TOWARD A POLICY FRAMEWORK

FOR ANALYZING

EDUCATIONAL SYSTEM EFFECTS

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THE CENTER

Every child has the capacity to succeed in school and in life. Yet far too many children fail to meet their potential. Many students, especially those from poor and minority families, are placed at risk by school practices that sort some students into high-quality programs and other students into low-quality education. CRESPAR believes that schools must replace the "sorting paradigm" with a "talent development" model that sets high expectations for all students, and ensures that all students receive a rich and demanding curriculum with appropriate assistance and support.

The mission of the Center for Research on the Education of Students Placed At Risk (CRESPAR) is to conduct the research, development, evaluation, and dissemination needed to transform schooling for students placed at risk. The work of the Center is guided by three central themes—ensuring the success of all students at key development points, building on students' personal and cultural assets, and scaling up effective programs—and conducted through research and development programs in the areas of early and elementary studies; middle and high school studies; school, family, and community partnerships; and systemic supports for school reform, as well as a program of institutional activities.

CRESPAR is organized as a partnership of Johns Hopkins University and Howard University, and is one of twelve national research and development centers supported by a grant (R117-D40005) from the Institute of Education Sciences (IES, formerly OERI) at the U.S. Department of Education. The centers examine a wide range of specific topics in education including early childhood development and education, student learning and achievement, cultural and linguistic diversity, English language learners, reading and literacy, gifted and talented students, improving low achieving schools, innovation in school reform, and state and local education policy. The overall objective of these centers is to conduct education research that will inform policy makers and practitioners about educational practices and outcomes that contribute to successful school performance.

ABSTRACT

School reform efforts over the last two decades have become increasingly more complex and systemic. Yet, studies that have as their primary purpose identifying and understanding the function of linkages in school reform processes are virtually nonexistent in the school effects and school improvement literature. This report proposes a model that emphasizes the study of linkages between levels in the policy system. It also focuses on where individual, collective, and material capacity across the educational policy system can be developed to support linkages and the flow of resources and communication across them. The report includes an extensive review of the American reform literature since *A Nation at Risk* was published, using a conceptual framework to identify linkages, and areas where capacity can be developed to support sustained reform at the school level. The report closes with implications and directions for future research.

ACKNOWLEDGMENTS

INTRODUCTION

Designing systemic models for evaluating and studying policy implementation has become increasingly more important with the advent of standards-based reform and the No Child Left Behind Act (NCLB) of 2002. Standards-based reform is inherently a systemic approach that creates a more tightly coupled educational policy system, partly by emphasizing aligned accountability systems and curriculum frameworks as the way to increase student achievement (Clune, 1998). Increasing teacher knowledge and improving pedagogy, classroom management, and the quality of learning materials can no longer be considered sufficient to improve student-learning outcomes as measured by standardized assessments. Aligning classroom curricula with state standards has also become a necessity (Clune, 1998; Massell, 1998), as NCLB has connected sustained federal Title I funding to school improvement and compliance with NCLB goals. Demands for coordinated communication and resource distribution across policy domains have accordingly increased. State, district, and school leaders feel pressure to align standards, assessments, and professional (Datnow, Lasky, Stringfield, & Teddlie, in press). A major challenge now is to understand what linkages exist throughout the educational system, how resources and communication flow across these linkages, and what resources need to move across them to increase systemwide capacity to support improved teaching and learning. The increased emphases on systemwide alignment, and the new federal policy context have made the need to conduct systemic evaluations of school improvement efforts more pressing.

A closely related component of NCLB that has created new linkages and placed new capacity demands on education stakeholders is the call for data use in decision-making across the education system. Student achievement data now flow directly to state and federal governments in ways not seen before. The 1988 and 1994 reauthorizations of Title I and the NCLB legislation have mandated progressively greater use of data for school improvement, particularly in the gathering, aggregating, and upward reporting of student-level data. Data use is no longer a choice for school leaders (Earl & Katz, 2002). It is a must because student achievement outcomes as measured by standardized assessments, typically in math and reading, can determine how a school is ranked (Acker-Hocevar & Touchton, 2001), how its resources are allocated (Elmore & Burney, 1997; Massell, 1998), and whether the school or district will receive sanctions or rewards (Amrein & Berliner, 2002; Lindle, 1999; O'Day, 2002). Interventions designed to improve teaching and learning in low-performing schools are embedded in this larger policy context and are increasingly being judged by the degree to which they can directly affect student outcomes in three primary areas: standardized test scores, increased graduation rates, and improved student attendance.

How to create the systemic capacity to meet the requirements of this policy context is a salient question to ask. So, too, is the question of how to study the education system as a whole and systematically analyze linkages across it. With the increased emphasis on alignment and standards, intervention and reform strategies have become more complex. Many of these interventions are systemic (Clune, 1998; Knapp, 1997; Datnow & Kemper, 2002) and include stakeholders from various organizations. Yet few studies evaluating the viability of these interventions used a systemic model to guide their research. In a review of the literature, Datnow et al.

(in press) found no studies that had as their primary purpose a systematic analysis of linkages across the education policy system. They also found that an understanding of education or reform systems is often assumed, rather than actually identified. There is a clear need for more theory-based, integrated, and complex models using various mechanisms for evaluation, and for research that specifically documents and disseminates information on processes of developing and refining sophisticated models to guide complex evaluations (Dietz, Vanderputten, & Anderson, 2004; Katzenmeyer & Frechtling, 2004).

This systemic model theorizes the education system as interconnected. A core feature of the model is its focus on systemic linkages to bring greater knowledge about how the education system works as a whole, and how policy, data, and resources move through the system. In this model, a linkage is, in essence, a bridge: It creates the connection between two otherwise disconnected points. The model identifies key policy domains in the educational system and provides a framework to systematically analyze the linkages that exist across the system and how resources and communication move across these linkages. The model also proposes that the reform capacity of different organizations within the system affects the ways that linkages are used, created, or ignored. Reform capacity refers to the human skill, knowledge, beliefs, inclinations (individual and/or collective) and the material resources available at all levels -- federal, state, district, and school – to achieve the task of reform implementation aimed at improving teaching and learning. Inherent in the model's conceptualization of the policy system as interdependent are the reflective and regenerative processes of reform capacity building. In this system, individuals within organizations are engaged in active processes of adaptation that are organic and context-sensitive while still connected to the larger whole. Capacity is increased throughout the system and within domains as people learn to rethink how organizations can function, coordinate, and develop the human and material resources necessary to support improved teaching and learning opportunities. I hypothesize that the conditions will exist for effective teaching and robust learning when (a) individual, collective, and material capacity for reform and learning are high in all organizations throughout the education system; (b) the necessary linkages are in place and resources and communication move effectively across these linkages; and (c) these resources and communications are contextually appropriate.

Work on several different projects shaped this model. One was an extensive review of the American literature on reform efforts to improve teaching and learning for culturally and linguistically diverse students since the publication of *A Nation at Risk* (Datnow et al., in press). One primary criterion for inclusion in this review was that the research needed to address at least two levels in the educational policy system. This study revealed that education lacks a solid knowledge base regarding what linkages exist and how they are used in the education system. A second project was a longitudinal study evaluating the implementation of Comprehensive School Reform designs in three states (Datnow & Kemper, 2002, 2003; Datnow, Borman, Stringfield, Overman, & Castellano, 2003), which also revealed the need to understand both what linkages exist among policy contexts in the education system, and how capacity in these different domains affects school improvement. Research has illustrated that reform programs can temporarily "fix" schools, but most gains brought about by school improvement efforts are lost over time. Work by Clune (1998), Fullan (2004), McNeil (2000), and Stringfield, Datnow, and Ross (1998)

has demonstrated that it is rarely enough to direct improvement efforts solely at teachers and schools; coordinated support from the school district, local education authority, state, and federal levels enhances the likelihood that reforms will have lasting effects. Developing systemic reform capacity may well be necessary for instituting and sustaining continuous improvement in schools.

This model extends previous work by facilitating analysis of both the systemic linkages between districts, state agencies, federal agencies, external partners, and schools; and individual, collective, and material capacities across the policy system to support and sustain improvement. Three questions guide this research report:

- What systemic linkages seem to be most effective in school improvement?

- What systemic linkages seem to be least effective in school improvement?

- In what areas can capacity be developed to support systemic linkages in school improvement processes?

In trying to identify the linkages between the domains that comprise the policy system, however, it became apparent that little empirical research describes or identifies such linkages. Hence, to answer the questions guiding this report, I used the conceptual framework that follows to conduct secondary analyses of empirical and quasi-experimental quantitative, qualitative, and mixed-method school reform research that addressed at least two levels in the policy system; and focused primarily on efforts geared toward culturally or linguistically diverse, typically high-poverty students. I will first present the theoretical framework that orients this review of systemic reform research. I then provide a discussion of linkages that appear to be most effective in of school improvement, followed by linkages that appear to be less effective. I then discuss several areas where capacity to support systemic linkages can be developed. I close with conclusions, implications for future policy, practice, and further research.

Conceptual Framework

Understanding interdependence between organizations and individuals in a policy or reform system requires research that examines the linkages across the system that connects people, resources, and organizations. Taking a systems approach makes it possible to identify interrelationships between elements that might otherwise be perceived as disconnected fragments (Patton, 1990), and to understand patterns of change (Senge, 1990). In systems thinking, the whole is greater than the sum of discrete parts, so an understanding of the parts does not de facto constitute an understanding of the whole (Tanner & Fiore, 2004).

Organizations are part of interconnected systems that have interconnected parts, are dependent on each other, and influence each other (Senge, 1990). "A system is a set of interrelated, conceptually inseparable, functionally unique parts that interact with each other to operate as a whole" (Tanner & Fiore, 2004). Smaller systems are connected to larger systems by linkages. Educational intervention systems are part of larger policy systems; and these systems are interdependent.

The school system can thus be conceived of as interconnected and interdependent. It is an open system with permeable and malleable boundaries that is embedded within a larger global context. In this system, capacity exists in different ways within discrete policy domains and within individuals. Each domain is a unique context that is connected to other domains by different types of linkages. Linkages vary in their permanency, formality, adaptability, robustness, and importance. They are neither static nor homogeneous. Using this framework allows one to investigate both within the black box (Little, 2001) of each context while also examining the integrity of the linkages across contexts, and determining what linkages need to be created to facilitate a reform, and how reform efforts, information, and material resources move through the system.

To capture the *interrelations* among social contexts, the reform process is analyzed as a co-constructed, "conditional process," "as a web of interrelated conditions and consequences," where the "consequences of actions in one context may become the conditions for the next" (Hall & McGinty, 1997, p. 461). Interactions in one policy domain generate outcomes, such as policy statements or new procedures, which in turn potentially condition the interactions of other actors in other domains in the policy system (Datnow, Hubbard, & Mehan, 2002).

In this framework, capacity exists within these separate, yet interconnected, policy domains; individuals within these domains also embody it. Capacity for reform implementation and improving teaching and learning within institutions, organizations, and communities is understood as being the sum of individual, collective, and material capacity.

Individual capacity is what an individual brings with him or her. It includes personal commitment, a disposition to learn about instruction and to view learning as ongoing, and substantive knowledge about reform ideas (Spillane & Thompson, 1997); individual beliefs, values, knowledge, skill, identity, and past experiences with reform (Stoll, 1999); emotional well-being (Hargreaves, 1998); and professional vulnerability (Lasky, 2004).

Collective capacity is more than the sum of the capacities of the individuals within a group; it is akin to distributed knowledge (Lave & Wenger, 1991). It includes networks, and relations among reform stakeholders that result from a prevalence of norms such as trust and collaboration. It also includes a sense of obligation among individuals (Spillane & Thompson, 1997); organizational climate, norms, collegiality, socio-emotional support (Stoll, 1999); and the collective skills and knowledge of the individuals.

Material capacity is literally the material resources within an organization. For reform implementation, they might include financial resources for staffing, staff time (Spillane & Thompson, 1997), the condition of the physical plant, technology, and books and professional development materials.

These different types of capacity exist in varying degrees within policy domains, which are connected to each other by linkages. A linkage is in essence a bridge: It creates the connection between two otherwise disconnected points. It is an expression of existing capacity, while also being an *aspect of* capacity building. Coordinating the movement of human and material resources across the linkage is as important as the linkage itself, because a linkage is only a

pathway between two or more policy domains. It does not reflect how it is (or is not) used, nor the quality of the resources or communications crossing it. There are several kinds of linkages:

Structural linkages refer to those from state and federal policy domains that affect education, how education and reform is funded, and the role of accountability systems, as with funding to support schools or policy mandates.

Formal linkages refer to official communications sent between policy domains that pertain to reform implementation, as with any notification or document sent from one agency to another to plan meetings or to confirm progress.

Informal linkages refer to communications that are not official, yet pertain to reform implementation, as with telephone calls or email messages between colleagues.

Relational linkages refer to the ties that are formed in an effort to implement or block reform, as occurs when district leaders work with friends or professional colleagues in the community to develop partnerships, or when political alliances are developed to block or support reform implementation.

Ideological linkages refer to conceptual bridges that make it possible to change an individual's negative attitude toward reform into one of acceptance and willingness to embrace reform purposes and goals. This is especially important when reform stakeholders hold different beliefs about the purposes of reform.

Temporal linkages refer to continuity of reform efforts. Reform efforts can go through phases and may have different elements over time, but can remain guided by the same core principles, goals, and values.

Figure 1

Figure 1 depicts only structural linkages between key policy domains identified in the American school reform literature. Strong, well-established structural linkages (as shown between the domains of the federal government and the state, the state and the district, and the district and school) are depicted with bold arrows. Arrows with slender lines depict firmly entrenched structural linkages. The arrows connecting the various reform domains are bidirectional to represent the way communication and resources move across linkages in the system. Individual, collective, and material capacity for reform and learning vary in each domain.

THE MOST IMPORTANT SYSTEMIC LINKAGES IN SCHOOL REFORM

In this section, I address linkages that appear to be most salient for moving communication and resources across policy domains in the process of reform in today's schools.

Federal, State, and Community Financial Support for Public Schools and for Reform

Public schools in the United States depend on local, state, and federal dollars for their basic operating needs, as well as improvement efforts. Financial support for schools from government agencies is primarily a structural linkage. Funding formulas and structures to support schools vary considerably. Some have adequacy models, which intentionally create structures to channel

Conceptual Framework: Structural Linkages
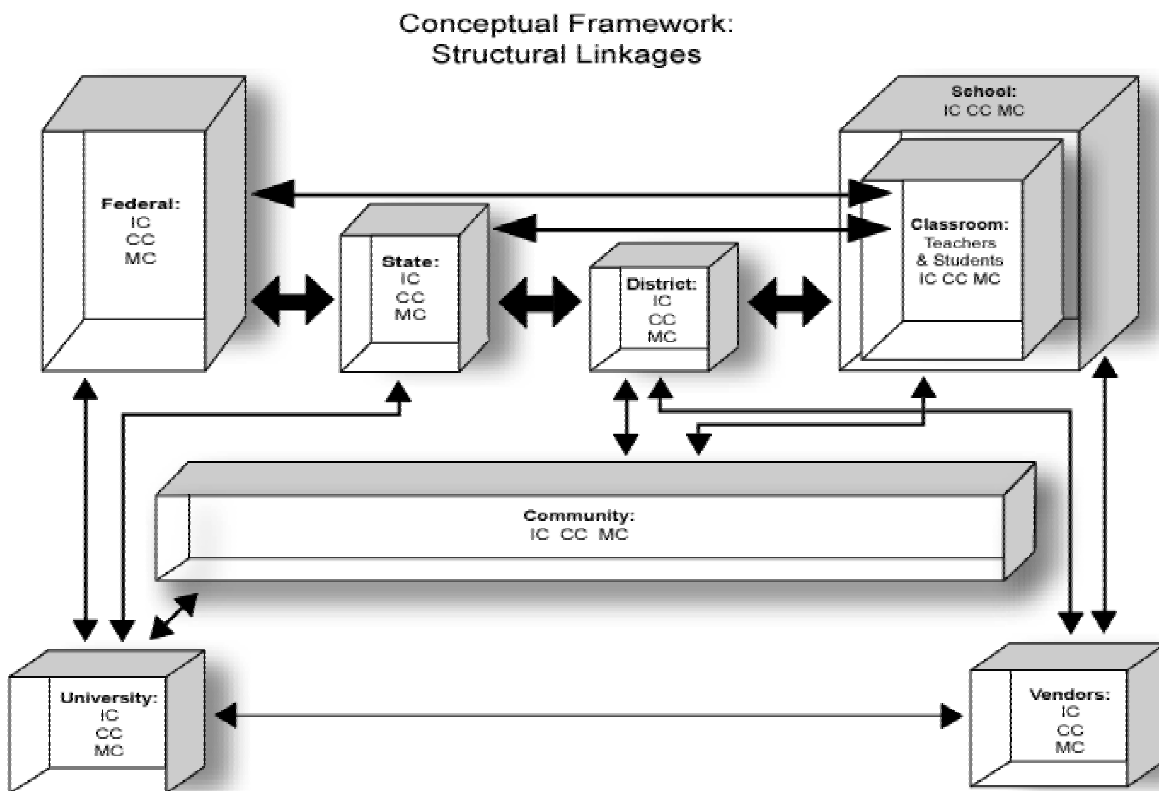
Note. IC = Internal Capacity; CC = Collective Capacity; MC = Material Capacity

financial resources to special needs, second language, and high-poverty students, while other models emphasize equity among schools and tend toward lower levels of basic funding for schools and improvement efforts (Berne & Stiefel, 1999; Carr & Fuhrman, 1999; Guthrie & Rothstein, 1999; Ladd & Hansen, 1999; Odden & Clune, 1998). These different funding models have a direct effect on the dollars allocated to schools for teaching and learning.

Improvement efforts have proven to be more expensive and labor intensive than many policymakers or school reformers imagined. Little is known about how much financial support is actually needed for schools to meet the challenge of providing all students with a high-quality education (Finnigan, O'Day, & Wakelyn, 2003; Guthrie & Rothstein, 1999; Ladd & Hansen, 1999). We do know, however, that the way these resources are organized and structured can facilitate or hinder capacity-building efforts (Anyon, 1997; Christman & Rhodes, 2002; Massell, 1998).

Within the United States, state funding models vary greatly. Some states have virtually no difference between what students in high-poverty and low-poverty schools receive. For instance, in 2003, New Jersey reportedly spent $10,038 per student in low-poverty districts, and $10,026 per student in high-poverty districts—a difference of $12, or 0.1% (this equalization was due to a court order). Illinois spent $7,760 per students in low-poverty districts, and $5,561 for each student in high-poverty districts—a difference of $2,384, or 39.5% (Carey, 2003). These differences, both in total spending per student and spending for high- and low-poverty students, have real consequences for student learning and schools' reform capacity (Ladd & Hansen, 1999; Minorini & Sugarman, 1999; Odden, 1999). School and reform funding operates as a key linkage between systemic levels because it is a structural condition for operating schools and supporting improvement efforts.

Resource Partnerships

Resource partnerships are linkages that focus on bringing personnel and/or materials to states, districts, or schools in need of additional resources to support improvement efforts. They are relational, formal, and informal in nature. Improving teaching and learning requires money to hire external partners capable of increasing leadership capacity, teacher content, and pedagogical skill and knowledge; technological resources, books, teaching guides, and other material resources are often necessary as well (Finnigan, O'Day, & Wakelyn, 2002; Hamann & Lane, 2002; Horn, 2000; Longoria, 1998).

States, districts, and schools that have been more successful in sustaining improved teaching and learning generated extra financial resources by realigning funding sources and/or finding new sources of money to support their improvement efforts (Clune, 1998; Lusi, 1997; Togneri & Anderson, 2003). These can be external partnerships such as reform design teams, philanthropic organizations, universities, businesses, or other community organizations (Bodilly, 2001; Datnow, Borman, Stringfield, Overman, & Castellano, 2003; Henig, Hula, Orr, & Pedescleaux, 1999; Stone, Henig, Jones, & Pierannuzi, 2001). This kind of linkage is particularly important for high-poverty districts or schools because it helps them raise the level of financial and

human resources closer to those in middle-class and wealthy districts and in schools that benefit from their locale and tax base (Horn, 2000; Snipes, Doolittle, & Herlihy, 2002). Two federal programs, Comprehensive School Reform Demonstration (CSRD) and Title I, facilitate such resource partnerships by providing money that schools can use to engage reform design teams offering research-based models for school reform (Borman & D'Agostino, 2001; Datnow & Kemper, 2002).

Educational Policy Generated from Governmental Agencies

Educational policy generated from governmental agencies is one of the most robust and enduring linkages in virtually all of the educational systems around the world (Gidney, 1999; Jennings, 2003; Whitty, Power, & Halpin, 1998). Educational policy can be both structural and temporal. Relational linkages can also affect the direction government education policy takes. Reform efforts are increasingly being initiated from these higher levels, greatly affecting how schools and districts work. Governmental education policy is shaped by historical, social, economic, and political circumstances, and thus changes over time (Berliner & Biddle, 1995; Massell, 1998). New policies from the federal level have significantly reshaped several dimensions of schooling and notions of accountability (Jennings, 2003). The American government has attempted to change the education system through policy mandates. With such a prevalence of educational policy from government agencies, one of the most salient linkages between systemic levels is top-down educational policy. Policy significantly shapes many aspects of schooling, including how schools are funded, what reform efforts look like, how they will be funded, and for what processes or outcomes they will be held accountable (Cuban, 2003; Fuhrman, 2003; Jennings, 2003; O'Day & Smith, 1993; Vinovskis, 2003).

The standards and accountability systems developed over the last decade are perhaps the most prominent linkages among federal, state, district, and school policy domains. Some policymakers and reformers hold top-down notions of accountability, while others hold more distributed notions of "symmetric accountability," which include shared responsibility on the parts of students, teachers, administrators, researchers, and policymakers in improvement efforts (Linn, 2003; Porter & Chester, 2001).

While designed for school improvement, state or district accountability systems can both facilitate and interfere with reform efforts (Elmore & Burney, 1998; Finnigan, O'Day, & Wakelyn, 2003; Hannaway, 2003; Porter & Chester, 2001; Spillane, 1996; Spillane, 1999; Stein, Hubbard, & Mehan, 2002). In the United States, several attempts at improving teaching and learning that have achieved modest increases in student test scores focused on systemwide internal capacity building to develop, choose, coordinate, and finance appropriate assessments, content and performance standards, and support systems for low-performing schools (Anderson, 2003; Guthrie & Rothstein, 1999; Hamann & Lane, 2002; Hightower, 2002a; Mac Iver & Farley, 2003; Togneri & Anderson, 2003). On the other hand, there is little to no evidence to suggest that accountability systems that emphasize sanctions without capacity building can increase student learning as measured by standardized assessments (Amrein & Berliner, 2002; Cibulka, 2003; Livingston & Livingston, 2002; Malen, Croninger, Muncey & Redmond-Jones, 2002.

States differ in their approach to accountability and support systems; some are more centralized than others (Lusi, 1997; Oakes, Quartz, Ryan, & Lipton, 2000). States with strong centralized policies need a way to bridge the gap between the top and bottom, while states with local control find that the assessment/support network is a politically acceptable way to provide strong instructional guidance. In both kinds of states, assessments and professional development networks bridge the often substantial gaps between the large "grain size" of the standards and the more specific tasks demanded by teaching and learning (Clune, 1998).

Professional Development and Learning Partnerships

Learning partnerships, or a focus on increasing the knowledge or skills of people in varying levels in the policy system, can be key formal, relational, and temporal linkages in educational reform. Because this model addresses systemwide learning, professional development and learning refer to (a) the acquisition of skills and knowledge necessary to facilitate reform across all policy domains, and (b) increased student learning. The reform stakeholders who have taken seriously their responsibility to learn what needs to be done to improve achievement have made the most significant inroads to improving teaching and learning, as measured by standardized tests of student content and/or process knowledge, and teacher reports of implementation (Hamann & Lane, 2002; Lusi, 1997). Learning opportunities include both formal and informal educational sessions; visits to other countries, provinces, districts, boards, or schools that have been more successful in their improvement efforts; outside experts or vendors to provide professional development; or conferences where people successful in a specific area skill share their knowledge or expertise (Clune, 2001; Datnow & Kemper, 2002; Horn, 2000).

Although the evidence is still scant that professional development can lead to increased student achievement as measured by standardized assessments, there is mounting evidence to suggest that train-the-trainer and one-shot professional development intervention models are not time intensive enough to bring both breadth and depth of change. Supovitz and Turner (2000) estimated it takes 80 to 160 hours of professional development in a content area to see significant changes in teaching practices. The most promising professional development models appear to be those that are site-based and integrated into the work day, and help teachers meet the objectives of state standards, as well as individual students' developmental needs. They also include highly qualified mentors, intensive summer institutes, and strong emphasis on increasing subject-area knowledge and improving techniques (Desimone, Porter, Garet, Suk Yoon, & Birman, 2002; Elmore & Burney, 1997; Finnigan, O'Day, & Wakelyn, 2003; Stein, Hubbard, & Mehan, 2002; Supovitz & Turner, 2000). In summary, learning partnerships are a key linkage for increasing systemwide capacity to support reform and increased learning.

Problem-solving Partnerships

Problem-solving partnerships coordinate efforts across levels to develop problem-solving and planning capacity to implement or adapt reform efforts. They tend to encompass relational and both formal and informal linkages. People working in national, state, or district organizations

responsible for designing, coordinating, and overseeing the requirements of systemic reform are often faced with having to create infrastructures, funding formulas, and systems for which they have no precedent. Some reform leaders at higher levels in the policy system have created partnerships with outside experts to help them envision, plan, and implement improved learning and teaching (Hamann, 2003; Henig, Hula, Orr, & Pedescleaux, 1999; Lusi, 1997; Stone, Henig, Jones, & Pierannuzi, 2001). Central to what these leaders have done is to develop an orientation toward learning (McLaughlin & Talbert, 2002). The leaders in these organizations reported that they could not achieve what the new reforms required of them, so they sought outside help. Challenges requiring outside assistance included such things as coordinating work assignments and reports of support teams; providing quality training of sufficient frequency, depth, and breadth to be useful; controlling quality; defining what a good state or district plan looks like; developing techniques to collect and analyze data; accessing information and resources; responding to local or school needs, and understanding the extent to which the external groups hired to provide professional development can actually meet the needs of districts and schools (Billig, Perry, & Pokorny, 1999; Finnigan, O'Day, & Wakelyn, 2003; Goertz, Duffy, & Le Floch 2001; Massell, 1998; O'Day & Gross, 1999). Problem-solving partnerships are a key linkage for increasing systemwide capacity to support reform efforts.

Linking Present Reform Efforts with Past Reform Efforts

One of the most important linkages between systemic levels is the connection of present reform efforts with those of the past. This is a key temporal linkage. Elmore and Burney (1998) used the term "continual improvement" in describing reform efforts that have (a) stable core components that endure over time, and (b) internal feedback loops that make it possible for reform leaders to make decisions based on the most current information, then adapt implementation strategies as needed. This kind of stability in the focus of reform requires coordination and planning across multiple policy domains and reform stakeholders (Clune, 2001; Stone, Henig, Jones, & Pierannuzi, 2001). In the United States, sustaining state policies is difficult (Cibulka & Derlin, 1998), although Cuban (2003) asserted that educational policy at the federal level across the Clinton and Bush administrations has been fairly consistent. Instability of state reform is due in part to policies being rejected by a new governor, chief state school officer, state board, or legislature before they are adopted or implemented (Cibulka & Derlin, 1998). Generally speaking, the states that are most successful in creating both depth and breadth of reform implementation are those that built on reforms that went back 10 to 15 years. In these instances, there was continuity, rather than discontinuity, between the earlier efforts and the current systemic reforms (Clune, 1998).

Political Alliances

Political alliances are a powerful linkage for coordinating and aligning both human and financial resources across policy domains. Such alliances are relational, formal and informal linkages. Continuity in political will among multiple stakeholders and over time is essential for effective and sustained capacity building to improve teaching and learning (Clune, 1998; Hamann, 2003; Massell, 1998). Robust and enduring political alliances create a critical mass necessary for de-

termining the direction policy will take; the types of reforms and improvement efforts that will be emphasized; how and to whom resources will be allocated; how state accountability systems look, including the assessments that are used, the development of content standards and the proficiency levels for performance standards; how district superintendents and school boards are chosen; and whether or not building capacity in low-performing schools is valued or whether sanctions are emphasized (Anyon, 1997; Beck & Allexsaht-Snider, 2001; Cibulka & Derlin, 1998; Hamann & Lane 2002; Hess, 1999; Oaks, Quartz, Ryan, & Lipton, 2000; Spillane, 1999; Stone, 1998).

Relational Linkages

Robust, trusting professional relationships across policy levels, termed relational linkages, are essential to sustained reform efforts (Bryk & Schneider, 2002; Stein, Hubbard, & Mehan, 2002). Teachers are more likely to be receptive to external intervention when they trust and feel respected by the people providing professional development or introducing intervention strategies (Stein, Hubbard, & Mehan, 2002). Collegial trust and collaboration among teachers enhances the likelihood of changed practices (Bryk & Schneider, 2002; Stein, Hubbard, & Mehan, 2002). Trusting relationships between teachers and students also appear to be necessary for teachers to willingly risk being vulnerable in front of their students when trying new teaching techniques or strategies (Lasky, 2004).

Reform efforts can begin or end over casual conversations or serendipitous encounters (Datnow, Hubbard, & Mehan, 2002; Hamann, 2002). Personal alliances and allegiances are potent linkages, as the people who are brought together often share values, a sense of purpose, and have common ideas about the direction reforms might take. Personal relationships are significant as informal linkages that create unity and a common purpose among groups (Rich, 1996). These can both facilitate and impede improvement efforts (Hamann, 2003). Obviously, whether the relationship focuses on improving instruction rather than maintaining the status quo affects the success of reform. Likewise, processes such as nepotism and political patronage are likely to affect the reforms (Anyon, 1997; Rich, 1996; Stone, 1998). These relational linkages, then, can promote, as well as hinder, school reform.

Ideological Linkages or Shared Values, Vision, and Goals across Reform Stakeholders

When reform leaders initiate improvement efforts that challenge individuals' existing belief systems, one of the most important linkages that people need to make is ideological. Creating a shared vision is one of the most commonly cited linkages among stakeholders both within schools and more broadly (Elmore & Burney, 1997; Teddlie & Stringfield, 1993; Togneri & Anderson, 2003). Creating a shared vision or sense of purpose can mean that ideological chasms need to be bridged, particularly when working with a broad spectrum of reform stakeholders. If the ideological chasms cannot be bridged, productive change is unlikely to occur.

Individual beliefs are a critical dimension in understanding how educators exercise their agency when responding to educational reform (Datnow, Hubbard, & Mehan, 1998). Beliefs

about students' race and socioeconomic status are particularly important in how they shape district personnel, school administrator, and teacher willingness to implement a rigorous curriculum to all students (Oakes, Quartz, Ryan, & Lipton, 2000; Spillane, 1998). Teacher beliefs about reform efforts also greatly affect how they understand, interact with, implement, adapt, or ignore them (Datnow, Hubbard, & Mehan, 1998). Thus, ideological linkages can be vital for moving improvement efforts forward when reform requirements may conflict with belief systems and moral purposes of key stakeholders.

Before moving on to a discussion of linkages that are less effective for sustaining school reform, it is important to understand that each of the linkages identified as being positive or effective linkage can also be used to maintain status quo practices or to usurp reform implementation. The human factor is the primary unpredictable element in each policy domain and in how linkages are or are not used. Nepotism is one example of relational linkages and shared values gone awry. Similarly, a weak district Title I director could focus on the least-likely-to-be-productive aspects of the federal No Child Left Behind (NCLB) Act and, thus, not use an important structural linkage for improving instruction. Recent reform mandates necessitate building support for a new set of political arrangements that support excellence and equity in schools (Stone, 1998). Transforming long-standing personal, social, and political arrangements in the education system is no small task. These elements taken together are likely to be core factors that further explain why reforms based on equity and excellence are difficult to implement.

WHAT SYSTEMIC LINKAGES ARE LESS EFFECTIVE FOR SUSTAINABLE SCHOOL REFORM?

When analyzing linkages that are not particularly effective, it is important to clarify that the presence of a linkage does not ensure that resources or communication across policy domains are coordinated, high quality, or generally conducive to improving teaching and learning. Each of the linkages identified in the previous section becomes ineffective or counterproductive when the resources that flow across it are of low quality, inappropriate for the context in which they will be used, are not coordinated in their distribution, or used toward goals negatively aligned with the stated purpose of the system. Likewise, if a linkage exists, but is not used, it is ineffectual. For instance, learning partnerships are not effective when they are short, not based on mutual respect, or use materials inappropriate for the situation. Similarly, funding linkages that do not provide adequate operating expenses for high-quality education and that do not allocate sufficient funds for personnel and other supporting resources are ultimately ineffectual in bringing about improved teaching or learning. For example, if grants are available to schools to facilitate their improvement efforts, but school or district personnel do not know about them, then such grants become an ineffectual linkage for school reform. Similarly, if a start-up grant is insufficient for institutionalizing a change, the long-term effect is likely to be counterproductive to the system or school.

Linkages between State-Federal Levels and Local Levels that are Simply Funding Streams

Simply providing money can improve capacity for improved teaching and learning, but not necessarily. States, districts and schools with low reform capacity need outside expertise and other kinds of assistance to develop the skills necessary for supporting school improvement efforts (Bascia, 1996; Hatch, 2000). The key here is helping schools and systems develop basic organizational and leadership capabilities, reduce non-productive teacher turnover, create an orderly school climate, develop teacher skill and content knowledge, and create self-monitoring and continual learning capabilities. In some instances, improvement efforts also include repair of the actual physical plant; it may include building safe, new schools with enough basic equipment for students to learn and teachers to teach (Cotton, 1995; Reynolds & Teddlie, 2000; Snipes, Doolittle, & Herlihy, 2002; Taylor, 1990). In short, capacity is built most naturally on top of existing capacity (Hatch, 2000).

Private and government seed money for reform is often not enough to sustain reform efforts in areas that do have a strong tax base, and a vibrant local economy (Rich, 1996). Schools and districts in areas that generate low property tax revenues are at a disadvantage. In schools in high-poverty areas, funding formulas based on adequacy rather than equity seem promising as a way to provide extra financial resources to get these schools and districts on par with the per student expenditures of their counterparts in more prosperous areas (Ladd & Hansen, 1999; Odden, 1999; Odden & Clune, 1998). There are, however, many examples of more affluent districts creating political and relational linkages to defeat efforts to equalize funding.

Rewards and Sanctions that are Not Accompanied by Capacity Building

By themselves, rewards and sanctions do not build organizational capacity to support improved teaching and learning. They can be effective as warnings to low-performing schools, alerting that changes need to be made. They may also serve to warn schools and districts that, while they may adequately educate a majority population, they are not serving a specific minority group. Rewards are occasionally viewed as effective incentives for successful teachers, schools, or districts, but research demonstrating long-term effects of such incentives is lacking. Of equal concern, Clune (1998) and Finnigan, O'Day, and Wakelyn (2003) found that to improve organizational capacity for teaching and learning, opportunities for professional development that spread both broad and deep are necessary

There is mounting evidence in the United States that in instances where the risk of sanctions is high, broadly defined teaching and learning can be compromised by narrowing the curriculum, replacing the regular curriculum with test preparation material, losing teaching time to test preparation, or encouraging low-achieving students to drop out of school (Amrein & Berliner, 2002; Hannaway, 2003; Livingston & Livingston, 2002; McNeil, 2000; McNeil & Valenzuela, 2001).

Results of state takeovers and reconstitution efforts for schools that have been sanctioned are mixed. On the positive side, they can help to reduce nepotism within a school district's decision-making processes, improve a school district's administrative and financial management

practices, and upgrade the condition of rundown school buildings (Cibulka, 2003; Rudo, 2001). There is virtually no evidence, however, that state takeovers or reconstitutions actually improve teaching and learning (Cibulka, 2003; Malen, Croninger, Muncey & Redmond-Jones, 2002; Rudo, 2001).

Capacity. There are several areas where individual, collective and material capacity to support linkages across policy domains can be developed to better facilitate reform. In the section that follows, the most salient areas addressed in the empirical literature are discussed.

Restructuring Finance Systems to Meet New Policy Charges

Financial support from states is a fundamental and structural condition for schools to function. American public schools do not generate the income or profit to cover full operating expenditures. Financial support is also a condition for implementing reform and improving teaching and learning. Little is known, however, about how much financial support is actually needed for schools to provide all students with a high-quality education (Guthrie & Rothstein, 1999; Massell, 1998) or how to create formulas that fully fund standards-based reform and education (Odden, 1999; Odden & Clune, 1998).

Odden and Clune (1998) proposed that state school financing systems are "aging structures in need of renovation" (p. xi). These systems are under attack, not only because they have failed to do the job for which they were conceived, but also because they are inadequate both for current finance problems and for the finance challenges that standards-based reforms place on school systems (Odden, 1999). Odden argued that, in several states, school finance formulas in the present reform context actually exacerbated fiscal disparities (Odden, 1999). Odden and Clune maintained that the existing infrastructures and formulas are ineffective in providing schools with adequate funding, particularly in the current standards-based climate that requires a high-quality education for all students. Odden and Clune and others (Duncombe & Yinger, 1999; Guthrie & Rothstein, 1999; Minorini & Sugarman, 1999) built a case for a model based on adequacy rather than models based on equity, which focus on providing equal funding to all schools. The adequacy model, they say, is better suited to provide financial resources to all schools, particularly those in the poorest areas, with at-risk students, or identified as needing improvement.

Establishing what adequacy means is not easy, and is an inherently value-bound undertaking. People who value a democratic threshold principle for education are likely to ask for more resources for schools to ensure that all students are adequately prepared to be fully participating members of a democratic society. Others, who hold more functional or market-based approaches to education, will be likely to argue for fewer resources, as they tend to hold a more narrow interpretation of the role of schooling in society, one that may focus primarily on preparation for the job market. Because the optimal mix and level of resources needed to improve teaching and learning in low-performing schools is unknown, several researchers have proposed that further research is needed to identify what states will need to provide high-quality education to all students (Duncombe & Yinger, 1999; Guthrie & Rothstein, 1999).

Generating Resources for Reform

While states need formulas in place so that policymakers and educators know the actual cost of educating students, they also need money to support schools. Many states have found that they simply do not have the money they need to help those schools identified as in need of improvement. For instance, in 1999-2000, California identified more than 3,000 schools as underperforming, yet included only 860 of them in the first two years of its Immediate Intervention/Under-performing Schools Program. Other states limited the schools they identified as needing assistance to correspond with the available resources. For example, Maryland and Connecticut identified only their lowest performing schools for state assistance. Federal funds, particularly Title I dollars, have been a principal source of funds for program improvement initiatives (Goertz, Duffy, & Le Floch 2001). Yet even with the additional federal dollars, many states still do not have the money for extra resources for all schools identified as needing improvement.

Creating new pathways for funding and realigning existing funding structures were key components in several reform efforts (Datnow & Kemper, 2002; Elmore & Burney, 1997; Lusi, 1997; Guthrie & Rothstein, 1999; Oakes, Quartz, Ryan, & Lipton, 2000; Smylie & Wenzel, 2003; Snipes, Doolittle, & Herlihy, 2002). In each, leaders at the state, district, or school level restructured funding formulas to direct more dollars into school reform, sought external financing sources to support reform, and in some instances worked with outside experts to redesign funding formulas or strategize ways to bring extra dollars to reform efforts. For example, the Vermont Department of Education (VDE) pursued external grants from organizations such as the National Science Foundation and the New American Schools Development Corporation. The VDE was selective and intentional when it applied for grants. Reform leaders applied to organizations that could directly support their statewide capacity-building efforts in identifying exemplary schools and improving teacher knowledge and pedagogical expertise (Lusi, 1997).

Restructuring State, District, and Other Public Agencies to Meet New Policy Charges

There are several areas in which states can develop capacity to support the ability of state-level employees to better design, direct, and coordinate reform efforts. Billig, Perry, and Pokorny (1999) asked state education agency staff to describe models, strengths, challenges, and lessons learned as they implemented the school support provisions of the Improving America's School Act. They identified several areas where state agencies need assistance in building internal capacity to meet their new responsibilities.

All state education agency representatives faced challenges in designing new systems. Among these challenges are: coordinating work assignments and reports of support teams; providing quality training of sufficient frequency, depth, and breadth to be useful; and maintaining quality control (Billig, Perry, & Pokorny, 1999). Many of them discussed the need to provide in-depth professional development on a multitude of issues, including what a good state plan looks like; how to collect and analyze data; how to access information and resources; and what it means to be responsive to local needs. The authors concluded their analysis by saying that, if they are to be viable systems, state agencies need to share information about their models, de-

velop more consistent training and management systems, and promote the use of support structures. They would also benefit from direct guidance on how to establish these systems.

Restructuring central offices was a core component of several district-led reforms (Elmore & Burney, 1997; Snipes, Doolittle, & Herlihy, 2002; Togneri & Anderson, 2003). District leaders who ask questions about how to improve instruction and achievement rather than assuming they have all the answers can bring about systemic commitment and capacity for change within the central office (McLaughlin & Talbert, 2002). Districts in these studies restructured the size of the district office, redefined the tasks of district personnel, and in some cases, eliminated positions. They also refocused district-office norms on supporting teaching and learning in classrooms. District administrators learned how to track schools' progress then define specialized support needs; incorporate stakeholders' input on reform goals and engage their support; employ resources strategically and broker educators' access to knowledge resources, and respond to state policies in ways that preserved the district's strategic focus. In this way, central office modeled the risk-taking and learning for employees throughout the district (McLaughlin & Talbert, 2002). Several districts also redefined the role of the superintendent. In these instances, boards of directors believed that in order to drive reforms into the classroom, the district superintendent also needed to be held responsible for implementation (Snipes, Doolittle, & Herlihy, 2002).

Coordinating Federal, State and District Accountability Systems

Standards-based reforms require districts and states to take an active role in developing, choosing, and coordinating accountability systems. There is little actual research on how districts or states build their internal capacity to develop coordinated, fair, and sound accountability systems. Goertz, Duffy, & Le Floch (2001) proposed that variations in state accountability systems reflect the differences in state demographics, political culture, educational governance structures and policies, and educational performance. State capacity to design, support, and monitor accountability systems also appears to be a key factor affecting variation in these systems.

O'Day and Gross (1999) examined both the congruence among the policies governing Title I accountability and those governing accountability for all schools in California, Kentucky, and three districts, San Francisco, Chicago, and New York City. They also examined whether there was congruency in how schools were identified across states and districts. They found that Title I lists and state/local lists were not kept together except in Kentucky. Different offices kept records of Title I schools and low-performing schools identified as needing intervention. Once offices were identified, finding employees who could provide researchers with the data they needed was not easy or direct, particularly with Title I records. Once these individuals were found, they were frequently unable to provide information on policy processes or support systems.

In this study, the majority of state-identified low-performing schools were Title I schools. These different accountability systems often did not work in concert with each other. This led the authors to propose that Title I schools are sometimes subject to at least two accountability systems measuring student performance: that required by the Title I provisions of the Elementary and Secondary Education Act (ESEA) and that required by the state or local jurisdiction. People

working in these different accountability systems did not always coordinate the information they sent to low-performing Title I schools. State and Title I accountability systems also have discrepancies in the ways they identify schools as needing improvement. Researchers proposed that these inconsistencies in criteria occur due to three interrelated factors: differences in the purposes of the accountability systems, differences in who identifies the schools, and general problems in implementation and administrative coordination (O'Day & Gross, 1999).

Providing assistance to schools identified as low performing has turned out to be more complex than many policymakers and school reformers realized. The O'Day and Gross (1999) analysis points to several areas where states need to develop linking capacity, including establishing basic communication between personnel working in different agencies responsible for Title I and low-performing schools; linking or coordinating data bases, filing systems, and basic record keeping; coordinating or aligning how Title I schools are identified across jurisdictions; and coordinating intervention plans and resource allocation to schools.

Aligning district standards, curriculum, and accountability systems internally and with state standards is a key linkage that can increase collective district capacity because it helps to focus reform activities (Regional Educational Lab Network, 2000). Some districts have developed standards and accountability systems that go beyond state systems (Hightower, 2002b). Along with creating a buffer between schools and political vicissitudes at the state level, such action can become another strategy for focusing goals. Rather than vaguely trying to improve student achievement, districts have specific, measurable, long-term goals with deadlines, as well as specific intermediate goals for each year of reform, (i.e. school-identified targets, and feedback systems to keep leaders abreast of how effective their strategies are) (Snipes, Doolittle, & Herlihy, 2002).

Several districts have also developed greater capacity to use and interpret data to guide decision-making, align standards and curricula, ascertain whether reform efforts are leading to increased student achievement, and adapt reform strategies. In these districts, leaders remain aware of conditions and base reform decisions on up-to-date information by gathering data and creating feedback and reflection loops, which use the most current information to facilitate problem-solving, decision-making, and planning (Elmore & Burney, 1997, 1998; Stein, Hubbard, & Mehan, 2002; Togneri & Anderson, 2003).

District as Mediator of Federal and State Policy Directed at Schools

As mid-level organizations in the policy system, districts can be key mediators of federal, state, or provincial policies. When district leaders have a strong and articulated theory of change or clear and articulated directions for change, they can help buffer schools from fast-changing or inconsistent policies while also coordinating the demands from multiple and possibly inconsistent accountability systems (Stein, Hubbard, & Mehan, 2002; Togneri & Anderson, 2003).

As a mid-level policy domain, districts coordinate communication in many directions. They both receive and direct communication and resources to agencies to which they are accountable and to schools under their supervision. There is a clear interdependence, particularly at

the district and school levels, between all individuals and groups involved in the reform process (Lusi, 1997; Snipes, Doolittle, & Herlihy, 2002; Togneri & Anderson, 2003).

In the United States, the roles that districts play in school improvement efforts are quite diverse. Some districts have greater capacity to design, direct, and coordinate improvement strategies, while others have virtually none. Districts that have begun to improve teaching and learning have several elements in place, all focusing on improving student learning. These elements include, stable leadership across the school board, the district office, and the school. Such districts provide quality resources and skillfully coordinated resource distribution. They provide networks for leaders across sites. They develop systemwide capacity (particularly content and process knowledge), problem-solving skills, and planning ability. They provide materials and appropriate personnel. The district enjoys a history of trust and cooperation and few crises arise. School leaders meet district standards and the district works to ensure union support (Bodily, 1998; Elmore & Burney, 1997, 1998; Hightower, 2002b; Kirby, Berends, & Naftel, 2001; Resnick & Glennan, 2002; Togneri & Anderson, 2003). Districts thus become key midlevel domains for coordinating the flow of both resources and communication across multiple levels of the policy system.

Developing Leadership Capacity

Distributed leadership was a key feature of several district-wide reform efforts. Several reforming districts have distributed the responsibility for instructional leadership across key stakeholders, including board members, superintendents and central office staff, union leaders, principals, teacher leaders, state education leaders, universities, and parents. Each group had clear roles that it performed to support reform (Elmore & Burney, 1997; Hightower, 2002a; Massell & Goertz, 2002; Snipes, Doolittle, & Herlihy, 2002; Togneri & Anderson, 2003). For instance, board members designed policies and supported instruction, while superintendents and central office staff viewed instructional reform as a way to improve student achievement. Union leaders worked actively with district leaders to increase instructional supports for teachers. Principals provided instructional leadership to the school while also bringing the district's vision into the school building. Teacher leaders provided additional on-site instructional support to other teachers. State education leaders provided funding for district-level professional development for teacher leaders, and principal training, among other things. Universities began to strategically partner with districts (Togneri & Anderson, 2003).

Superintendent.   Core elements in sustaining school and district reform were district superintendents' capacity to set clear goals, generate clear district norms; problem-solve, rally support, and develop and sustain trusting relationships and strong political networks, while securing needed resources (Christman & Rhodes, 2002; Elmore & Burney, 1997, 1998; Hamann, 2003; Hightower, 2002a, 2002b; Marsh, 2002; Spillane, 2000; Watson, Fullan, & Kilcher, 2002). Superintendents must decide what the unit of change will be. Recent research indicates that for breadth and depth of reform to occur, focusing on the whole district may be more appropriate than simply trying to reform individual schools (McLaughlin & Talbert, 2002; Togneri & Anderson, 2003; Snipes, Doolittle, & Herlihy, 2000). To accomplish this, however, superintendent

must exercise sophisticated planning and political skills (Elmore & Burney, 1997, 1998; Hightower, 2002a, 2002b; Resnick & Glennan, 2002; Snipes, Doolittle, & Herlihy, 2000). Whether superintendents, themselves have the capacity to direct such systemwide change is an important question to ask.

Principal. Several districts have focused resources on increasing the principal's capacity to direct, manage, and coordinate reform. In these districts, principals received systematic and extensive professional development to help them develop skills district leaders believed were central to ensuring that reforms extended into the classroom (D'Amico, Harwell, Stein, & den Heuvel, 2001; Elmore & Burney, 1998; Foley, 2001; Hightower, 2002a, 2002b; Togneri & Anderson, 2003). As with superintendents, principals' roles are demanding and require diverse skills, including managing their schools' external resources; obtaining the human, intellectual, and material resources needed to support their schools' development activities; establishing strong, productive relationships with external partners and with central administration staff; providing instructional leadership while making norms and expectations clear; and protecting their schools from external distractions and interference (Elmore & Burney, 1998; D'Amico, Harwell, Stein, & den Heuvel, 2001; Foley 2001; Hightower 2002a, 2002b; Togneri & Anderson, 2003). Principals are also among the first in the school community to feel the sparks of external pressure and opportunities for change. They are thus in a unique position to initiate development that is context-sensitive (Wenzel et al., 2001).

Teacher. While fewer district-led reforms appear to focus on developing teacher leadership capacity to facilitate reform, evidence suggests that teacher leadership in schools can also help facilitate improvement efforts. As with professional development for principals, teacher leaders receive professional development designed to prepare them for the demands they will face as site-level agents responsible for reform affecting classroom teaching (Hightower, 2002a; Massell & Goertz, 2002; Snyder, 2002; Stein, Hubbard, & Mehan, 2003). When implementing district-wide school improvement plans, teacher leaders can provide instructional support to other teachers, serve as bridges between the administrative office and the classroom, and assist principals by overseeing administrative roles tied to instruction, such as data analyses or professional development planning (Togneri & Anderson, 2003). At the school, they can also be key negotiators in efforts to build school-level capacity, in part by creating linkages between teacher beliefs and capabilities, and reform goals (Stein, Hubbard, & Mehan, 2003).

Choosing Reform Focus and Models

Reform leaders, whether superintendents or external partners, choose different models, and focus on different core elements when reforming schools under their charge. There is increasing evidence that if a district's goal is to increase student learning, then developing a plan that puts priority on increasing school *and* district capacity to support improved teaching can be more effective than other strategies. The Chicago reform efforts initially focused on developing strong site-based management (Smylie & Wenzel, 2003; Wenzel et al., 2001). Philadelphia had a multi-pronged approach (Christman, 2001; Christman & Rhodes, 2002). Other districts have focused primarily on improving teacher knowledge and skill, increasing leadership capacity to guide and

coordinate reform, and aligning curricula with state standards (Anderson, 2003; Massell & Goertz, 2002; Snipes, Doolittle, & Herlihy, 2002; Togneri & Anderson, 2003). Districts taking this last approach appear to be making greater strides in improving student outcomes and closing achievement gaps as measured by standardized assessments (Smylie & Wenzel, 2003; Snipes, Doolittle, & Herlihy, 2002; Togneri & Anderson, 2003).

Increasingly, districts are choosing research-based or university-developed reforms. Some are based primarily on principles for good teaching, some offer guidelines for district-wide reform, and others offer both.

In some districts, organizing principles were imported from university-school partnerships or developed internally. For instance, Providence, R.I., built its reforms around the Principles of Learning developed by The Institute for Learning at The University of Pittsburgh (Togneri & Anderson, 2003). The Zuni Public School District in New Mexico embedded district-wide reform efforts in the Standards for Effective Pedagogy developed by the Center for Research Excellence and Diversity in Education (CREDE) at University of California Santa Cruz (Tharp et al., 1996). New York District #2 developed its theory of action internally, and when the reformist superintendent moved to San Diego, transferred the principles developed in New York to San Diego (Elmore & Burney, 1998; Hightower, 2002a). The Principles of Learning, and the CREDE standards both focus only on classroom practice. The District # 2 reform principles are broader and address system-wide elements as well (Elmore & Burney, 1998; Hightower, 2002a).

Curriculum and Standards Development

In their review of district involvement in school reform that spans almost two decades, Mac Iver and Farley (2003) identified an almost ubiquitous need for districts to develop decision-making skills about curriculum and instruction that are linked to standards, as well as to develop their capacity to help teachers achieve state standards. In the context of standards-based reforms, schools increasingly need assistance in building their internal capacity to interpret state frameworks and student performance standards. They also need help in changing their classroom practices in ways consistent with state or district expectations for more rigorous instruction. Several districts have taken the lead in this area (D'Amico, Harwell, Stein, & den Heuvel, 2001; Elmore & Burney, 1997, 1998; Snipes, Doolittle, & Herlihy, 2002; Stein, Hubbard, & Mehan, 2002; Togneri & Anderson, 2003).

One virtually unstudied area is the role of local education agencies in adapting curricula to meet more rigorous state standards. A study by Spillane (1999) explores the relationship between local education agencies (LEAs) and state government in Michigan mathematics and science reform implementation. One of his key findings was that LEAs will and "capacity for" reform are interdependent. Almost all of the district-level policymakers in his study were willing to reform mathematics instruction, but lacked mathematical knowledge. Few of them could conceive of ways to reform curriculum so that it reflected the more substantive changes in content and pedagogy put forth in state standards.

Spillane found that changing the topics covered in the new math reform was familiar to most district leaders; six of the nine LEAs had previously done this sort of policy work. They did not, however, have either the content or process knowledge in either mathematics or science that the more rigorous reforms required. In short, revising local policies to reflect this more sophisticated mathematical and science knowledge involved LEAs actually learning science and math well enough to meet their charge. However, for LEAs to engage in the sort of learning necessary for them to substantively align their policies with standards, these district leaders would have to understand the inadequacies of their current mathematical, scientific, and pedagogic knowledge. Most were not aware of a gap in their mathematical and scientific knowledge, though some district leaders did acknowledge that they did not have a good grasp of the reforms. It was more the case that LEAs with understanding of the more sophisticated reform ideas were confident they were revising local policies in ways consistent with the standards. This example highlights the importance of linking district curriculum developers with outside experts in order to develop their capacity in the areas of mathematical and scientific content and process knowledge. This kind of learning partnership can increase the likelihood that rigorous mathematics and science standards and curricula will be developed.

Providing Effective Professional Development

The strategies for providing professional development, the types offered, and their quality varies by states and districts (Lusi, 1997; Massell & Goertz, 2002; Watson, Fullan, & Kilchner, 2002). Massell (1998) found that the states she studied used only a few strategies to provide professional development to teachers. The most prevalent was to create or support an external professional development infrastructure that relied on pre-existing service providers. This was done in part because state officials believed that higher levels of government should decentralize control and authority to local levels. The logic was that local-level decision-making would improve the quality of service. There was also a practical component to their decision: state department of education staff had also been reduced 25% or more in some states.

Districts appear to take three primary approaches to providing professional development to principals and teachers in schools. They either design their own internal district-wide networks; hire external partners to provide professional development to schools; or some combination of the two. Another option, which usually leaves out the district as a central player, is partnerships or grant programs, such as CSR or Annenberg (Datnow & Kemper, 2002; Elmore & Burney 1997; Finnigan, O'Day, & Wakelyn, 2003; Hightower 2002a, 2002b; Snipes, Doolittle, & Herlihy, 2000; Stein, Hubbard, & Mehan, 2002; Togneri & Anderson, 2003). Whichever approach they take, districts generally gear their efforts to a reform's organizing principles or goals (Anderson, 2003; Elmore & Burney, 1997; Mac Iver & Farley, 2003; Massell & Goertz, 2002; Snipes, Doolittle, & Herlihy, 2002; Togneri & Anderson, 2003).

One key component in designing effective professional development support systems is choosing vendors who can institute changes in classroom teaching. Both state- and district-level reform leaders need to build their capacity to choose external professional development vendors who offer such interventions. At the state level, many of the external vendors that Massell (1998)

studied did not provide enough professional development to affect student test scores. In many instances, these groups provided shallow assistance or traditional workshops; these did not change teaching. This led researchers to ask whether support providers themselves have the knowledge, skills, or time needed to provide high-quality, appropriate professional development. Service providers lacked both the expertise and quantity of professional developers to reach those teachers who needed assistance. State leaders lacked the expertise to choose vendors who could provide learning opportunities affecting teaching.

In analyzing the Chicago accountability system, Finnigan, O'Day, and Wakelyn (2003) found that reform leaders needed to develop their capacity to choose effective vendors to provide professional development to teachers. Vendors who were hired to increase teaching capacity in sanctioned schools fell short for several reasons. First, virtually none of the external providers had a systematic approach to literacy development. Second, the professional development methods were not deep or intensive enough to generate changes in teaching practices. Most external partners relied on either one-day workshops or train-the-trainer models. Neither of these approaches was successful in changing teaching. A more hopeful approach was on-site literacy coordinators. This intervention involved experts working one-on-one with teachers, observing their classroom teaching, and providing specific feedback about how to improve their literacy instruction. Third, because the district emphasized increasing student test scores, professional developers tended to focus on low-level test preparation activities, such as covering skills that would be tested and helping teachers map curriculum onto the test specifications. This tendency to focus professional development on the test, rather than on state standards, did not build teacher capacity to align curriculum to state standards, and had a limited effect on learning.

Improving classroom teaching may be a more complex endeavor than reform leaders had initially imagined. In analyzing District #2 reform efforts, D'Amico, Harwell, Stein, and den Heuvel (2001) inquired into what aspects of the District #2 literacy program and accompanying district support resulted in improved learning, as measured on standardized assessments for all 5 students in grades 3 to 5. They found that what improved overall learning, and began to close the achievement gap between poor minority students and their middle- to upper-middle- class counterparts was providing professional development in conjunction with choosing curriculum frameworks that developed basic and higher level thinking skills. In their research, it was the combination of the Balanced Literacy program, the TERC's Investigations curriculum for math, and high-quality professional development that provided the support that teachers needed to improve their teaching. More recent research has also found that both the depth of the implementation and the kind of reform model chosen affected achievement outcomes, as measured by standardized student assessments, for linguistically diverse students (Datnow, Borman, Stringfield, Overman, & Castellano, 2003).

IMPLICATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The purpose of this report is to provide a model of the policy system that identifies key policy domains, provides a beginning analysis of the linkages that exist across policy domains in the educational system, and finds key areas for capacity-building to support linkages. The findings suggest that there are systemic linkages that can be potent forces in educational improvement efforts. The systematic analysis of linkages that exist across policy domains is virtually nonexistent in educational research. For instance, not a single piece cited in this report provided a working definition for linkages between or within policy domains. Likewise, there is a dearth of research that has as its primary focus understanding what linkages exist between policy domains, how resources and communication move across these linkages to affect policy implementation, or what other linkages need to exist to facilitate the coordinated flow of resources and communication across policy domains.

Inherent in my analysis of linkages are several areas where capacity for supporting and sustaining school reform efforts can be developed throughout the policy system. One key direction for future research is studies that focus on how various agencies and organizations in the education policy system develop their internal capacity to create and use linkages. Another area is studies that examine how systemic capacity to provide quality resources and effectively coordinate the movement of both communication and resources across linkages is developed. Standards-based reform assumes that systemic linkages exist, and that capacity, especially at higher levels in the educational system, supports such complex reforms. That assertion remains unproven and provides ample ground for further research.

This analysis of linkages indicates that the flow and quality of resources across linkages greatly affect the viability of improvement efforts. For each of the linkages identified as important to school reform, it is essential that the flow of resources or communication across them is coordinated, and that the resources or communications themselves be of high quality and appropriate for the context in which they are being used. It also demonstrates that a lack of capacity to support reform at any level in the policy system affects the ability of people in other policy domains to successfully direct, coordinate, or support improvement efforts. By analogy, an automobile with a wonderful engine, new tires, and a broken transmission simply cannot move.

This analysis provides evidence to suggest that simply creating more tightly (or loosely) linked policy systems does not in and of itself ensure increased capacity for teaching and learning. Likewise, the story is more complex than suggesting that the presence or absence of linkages between policy domains is a key factor in school reform. It is possible to have a policy system that is relatively tightly coupled, or that is linked closely to other policy domains, that also has low individual, collective, or material capacity in key policy domains. The lack of capacity creates the conditions in which resources, will, skill, knowledge or the disposition to improve classroom teaching and student learning are missing (Lasky & Foster, 2003).

One of the primary implications of this analysis concerns the models and conceptual frameworks that guide our research, because they provide our parameters and ground rules. School effectiveness and school improvement have not previously had a model for conducting

systematic analysis of linkages and reform capacity across policy domains in the education system. This conceptual framework thus becomes a springboard for developing other comprehensive models that examine (a) linkages across and within the policy system, and (b) capacity building to support school improvement efforts. This model also provides one example of how to link the world of street-level bureaucrats to the systemic patterns with which policymakers are concerned (McLaughlin, 1987).

There are multiple and simultaneous sources of causality at the federal, state, district, community, school, and classroom levels that affect how policy is interpreted, acted upon, and implemented. The model proposed here provides a framework that can more completely identify the complexity inherent in any causal chain of events and outcomes in the education policy system. Figure 1 in the conceptual framework provides a picture of the structural linkages that connect policy domains in systemic reform implementation. It allows for systematic analyses of the linkages that connect policy domains; whether and how resources move across the linkages; or the quality and appropriateness of the resources that move across linkages. It also allows for a systematic analysis of individual, collective, and, material capacity within each policy domain. Further, it shows how varying capacity for learning and reform implementation in one domain might affect policy implementation throughout the system.

Appendix 1 provides a more realistic picture of how systemic policy implementation processes actually work as described in the school reform literature reviewed for this technical report. It maps the structural, formal and informal, ideological, relational, and temporal linkages throughout the education policy system.This model includes the possibility for nonlinear movement and unpredictability across the policy system; it also shows the messiness and complexity inherent in policy and reform implementation. There is, however, no statistical model sophisticated enough to analyze the multiple and simultaneous influences affecting any single outcome. Nor could any one qualitative study systematically analyze all of the elements affecting a causal chain. This leads to the model in the third appendix.

Appendix 2 shows how the model can be used to emphasize specific policy domains and variables in a study of school effects. In this model, structural, formal, and temporal linkages among the federal, state, district, and school and classroom domains are the topic of study. Because this report relied on secondary analyses of prior research, a study that focuses on how these linkages work, and how resources and communication flow across them would be of importance. It is only one of many possible frameworks that could be developed from the larger model, the important feature being that the number of variables under study is greatly reduced, while holding the bigger picture in mind.

Another area of study would be to explore how this model generalizes across international contexts. Key policy domains and linkages across them no doubt vary from country to country, though some do generalize (Datnow, Lasky, Stringfield, Teddlie in press). This model would provide the framework to conduct cross-national comparative studies of areas such as what the key policy domains are; what linkages exist; what linkages need to be created; in what areas does capacity for developing and supporting linkages need to be developed; what resources

need to be moved across which linkages to best facilitate school improvement efforts; and how much systemic capacity to develop, direct, and coordinate reform.

To make school systems move forward, policymakers need to more carefully examine current system linkages and consider how to develop systemwide capacity to support improved teaching and learning. Finally, much more research needs to be conducted on how states and the federal government can most effectively develop their own internal capacity and linkages to other organizational levels in order to develop, direct, coordinate, and support school reform.

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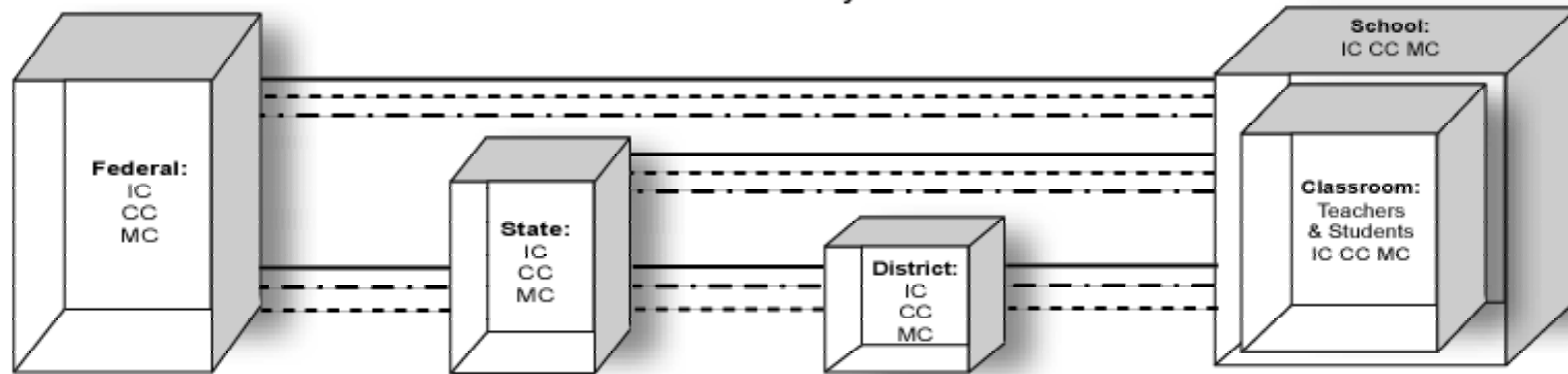
APPENDIX 1

Conceptual Framework: Linkages*
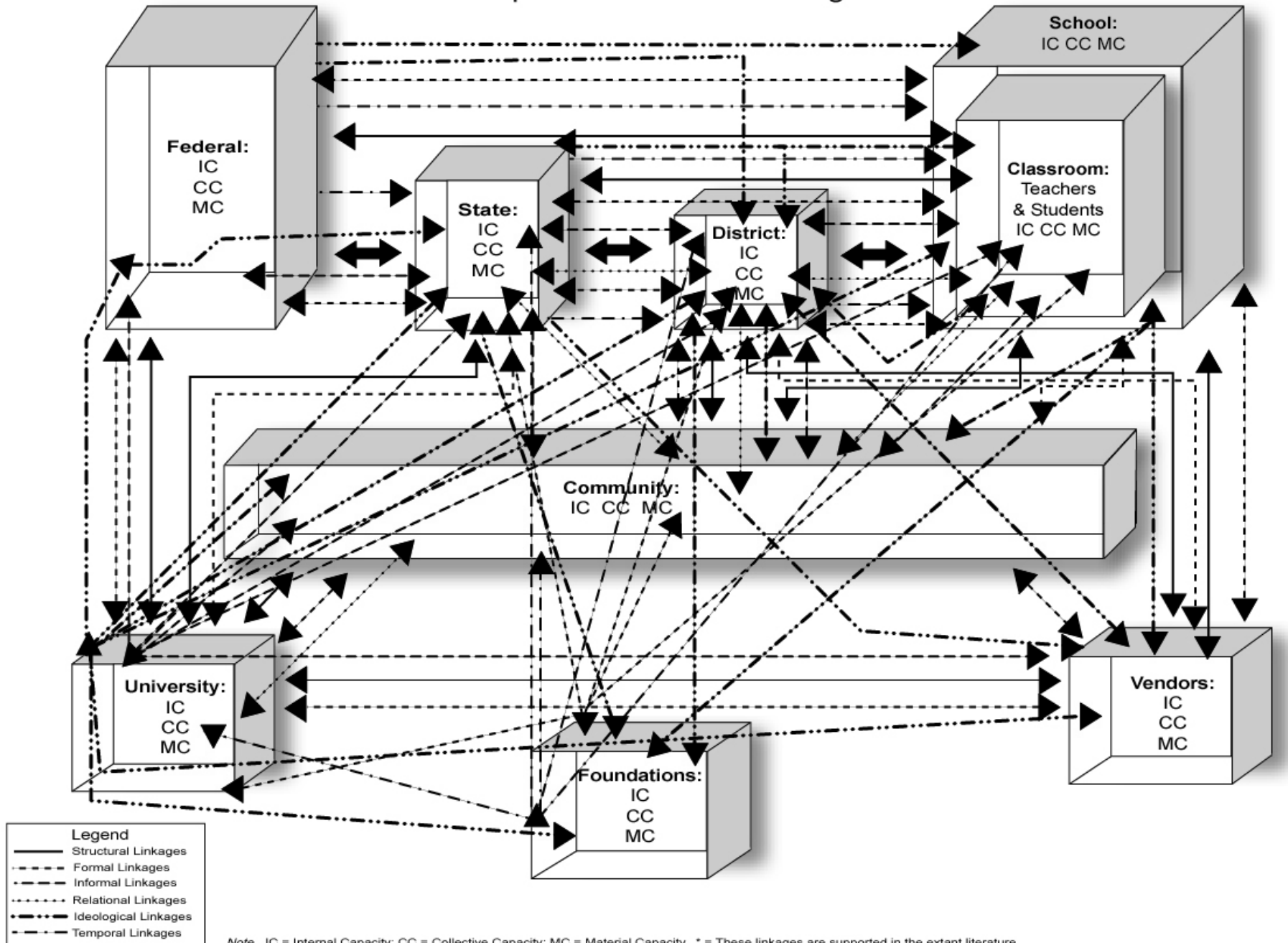
Note. IC = Internal Capacity; CC = Collective Capacity; MC = Material Capacity. * = These linkages are supported in the extant literature.

Conceptual Framework:
Structural, Formal, and Temporal Linkages
Between Select Policy Domains*

Legend

——— Structural Linkages
- - - - Formal Linkages
-·- -·- Temporal Linkages

Note. IC = Internal Capacity; CC = Collective Capacity; MC = Material Capacity.
* = These linkages are supported in the extant literature.