, 2000). When school-level educators become knowledgeable about data use, they can more effectively review their existing capacities, identify weaknesses, and better chart plans for improvement (Earl & Katz, 2006).

Data-driven decision making is also critical to identifying and finding ways to close achievement gaps between white and minority students (Bay Area School Reform Collaborative, 2003; Olsen, 1997). One of the expected outcomes of using evidence to base decisions is the questioning of long-held assumptions about students and student achievement. In some instances when educators are confronted with evidence that challenges their views about students' abilities, data can act as a potential catalyst for changing perceptions (Datnow & Castellano, 2000; Skrla & Scheurich, 2002). Armstrong and Anthes (2001) indicated that comparisons to high-performing schools with similar student demographics helped teachers in lower-achieving schools to stop blaming students' background for low academic results. Skrla and Scheurich (2002) suggested that the Texas accountability system's emphasis on disaggregating student data by subgroups helped to displace, but not eliminate, deficit views of students. Similarly, Woody's (2004) survey of educators' views on California's accountability system found that larger data patterns increased teachers' awareness of inequities in student outcomes.

Prior research on DDDM indicates several key strategies, or areas of work, particularly when the reform is initiated by a system as part of a large-scale educational reform effort. First of all, studies indicate that using data must be a key feature in reform plans rather than a supplemental or sporadic activity (Datnow, Park, & Wohlstetter, 2007; Supovitz & Taylor, 2003; Togneri & Anderson, 2003). Becoming a learning organization necessitates a collaborative environment in which teachers and administrators have multiple opportunities and resources to examine and interpret data, followed by time to develop an action plan to change behavior. Furthermore, the effective use of data must occur at the district, school, and classroom levels (Armstrong & Anthes, 2001; Datnow et al., 2007; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Supovitz & Taylor, 2003; Togneri & Anderson, 2003; Wayman & Stringfield, 2006). Because DDDM is a system-wide activity, the co-construction framework is a helpful way for thinking about the activities and interrelationships of the individuals involved, up, down, and around the system.

Also, in districts where DDDM is prevalent, there is often a culture of inquiry (Earl & Katz, 2006) that supports data use at all levels. Districts are actively transforming their professional development practices from ones that focus on compliance to support in order to build the capacity of their staff to participate in decision-making processes and create an organizational culture of inquiry

(Petrides & Nodine, 2005). A culture of continuous improvement accompanies this culture of inquiry. Also, inclusiveness in the DDDM process is often prevalent. Not only are principals privy to repositories of assessment data, but teachers are as well. Teachers are often encouraged to take a close look at grade-level and classroom data and share and discuss the data with each other (Armstrong & Anthes, 2001).

As part of engaging in DDDM, districts often create a closer alignment between the curriculum and state standards. This typically involves creating benchmarks and standards for each grade level. Increasingly, districts are also implementing regular assessments throughout the school year in order to make sure that student progress toward standards is regularly monitored and that instructional adjustments are made accordingly (Armstrong & Anthes, 2001; Petrides & Nodine, 2005). Scorecards are also utilized as a management tool to monitor and measure the progress of schools as well as to assist districts and school in aligning their goals (Petrides & Nodine, 2005).

However, data need to be actively used to improve instruction in schools, and individual schools often lack the capacity to implement what research suggests (Wohlstetter, Van Kirk, Robertson, & Mohrman, 1997). The implementation of NCLB has set the stage for schools to become "data-rich" but not necessarily for teachers to be effective data users; in other words, the presence of data alone does not lead to substantive and informed decision making. Thus, districts play a key role in developing capacity and structures to enable effective data use. Previous studies on the implementation of DDDM confirm that structural enablers, effective leadership, and positive socialization toward data use impact its effectiveness (Armstrong & Anthes, 2001; Datnow et al., 2007; Ingram et al., 2004).

In districts that support DDDM, the superintendent and school board members often know how to lead and support data use. Districts often have staff that work as liaisons with principals and individual schools (Armstrong & Anthes, 2001). Some districts are hiring instructional guides for each school to help faculty interpret student achievement data and to develop plans for improving outcomes. Overall, strong leaders, committed to utilizing data for decision making and knowledgeable about the process, are essential to ensuring that a positive culture for data use is implemented at the school level (Dembosky et al., 2005; Marsh et al., 2005; Petrides & Nodine, 2005). They lead by creating an atmosphere where data use practices are relevant for instructional decision making.

School systems that are more successful in data use also tend to balance both standardization and flexibility (Datnow et al., 2007; Marsh et al., 2005). A degree of autonomy and flexibility for teachers is necessary in order to maintain the perspective that decisions are based on data rather than predetermined conclusions. In schools where DDDM practices became a core element for improvement processes, central office administrators, principals, and lead teachers expected data to be used to inform and justify decisions. Whether teachers have the flexibility to reorganize their student groups based on benchmark assessments, re-teach previous topics outside the scope and sequence of the curriculum, or alter the pace of the curriculum impacts the degree to which data will be used to guide decisions.

Teachers need time to review and make sense of data if it is going to affect their instruction. In districts and schools that use data effectively, time is reallocated in the school day for reflection and professional development (Datnow et al., 2007; Feldman & Tung, 2001; Halverson, Grigg, Prichett, & Thomas, 2005; Marsh et al., 2005). Group-based inquiry or "collaborative data teams" have been found to be successful in implementing DDDM across a system due to the broad participation from a diverse array of staff including teachers and administrators (Mason, 2002). School systems are also starting to data reflection protocols in order to guide these data meetings (Datnow et al., 2007). These structured data discussions provide teachers with continuous and intensive opportunities to share, discuss, and apply what they are learning with their peers (Garet, Porter, Desimone, Birman, & Yoon, 2001; Wilson & Berne, 1999). Once teachers identify instructional and learning gaps, improvement efforts may be blocked if teachers are unaware of intervention or instructional strategies. Leaders can address these needs by developing external partnerships to help build system-wide capacity (Anthes & Armstrong, 2001; Datnow et al., 2007).

Studies consistently suggest that as part of their capacity-building efforts, districts often provide professional development for principals and teachers so that they can learn to use data effectively (Petrides & Nodine, 2005; Togneri & Anderson, 2003). This is very important, as a perpetual problem that many schools face in making data-driven decisions is the lack of training regarding how to incorporate data into the school improvement process (Cromey, 2000). The onslaught of "drive-by" training sessions (Elmore, 2002) that do little to address the specific needs of schools and teachers cannot support the ongoing learning that is required for capacity building (Darling-Hammond & McLaughlin, 1995). Instead, effective professional development provides teachers with continuous and intensive opportunities to share, discuss, and apply what they are learning with other practitioners (Garet et al., 2001; Wilson & Berne, 1999). In order for this to occur, system-level support needs to be in place. In addition to consistent structured time for collaboration and professional learning, schools need strategies for planning, sharing, and evaluating their efforts.

Thus, developing teachers' capacity to become effective at using data to inform their instruction requires actions at multiple levels. Studies have suggested that school systems empower teachers to use data to inform their instruction and learning by: (1) investing in user-friendly data management systems that are accessible to teachers; (2) offering professional development for staff in how to use data and how to make instructional decisions on the basis of data; (3) providing time for teacher collaboration; and (4) connecting educators within and across schools to share data and improvement strategies (see Datnow et al., 2007). However, it is important to note that teachers need not only the capacity but also the *empowerment* to make instructional decisions based on data. School and system leaders need to provide scaffolds of support, but at the same time allow teachers enough flexibility to act on the basis of an informed analysis of multiple sources of data about their students' progress.

Overall, school systems play an increasingly pivotal role in leading and partnering with school sites to make data-driven practices an engine of reform. However, it is at the school level where everything comes together – and where DDDM is co-constructed by local educators (Datnow et al., 2007). School leaders provide time for meeting to discuss data, flexibility for re-teaching, and curriculum and material resources in order to facilitate data-driven instruction. Schools also develop their own assessments and tools for acting on data, which were often created by teachers working together. Like the systems, schools also function as places to build human and social capital in the form of building the knowledge and skills of teachers, a process which happened through professional development, instructional leadership, and networking among teachers. Schools also play a critical role in providing the expectations for data-driven instruction among teachers, as well as creating a climate of trust and collaboration so that teachers can work in professional learning communities to improve their practice (Datnow et al., 2007).

Thus, in DDDM, we see that reform success is a joint accomplishment of individuals and policies at multiple levels of the system. Broader federal and state accountability policies provide an important frame for the work that happens at the system and school levels. Although the crux of the work around data use takes place at the school and district levels, NCLB has helped to provide the political leverage needed in order for districts to stimulate improvement at the school level. The federal government holds states, districts, and schools accountable for student performance. States set curriculum standards and also hold schools and districts accountable. However, DDDM is in the work of teachers and administrators. As Dowd (2005) explains, "data don't drive," and therefore local educators co-construct the outcomes of this reform in their daily work with each other and with students.

Conclusion

When we examine events and actions across various contextual levels in the policy chain, we find that conditions at the federal, state, district, school, and design-team levels all co-construct the implementation of large-scale educational reform. Whereas a technical-rational view of educational change might suggest that implementation is an activity restricted to a group of people in schools at the bottom of the policy chain, we see here that implementation is a system-wide activity, even when the desired change is mainly at the school level. However, the various policy levels have varying degree of influence, and varying levels of connection with each other in the schools and districts. These findings point to the need for viewing events in broader contextual levels not just as "background" or "context" but as important, dynamic shaping forces in the large-scale educational reform process.

In order to fully understand the co-construction of a multi-level reform like the ones discussed here, researchers would ideally gather detailed, longitudinal case-study data on the district, state, community, and other systemic linkages that might influence large-scale educational change efforts. Multiple schools and school

systems would be involved. The study might employ a mixed-methods design that supplements the qualitative data with valid and reliable measures of student achievement over at least a 3-year period. Survey data gathered from teachers and principals would also be very useful in assessing the extent to which educators at the school level have been engaged in reform efforts. For example, teachers and principals could be asked about the presence of systemic structural supports (e.g., collaboration time, networks), professional development, and resources devoted to assist in the reform effort.

Examining the co-construction of reform and the linkages across the educational system would likely provide insights that can inform the fields of educational research, policy development, and evaluation. However, there is a dearth of empirical research with the primary goal of identifying or describing such linkages. This gap in the reform literature reflects a systemic weakness in understanding why reform efforts have not been more successfully sustained. Clearly, educational reform involves formal structures, such as district offices, state policies, and so on. It also involves both formal and informal linkages among those structures. Yet, reform involves a dynamic relationship, not just among structures but also among cultures and people's actions in many interlocking settings. It is this intersection of culture, structure, and individual agency across contexts that helps us better understand how to build positive instances of large-scale educational change.

References

Alwin, L. (2002). The will and the way of data use. *School Administrator, 59*(11), 11.

Anderson, S. (2003). *The school district role in educational change: A review of the literature.* Ontario: International Centre for Educational Change, Ontario Institute of Studies in Education.

Armstrong, J., & Anthes, K. (2001). *Identifying the factors, conditions, and policies that support schools' use of data for decision making and school improvement: Summary of findings*. Denver, CO: Education Commission of the States.

Bay Area School Reform Collaborative. (2003). *After the test: Using data to close the achievement gap.* San Francisco: Author.

Berman, P., & McLaughlin, M. W. (1978). *Federal programs supporting educational change, Vol. VIII.* Santa Monica, CA: Rand.

Bernhardt, V. L. (1998). *Multiple measures*. Invited Monograph No. 4. CA: California Association for Supervision and Curriculum Development (CASCD).

Center on Education Policy. (2004). *From the capital to the classroom: Year 2 of the No Child Left Behind Act.* Washington, DC: Author.

Cohen, D. K., Moffitt, S. L., & Goldin, S. (2007). Policy and practice. In S. Furhman, D. Cohen, & F. Mosher (Eds.), *The state of education policy research* (pp. 63–85). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Cromey, A. (2000). *Using student assessment data: What can we learn from schools?* Oak Brook, IL: North Central Regional Educational Laboratory.

Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan, 76*(8), 597–604.

Datnow, A., & Castellano, M. (2000). Teachers' responses to success for All: How beliefs, experiences, and adaptations shape implementation. *American Educational Research Journal, 37*(3), 775–799.

Datnow, A., Hubbard, L., & Mehan, H. (2002). *Extending educational reform: From one school to many.* London: RoutledgeFalmer Press.

Datnow, A., Park, V., & Wohlstetter, P. (2007). *Achieving with data: How high-performing school systems use data to improve instruction for elementary students.* A report commissioned by the NewSchools Venture Fund. Los Angeles, CA: Center on Educational Governance.

Datnow, A., Stringfield, S., Lasky, S., & Teddlie, C. (2006). *Integrating educational systems for successful reform in diverse contexts*. New York: Cambridge University Press.

Dembosky, J. W., Pane, J. F., Barney, H., & Christina, R. (2005). *Data driven decisionmaking in Southwestern Pennsylvania School Districts.* Working paper. Santa Monica, CA: RAND

Dowd, A. C., (2005). *Data don't drive: Building a practitioner-driven culture of inquiry to assess community college performance*. Boston: University of Massachusetts, Lumina Foundation for Education.

Doyle, D. P. (2003). Data-driven decision-making: Is it the mantra of the month or does it have staying power? *THE (Technological Horizons in Education) Journal, 30*(10), 19–21.

Earl, L., & Katz, S. (2002). Leading schools in a data rich world. In K. Leithwood, P. Hallinger, G. Furman, P. Gronn, J. MacBeath, B. Mulforld, & K. Riley (Eds.), *The second international handbook of educational leadership and administration.* Dordrecht, Netherlands: Kluwer.

Earl, L., & Katz, S. (2006). *Leading schools in a data rich world.* Thousand Oaks, CA: Corwin Press.

Elmore, R. F. (1979–1980). Backward mapping: Implementation research and policy decisions. *Political Science Quarterly, 94*(4), 601–616.

Elmore, R. F. (2002). *Bridging the gap between standards and achievement: The imperative for professional development in education.* Washington, DC: Albert Shanker Institute.

Elmore, R., & Sykes, G. (1992). Curriculum policy. In P. W. Jackson (Ed.), *Handbook of research on curriculum.* New York: Macmillan.

Feldman, J., & Tung, R. (2001). *Whole school reform: How schools use the data-based inquiry and decision making process.* Paper presented at the 82nd annual meeting of the American Educational Research Association in Seattle, WA.

Finn, C. E., & Hess, F. M. (2004). On leaving no child left behind. *Public Interest, 157*, 35–57.

Firestone, W. A., Fitz, J., & Broadfoot, P. (1999). Power, learning, and legitimation: Assessment implementation across levels in the United States and the United Kingdom. *American Educational Research Journal, 36*(4), 759–793.

Fullan, M. (1991). *The new meaning of educational change.* London: Cassell.

Garet, M., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915–945.

Hall, P. M., & McGinty, P. J. W. (1997). Policy as the transformation of intentions: Producing program from statutes. *The Sociological Quarterly, 38*, 439–467.

Halverson, R., Grigg, J., Prichett, R., & Thomas, C. (2005). *The new instructional leadership: Creating data-driven instructional systems in schools* (Wisconsin Center for Education Research Working Paper No. 2005-9). Madison, WI: Authors.

Ingram, D. Louis, K. S., Schroeder, R. G. (2004). Accountability policies and teacher decision-making: Barriers to the use of data to improve practice. *Teachers College Record, 106*(6), 1258–1287.

Johnson, J. H. (1999). Educators as researchers. *Schools in the Middle, 9*(1), 38–41.

Johnson, J. H. (2000). Data-driven school improvement. *Journal of School Improvement, 1*(1), XX.

Kerr, K. A., Marsh, J. A., Ikemoto, G. S., Darilek, H., & Barney, H. (2006). Strategies to promote data use for instructional improvement: Actions, outcomes, and lessons from three urban districts. *American Journal of Education, 112*(3), 496–520.

Lafee, S. (2002). Data-driven districts. *School Administrator, 59*(11), 6–7, 9–10, 12, 14–15.

Lincoln, Y. S. (2002). *On the nature of qualitative evidence*. A paper presented for the Annual Meeting of the Association for the Study of Higher Education. Sacramento, CA.

Mandinach, E. B. Honey, M., & Light, D. (2006). *A theoretical framework for data-driven decision making.* Paper presented at the annual meeting of AERA, San Francisco.

Marsh, J. A., Kerr, K. A., Ikemoto, G. S., Darilek, H. Suttorp, M., Zimmer R. W., et al. (2005). *The role of districts in fostering instructional improvement: Lessons from three urban districts partnered with the Institute for Learning*. Santa Monica, CA: Rand Corporation.

Mason, S. (2002, April). *Turning data into knowledge: Lessons from six Milwaukee Public Schools*. A paper presented at the annual conference of AERA, New Orleans.

McIntire, T. (2002). The administrator's guide to data-driven decision making. *Technology and Learning, 22*(11), 18–33.

McIver, M., & Farley, L. (2003). *Bringing the district back in: The role of the central office in improving instruction and student achievement* (Report No. 65). Baltimore: Center for Research on the Education of Students Placed at Risk, John Hopkins University.

McLaughlin, M. & Talbert, J. E. (1993). *Contexts that matter for teaching and learning: Strategic opportunities for meeting the nation's standards educational goals*. Stanford, CA: Stanford University Center for Research on the Context of Secondary School Teaching.

National Center for Educational Statistics. (2007). *Mapping 2005 proficiency standards onto the NAEP scales* (NCES-2007-482). US Department of Education. Washington, DC: Author.

No Child Left Behind. (2002). Public Law 107–110.

Olsen, L. (1997). The data dialogue for moving school equity. *California Tomorrow Perspectives, 5*, 48–61.

Petrides, L., & Nodine, T. (2005). *Anatomy of school system improvement: Performance-driven practices in urban school district.* San Francisco, CA: NewSchools Venture Fund.

Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J. V. Wertsch, P. Del Rio and A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139–164). Cambridge: Cambridge University Press.

Sarason, S. (1997). Revisiting the creation of settings. *Mind, culture, and activity, 4*(3), 175–182.

Skrla, L., & Scheurich, J. (2001). Displacing deficit thinking. *Education and Urban Society, 33*(3), 235–259.

Spillane, J. P., Reiser, B. J., & Reimer, T. (2002). Policy implementation and cognition: Reframing and refocusing implementation research. *Review of Educational Research, 72*(3), 387–431.

Supovitz, J., & Taylor B. S. (2003). *The Impacts of standards-based reform in Duval County, Florida, 1999–2002*. Philadelphia, PA: Consortium for Policy Research in Education.

Tharp, R. G. (1997). *From at risk to excellence: Research, theory, and principles for practice, research report #1*. Santa Cruz, CA: Center for Research on Education, Diversity and Excellence.

Togneri, W., & Anderson, S. (2003). *Beyond islands of excellence: What districts can do to improve instruction and achievement in all schools.* Washington, DC: Learning First Alliance.

Wilson, S., & Berne, J. (1999). Teacher learning and the acquisition of professional knowledge: An examination of research on contemporary professional development. *Review of Research in Education, 24*, 173–209.

Wohlstetter, P., Van Kirk, A. N., Robertson, P. J., & Mohrman, S. A. (1997). *Organizing for successful school-based management*. Alexandria, VA: Association for Supervision and Curriculum Development.

Woody, E. L. (2004). *Voices from the field: Educators respond to accountability*. Berkeley, CA: Public Analysis of California Education.