

**Mapping the Policy Environment for High-Quality Teaching:  
Can We Get There from Here?**

by

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Ideas about how to reform and improve the quality of schooling in the United States are plentiful. Central to these ideas is a set of education reforms that focus on improving the quality of teaching in public elementary and secondary schools. Based on the argument that teachers are the “single most important factor in student learning” (Darling-Hammond, 1997; National Commission on Teaching and America’s Future [NCTAF], 1996; Sanders, 1998; Sanders & Rivers, 1996), reforms seek to elevate the quality of teaching in schools by changing teacher preparation programs (Darling-Hammond & Young, 2002; Education Week, 2003 January 9), altering hiring, retention, and licensing policies (Hanushek & Pace, 1995; Murnane, 1991), enhancing professional development opportunities for teachers (Cohen & Hill, 2000; Education Week, 2003 January 9), and aligning curriculum standards with assessment policies (Education Week 2001, January 11; O’Day & Smith, 1993). Although many of these reforms frame the “problem of teacher quality” differently, the goal is essentially the same – to promote higher levels of student learning through changes in policies that affect teachers’ knowledge and practices.

The history of curricular and instructional reform in the United States, however, has not been a history of radical change, innovation, or development, especially of the scope being promoted by professional organizations, current reform movements, and government agencies (Cohen, 1988; Cuban, 1990, 1998; Elmore, 1996; Tyack & Cuban, 1995). The core technology of schools – that is, how teachers and students understand and engage in teaching and learning – has proven to be amazingly resilient. The predominant construction of teaching that has persisted for more than 50 years involves teachers presenting students with discrete facts about isolated subjects (Cohen, 1988; Cuban, 1990, 1998). Learning is assessed by requiring students to repeat information presented by teachers, either through classroom recitation or on tests that require right-or-wrong answers to a series of factual questions (Elmore, 1995, 1996). Although there have always been examples of classrooms (and entire schools) with alternative approaches to teaching and learning, these exceptions exist largely on the margins of how the core

technology is understood and enacted in most classrooms (Elmore, 1996). Why would this wave of reforms be any different?

While there is ample reason for pessimism, there is also some cause for cautious optimism. Previous reforms were implemented in a different policy environment – one characterized by strong local control and limited external influences, relative isolation of schools and school districts from education-related agencies, and a weak or under-developed body of professional knowledge. The current policy environment is far more complex (Rowan & Miskel, 1999) and focused on student learning (Elmore, 1995; Rowan, 1995a,b).<sup>1</sup> State and federal agencies have greater leverage to implement change than in the past, including leverage over curricular goals, standards, and assessments. Increasing numbers of professional organizations, community agencies, and business associations have also sought to have their voices heard about how schools operate, making schools and districts far less isolated. Moreover, there has been an impressive growth in professional knowledge, especially around principles of learning (Alexander & Murphy, 1998) and school management (Rowan 1995a). While alignment between these policy forces is imperfect, sometimes leading to conflicting mandates and contrasting conceptions of teaching and learning, each indicates an important change in the policy environment surrounding schools and classrooms.

In this paper we focus on two broad trends or changes in the policy environment that we believe have the potential to influence teaching – the use of high-stakes accountability measures by state and federal policy makers to define goals and priorities for schools, and the growth in a professional knowledge base on teaching and the effects of different organizational designs on teachers' work. Recent scholarship in these areas, as well as our own experiences in the High Quality Teaching<sup>2</sup> study,

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<sup>1</sup> Student learning is certainly not the only focus in the policy environment. Nonetheless, this does appear to be one of those relatively rare moments in the history of education reform where alternative conceptions of teaching and learning are dominant themes for reform ideas (Elmore, 1995; Tyack & Cuban, 1995).

<sup>2</sup> The High-Quality Teaching Study is a five-year, longitudinal study of 4<sup>th</sup> and 5<sup>th</sup> grade teachers. The study investigates how teachers in moderate- to high-poverty schools scale up their practice to promote high-levels of learning in reading and mathematics, as well as address differences in learning between students in their classroom. The study is a partnership between the University of Maryland and Montgomery County Public Schools; it is supported by a grant from the Integrated Educational Research Initiative, a combined effort of the National Science Foundation, the U.S. Department of Education, and the National Institutes of Health.

suggests that successfully promoting more powerful forms of teaching and learning requires more integrated theoretical frameworks to guide policy, practice, and research. We argue that improving the quality of classroom teaching depends on a synthesis of insights from multiple domains of research (e.g., cognitive psychology, educational administration, and policy studies), as well as the recognition of on-going political and social realities that influence teachers' understandings of their work and the conceptions privileged by reforms.

We begin by briefly describing what we mean by high-quality teaching. Next we define the policy environment surrounding schools and classrooms, including teachers' linkages to the policy environment and how these linkages might influence the implementation of curricular and instructional reforms. Then we describe what we consider to be major trends in the policy environment and how these trends might affect, either negatively or positively, efforts to enhance the quality of teaching in classrooms and schools. We end with a set of propositions related to developing a more integrated theoretical framework and knowledge base to guide policy, practice, and research. These propositions have helped to guide some of our own research in the High-Quality Teaching study.

### WHAT IS HIGH-QUALITY TEACHING?

Recent curricular and instruction reforms propose ambitious and fundamental changes in conceptions of teachers' work and student learning.<sup>3</sup> These reforms present an alternative vision of what students should learn and what teachers and administrators should do to enable such learning. Regardless of the reform label, whether it is "teaching for understanding," "authentic instruction," "student-directed learning," "teaching for meaning," or "social constructivism," advocates propose a fundamental shift away from behaviorist models of teaching and learning toward cognitive models of teaching and learning. Such a shift has not only important implications for how students and teachers interact in classrooms but also important implications

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<sup>3</sup> We focus on curricular and instructional reforms commonly associated with standards-based reforms. While we acknowledge other reforms that promoting changes in curriculum and instruction, we focus on this set of reforms because they represent fundamental changes in conceptions of teaching and students' capacity for learning.

for what constitutes effective forms of school organization and desirable policies (Elmore, 1995; Rowan, 1995a).

In traditional classrooms, teachers talk and students listen (Cohen, 1988; Elmore, 1995, 1996). Individual teachers present students with discrete, isolated facts or sets of skills, which students acquire through memorization, recitation, and the successful completion of simple tasks (e.g., worksheets or tests with right-or-wrong answers). What students are to know and be able to do is organized into a standard curriculum divided into discrete subjects or sets of topics. Teachers progress through the curriculum sequentially, starting with materials thought to be the easiest or most rudimentary and advancing to material thought to be more difficult and demanding. Quality is judged largely in terms of how much curricular material is covered successfully over the course of a school year.

Recent curricular and instructional reforms present an alternative vision of teaching and learning in classrooms. Advocates for these reforms portray traditional teaching practices as ineffectual or limited because they fail to deeply engage students in content knowledge. Rather than reproduce discrete facts or demonstrate mastery of isolated skills, students are expected to frame academically meaningful problems, discover solutions, pose alternatives, and acquire a deep understanding of the epistemological principles underlying different content areas. Although teachers may work from a curriculum framework, they tailor tasks to suit students' interests, expand their cognitive skills, and deepen their understanding of content knowledge; doing so requires fluid curriculum, one that can be tailored to what students currently know and can do so as to leverage interests and prior knowledge to higher levels of cognitive growth and development. Quality is gauged not by the amount of curricular material covered but by the depth of understanding acquired by students.

These alternative conceptions of teaching and learning have been expressed in some detail by professional associations tied to standards-based reform.<sup>4</sup> The International Reading

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<sup>4</sup> These conceptions of teaching and learning are not limited to the standards-based reform movement or to the professional groups associated with the movement; similar conceptions of teaching and learning date back to at least

Association (IRA, 1996) envisions students who are proficient users of language, motivated and able to read a wide range of texts, and able to draw on numerous strategies to interpret, evaluate, and appreciate those texts. In their Vision for School Mathematics, the National Council for Teachers of Mathematics (NCTM, 2000) presents a similar vision of academically challenging tasks that require the acquisition of not only procedural but conceptual knowledge:

*Students confidently engage in complex mathematical tasks chosen carefully by teachers. They draw on knowledge from a wide variety of mathematical topics, sometimes approaching the same problem from different mathematical perspectives or representing the mathematics in different ways until they find methods that enable them to make progress. Teachers help students make, refine, and explore conjectures on the basis of evidence and use a variety of reasoning and proof techniques to confirm or disprove those conjectures. (<http://standards.nctm.org/document/chapter1/index.htm>)*

In stark contrast to how teachers typically describe their work, as routine and unchanging (Rowan 1977),<sup>5</sup> these curricular and instructional reforms conceptualize teachers' work as complex and cognitively challenging (Cohen, McLaughlin, & Talbert, 1993; Lampert, 2001; Spillane, 1999). To be successful, teachers must possess high levels of content-specific pedagogical expertise (Shulman, 1986) if they are to present content in ways that deeply engage students in meaningful learning (Brophy & Good, 1986). High-quality teaching occurs when teachers use curricular materials, students' knowledge, and their own content knowledge to promote increasingly more powerful learning opportunities for students (Cohen, Raudenbush, & Ball, 2001).

## WHAT IS THE POLICY ENVIRONMENT?

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the work of Dewey (1905) and his adherents. We focus on these depictions because they are the most prevalent in the current policy environment.

<sup>5</sup> According to Rowan (1998), the vast majority of teachers (82%) describe their work as having low levels of task uncertainty (82 percent), while roughly half (50%) describe their work as having low levels of task variety.

The changes promoted by these reforms require fundamental changes in not only teachers' work but fundamental changes in the institutional expectations that support traditional conceptions of teachers' work and students' learning. Schools, like all organizations, operate within a particular policy environment where competing political interests and cultural understandings shape these expectations (Tyack & Cuban, 1995; Sarason, 1999). While there is no single definition of what constitutes a policy environment, Scott and Meyer's (1991) notion of societal sectors provides a useful conceptual framework.<sup>6</sup> A policy environment is "(1) a collection of organizations operating in the same domain, as identified by the similarity of their services, products or functions, (2) together with those organizations that critically influence the performance of the focal organizations ..." (p. 117). This latter group can include a wide range of related organizations (or publics), such as suppliers, competitors, funding sources, consumers, and regulators. When we think about schools as a focal collection of organizations, proponents of standards-based reforms, such as the National Council for Teachers of Mathematics (NCTM) and the National Council for Teachers of English (NCTE), fall within the category of related organizations, as do other professional associations, state and federal education agencies, teachers' unions, teacher preparation programs, textbook manufacturers, students, parents, and tax payers.<sup>7</sup>

Modern societies are increasingly characterized by functionally differentiated policy environments (e.g., the environment surrounding education-related organizations v. the environment surrounding health-care-related organizations) (DiMaggio & Powell, 1991; Scott & Meyer, 1991). The interdependencies within sectors encourage the creation of more elaborate organizational structures, as well as boundary-spanning linkages between organizations within environments that permit

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<sup>6</sup> Our use of the term policy environment is interchangeable with Scott and Meyer's (1991) notion of a societal sector or DiMaggio and Powell's (1991) concept of organizational fields. Scott and Meyer recognize the similarity in these terms and the conceptualization of policy environments in public policy studies (e.g., Wildavsky, 1979). Regardless of the term used, the analytic goal is to identify the boundaries of influence that comprise an organization's environment.

<sup>7</sup> What is remarkable about schools is that there are so many organizations and publics vying for influence over local policies and practice. Although schools, like other organizations, seek to maintain boundaries and buffer core activities from external influences (Ogawa, Crowson, & Goldring, 1999), the boundaries between schools and influential agents in the surrounding policy environment is quite permeable (Cohen, Raudenbush, & Ball, 2001).

coordination and resource exchanges (Bidwell 1965; DiMaggio & Ogawa, Crowson, & Goldring, 1999; Perrow, 1979). As policy environments become more complex, governing agencies seek regulatory power or influence over organizations within the environment, creating additional pressures for organizations to centralize and institutionalize organizational processes. The interest and expansion of federal authority in education over the past several decades, from civil rights to high stakes accountability, supports this proposition. Although schools, like other organizations, develop strategies and mechanisms for buffering internal operations from external influences (Bidwell, 1965; Ogawa, Crowson, & Goldring, 1999; Perrow, 1979),<sup>8</sup> their structure and internal operations are increasingly influenced by the characteristics of their policy environment.

#### Technical v. Institutional Processes

Policy environments can be distinguished along at least four dimensions – the extent to which organizational structures reflect technical or institutional processes, the hierarchical structure of organizations, decision-making privileges, and types of control mechanisms utilized within and between organizations (Scott & Meyer, 1991). Organizations with strong technical requirements are rewarded primarily for the effective and efficient control of their production systems, whereas organizations with strong institutional requirements are rewarded for conforming to regulatory rules and normative beliefs about how organizations should function.<sup>9</sup> Organizations can operate within environments that have strong technical requirements, as well as strong institutional requirements (e.g., general hospitals, utilities, and banks). Schools, like churches, legal agencies, and mental health clinics, have been characterized as operating in policy environments with strong institutional expectations but weak technical requirements (Meyer & Rowan, 1978; Scott & Meyer, 1991; Rowan, 1982).<sup>10</sup>

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<sup>8</sup> Perrow (1986) argues that “buffering strategies” need not be entirely defensive, or at least as defensive as portrayed by institutional theorists. Organizations can also seek to shape their policy environments, as evidenced by the lobbying activities of teachers’ unions and other professional associations.

<sup>9</sup> While the technical and institutional dimensions of a policy environment can be distinguished analytically, they are more difficult to separate into distinct phenomenon. Even the adoption of a proven instructional strategy involves some level of “institution building” (Rowan & Miskel, 1999), especially if the adoption of the strategy alters current beliefs about effective practices, responsibilities, or benefits.

<sup>10</sup> This does not mean that there is no technical knowledge about how schools should be organized or how teachers should teach; rather, it means that this knowledge is less well developed than in other policy environments (e.g., engineering or general manufacturing). Consequently, technical considerations about the most effective ways to

### Hierarchical Structure

Policy environments also differ in terms of vertical elaboration. Public organizations in the United States typically function within environments with at least three levels: local, state, and federal. For example, individual public schools<sup>11</sup> are organized typically into school districts, while school districts are organized into states, and states are connected to federal structures, such as the Department of Education or the Office for Civil Rights. There are also local, state, and national chapters for many professional associations, civic organizations, teachers' unions, and parent groups, as well as a growing number of regional structures (e.g., regional education laboratories, technical assistance centers, and textbook markets) that may influence what happens across or within levels of the policy environment surrounding schools. These structures contribute to the complexity of the policy environment, as well as the complexity of the policy messages that travel between and within organizational boundaries.

### Decision-Making Privileges

Related to the hierarchical structure of a policy environment is the distribution of decision-making authority. Decision-making regarding the purpose and goals of an organization (programmatic), the means or procedures for obtaining goals (instrumental), or the distribution of resources (fiscal) may be centralized or decentralized (Scott & Meyer, 1991). Although the past century has witnessed a substantial increase in the centralization of authority within the public school system, especially at the state and federal levels of government (Croninger & Malen, 2002; Malen & Muncey, 2000), decision-making privileges are still highly fragmented (Cohen & Spillane, 1993; Meyer, Scott, & Strang, 1987). Centralization has occurred largely in the area of fiscal authority, which state and federal agencies increasingly use in the forms of sanctions and regulatory requirements to influence local decisions about priorities and practices

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promote student learning play less of a role in the operation of a school than institutionalized beliefs about how teachers *should* teach and schools *should* function.

<sup>11</sup> From a purely theoretical perspective, we might also argue that classrooms are organized into schools. This is especially the case if classrooms can be characterized as a distinct organizational unit where teachers have substantial control over what they do within classrooms. This is certainly the argument made by Bidwell (1965), Lortie (1975), Meyer & Rowan (1977), and Weick (1976).

(Meyer & Scott, 1993). While decisions about programs and practices are made locally, they are subject to a broad range of competing influences from the policy environment (Scott & Meyer, 1991).

### Mechanisms of Control

Policy environments may also differ in the mix or modes of control exercised to assess organizational performance. Structural controls focus on the adequacy of facilities and equipment, suitability of specific organizational features, or the qualifications of personnel. Process controls focus on the activities of personnel measured against performance standards, while outcome controls focus on the characteristics of organizational products (the extent to which products “measure up” to some criterion of quality). The fragmentation of authority within a policy environment creates fertile ground for the elaboration and duplication of control mechanisms, as different organizations at different levels attempt to influence the actions of other agents (Scott & Meyer, 1991). Within the policy environment surrounding schools, there are a multitude of controls mechanisms, ranging from accreditation and certification requirements (structural) to special education and Title IX requirements (process) to student assessment and performance requirements (outcome). Because these controls originate from different sources of authority and are translated through different levels of the policy environment, there is a high likelihood of conflicting requirements and contradictory policy signals.

### Teacher Linkages to the Policy Environment

Teachers and classrooms are linked to the policy environment in multiple ways.<sup>12</sup> Spillane (1999) suggests that teachers’ experience the policy environment through five distinct linkages, which taken together, constitute a “zone of enactment” – that is, a complex array of external factors that bear on teachers’ practices. These linkages, which include teachers’

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<sup>12</sup> Administrators are also linked to the policy environment in important ways. We plan to develop this idea more fully and explore these linkages as part of our study of High Quality Teaching.

interactions with students, parents, private industry (e.g., textbook manufacturers and business partnerships), professional colleagues (formal and informal), and policymakers (direct and indirect), situate teachers' actions in the surrounding policy environment. Exchanges across these linkages interact with teachers' personal knowledge, beliefs, and dispositions to shape teachers' motivation and capacity for implementing curricular and instructional reforms.

Consider teachers' interactions with colleagues, students, or parents. Each of these members of the policy environment hold particular conceptions of teaching, as well as beliefs about what constitutes valuable knowledge and how classrooms and schools should be structured. These beliefs are deeply rooted in the social structures within and surrounding schools, for they dictate respective responsibilities and tacit agreements about the distribution of schools resources, opportunities, and rewards (Elmore, 1995). Altering traditional patterns of instructional interaction and organization can be especially difficult if doing so creates uncertainties for teachers, students, and parents about responsibilities and access to valued goods (Cohen, 1988; Cohen, Raudenbusch, & Ball, 2001; Cuban, 1990; Elmore, 1995, 1996; Lortie, 1975). Alternatively, access to reform networks, supportive instructional tools and materials, relevant professional development opportunities, and supportive colleagues can also provide teachers with the leverage that they may need to change local expectations about teaching and learning (Cohen, McLaughlin, & Talbert, 1993; Cohen & Hill, 2000; Spillane, 1999).

#### CHANGES IN THE POLICY ENVIRONMENT

We argue that there are two fundamental changes occurring in the policy environment that have the potential for affecting significantly teachers' work and students' learning. These changes involve the implementations of high-stakes accountability policies, as well as the emergence of a core set of beliefs about what promotes high levels of student learning and effective schools. While the former constitutes an expansion of governmental control over school priorities and goals, the latter presents the possibility of teachers and policymakers having access to technical knowledge about how to promote higher levels of student learning. Although

there is considerable debate about the effects of high-stakes accountability policies (Amrein & Berliner, 2002), one argument is that the specification of student performance outcomes has the potential to dramatically alter the status quo in classrooms (Baron & Wolf, 1996; Rothman, 1995). The development of a technical knowledge-base in schools may also represent a potentially important shift in conceptions of teaching and learning, creating an important basis for further professionalization and the development of content-specific pedagogical expertise (Alexander & Murphy, 1998; Darling-Hammond, 1997; Darling-Hammond & Youngs, 2002; Rowan, 1995a,b; Elmore, 1995, 1996).

### High-Stakes Accountability

During the past 20 years there has been a remarkable change in governance structures that influence local education policies and practices. Governmental agencies have steadily moved education policy to the forefront of their legislative agendas, promoting a range of policies that sought first to emphasize basic instruction and then to promote more intellectually ambitious tasks in the classroom (Cohen & Spillane, 1993; Elmore, 1995, 1996; Rowan, 1995a). While local governments retain substantial authority over school policies, these policies are being “aligned” with state and federal priorities. Through the recent implementation of high-stakes accountability measures, this realignment has meant an increasing focus on what teachers and students do in the classroom, how we recognize learning in students’ work, as well as how we recognize quality in teachers’ preparation and actions (Baron & Wolf, 1996; Darling-Hammond & Young, 2002). Government agencies are paying remarkably greater attention to how teachers are prepared, what teachers are to teach, what students should be able to do, and whether students have actually attained those learning goals through assessments (Cohen & Spillane, 1993; Heubert & Hauser, 1999; Rothman, 1995).

This attention has manifested itself most clearly in high-stakes accountability policies that seek to strengthen incentive for promoting high-quality teaching and greater gains in learning. Virtually all states (47 states) have implemented state-based curriculum frameworks in core academic subjects. These frameworks, organized by subject areas, retain some of the

traditional focus on the acquisition of basic facts and skills but also urge greater emphasis on intellectually challenging instruction and deep understanding of academic subjects. The vast majority of states have also aligned curriculum standards to criterion-referenced assessments in language arts (42 states) and mathematics (40 states), while more than one-third (19 states) have aligned curriculum standards to assessments in science, and one-quarter (13 states) have aligned curriculum standards to assessments in social studies and history. Although fewer states have specific policies that use sanctions and rewards to hold schools accountable for student performance on assessments, more than half of the states (27 states) rank order schools by performance and nearly one-third (14 states) apply sanctions to schools if substantial proportions of students fail to achieve a specified criterion on assessments (Education Week, 2001 January 11).

The reauthorization of the 2001 Elementary and Secondary Education Act, No Child Left Behind, further “ratchets” the accountability for state frameworks, standards, and assessments by requiring schools receiving federal dollars to make “adequate yearly progress” toward federally articulated timetables or face a range of possible sanctions, including loss of funding, school reconstitution and school closure. Schools are required to assess progress annually in grades 3-8, and at least once in high school, with an ultimate goal of having *all* students perform at the “proficient” level on state tests by the 2013-14 school year. States are rewarded for closing the achievement gap and schools can receive bonuses for improving the achievement of disadvantaged students; states and schools that fail to make “adequate yearly progress” – that is, fail to meet annual performance targets two years in a row – receive reductions in funding and progressively more severe sanctions (Olson, 2003 February 19). Although states retain authority to set their own standards for “proficient performance” and “adequate yearly progress”, No Child Left Behind sets a highly ambitious timeline for change, widens the scope of performance expectations to include reducing the achievement gap between specific populations of students, and dramatically increases assessment requirements.

Effects on student achievement. The research on the effects of high-stakes accountability remains sparse and controversial (Viadero, 2003 January 8). Using longitudinal data from the National Assessment of Educational Progress (NAEP), Amrein and Berlinger (2002) argue that states that have adopted high-stakes assessments show few gains in achievement. Others, using NAEP data, have found modest though positive results on student achievement in states that have adopted more rigorous assessment policies (Carnoy & Loeb, 2003; Viadero, 2003 February 5). Still others (Cohen & Hill, 2000; Cohen, McLaughlin, & Talbert, 1993) argue that the effects on student achievement depend largely on how assessment policies are mediated by key actors and organizational levels within the policy environment. In their study of standards-based mathematics' reforms in California, Cohen and Hill found higher levels of student achievement for teachers who participated in professional development opportunities that explicitly focused on explaining reform ideas, assessments, and instructional strategies consistent with reforms.

Effects on high-quality teaching. Studies have also sought to investigate the effects of high-stakes assessment policies on teaching. Firestone, Mayrowetz, and Fairman (1998) examined how mathematics assessments under conditions of moderate to low stakes influenced the teaching practices of middle-school teachers in Maine and Maryland. Firestone and his colleagues concluded that teachers in Maryland, where assessment results were tied to moderate stakes, focused more classroom activities on the test than teachers in Maine, where assessment results had no clear consequences for schools. There was little evidence that assessments actually changed how teachers approached mathematics instruction in the classroom, though; rather, teachers focused on aligning existing curriculum with the content of assessment by providing students with opportunities to practice with assessment-like formats and adjusting curriculum pace to cover the content of assessments.

A recent national survey of teachers conducted by the National Board on Educational Testing and Public Policy at Boston College reinforces these findings. While teachers in high-stakes states were four times as likely as teachers in low-stakes states to say that assessment results influenced their teaching on a daily basis, they were also more likely to say that

assessments influenced curriculum content and coverage than to say that assessments influenced their approach to teaching specific subjects (Olson, 2003 March 12). High-stakes accountability policies in isolation of other policies, particularly professional development opportunities and collegial supports, appear to be very weak levers by which to change fundamentally teachers' conception and enactment of practice (Cohen & Hill, 2000; Firestone, Mayrowetz, & Fairman, 1995; Spillane, 1999).

While there is little evidence that high-stakes accountability policies, in-and-of-themselves, will change conceptions of teaching and learning, such policies may reinforce traditional practices if they promote forms of assessment that privilege low standards and the acquisition of basic skills. Most states have aligned curriculum standards to criterion-referenced assessments, but states vary dramatically in the specificity of content standards, the rigor of assessments, and the performance levels required of students to achieve "proficiency" (Linn, Baker, Betebenner, 2002). States with low standards and less rigorous tests are more likely to meet the new accountability standards set by No Child Left Behind, though even these states will have to make dramatic improvements if they are to attain 100 percent "proficiency" by 2014. Given the history of gains in states that emphasize high standards and tests that measures students' cognitive processes, the goal is probably unattainable.

States with lower performance standards have far fewer students to bring up to "proficiency" than states with higher standards. In Texas 91 percent of 8<sup>th</sup> grade students attained state-designated performance standards in reading in 2001, while 92 percent attained the same standard in mathematics; in Maryland, however, where state assessment tapped complex reasoning and problem solving skills, the attainment rates were only 27 percent and 46 percent respectively for 8<sup>th</sup> grade students.<sup>13</sup> Because the Texas Assessment of Academic Skills (TAAS) sets relatively low performance standards and emphasizes the acquisition of basic skills, much higher proportions of Texas students achieve "proficiency". The No Child Left Behind

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<sup>13</sup> Linn, Baker, and Betebenner (2002) estimate the level of difficulty for TAAS to be below the basic level of performance on NAEP and the level of difficulty for MSPAP to be roughly mid-way between basic and proficiency levels of performance on NAEP.

legislation allows states to determine their own definitions for proficiency, as well as determine the type of assessment that will be used to gauge student learning. States that do not want to be penalized for setting higher standards will set lower standards that emphasize instruction in basic skills.<sup>14</sup>

Moreover, the annual rate of gain required for schools to attain the goal of 100 percent proficiency by 2014 far exceeds average annual rates of gain documented for most states, particularly states with high standards and rigorous assessments. If NAEP is used as the benchmark, roughly one-third (32 percent) of 4<sup>th</sup> grade students nationwide achieved proficiency in reading in 2000, compared to approximately one-quarter (26 percent) of 4<sup>th</sup> grade students in mathematics. For states to reach the 100 percent proficiency criteria set by No Child Left Behind, states would have to register achievement gains of roughly 5 percentage points a year in both reading *and* mathematics. However, only three states out of the 33 that participated in NAEP's 4<sup>th</sup> grade reading assessments achieved an annual growth rate of *one* percentage point per year between 1992 and 1998, 15 out of 34 achieved this rate in mathematics during the same time period, and no state achieved the rate in *both* reading and mathematics (Linn, Baker, & Betenbenner, 2002). These results appear to indicate that it very difficult, if not impossible, to achieve gains required by No Child Left Behind, especially in states that set ambitious performance standards and utilize assessments that require the use of higher-order thinking skills.

Although No Child Left Behind marks a dramatic increase in federal influence over school goals and priorities, it is hard to imagine the policy promoting high-quality teaching, at least not as understood by those who promote a cognitive model of learning. As currently understood, No Child Left Behind provides strong incentives for states to adopt relatively low standards of performance for students and implement assessments that focus the acquisition of

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<sup>14</sup> Maryland discontinued its Maryland School Performance Assessment Program (MSPAP) because of controversies surrounding the benchmarking of performance standards and the assessment requirements of No Child Left Behind. The new assessments include a larger number of multiple-choice questions and fewer questions that tap students' problem-solving skills.

basic skills. States that adopt higher standards and focus on the assessment of high-order skills are much less likely to achieve the 100 percent proficiency standard set by the legislation.<sup>15</sup> States may not have the option of ignoring the challenges set forth by the legislation, even if those challenges are impossible because failure requires a series of progressively punitive sanctions or the sacrifice of federal funding. As a result, No Child Left Behind may well have the pernicious effect of encouraging states to adopt less ambitious standards for both teaching and learning.

### A New Knowledge Base?

Schools are thought to be a unique form of organization – highly bureaucratic in structure with weakly controlled core technologies (Meyer & Rowan, 1977; Scott & Meyer, 1991). By core technologies we refer to how teaching and learning are conceptualized and organized as tasks, how teachers and students engage in those tasks, and how teaching and learning is recognized in teachers’ actions and students’ work.<sup>16</sup> In a traditional bureaucracy, core technologies are rationalized and regulated through administrative functions (Perrow, 1979; Thompson, 1967). What is unique about schools is that bureaucratization results not from a rationalized technical core but from institutional pressures to adopt organizational forms consistent with prevailing lore and traditions about what constitutes a “good school” (Bidwell 1965; Elmore, 1995; Weick 1976).

The absence of a clear technology – that is, of technical rules and procedures for accomplishing desirable instructional goals – limits the effect that reforms can have on instructional outcomes. But policy environments (or the institutions that they represent) are not fixed and immutable (Rowan & Miskel, 1999). There is evidence that the institutional

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<sup>15</sup> Even at relatively low standards of performance the No Child Left Behind goal of 100 percent “proficiency” may not be obtainable in the time frames specified by the legislation. It is far, far more difficult to achieve this goal across all tested subjects, across all grades, and for all the specified sub-populations of students (economically disadvantaged students, major racial/ethnic groups of students, students with disabilities, and students with limited English proficiency) than it is for a single subject, grade, or population of students.

<sup>16</sup> Because recent reforms have defined productivity largely in terms of academic learning, we focus on teaching and learning as it relates to students’ acquisition of content knowledge and related academic skills. It might be argued, however, that this is a relatively restrictive perspective on the expectations that various publics hold for schools (see, e.g., Graham 1993; Rosenholtz, 1991).

expectations surrounding schools are being merged with a new technical knowledge base – that is, a set of professional and public expectations about how students learn, how teachers can effectively promote learning, and how organizational designs influence teachers’ practice (Elmore, 1995; Rowan, 1995b; Rowan & Miskel, 1999). Utilizing this knowledge base, reform advocates have promoted alternative conceptualizations of teaching and learning and urged the restructuring of schools to enhance both (Elmore, Peterson, & McCarthy, 1996; Knapp & Associates, 1995; Newmann & Wehlage, 1995; Rowan, 1990a).

Knowledge about teaching and learning. Although theories of teaching continue to shift and new models continue to emerge, the general contours for these theories and models are increasingly set by a series of core principles about how children learn, and, correspondingly, how successful teachers teach (Alexander & Murphy, 1998; Bransford, Brown, & Cocking 1999; Brophy & Good, 1986). What distinguishes these beliefs from earlier propositions about teaching is that they are based on an emergent body of research about learning (Alexander & Murphy, 1998) that is being linked to rich descriptions of successful practice (Lampert, 2001; Ball & Cohen, 1999). In our own study of high-quality teaching, we draw on the five principles or understandings of learning from the American Psychological Association’s Learner-Centered Principles (Alexander & Murphy, 1998):<sup>17</sup>

- *Knowledge base.* One’s existing knowledge serves as the foundation of all future learning by guiding organization and representations, by serving as a basis of association with new information, and by coloring and filtering all new experiences.
- *Strategic processing or executive control.* The ability to reflect on and regulate one’s own thoughts and behaviors is essential to learning and development.
- *Motivation and affect.* Motivational or affective factors, such as intrinsic motivation, attributions for learning or personal goals, along with the motivational characteristics of learning tasks, play a significant role in the learning process.
- *Development and individual differences.* Learning, although ultimately a unique adventure for all, progresses through various common stages of development

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<sup>17</sup> There are alternative expressions of these core beliefs [see, e.g., Elmore’s (1995) description of “emerging ideas about best practice”]. What is remarkable about various syntheses of the research on learning is how similarly they describe core beliefs or findings.

influenced by both inherited and experiential or environmental factors.

- *Situation or context.* Learning is as much a socially shared undertaking as it is an individually constructed enterprise.

These principles of learning suggest that teachers must have a particular type of expertise, one that privileges teachers' content knowledge and professional judgments about how to create powerful learning opportunities in specific contexts. Different subjects, different topics, different students, and different curricular materials make specific and potentially different demands on teachers' content and pedagogical expertise (Alexander & Fives, 2000; Shulman, 1986). While generic knowledge and skills, such as those conveyed by "best practices," may establish a foundation for teachers' expertise, their utility depends on a teacher's understandings of what students know, their cognitive skills, personal interests, and individual development (Alexander & Murphy, 1998). High-quality teaching is not a discrete act or set of practices; rather, it is the outcome of a series of interactions between students and teachers in specific contexts that creates the conditions in which deep learning can occur (Barr & Dreeben, 1983; Lave, 1988; Rogoff, 1990).

Although teaching has been described as essentially complex and non-routine before (Bidwell, 1965; Lortie, 1975; Meyer & Rowan, 1978; Weick, 1976), these earlier conceptions differ notably from more recent ones (see, e.g., Lampert, 2001; Palincsar & Brown, 1984; Rogoff, 1990). Earlier conceptions of the non-routine nature of teaching were defined by the absence of useful technical and professional knowledge; in contrast, recent conceptions of teaching emphasize the vital role this knowledge plays in learning. This knowledge includes teachers' understandings of content, elaborated principles of learning, and contextualized pedagogical schema, each developed and extended through teacher preparation programs, professional development, reflections on practice, and collaboration with colleagues (Ball & Cohen, 1999; Hiebert, Gallimore, & Stigler, 2002; Shavelson & Stern, 1981; Valli, 2000). While "best practices," generic strategies, and prescriptive models can contribute to the repertoire of successful teachers, content and pedagogical expertise involves considerable improvisation

and adaptation of knowledge to diverse student interests and understandings (Ball & Cohen, 1999; Cohen, Raudenbush, & Ball, 2001; Spillane, 1999, 2000).

School organization and management. Throughout the 1980s and into the 1990s, a large body of literature emerged on the effective organization and management of schools. In response to several decades of research that suggested “schools don’t make a difference,” researchers sought to identify the organizational characteristics of schools with high levels of achievement.<sup>18</sup> Although the “effective schools” literature gave rise to its own set of propositions about how to organize and manage schools, these initial propositions were relatively silent about how variations in organizational structures influence teaching. The propositions identified organizational factors that varied with achievement, but they did not shed any light on how organizational factors actually affect the internal dynamics of schools, particularly those dynamics that involve how teachers teach and students learn (Rosenholtz, 1991). Subsequent work has sought to explain how various organizational designs influence achievement through teachers’ work (Little, 1999; Rosenhotz, 1991) and how conceptions of teaching influence organizational designs (Rowan 1990a,b; Rowan, Raudenbush, & Cheong, 1992).

Outside the classroom, concentric and overlapping organizational structures affect teachers’ development of content and pedagogical expertise, as well as influence the nature of learning opportunities afforded students (Newmann & Wehlage, 1995; Valli, 2000). School-level and district-level policies are thought to be especially influential because they mediate external policies promoted by government agencies, such as state-level curriculum standards, high-stakes accountability mandates, or regulations regarding the use of federal funds (Elmore, Peterson, & McCarthy, 1996; Rosenholtz, 1991; Spillane, 2002; Spillane, Diamond, Burch, Hallet, Jita., & Zoltner, 2002). While there is no uniform set of principles about how organizational designs influence teaching, a number of factors have been discovered in studies that examine the intersection between instructional practices and organizational policies (Bryk, Camburn, & Louis, 1999; Cohen, McLaughlin, & Talbert, 1993; Elmore, 1995; Elmore,

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<sup>18</sup> For a review of this literature, see Rosenholtz (1985).

Peterson, & McCarthey, 1996; Knapp & Associates, 1995; Little, 1999; Louis, Kruse, & Associates, 1995; Newmann & Wehlage, 1995; Rowan, 1990b; Spillane, 2002; Spillane et al., 2002).<sup>19</sup> These factors include:

- *Mediating effects.* District- and school-level administrators mediate reform messages about how teachers are to teach and students are to learn. How district- and school-level administrators understand reforms and communicate their messages to teachers strongly affects the forms of teaching and learning promoted within schools.
- *Organic controls.* Alternative conceptions of teaching and learning place a high value on teachers' curricular knowledge, professional judgments and understandings of learning tasks. Organizational forms that provide opportunities for teachers to participate collectively in decision-making and facilitate teachers' commitment are consistent with these alternative conceptions of teaching and learning.
- *Distribution of resources.* Important organizational decisions that influence the implementation of alternative conceptions of teaching and learning include how administrators allocate students to teachers, schedule instructional time, and provide opportunities for teachers to work collegially on collective tasks.
- *Access to knowledge.* Because teaching requires improvisation, experimentation, and adaptation, professional development opportunities are an important way to introduce teachers to new reform ideas, to provide opportunities to reflect on practice and to provide occasions to refine strategies for engaging students in meaningful learning opportunities.
- *Assessment practices.* How quality is assessed shapes strongly how teachers understand their priorities and collective mission. Alternative forms of teaching and learning emphasize the use of assessment practices that focus on higher-order thinking and the depth of students' understanding of content, whereas traditional assessments emphasize recall and the acquisition of basic knowledge.

When teaching is understood to be a routine technology, quality is largely a matter of compliance or fidelity to a limited set of best practices. Administrators play a pivotal role in guaranteeing that teachers' comply with accepted routines thought to produce "high levels" of learning (Rowan, 1990a, 1990b). When teaching is understood as a complex technology, however, quality requires that administrators work with teachers to create the conditions under which successful teaching can occur, including the distribution of instructional resources and the enhancement of local capacity to use resources meaningfully. Most important among these tasks is how to tap into teachers' knowledge

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<sup>19</sup> This is not an exhaustive list of factors but a description of some of the ideas that have emerged from organizational research. We focus on those factors that we consider to be most closely related to teaching and learning.

and understandings of students' instructional needs. Because teachers are thought to have content-specific expertise, as well as the clearest understanding of students' knowledge, interests, and development, their perspectives on how to structure schools to enhance achievement is crucial (Bryk, Camburn, & Louis, 1999; Louis, Kruse, & Associates, 1995).

Effects on student achievement. Assessing the effects of high-quality teaching on student learning is complicated by the nature of the phenomenon. Because high-quality teaching is contextualized or partially contingent on the “fit” between practice, content, and students, what constitutes effective practice can vary across time, lessons, subjects, and classrooms (Ball & Cohen, 1999; Cohen, Raudenbush, & Ball, 2001). As a result, researchers have focused on a range of strategies to estimate the occurrence of high-quality teaching, from surveys of teachers' professional beliefs and practices (Mayer, 1998; Rowan, 1998, 2000; Rowan, Correnti, & Miller, 2002; Spillane, 2002) to in-depth observations of patterns of interactions in classrooms (e.g., Cohen, McLaughlin, & Talbert, 1993; Newmann & Wehlage, 1995; Knapp and Associates, 1995) to teacher narratives (e.g., Lampert, 2001). When these studies have investigated achievement gains, they have generally found a positive link between student learning and the emphasis teachers place on conceptual understanding, cognitive processes, and authenticity in instructional tasks (Cohen & Hill, 2000; Gamoran, Porter, Smithson, & White, 1997; Knapp & Associates, 1995; Newmann & Wehlage, 1995; Rowan, 2000; Rowan, Correnti, & Miller, 2002). These gains can be demonstrated across multiple assessments, such as mathematical reasoning, reading comprehension, and writing (Knapp and Associates, 1995).

Moreover, the benefits of what we have described as high-quality teaching apply generally to students, regardless of achievement level or family background. As Knapp and his associates discovered (1995), teachers can engage low-achieving students from economically disadvantaged backgrounds in challenging academic tasks, and these practices promote learning for low-achieving students just as they promote learning for high-achieving students; comparable arguments have been made in other studies that have investigated authentic instruction (Newmann & Wehlage, 1995), reciprocal teaching (Brown, Palincsar, & Purcell, 1986; Palincsar & Brown, 1984), or differences in the academic demand teachers place on students when

covering curricular topics (Gamoran, Porter, Smithson, & White, 1997). These studies cast doubt on the conventional wisdom, all too prevalent in classrooms and schools, that low-achieving students do not benefit from instruction that engages students in academically challenging, rigorous work (Brown, Palincsar, & Pursell, 1986; Elmore, 1995).

The affects of teacher practices on student learning, however, are contingent on a range of other factors, including teachers' conceptions of teaching and learning (Cohen, McLaughlin, & Talbert, 1993; Spillane, 1999), curricular coverage (Rowan, 2000; Rowan, Correnti, & Miller, 2002), the organizational context that shapes possibilities for instructional tasks (Elmore, 1995; Knapp and Associates, 1995), and the forms of assessment used to measure learning (Newmann & Wehlage, 1995).<sup>20</sup> Gains in student achievement are likely to be greatest when teachers' have a deep understanding of content, their students, and how to organize learning tasks to promote deeper engagement with content knowledge; when curricular topics assessed by achievement are covered in class; when organizational policies and practices support the implementation of alternative conceptions of teaching and learning; and when assessments actually measure student gains in conceptual understanding and reasoning. Very few studies, however, have examined very systematically how these factors mediate the achievement effects of high-quality teaching.<sup>21</sup>

Scope of high-quality teaching. The most detailed descriptions of high-quality teaching come from teacher narratives (see, e.g., Lampert, 2001). Although these descriptions provide rich, highly detailed examples of teaching practices over time, they do not estimate the prevalence of high-quality teaching across classrooms. By most accounts, such teaching is rare (Cohen, 1988; Cohen & Spillane, 1993; Elmore, 1995, 1996; Firestone, Mayrowetz, & Fairman, 1998; Spillane, 2000). Rowan (1998) used survey data from over 600 teachers in 16 California high schools to estimate of teachers' conceptions of their work. If this sample is roughly

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<sup>20</sup> While there is evidence that high-quality teaching need not suppress students' mastery of basic skills and content knowledge (see Knapp and Associates, 1995; Mayer, 1998), assessments that fail to tap students' conceptual understandings and reasoning processes underestimate the benefits of high-quality teaching.

<sup>21</sup> For examples of studies that attempt to capture a broad range of factors thought to influence the effects of high-quality teaching on student learning, see Knapp and Associates, 1995, or Newmann & Wehlage, 1995.

representative of teachers nationwide, 47 percent of teachers see their work as routine (low in uncertainty and task variety), 35 percent see their work as similar to engineering (low in uncertainty but high in task variety), 3 percent see their work as craft-like (high in uncertainty but low in task variety), and 14 percent describe their work as non-routine (high in uncertainty and variety). Because high levels of uncertainty and high levels of task variety are associated with teachers who conceive of teaching as complex and non-routine, high-quality teaching would appear to be relatively uncommon in classrooms.<sup>22</sup>

Rowan (1998) notes that task uncertainty (17 percent) is far less common than low levels of task variety (50 percent). One interpretation of this relationship is that many teachers may be involved in a wide range of activities, such as school improvement and site-based management, outside of the classroom. If so, organic forms of organization, which emphasize teacher influence and participation in decisions, may not guarantee high-quality teaching in classrooms. On the contrary, teachers may approach teaching as standardized and routine even when administrators value their judgment and promote collegial relationships and participation in school governance and school improvement plans. Teachers' accounts of their participation in site-based management councils provide some support for this contention (Croninger & Malen, 2002). If so, routine, traditional forms of teaching may occur in highly organic structures, just as they do in highly bureaucratic structures.

The relatively low prevalence of high-quality teaching has two important implications about what we know about the consequences of more rigorous curricular standards and instructions. First, the link between organizational structures and high-quality teaching is somewhat ambiguous. While studies have been able to identify structures consistent with high-quality teaching, the relationship is complex and not well understood. Organic forms of organization may be necessary but not sufficient conditions for high-quality teaching (Rowan & Miskel, 1999). Second, the absence of variation in teaching practices (Rowan, 2000), as well as

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<sup>22</sup> Few would argue that high-quality teaching is commonplace in classrooms, but we have few empirical benchmarks by which to confirm the belief. Rowan's survey, though indirect, provides one a useful estimates of how teachers conceive of their work.

the absence of variation in organizational forms (Elmore, 1995), seriously limits any investigation of the effects of either teachers' practice or specific organizational designs. Current studies may substantially underestimate the influence of these factors on teaching and learning.

## DISCUSSION AND CONCLUSIONS

Can we achieve high-quality teaching in classrooms and schools given the current policy environment? We began by asking this question and examining changes in the policy environment that might create the conditions for implementing more rigorous instruction and higher expectations for student learning. Our approach to this question reflects our belief that attempts to influence teaching and learning occur within a broader political and social context, not just within the context of a single classroom, school or a local community. This context, which we have referred to as the policy environment, creates opportunities for change and understandings of what curricular and instructional reforms are attempting to accomplish. "Getting to" high-quality teaching requires traversing the policy environment – that is, addressing not only what teachers believe and do in classrooms but also what different publics believe teachers should do and students should know as the result of teaching.

### Importance of Policy Environments

We argued that the policy environment of schools has changed significantly over the past fifty years, making it more complex and more hierarchically structured with stronger ties to governmental agencies. Conflicting interests and multiple control mechanisms create competing and sometimes contradictory reform messages. We identified two prominent trends within the policy environment consistent with this proposition: (1) the promotion of high-stakes accountability policies, particularly as enacted through the 2001 No Child Left Behind legislation, and (2) the rudiments of a technical knowledge base that links teachers' practice and organizational policies to high-quality teaching and learning. The first of these trends, if fully enacted at the state and local levels, may encourage schools to set low standards for "proficiency" that focus on the acquisition of basic skills; the second of these trends encourages schools to set high standards that focus on the acquisition of higher-order skills.

Coherence in the policy environment? It's tempting to argue that the difficulties experienced in promoting high-quality teaching are primarily due to an absence of coherence in the policy environment. This diagnosis is consistent with calls for systemic reform and the widespread alignment of policies and practices that affect the operation of schools. While we believe that there is truth to this argument, recommending coherence belies the political and socially "messy" character of the policy environment affecting schools. The policy environment in which schools operate is "incoherent" because multiple publics have a stake in how schools operate, including what is defined as high-quality teaching and the forms of knowledge privileged by such a definition. Coherence might be accomplished if fewer publics were interested in what happens in schools, but this is unlikely to occur in the near future.<sup>23</sup>

We are not suggesting that *greater* coherence is impossible, only that the political and social nature of policy environments makes it impossible to achieve a *fully* coherent and aligned system of education. Such a system might not even be desirable or compatible with high-quality teaching, especially if achieving a "coherent policy environment" required a highly routine, prescriptive conception of teaching and learning. Our understanding of high-quality teaching privileges the professional judgments of local teachers and administrators and presumes a degree of flexibility so that learning tasks can be tailored to local contexts. Moreover, some degree of incoherence is probably a positive feature of the institutional character of policy environments, because it permits publics with different political interests and educational values to support a common school system.

The question may not be how to create coherence across the policy environment but how to create greater coherence along specific dimensions. While a fully coherent policy environment is unlikely, it may be feasible to create greater coherence around specific reforms or

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<sup>23</sup> This, of course, is one argument for distributing educational opportunities on the basis of markets (see, e.g., Chubb & Moe, 1990). We question though whether market-based choice would truly lead to coherence in the policy environments of schools rather than simply privilege another set of actors with vested interests in how schools function.

aspects of the environment that directly affect teaching and learning.<sup>24</sup> Privileging teaching and learning in policy discussions could be one step toward greater coherence, especially if these discussions considered seriously the problems of teaching and learning and how proposed policies might alleviate or exacerbate such problems. However, the contentious “reading and math wars” provide evidence that policy discussions in and of themselves do not ensure coherence. So a second step toward greater coherence would be to make explicit the conceptions of teaching and learning embedded in particular policies and reform agendas, while a third step might be to consider explicitly the probable impact of policies and practices on teaching, learning, and school management.<sup>25</sup>

Conflicts would remain because there would still be differences of opinion about what constitutes quality and whether advocated reforms could be justified given the costs to specific organizations and publics. Nonetheless, careful consideration of the conceptions of teaching and learning embedded in policies and practices would help to make conflicts and the educational stakes involved more public. As states, districts, and local schools wrestle with the implementation of state-sponsored accountability standards and No Child Left Behind, an important question is how are these policies influencing the quality of teaching and the nature of learning in classrooms? Our own assessment is that there will be strong pressures to set low standards, focus on the acquisition of basic skills, and emphasize curricular coverage. But are these the outcomes to which we want to hold teachers and students accountable? Unfortunately, this question isn’t even acknowledged in the current legislation.

Political face of reforms. Ultimately, promoting high-quality teaching requires promoting an alternative conception of teaching and learning, one that differs substantially from the institutionalized expectations that dominate the current policy environment. The professional

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<sup>24</sup> Even in this more limited regard there is likely to be irresolvable conflicts about educational goals and priorities. As we stated earlier, the institutional charters underlying schools include multiple expectations, of which rigorous learning is only one. We focus on this aspect of schools because it is the focus of our study.

<sup>25</sup> While almost unimaginable in education, other areas of public concern require just such an assessment. Environmental regulations, for example, require explicit assessments of the likely impact of new legislation on environmental quality. While there is no consensus about what constitutes “environmental quality,” the explicit consideration of how policies affect the environment highlights important differences in perceptions of quality and likely tradeoffs regarding the environment if policies are enacted.

knowledge and actions of teachers are only two aspects of that environment. Policymakers, administrators, parents, and students also affect how teachers teach and what students learn. Enhancing the quality of teaching and learning requires the promotion of a particular vision of teaching and learning, educating various publics about that vision, and consolidating political interests in support of change. Promoting high-quality teaching and learning requires that a majority of the publics that influence teachers' work have both a deep understanding of what instructional and curriculum reforms are attempting to accomplish, as well as a commitment to the importance of change.

When curricular and instructional reforms are viewed from this vantage point, the challenge is not simply technical – it is political as well. Change involves creating a new set of institutional expectations about how schools should operate, how teachers should teach, and what students should know. To the extent that policymakers and reform advocates can create coalitions supportive of high-quality teaching, the curricular and instructional reforms that they promote have a higher likelihood of taking root in classrooms and schools. Although the success of ambitious curricular and instructional reforms requires a substantial elaboration of the technical knowledge available to teachers and administrators, this knowledge will be more useful in a policy environment that supports the ends to which it is directed.

#### Importance of Technical Knowledge

The second trend that we examined was the emergence of a technical knowledge base on teaching tied to cognitive research and the research on effective schools. We argued that current conceptions of teaching and learning are different from prior conceptions in the importance that they attribute to the technical knowledge base available to teachers in creating successful, more challenging learning tasks for students. Whereas prior conceptions portray teaching as complex because no technical knowledge base was thought to exist, current conceptions portray teaching as complex because the knowledge base relevant to teachers is itself complex with uncertain implications for practice. Moreover, we argued that there is a growing nexus between research on teaching and learning and research on school effects. As this nexus grows, so too should our

knowledge of how to structure schools to promote more academically challenging teaching and learning.

The knowledge base that we have addressed in this paper is multifaceted. One aspect is the content knowledge that teachers have of the subjects that they teach. A second aspect is the generic pedagogical knowledge that teachers possess, while a third is the content-specific pedagogical knowledge that teachers possess about how to present specific content to students in meaningful ways. Much of the literature on how to develop a technical knowledge-base focuses on these aspects of teachers' knowledge. Questions about how to develop teachers' disciplinary knowledge, how best to present content, and the extent to which assessments do and do not capture students' knowledge of content are fundamental to this literature. Encouraging high-quality teaching from this perspective requires creating more powerful learning opportunities for teachers, including opportunities for teachers to work with colleagues in transforming experience into practical or craft-like knowledge.

While we believe that these aspects of the knowledge are important, if not crucial, we also think that other aspects of the knowledge base require careful consideration and development. We are especially interested in those aspects of the knowledge base that tap conflicts or disagreements about what constitutes quality teaching and desirable forms of learning for students. These aspects of the knowledge base capture the intersection of teaching practices and administrative actions, as well as frame fundamental tensions in the policy environments of schools. We do not see these tensions as resolvable; rather, we see them as enduring dilemmas faced by teachers, administrators, and policymakers. They include: (1) basic v. higher-order learning outcomes, (2) generic v. context-specific technical knowledge, (3) breadth v. depth in curricular coverage, and (4) excellence v. equity in outcomes. How teachers, administrators, and policymakers address these tensions determines how they understand teachers' work and what students are to accomplish in their classrooms.

Basic v. high-order outcomes. As is evident from the "Reading and Mathematics Wars," the meaning of high-quality teaching is highly contested. These "wars" pit those who believe that children

must learn basic skills before acquiring higher-order thinking against those who believe that children who have focused heavily on decontextualized skills may never effectively apply those skills to either their studies or important tasks in life (Adams, 1990). Each side tests the success of instruction by measuring the outcomes that it values (acquisition of basic knowledge and facts v. higher-order thinking skills and more integrated frames of knowledge). An emerging compromise is instruction that includes basic skills

and higher-order thinking, the exact mix for any particular classroom being based on a teacher's assessment of children's strengths and needs (Pressley, Rankin, & Yokoi, 1996; Willoughby, 2000).

Although there is evidence that students can acquire both basic skills and high-order skills in academically challenging classrooms (Brown, Palincsar, & Purcell, 1986; Knapp and Associates, 1995; Mayer, 1998; Palincsar & Brown, 1984), less is known about how teachers strike the appropriate balance between basic and high-order outcomes and under what conditions such a balance is possible. Given our assessment of the likely effects of No Child Left Behind on state policies, this tension is likely to intensify. Understanding the sources of these tensions, as well as how teachers and administrators seek to address them, would extend the technical knowledge base in important ways. Minimally, it would provide a problem frame relevant to tensions within the policy environment that could become the focus of external research and practitioner-based inquiry.

Generic v. subject-specific knowledge. Other arguments within the policy environment revolve around the generic v. subject-specific nature of high-quality teaching. The process-product research of the 1970s and 1980s privileged the generic perspective (Dunkin & Biddle, 1974; Brophy & Good, 1986). This research has been called "arid empiricism," since it lacks a theoretical, principle-based, explanatory framework. Many also regard the findings (e.g., teacher enthusiasm, clarity of instruction, academic press, high expectations) as too general and imprecise to offer meaningful guidance to teachers. The potential strength of the generic perspective is its ability to capture underlying principles

of good teaching across contexts; the weakness is that it ignores the possibility that high-quality teaching in one content area might not resemble high-quality teaching in another.

In stark contrast, pushed to its logical conclusion, the “subject-specific” perspective says that quality teaching is substantially different from one classroom to the next, from one lesson to the next. Since each student and each teacher is constantly changing, and each curriculum topic brings its own set of challenges for students and teachers, the only possible knowledge-base for teaching would be a constantly expanding set of descriptive cases. Few teachers or administrators are likely to be able to function effectively with this level of uncertainty (Rosenholtz, 1991). An important area of investigation, therefore, is how teachers and administrators balance generic conceptions of teaching quality with subject-specific conceptions of teaching quality. An investigation of the assignment of students to teachers, as well as teachers to subjects, would shed some light on this aspect of teaching and learning.

Breadth v. depth. A fundamental assumption of high-quality teaching is that students should be given the time and space to explore new topics in depth. Without an in-depth perspective on curricular topics, teaching is more likely to emphasize basic skills and the recitation of facts than the quality of reasoning used by students or a deep understanding of content. Yet both teachers and administrators face this dilemma constantly. Teachers face this dilemma when they decide whether or not to introduce new content areas, while administrators face this dilemma as they work with curriculum advisors to determine standards for student learning. As we suggested earlier, current standards seem to privilege breadth of coverage compared to depth of coverage, especially for teachers who feel pressured to guarantee that students will do well on tests that measure curriculum coverage.

Because decisions about what students should know and how they should demonstrate their knowledge are integral to conceptions of high-quality teaching, investigations into how teachers and administrators balance these concerns should provide important insights into how to promote high-quality teaching. It is hard to imagine how high-quality teaching can be implemented in schools if curriculum pace becomes the standard for instructional quality. Flexibility in how to respond to students’ misconceptions and interests is a fundamental principle embedded within the notion of high-quality teaching. By investigating more thoroughly how administrators allocate time to topics, how

teachers address concerns about curriculum coverage within the classroom, and how those concerns are accentuated (or attenuated) by administrative actions and policies, researchers and practitioners could substantially elaborate the technical knowledge-base available to teachers, administrators, and policymakers.

Excellence v. equity. Yet a fourth, and more recent, area of disagreement in conceptualizations of high-quality teaching, is the tension between academic excellence and academic equity. Excellence is associated with high levels of learning within classes or instructional groups, as generally indicated by a mean score on some measure of achievement. Equity, on the other hand, is associated with small or diminishing achievement gaps between advantaged and disadvantaged students. While the two dimensions are not mutually exclusive, they do not necessarily occur in the same classrooms or through the same teaching practices. Achieving excellence *and* equity requires a set of teaching practices and administrative actions that are poorly understood, though fundamental to expectations within the policy environment that “all children can learn”. Greater insights into how teachers and administrators understand these challenges would help in developing a knowledge base reflective of expectations characteristics of the current policy environment.

Administrators face the challenge of distributing students across teachers’ expertise, just as teachers face the challenge of distributing their own resources across students within their classroom. These decisions, along with their consequences, represent an important aspect of the technical knowledge base available to administrators and teachers. The assumptions underlying high-quality teaching suggest that teachers must feel comfortable teaching students with different academic and social backgrounds, distributing their personal resources and fashioning learning tasks reflective of the different instructional needs of their students. Administrators help to shape the challenges that teachers face by how they assign students to teachers and provide teachers with additional resources to address diverse instructional needs. Without a clear understanding of how teachers and administrators approach these challenges, both successfully and unsuccessfully, it will be difficult to promote forms of teaching that elevate learning and reduce inequities in student outcomes.

## CONCLUSION

We have argued that current research on teaching, learning, and leadership provides a rudimentary framework around which to develop and organize technical and professional knowledge, as well as an emergent portrait of what constitutes high-quality teaching and effective leadership. It does not, however, constitute a detailed knowledge base about the problems that teachers and students confront in classrooms, the ways on which teachers have sought to address problems, or the ways in which administrators can help teachers be more successful in schools. Most teachers, administrators, and policy makers would regard high-quality teaching as that which promotes equity and excellence in the areas of basic skills and high-order thinking. Most would probably argue as well that constructs and measures of quality teaching must be flexible enough to account for diversity of contexts and subject-matter, yet specific enough to identify underlying principles of high-quality teaching. But empirical research, theoretical perspectives, and policy recommendations lag behind these common-sense understandings. The challenge for the rapidly changing policy environment is to base decisions on a framework that considers these components of high-quality teaching in a more comprehensive and integrated manner than has been attempted so far.

REFERENCES

- Adams, M. (1990). Beginning to read: Thinking and learning about print. Cambridge, MA: MIT Press.
- Alexander, P. A., & Fives, H. (2000). Achieving expertise in teaching reading. In L. Baker, M. J. Dreher, & J. T. Guthrie (Eds.), Engaging your readers: Promoting achievement and motivation (pp. 285-308). New York: Guilford.
- Alexander, P. A., & Murphy, P. K. (1998). The research base for APA's learner-centered psychological principles. In N. M. Lambert & B. L. McCombs (Eds.), Issues in school reform: A sampler of psychological perspectives on learner-centered schools (pp. 25-60). Washington DC: The American Psychological Association.
- Amrein, A. L., & Berliner, D. C. (2002). High-stakes testing, uncertainty, and student learning. Education Policy Archives, 10(18), 1-70.
- Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In L. Darling-Hammond & G. Sykes, Teaching as the learning profession: Handbook of policy and practice (pp. 3-32). San Francisco: Jossey-Bass
- Baron, J. B., & Wolf, D. P. (1996). Performance-based student assessment: Challenges and possibilities. Chicago: University of Chicago Press.
- Barr, R., & Drebber, R. (1983). How schools work. Chicago: University of Chicago Press.
- Bidwell, C. (1965). The school as a formal organization. In J. G. March (Ed.), Handbook of organizations (pp. ). Chicago: Rand McNally.
- Bransford, J. D., Brown, A. L., Cocking, R. R. (Eds.) (1999). How people learn: Brain, mind, experience, and school. Washington DC: National Academy of Science.
- Brophy, J. E., & Good, T. (1986). Teacher behavior and student achievement. In M. C. Wittrock (Ed.), Handbook of research on teaching (3<sup>rd</sup> edition, pp. 328-375). New York: McMillan.
- Brown, A. L., Palincsar, A. S., & Purcell, L. (1986). Poor readers: Teach, don't label. In U. Neisser (Ed.), The school achievement of minority children. New perspectives (pp. 105-144). Hillsdale, New Jersey: Lawrence Erlbaum.
- Bryk, A.S., Camburn, E., & Louis, K.S. (1999). Professional community in Chicago's elementary schools: Facilitating factors and organizational consequences. Educational Administration Quarterly, 35, 751-781.
- Carnoy, M., & S. Loeb (2003 forthcoming). Education Evaluation and Policy Analysis

- Cohen, D. K. (1988). Teaching practice: Plus que ca change... In P. Jackdson (Ed.), *Contributions to educational change: Perspectives on research and practice* (pp. 27-84). Berkeley: McCutcheon.
- Cohen, D. K. (1995). What is the system in systemic reform? *Educational Researcher*, 24, 11-17.
- Cohen, D. K., & Hill, H. (2000). Instructional policy and classroom performance: The mathematics reform in California. *Teachers College Record*, 102, 294-343.
- Cohen, D. K., & McLaughlin, M. W., & Talbert, J. E. (Eds.), (1993). *Teaching for understanding. Challenges for policy and practice*. San Francisco: Jossey-Bass.
- Cohen, D. K., Raudenbush, S. W., & Ball, D. L. (2001). In Boruch, R., & Mosteller, F. (Eds.), *Evidence matters: Randomized trials in education research* (pp. xx-xx). Washington DC: Brookings
- Cohen, D. K., & Spillane, J. P. (1993). Policy and practice: The relations between governance and instruction. In S. H. Fuhrman (Ed.), *Designing coherent education policy. Improving the system* (pp. 35-95). San Francisco: Jossey-Bass.
- Croninger, R. G., & Malen, B. (2002). The role of school governance in the creation of community. In K. Leithwood & P. Hallinger (Eds.), *Second international handbook of educational leadership and administration, Part one* (pp. 281-320). Dordrecht, The Netherlands: Kluwer
- Cuban, L. (1990). Reforming again, again, and again. *Educational Researcher*, 19(1), 3-13.
- Cuban, L. (1998). How schools change reform: Redefining reform success and failure. *Teachers College Record*, 99, 453-477.
- Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work*. San Francisco: Jossey-Bass.
- Darling-Hammond, L., & Youngs, P. (2002). Defining “highly qualified teachers”: What does “scientifically-based research” actually tell us? *Education Researcher*, 31, 9, 13-25.
- Dewey, J. (1905). *The child and the curriculum, and school and society*. Chicago: University of Chicago Press.
- DiMaggio, P. J., & Powell, W. W. (1991). The iron cage revisited: Institutional isomorphism and collective rationality. In W. P. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 41-62). Chicago: University of Chicago Press.
- Dunkin, M. J., & Biddle. B. J. (1974). *The study of teaching*. New York: Holt, Rinehart, & Winston

- Education Week. (2001 January 11). Quality counts 2001: A better balance: Standards, tests, and the tools of success. Education Week.
- Education Week. (2003, January 9). Quality counts 2003: "If I can't learn from you ..."  
Ensuring a highly qualified teacher in every classroom. Education Week.
- Elmore, R. F. (1995). Teaching, learning, and school organization: Principles of practice and the regularities of schooling. Educational Administration Quarterly, 31, 355-374.
- Elmore, R. F. (1996). Getting to scale with good educational policy. Harvard Educational Review, 66, 1-26.
- Elmore, R. F., & McLaughlin, M. W. (1988 February). Steady work: Policy, practice, and the reform of American education. Santa Monica CA: RAND.
- Elmore, R. F., Peterson, P. L., & McCarthy, S. J. (1996). Restructuring in the classroom: Teaching, learning, and school organization. San Francisco: Jossey-Bass
- Firestone, W. A. (1989). Educational policies as an ecology of games. Educational Researcher, 18 (70), 18-24.
- Firestone, W. A., Mayrowetz, D., & Fairman, J. (1998) Performance-based assessment and instructional change: The effects of testing in Maine and Maryland. Educational Evaluation and Policy Analysis, 20, 2, 95-114.
- Gamoran, A., Porter, A., Smithson, J., & White, P. (1997). Upgrading high school mathematics instruction: Improving learning opportunities for low-achieving, low-income youth. Educational Evaluation and Policy Analysis, 19, 325-338.
- Graham, P. A. (1993). What America has expected of its schools over the past century. American Journal of Education, 101, 83-98.
- Hanushek, E., & Pace, R. (1995). Who chooses to teach (and why)? Economics of Education Review, 14, 101-117.
- Heubert, J. P., & Hauser, R. M. (Eds.) (1999). High stakes: testing for tracking, promotion, and graduation. Washington DC: National Research Council.
- Hiebert, J., Gallimore, R., & Stigler, J. W. (2002). A knowledge base for the teaching profession: What would it look like and how can we get one? Educational Researcher, 31(5), 3-15
- Huberman, M. (1995). Networks that alter teaching: Conceptualizations, exchanges, and experiments. Teachers and Teaching: Theory and practice, 1, 193-211.
- Kanter, R. M., & Brinkerhoff, D. (1981). Organizational performance: Recent developments in measurement. Annual Review of Sociology, 7, 321-349.

- Knapp, M. S. and Associates. (1995). Teaching for meaning in high-poverty classrooms. New York: Teachers College Press.
- Lampert, M. (2001). Teaching problems and the problems of teaching. New Haven: Yale.
- Lave, J. (1988). Cognition in practice. Cambridge, England: Cambridge University Press.
- Linn, R. L., Baker, E. L., & Betebenner, D. W. (2002). Accountability systems: Implications of requirements of the No Child Left Behind Act of 2001. Educational Researcher, 31 (6), 3-16.
- Little, J. W. (1999). Organizing schools for teaching. In L. Darling-Hammond & G. Sykes, Teaching as the learning profession: Handbook of policy and practice (pp. 233-262). San Francisco: Jossey-Bass
- Lortie, D. (1975). Schoolteacher. Chicago: University of Chicago Press.
- Louis, K. S., Kruse, S.D., and Associates. (1995). Professionalism and community. Perspectives on reforming urban schools. Thousand Oaks, CA: Sage.
- Malen, B., & Muncey, D. (2000). Creating “A New Set of Givens”? The impact of state activism on school autonomy. In N. D. Theobald & Malen, B. (Eds.), Balancing local control and state responsibilities for K-12 education (pp 199-244). Larchmont, NY: Eye on Education.
- Mayer, D. (1998). Do new teaching standards undermine performance on old tests? Educational Evaluation and Policy Analysis, 20, 2, 53 – 73.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. American Journal of Sociology, 83, 340-363.
- Meyer, J. W., & Scott, W. R. (1993). Centralization and the legitimacy problem of local governments. In J. W. Meyer & W. R. Scott (Eds.), Organizational environments: Ritual and rationality (pp. 199-215). Beverly Hills, CA: Sage.
- Meyer, J. W., Scott, W. R., & Strang, D. (1987). Centralization, fragmentation, and school district complexity. Administrative Science Quarterly, 32, 186-201.
- Murnane, R. J. (1991). The case for performance-base licensing. Phi Delta Kappan, 73(2), 137-142.
- National Commission on Teaching and America’s Future (NCTAF). (1996). What matters most: Teaching for America’s future. New York: Author.
- National Council of Teachers of English (NCTE) & International Reading Association (IRA). (1996). Standards for the English Language Arts.

- National Council for Teachers of Mathematics (NCTM). (2000). Principles and standards for school mathematics (<http://standards.nctm.org/document/chapter1/index.htm>).
- Newmann, F. M., & Wehlage, G. G. (1995). Successful school restructuring. A report to the public and educators by the Center on Organization and Restructuring Schools. Madison, WI: University of Wisconsin-Madison.
- O'Day, J. A., & Smith, M. S. (1993). Systemic reform and educational opportunity. In S. H. Fuhrman (Ed.), Designing coherent educational policy (pp. 250 – 312). San Francisco: Jossey Bass.
- Olson, L. (2003 February 19). States' plans likely to test ESEA pliancy. Education Week, pp. 22-23.
- Olson, L. (2003 March 12). State tests influence instruction, research says. Education Week, p. 10
- Ogawa, R. T., Crowson, R. L., & Goldring, E. B. (1999). Enduring dilemmas of school organization. In J. Murphy & K. S. Lewis (Eds.), Handbook of research on educational administration (2nd edition, pp. 277-295). San Francisco: Jossey-Bass.
- Palincsar, A.S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and monitoring activities. Cognition and Instruction, 1, 117-175.
- Perrow, C. (1979). Complex organizations: A critical essay (2nd edition). Glenview IL: Scott, Foresman.
- Pressley, M., Rankin, J., Yokoi, L. (1996). A survey of instructional practices of primary teachers nominated as effective in promoting literacy. Scientific Studies of Reading, 1, 145-160.
- Riehl, C. (2000). The principal's school in creating inclusive schools for diverse students: A review of the normative, empirical, and critical literature on the practice of educational administration. Review of Educational Research, 70, 55-82.
- Rothman, R. (1995). Measuring up: Standards, assessments, and school reform. San Francisco: Jossey-Bass.
- Rosenholtz, S. J. (1991). Teachers' workplace. The social organization of schools. New York: Teachers College Press.
- Rosenholtz, S. J. (1985). Effective schools: Interpreting the evidence. American Journal of Education, 93, 352-388.
- Rowan, B. (1990a). Applying conceptions of teaching to organizational reform. In R. F. Elmore & Associates (Eds.), Restructuring schools: The next generation of reform (pp. 31-58). San Francisco: Jossey-Bass.

- Rowan, B. (1990b). Commitment and control: Alternative strategies for the organizational design of schools. In C. Cazden (Ed.), Review of research in education (V. 16, pp. 353-389). Washington DC: American Educational Research Association.
- Rowan, B. (1995a). Research on learning and teaching in K-12 schools: Implications for the field of educational administration. Educational Administration Quarterly, 31, 115-133.
- Rowan, B. (1995b). Learning, teaching, and educational administration: Toward a research agenda. Educational Administration Quarterly, 31, 344-354..
- Rowan, B. (1998). The task characteristics of teaching: Implications for the organizational design of schools. In R. Bernhardt, C. N. Hedley, G. Cattaro, & V. Svolopoulos (Eds.), Curriculum leadership. Rethinking schools for the 21st Century (pp. 37-54). Cresskill NJ: Hampton Press.
- Rowan, B. (2000 February 17). Assessing teacher quality: Insights from school effectiveness research. Paper prepared for meeting of U.S. Department of Education Panel: Strategies for Evaluating Efforts to Improve Preservice Teacher Education, Washington DC (?)
- Rowan, B., Correnti, R., & Miller, R. J. (2002). What large-scale, survey research tells us about teacher effects on student achievement: Insights from the *Propsects* study of elementary schools. Teacher College Record, 104, 1525-1567.
- Rowan, B., & Miskel, C. G. (1999). Institutional theory and the study of educational organizations. In J. Murphy & K. S. Lewis (Eds.), Handbook of research on educational administration (2nd edition, pp. 359-383). San Francisco: Jossey Bass.
- Rowan, B., Raudenbush, S. W., & Kang, S. J. (1991). Organizational designs in high schools: A multilevel analysis. American Journal of Education, 98, 238-265.
- Sanders, W. (1998). Value-added assessments. The School Administrator, 55(11), 24-32.
- Sanders, W., & Rivers, J. C. (1996). Cumulative and residual effects of teachers on future student academic achievement. Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.
- Sarason, S. B. (1999). Teaching as a performing art. New York: Teachers College Press.
- Scott, W. R., & Meyer, J. W. (1991). The organization of societal sectors: Propositions and early evidence. In W. P. Powell & P. J. DiMaggio (Eds.), The new institutionalism in organizational analysis (pp. 108-140). Chicago: University of Chicago Press.
- Shavelson, R., & Stern, P. (1981). Research on teachers' pedagogical thoughts, judgments, decisions, and behavior. Review of Educational Research, 51, 455-498.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. Educational Researcher, 15, 4-14.

- Spillane, J. P. (2000). Cognition and policy implementation: District policymakers and the reform of mathematics education. Cognition and Instruction, 18, 141-179.
- Spillane, J. P. (1999). External reform initiatives and teachers' efforts to reconstruct their practice: The mediating role of teachers' zones of enactment. Journal of Curriculum Studies, 31, 143-175.
- Spillane, J. P. (2002). Local theories of teacher change: The pedagogy of district policies and programs. Teachers College Record, 104, 377-420.
- Spillane, J. P., Diamond, J. B., Burch, P., Hallett, T., Jita, L., & Zoltners, J. (2002). Managing in the middle: School leaders and the enactment of accountability policy. Educational Policy, 16, 731-763.
- Thompson, J. D. (1967). Organizations in action. New York: McGraw-Hill.
- Tyack, D., & Cuban, L. (1995). Tinkering toward utopia: A century of public school reform. Cambridge MA: Harvard Press.
- Viadero, B. (2003 January 8). Reports fault with high-stakes testing. Education Week, pp. 5.
- Viadero, B. (2003 February 3). Researchers debate impact of tests. Education Week, pp. 1, 12.
- Valli, L. (2000). "Facilitating Reading Instruction Through School-Wide Coordination." In L. Baker, J. Dreher, & J. Guthrie (Eds.) Engaging young readers: Promoting achievement and motivation (pp. 237-263). New York: Guilford Press.
- Valli, L. (Ed.). (1992). Reflective teacher education: Cases and critiques. New York: SUNY Press.
- Weick, K. E. (1976). Educational organizations as loosely coupled systems. Administrative Science Quarterly, 21, 1-19.
- Wildavsky, A. (1979). Speaking truth to power: The art and craft of policy analysis. Boston: Little, Brown.
- Willoughby, S. (2000). Perspectives on mathematics education. In M. Burke & F. Curcio (Eds.), Learning mathematics for a new century (pp. 1-15). Reston VA: National Council of Teachers of Mathematics.