

PATRICIA BURCH and JAMES P. SPILLANE

HOW SUBJECTS MATTER IN DISTRICT OFFICE PRACTICE:
INSTRUCTIONALLY RELEVANT POLICY IN URBAN
SCHOOL DISTRICT REDESIGN

In recent years, there has been a virtual explosion of research interest in the role of school districts in instructional change (Hightower, Knapp, Marsh & McLaughlin, 2002). The consensus building within the research is that district action is pivotal to whether and how reforms reach classrooms. While drawing attention to how districts mediate instructional practice, most of the research to date tends to be subject-neutral. Specifically, very little of the research considers how subject matter acts as a context for district decision-making and action. Further, policy recommendations for strengthening districts' roles tend to be instructionally generic, assuming for example that teacher staff development needs are the same regardless of the subject matter focus of the reform. In other words, the view is what works for language arts will also work for mathematics (c.f. Massell, 2000; Porter and Chester, 2002).

The tendency of district policy research to overlook subject matter differences is problematic for several reasons. School leaders and teachers conceptualize instruction and efforts to improve it in strikingly different ways depending on the subject matter focus (Burch & Spillane, 2003; Little, 1993; Siskin, 1994). School leaders' responses to reform reflect fundamental differences in their views about the subject area, not only what counts as knowledge in that subject area but also perceptions about the degree of definition within that subject area. This research points to the importance of subject matter as a context for leadership practice across different levels of schooling. While there is some research on subject matter and leadership at the school level, there has been no attention to whether and how subject matter is an important context for leadership at higher levels of school administration, for example, district, state and regions.

Understanding relations between subject matter and district reform strategies has become urgent as state and federal agencies attempt to play a more active role in influencing instruction in specific

subject areas. In particular, mathematics and language arts have received far more attention from state policymakers than other subjects. Indeed, most states developed curricular standards and student assessments for mathematics and language arts well before they did so for science and social studies. The federal government's attempts to influence instruction also have differed by subject area, with some federal programs (e.g., Title I, Eisenhower Mathematics and Science Program, *No Child Left Behind*) requiring local responses in particular subject areas and ignoring others. Under *No Child Left Behind*, schools (and indeed districts) that fail to make measurable progress in reading and mathematics on standardized tests face severe sanctions and the possibility of school closure (see Spillane & Burch, in press). As a consequence, while districts face increasing pressure from many directions to take teaching and learning seriously, these pressures differ depending on the subject matter. Paying attention to how subject matter acts as a context for district policy allows for a richer and more nuanced understanding of the policy implementation process in the K-12 education sector. A recent synthesis of implementation literature suggests that patterns of coupling can vary by subject matter. For example, in elementary schools, science teaching remained mostly decoupled from administration and the policy environment, while language arts and mathematics were more tightly coupled (Spillane & Burch, in press). By situating district policy and practice within the broader instructional environment, we can understand why "systemic" instructional reforms evolve the way that they do. Subject specific policy research also can inform strategies for establishing tighter coupling in subject areas, for example, mathematics, where instructional improvements in some districts have remained more elusive.

In order to investigate how subject matter acts as a context for district policy, we studied patterns in how district administrators across three medium to large urban school districts responded to district level mandates to improve instruction system-wide and hold schools more accountable for instructional improvements in reading and mathematics. We begin by discussing the framework we developed to guide our analysis and then describe our research method. Arguing that analyses of district policy implementation must take account of subject matter, we identify several ways in which subject matter acted as a context for district policy design and implementation. We conclude by considering the implications of this evidence for future research on systemic instructional reforms.

THEORETICAL FRAMEWORK

The framework we developed integrates concepts across two domains of research: the influence of subject matter views on teachers' work (Ball, 1981; Ball & Bowe, 1992; Ball & Flacy, 1984; Siskin 1991; Grossman & Stodolsky, 1994), and institutional analyses of organizational practice (Scott, 1995). We used this framework to examine the interface between district administrators' views of subject matter and their leadership practices for improving instruction in specific content areas. The framework illuminated the ways in which norms of subject matter not only pervade schools but also work in and through policy making and governance at other levels.

Subjects and perceptions thereof vary in ways that are likely to result in differences in leadership practice and its consequences. First, the value the school and broader community place on a discipline varies by subject (Siskin, 1991, 1994). For example, time allocations, staffing, and professional development (time and content) all depend on the value attached to each subject. Second, there are epistemological differences among subjects; that is, there are differences in the nature of the knowledge of a discipline including its structure, sequence and desired goals.

Grossman and Stodolsky (1994) argued that school subjects vary on at least five dimensions: (1) the degree of definition: whether there is agreement or not regarding the content of the subject (i.e., more defined fields are characterized as emphasizing formal training as a measure of expertise; (2) scope: the extent to which a subject is homogenous or composed of multiple fields of study; (3) degree of sequence: degree to which prior learning is perceived as a requisite to later learning; (4) characterization of a subject as static or dynamic (i.e., more dynamic fields are characterized by active production of new knowledge, changing theoretical positions and a continuing need to stay up to date, while the content of more static subjects changes less rapidly); and (5) the degree to which a subject is viewed as core or basic. Variations in the ways that teachers perceive subjects are likely to be important in understanding relations between reform and instruction. For example, Ball (1981) found that English and Mathematics departments at one school responded very differently to efforts to create multi-ability classrooms. English teachers supported the effort whereas foreign language teachers argued against the reform.

The idea that there are distinctive institutional environments built up around different academic disciplines or subject areas has been applied primarily to investigations of teachers' practice. Policy researchers, on the other hand, have been slow to follow suit. Even as they argue greater attention to the instructional core, policy researchers have held tight to policy explanations rooted in organizational analyses and have paid scant attention to relations between instructional theory and policy design (Stein & D'Amico, 2000; Cobb, McLain, Lambers and Dean, 2003).

This omission likely reflects long-standing assumptions about the dividing lines in between the worlds of educational policy and practice. The nuances of classroom practice have been viewed as the primary domain of classroom researchers and therefore not an appropriate focus for policy studies. Our aim in this paper is to help bridge the gap between policy research and instructional research by illuminating how subject matter acts as an important context for broad-scale (in this instance, district-wide) instructional reforms.

In order to understand the relationship between administrators' views of subject matter and how they implement systemic instructional reform, we draw on ideas from the institutional analysis of organizations (Meyer & Rowan, 1977, 1978; Meyer, Scott and Deal, 1981) Like instructional researchers, institutional theorists view broader cultural norms as influences on educational policies and practices. From this perspective, the problem of implementation is inextricably connected to the institutional environment of reform, rather than being solely a function of implementers' inability or unwillingness to carry out policy intentions.

However, in comparison to subject matter scholarship in education, institutional theory provides a much more expanded lens for understanding how organizational structures and practices can act as carriers for broader social and cultural norms. Specifically, recent developments in institutional theory identify the rules and regulations developed by policymakers as critically important in the transmission of cultural norms from macro to micro levels of organization (Scott, 2001; Scott, Mendel & Pollack, 1996). From this view, norms of teaching and learning do not simply exist within peoples' minds as cognitive scripts, they are enacted and transformed in and through individual and organizational practices (Burch and Spillane, 2003, Coburn, 2004).

Drawing on this perspective, we examined evidence of how district administrators enacted subject specific views in the process of

implementing instruction, in particular in the context of their resource decisions and professional development approaches. In this investigation and building on our own prior work (Burch & Spillane, 2003), we treated structure as both the medium and outcome of human activity. Structure – in our case subject matter norms – constituted agency, providing the rules and resources upon which action are based. However, agents – in this case, district-level administrators – can also create, reproduce and potentially transform structure through the rituals, language and practices of policy implementation. This framework directed our attention to the interface between wider norms and district level reform strategies. It reminded us that subject matter differences, although important, do not represent universal truths but exist as perceptions – ways of seeing the world.

METHOD

Research sites and sample selection

The research focused on the implementation of instructional reforms in three medium-large urban school districts located in different parts of the country. At the outset of the study, district leaders within each school system were all in early stages of implementing ambitious reform agendas that articulated similar goals. These principles reflected growing consensus in the field about best practices of district reform (McLaughlin & Talbert, 2002). First, reflecting trends at the state and federal level, leaders in each district launched reforms that established standards for what students should know and be able to do at specific grade levels and in specific content areas. The standards adopted in each district elaborated on state-level standards, reflecting emphasis on building students' deep understanding of specific subject areas and their ability to apply and communicate what they had learned.

Second, as part of their “new reform agendas” superintendents in each district had committed to building a more responsive central office infrastructure and if needed revamping central office policy to better suit schools' needs. Among other things, district leaders convened task forces to conduct audits of district policies and practices in an effort to reduce duplication of services across departments. They introduced structural changes aimed at streamlining communication between schools and the central office, for example, by upgrading intra-district email systems and forming teams of administrators across departments to work consistently with the same schools.

While taking steps to support site-level agendas, district leaders also instituted policies that expanded district policy activity in educational decision-making. For example, they introduced policies that held schools more accountable for improvements in some subject areas but not others and in two districts, also revised principal evaluation protocol to reflect these changes. In each site, district leaders ramped up requirements for schools around data collection, increasing both the level and frequency of schools' data reporting requirements to the district. For example, in one district, schools were required to collect data that would help them monitor teachers' lesson plans and the amount of classroom time that they devoted to literacy activities.

Thus, in the fall of 2001 – the outset of the study – all three districts had introduced policies and structures that appeared to reflect a clear and unitary focus on instructional improvement. Press coverage of the reforms in each city placed a spotlight on the leadership of superintendents and school principals as largely determining the fate of the reforms. As the reforms unfolded, it became clear that the implementation practices of district administrators and the subject matter differences reflected within these practices played an enormous role in how district accountability policies reached schools and deserved a closer look.

Sample selection and data collection

This article draws on data from a larger study of school-central office interactions in urban district redesign. The analysis presented here primarily draws on interview data and artifact analysis at the central office level (see Table I). We used a theoretical sampling strategy (Glaser, 1978; Glaser & Strauss, 1970), derived from the study's core interest in understanding the role of central office staff in supporting instructional improvement in high poverty schools. At the central office level, we sampled across the major departments of the central office and interviewed respondents identified by observers in the system as key informants for understanding district policy and practice. Respondents represented a wide range of departments including the superintendent's office, curriculum and instruction, research and assessment, budget, categorical programs, professional development, and units organized around a district reform agenda.

Interviews with district staff focused on the roles and strategies that they viewed as important to their work, the challenges that

TABLE I
Description of respondent sample

| <i>Respondents department</i> | District A | District B | District C | Total |
|-------------------------------|------------|------------|------------|-------|
| Superintendent | 3 | 2 | 1 | 6 |
| Curriculum & instruction | 4 | 3 | 3 | 10 |
| Research & accountability | 1 | 2 | 1 | 4 |
| Professional development | 1 | 3 | 2 | 6 |
| Level directors | 1 | | 3 | 4 |
| Total | 10 | 10 | 10 | 30 |

they faced and the supports that they drew on in this work. Interview data were coded along theoretical lines. The major bins of the conceptual framework reflected empirical findings from prior research (explored above), in particular the importance of subject matter as a context for school-district communication and the importance of policymakers' perspectives and relationships within this dynamic.

For the purposes of this paper, we focused analysis of interviews and artifacts on four main branches of the coding scheme: respondents' descriptions of (a) their roles and responsibilities in instructional improvement (what they claimed to do not simply what one expected from their job title), (b) the strategies that they employed and encountered as a part of this work, (c) the challenges that they viewed as impeding this work, and (d) the outcomes of these innovations. The research team piloted codes by coding the same data set and discussing coding decisions and dilemmas. Each coder also checked for code re-code reliability. Our intra-coder reliability was 95% while inter-coder reliability (across five coders) was 90%. Halfway through the study, we repeated this exercise and derived similar percentages.

Coding for the study was used to index the multiple data sets collected for each of 30 central office administrators and to identify common patterns in administrators' views regarding subject matter and their roles in subject specific reforms. We indexed our codes by case-based nodes – district, programmatic reference, department, role – using a cross comparative method to test and refine assertions. For example, we ran tests on data related to administrators' views about teachers' needs in mathematics to verify that this finding was a cross district pattern and not unique to one site.

SCHOOL DISTRICT POLICY AND THE SCHOOL SUBJECT

District instructional policymaking

Reflecting national and state trends, reformers in each district put literacy and mathematics front and center in their local agenda to raise student achievement and eliminate the achievement gap. The emphasis on reading and mathematics was most clearly reflected in districts' decisions to give differential weight to these subjects in their accountability policies by making student performance in reading and mathematics the basis for evaluating school progress. The districts' emphasis on reading and mathematics is not surprising given that each district resided within a state and federal policy context which also targeted these subject areas via curricular frameworks and accountability mechanisms.

In each district, the district office blueprints for reform in reading and in mathematics also articulated an overarching theory of action for improving teachers' practice. This theory of action included an emphasis on teaching for understanding, research-based practices and teacher professionalism. Specifically, each district stressed a social construction view of student learning rather than a transmission approach. This model, which appeared in key documents across the three districts, emphasized activities and materials that engaged students' intellect and stimulated them beyond acquiring facts and toward analyzing content in ways that allowed them to hypothesize and discover meaning on their own. This emphasis on deep understanding of content area mirrored state established standards in reading and mathematics that reflected similar principles and measures of student learning.

Key policy documents in both reading and mathematics in each district emphasized the importance of evidenced-based practices. Documents describing the district's instructional philosophy identified evidence or a research base as guiding districts' textbook adoption or curriculum revision cycle. For example, two districts instituted school improvement policies that required schools to document the evidence base behind proposed school-level instructional improvements. Two of the school districts took additional steps to urge teachers to choose research based improvement strategies through their websites using links to research and evaluation centers and professional associations.

Within each district, the theory of instructional improvement in both reading and mathematics reflected a similar vision for good

professional development. This approach emphasized making professional development accessible to teachers through a variety of formats including school-based workshops, extended inquiry, and classroom visits. It also emphasized scheduling professional development in ways that would meet teachers' busy schedules and provide learning opportunities year round and in a variety of settings.

Thus, each district outlined an overarching theory of action to guide instructional improvements in both reading and mathematics. District policy statements emphasized common reform principles to be applied across subject areas, with key policy documents including frequent references to general reform principles such as standards-based instruction, leadership building, learning community, teacher professional development, in discussions of district strategy for improving both reading and mathematics.

Subject matter and central office reform priorities

Basic similarities in districts' reform agendas for reading and mathematics masked considerable variation by subject area in change strategies used by both top tier and mid-level district administrators. Top tier district administrators made staffing decisions that privileged literacy over mathematics within the district reform agenda. These three school districts staffed subject specific roles at two levels: central office administration and school-specific district support staff. Each district had designated a subject specific administrator for both reading and mathematics. However, central office staffing levels for literacy reforms in all three districts were higher than for mathematics. In District A, for example, literacy support staff outnumbered mathematics support staff by a ratio of almost 100:1. In District B, the department of teaching and learning hired a Literacy Standards consultant to work alongside a literacy specialist without creating a similar position in mathematics. In District C, two literacy coaches were hired to work with elementary and middle schools, and at the conclusion of the study, plans were underway to create similar position at the high school level. Concurrently, the district had only one full time mathematics consultant and indicated no plans to increase staffing within the mathematics department.

Top tier district administrators in the three districts further privileged literacy over mathematics via their policies of teacher staff development. The superintendent's reform plans in District C involved bringing every child to standards in literacy and mathe-

matics by 2001. In the early stages of reform enactment, District C administrators made decisions that seemed to ensure literacy a more privileged place than mathematics in the district's staff development program. Every elementary teacher, regardless of grade-level or content area focus, was required to participate in 72 hours of district literacy training over the course of 2 years. Literacy training involved a diverse menu of learning opportunities: site based workshops, classroom consultants, and summer intensives. District C offered teachers similar kinds of professional development opportunities in mathematics but did not require elementary teachers to participate in the training. Only those schools that elected to make math focal to their school improvement plan and buy back mathematics support services from the district received this training. In this way, literacy was prioritized over mathematics in district office reform practice.

A similar dynamic emerged in District A, which like District C had established ambitious goals for improving instruction in both mathematics and literacy. As part of its reforms, the district offered teachers an impressive array of staff development opportunities via its own staff developers and in collaboration with local professional developers. In the first year of the reform, a full-time literacy consultant was assigned to work with the low performing schools (close to one third of all schools in the district). District intervention for schools identified as low performers in mathematics was less aggressive than for literacy. Schools struggling in math had the option of electing to participate in the district's mathematics reform and did not have a district staff developer assigned to their school.

Thus, behind rhetoric identifying math and literacy as twin pillars in districts' reforms, we found evidence in all three districts of literacy becoming the top priority in reform practice. This prioritizing of literacy over mathematics took shape in macro level policy action such as human resource allocations by subject area and system-wide mandates related to teacher staff development. These broad patterns pressed us to examine the systems of meaning embodied in these policies and the particular views of knowledge and subject matter that they reflected. This analysis required looking inside of districts' organizational practices, at how central office administrators described their work on reforms and their views about subject matter. In this analysis, we found striking differences by subject area in administrators' change strategies for enacting instructional reforms and how they conceptualized the problem of student learning and of teacher learning.

Subject matter and district administrators' perspectives on student learning

All three districts in the study had either revised existing curricular frameworks or were putting into place policies aimed at fundamental changes in school mathematics and literacy. Reform goals in both mathematics and literacy stressed moving students towards deep mastery of both subject areas. However, district administrators conceptualized the problem of student learning differently for literacy compared with mathematics.

In literacy, administrators situated discussions of district priorities within an instructional context. In other words, they explained district decisions and actions in relationship to their own understandings of what it means to know and do literacy. While 60% of district administrators also identified mathematics as a district instructional priority, in explaining these priorities they made little reference to the activities of learning mathematics. Relative to literacy, administrators' accounts focused more on math as a policy or organizational priority and its place within local and national assessment policies as evidenced in Table II. We consider the nature of these patterns below.

Regardless of role, district administrators articulated a similar view of what it meant to improve literacy instruction district-wide.

TABLE II

Percentage of central office administrators expressing four views about literacy and mathematics

| Problem definition | View | Literacy | Mathematics |
|--------------------|---|----------|-------------|
| Subject area focus | Priorities defined in relation to policy or external grant guidelines | 7 | 55 |
| | Priorities defined in relation to student learning needs | 59 | 15 |
| Teacher learning | Focus on teachers' content knowledge | 2 | 60 |
| | Focus on teaching strategies | 60 | 4 |
| Student learning | Subject is core to curriculum | 80 | 60 |
| | Skills support learning in other content areas | 95 | 15 |

Note: $N = 30$. Percentages are based on leaders' statements about subject matter and responses to questions about leadership practice for mathematic and literacy improvements.

Because students read and write in every content area, every teacher should see themselves as a literacy teacher. Consider these examples, drawn from administrators working in different districts and in different capacities: “Our goal here is so people don’t just see this as something that language arts teachers should do or seeing literacy as something as you do in your reading period. Instead to see it as something happens all day long. When we say reading should be a priority, this doesn’t mean 2 hours of reading only, it means a science teacher should also use a portion of their science period to address the four components, to know is important to build reading fluency, whether its through vocabulary, or comprehension.” While representing individuals working in very different capacities – math administrator and school intervention specialist – the two accounts embody a common view of literacy (reflected in 95% of all interviews) as an essential skill with application to students’ learning in every content area.

In these accounts, administrators made explicit connections between their views of literacy as a school subject area and what they considered an appropriate focus of literacy reform in the district. A District C administrator explained, “The big thing in this district is the literacy initiative, seeing that as the foundation for everything, because if you can teach all teachers to be good literacy teachers, then your chances of getting students to standards is better.” The administrator identifies literacy as a cross-cutting skill that consequently should serve as “the foundation” for everything that the district does. All but five administrators we interviewed afforded literacy a similar designation, using terms such as “universal,” “foundational,” and “cross-cutting” to describe their district’s approach. Reflecting this perspective, a District B administrator described literacy as a universal language and therefore, “every teacher in this district really should see themselves as a reading teacher as a literacy teacher.”

As evidenced above, administrators’ accounts of district practice reflected a common understanding about the importance of literacy to students’ development as learners writ large. Because students read and write in every content area, literacy represented a broad measure of student progress in the district. For example, a District C administrator made an explicit connection between students’ literacy development and district priorities in stating, “Reading is essential, no child can read and make any kind of progress in school or in life if they are not literate, so the priority of this school district must be

getting all of its children to be literate and to be successful.” Similarly, when asked what would count as evidence of improved achievement in the district, a District B administrator described literacy development as a touchstone for improved test scores across content areas: “The bottom line is improved test scores as evidence, the way there is to focus on the framework (reading framework) looking at something that can be utilized across disciplines, you know, we want students to be able to read informational text and science and social studies and to know the vocabulary associated with those content areas, to be able to write about the reading.” The reading framework described by the administrator embodied overarching literacy concepts, easily applied and adapted to work across content areas. Across districts, administrators similarly connected their district’s cross-cutting strategy in literacy to theories and ideas about the importance of integrating reading and writing across disciplines.

Thus, in literacy there emerged evidence of policy symmetry between administrators’ theories of action and their theories of instruction. Administrators conceptualized the problem of broad scale improvement in literacy in ways that aligned with current views of literacy as contributing to students’ overall intellectual development. Being literate was defined as the ability to comprehend symbols and language across different content areas. Doing literacy reform denoted creating policies and practices that encouraged every teacher to make reading a central “topic” of instruction.

The connections between learning theory and policy design evident in literacy discussions were largely missing in discussions of mathematics reforms as explored below. To begin with, rather than arguing the importance of mathematics reform in terms of what students will learn and how they learn it, administrators described district mathematics goals in relationship to governmental policies (district, state and federal) and/or programmatic guidelines (e.g., NSF grants or expectations). Administrators were seven times as likely in mathematics than in literacy to identify a particular policy or programmatic initiative (state standard, testing policy and funding guidelines) as the primary driver for districts’ reforms in mathematics. Only 15% of district administrators described mathematics reforms in terms of improving the quality of instruction within classrooms.

For example, when asked about the district’s mathematics reforms, a District A mathematics director replied: “The district has

one math adoption program and schools must adopt that math program at all grade levels.” “So, how would you characterize that approach to learning math?” the administrator was asked. He answered, “Well I think what they attempted to do in math was to look at the NCTM (National Council of Teachers of Mathematics) standards. And to choose a system of materials that most closely aligned with the NCTM standards and mathematics assessments.” What is striking in this response is the emphasis on external programs and standards. Mathematics is identified as a priority for school improvement because the district has adopted a new mathematics program. Policy needs provided the stimulus for school-level action. This administrator made virtually no reference to what mathematics learning involved and what good mathematics instruction looked like. In the case above, typical of interviews across the three districts, the administrator remained silent about the content of math reforms even when asked specifically about the approach embodied within new mathematics program.

Administrators’ apparent unwillingness or inability to describe districts’ mathematics reforms in terms of classroom teaching and learning was also captured in the comments of a curriculum support personnel in District B. This administrator (like 60% of those interviewed) adamantly supported the district’s math focus, a view stirred in this instance by “the depressing and distressing middle and high school student performance in mathematics on standardized tests.” However, when asked, “How do you think a teacher, a high school or middle school teacher should teach mathematics?” the administrator answered, “We have to identify the standards which the state is using to make sure our (district standards) are aligned and then we have to make sure that we’re teaching based on those standards.” In discussing districts’ math reforms, administrators made frequent references to policies made by others – test standards, and guidelines – and referred very infrequently to the actual teaching and learning of mathematics in classrooms.

The broad patterns described above suggest important tensions between current views of mathematics as articulated by leaders in the field (e.g., NCTM) and how local policymakers understand mathematics. Current views within the field of school mathematics urge policymakers to design policies in ways that are harmonious with how children learn mathematics and what it means to do mathematics. This strategy invites policymakers to approach broad scale improvement from the vantage point of mathematics – in particular

what is known about how students learn mathematics – and to map backwards from classrooms in designing policies and structures to support that learning.

In the districts we studied, the majority of administrators identified policies and programs – rather than learning activities – as driving their district’s mathematics reforms. A much smaller percentage (15%) described a vision of mathematics reform rooted in how students learn mathematics. The majority of these statements focused on the need to build more articulation into math curriculum and the dangers of emphasizing higher order thinking before mastery of basic mathematics.

The limited emphasis on how students learn and what learning looks like in mathematics stood in sharp contrast to literacy discussions. As explored above, in literacy, administrators representing a broad range of departments offered very similar views of literacy and district practice in literacy. These views reflected shared ideas about the importance of literacy in students’ development as learners and its application across different content areas. In literacy, more than mathematics, there appeared to be the seeds of a professional teaching community within the district with a common vision of instructional change. In mathematics, evidence of a similar professional community was not as apparent. There was little evidence that administrators understood the importance of mathematics from a learning perspective, in spite of recognizing it as a policy mandate.

Patterns in how administrators understood the importance of mathematics relative to literacy illuminate how subject subcultures can mediate policymakers’ interpretations of instructional reforms. Subject subcultures were part of the institutional environment that structured how district staff responded to district-wide calls for improving instruction and eliminating the achievement gap. As perceptions, these views were further influenced by the social context in which administrators worked.

District administrators’ perspectives on teacher learning

Subject matter also acted as a context for how administrators framed the problem of teacher learning and change within literacy and mathematics. In literacy, administrators (60%) described the problem of teacher learning in terms of building teachers’ capacity to deliver instruction effectively. In mathematics, administrators (60%) articu-

lated a different set of priorities, focused more on building teachers' content knowledge and their conceptual understanding of the material embodied in new mathematics curriculum.

To investigate these differences, we draw on theoretical work that defines instruction as a multi-dimensional activity (Cohen, Raudenbush, Ball & Lowenberg, 2003; Spillane & Burch, in press). Instruction includes the teaching of specific academic content, using particular materials and teaching strategies, perhaps under different instructional grouping conditions or through the deployment of different discourse activities. From this perspective, districts may target different aspects of instruction in efforts to help schools improve teaching and learning. They can help teachers develop their teaching strategies or how they deliver instruction. They can help teachers develop content area knowledge, for example building awareness of the grammatical or linguistic structure of written and spoken language. Alternately or simultaneously, districts can focus on increasing teachers' access to new curriculum or tools.

Sixty percent of the administrators conceptualized the problem of teacher learning in mathematics as one of developing teachers' conceptual knowledge about mathematics and described professional development strategies aimed at building teachers' mathematical knowledge. "Content, content, content," exclaimed a District A administrator when asked to describe the focus of her district's professional development in mathematics. "So we are working with the universities to provide the principals with the resources this summer so they can help their teachers extend their knowledge in content. If teachers aren't really strong in mathematics, our scores really start to tumble." Reflecting the perspective of one out of two administrators, the administrator frames the problem of teacher professional development in mathematics primarily as one of developing teachers' content knowledge and sees lack of content knowledge as the primary culprit for the districts' low mathematics scores. As a leadership specialist, she works more directly with principals than with teachers but carries her views about teachers' needs into this work.

Similarly, a District B administrator, working in the mathematics department, framed the district's mathematics problem as a lack of content knowledge on the part of practicing teachers and outlined a professional development strategy consistent with these views. "We have a problem. We have content area deficiencies among many of the teachers who are teaching mathematics. There is a solution in the

works with this big new grant in which we are going to be partnering with other universities to provide content area courses.” This administrator was directing a new math initiative that departs in important ways from typical district fare. Among other things, school-based workshops would be taught by university educators. However, the content of professional development reflected long standing and relatively unquestioned views of teachers’ learning needs in mathematics, in particular their limited understanding of mathematics concepts.

In their discussion of teacher staff development, the remaining 40% of administrators did not specifically reference the importance of teachers’ content knowledge. Instead, they focused their responses on administrative issues or historical developments in teacher training in mathematics in the district. These discussions included descriptions of the nature of district support positions for mathematics, and general descriptions of the scope of professional development opportunities available to teachers. Other administrators, typically those who had worked in the district for many years, focused on historical developments in the district; for example, they spoke about the time frame for new curricular adoption and changes and implications of grant funding cycles.

Administrators conceptualized the problem of teacher learning differently in literacy. Compared to mathematics, they placed much more emphasis on how teachers deliver mathematics instruction in classrooms. Sixty percent delineated the district challenge as one of expanding teachers’ pedagogical strategies. For example, District A devoted most of its literacy professional development to four kinds of teaching strategies that they expected to be occurring in every classroom for 20 – 30 min blocks. This included word study, guided reading, writing and self-selected reading. Professional development strategies focused on helping teachers become more proficient in delivering instruction and organizing classroom learning environments to support that instruction. Reflecting this view, a staff developer in District A designed what he termed a literacy teaching packet “all full of different strategies, there’s a herringbone strategy which is basically a who, what, when, where, a kind of graphic organizer that looks like the bones in a fish. Also right now and it’s catching on is we’re using a lot of story frames. They’re little mini close procedures with blanks left out, so if you were teaching about setting, you would say the setting of this story takes place at blank. So we focus on teaching strategies.”

Across districts, administrators articulated a similar vision of teacher professional development in literacy focused on helping teachers deliver instruction more effectively. However, we found very little mention in literacy on helping teachers build disciplinary knowledge as evidenced in the statement of this District B administrator: “We are really aware of what teachers needs are and it’s not a formal needs assessment but you just know and some of those things include the ability to do small group instruction in reading and to assess students accurately.” This administrator and others interviewed had particular views about literacy and teachers’ needs within it. In literacy, unlike mathematics, the emphasis was on how teachers teach and less on what concepts they covered and had mastery over as teachers.

In accounts of district literacy practice, district administrators also tended to emphasize the importance of helping teachers respond effectively to students’ diverse learning needs. For example, in designing his “big bag of teaching strategies”, the literacy consultant quoted above looked for ways to help teachers be more effective within their current classrooms explaining, “You know in our particular circumstances, with our kids, our kids need more guidance in that strategy. Even if it is as simple as having them go back and read a section before they answer the questions. You know a lot of our kids don’t do that and that’s just one strategy teachers can use.” Here and across interviews, administrators described the problem of teacher learning in terms of helping teachers address the very immediate needs of children within their classrooms. As suggested by the following quote, administrators defined good teaching in literacy as responsive teaching and viewed their district’s professional development challenge as helping teachers move away from a one size fits all approach to delivering instruction. A District C administrator termed this approach “retooling of teachers” by which he meant “teaching them how to respond to individual student needs and how to be culturally relevant in strategies and how they deal with children as well as parents. It’s teaching them new tricks of the trade.”

In their discussions of literacy, the other 40% did not focus in any detail on the importance of building teachers’ pedagogical skills. Instead, these administrators focused on administrative issues related to the organization of teachers’ staff development, for example, the organization of conferences and summer institutes. Other administrators within this category focused on budget issues linked with

staffing in school level district support positions in reading and/or the historical time-line of districts' reading reforms.

The emphasis on creating effective learning environments in literacy stood in contrast to administrators' descriptions of mathematics practice. In mathematics, administrators were relatively silent about students' learning needs. Instead, their descriptions focused on highly generalized accounts of *teachers'* needs as learners, with particular emphasis on teachers' perceived math anxieties. For example, an administrator in District B described the focus of that district's mathematics initiative as "breeding confidence in the teacher who perhaps is predisposed to be afraid of mathematics and science. These are things they (teachers) need to know and softening it up in such a way that we are going to attract the teacher that doesn't have the background or the confidence to do it."

Similarly, when asked to describe the components of good professional development in mathematics, 60% of administrators answered along the lines of the following District B math specialist: "You know a good course for teachers should obviously focus on content, should contain content that teachers are required to teach." Here and across interviews we found little reference to differences in how students learn mathematics and the importance of helping teachers identify these differences and design instruction around them. Mathematics was understood mainly as a problem of teacher content knowledge, whereas literacy was understood chiefly as a problem of teacher pedagogical knowledge.

Administrators most intricately involved in providing technical support to schools also tended to be those most critical of their districts' focus on primarily building teachers' content knowledge in mathematics; they believed that the approach had limitations. For example, a math consultant in District C, frustrated with what she perceived as her district's teacher-centered approach to math reform confided, "At some point you have to be aware that you are doing things for teachers' sakes rather than kids' sakes." In her view, the district's emphasis on building teachers' content knowledge "might not be the best thing for low performing mostly minority kids" and yearned for the day when math professional development was designed around "what actually works best for kids in this district."

In summary, reflecting different understandings of what it means to teach effectively in mathematics versus literacy, district administrators provided teachers with distinctly different learning opportunities depending on the subject matter focus. Across districts, while

the format of professional development in both subject areas was “state of the art” in terms of its format (site based, continuous and intensive), the content of professional development reflected different conceptualizations of what teachers needed to know by subject area. One implication that can be drawn from these findings is the importance of subject subculture as an influence on broad-scale policy designs. However, the subject specific patterns explored above paradoxically also reveal how district administrators’ implementation practices not only enact but transform subject area norms. For example, in the district settings we studied, some administrators (albeit a small percentage) viewed helping teachers deal with diverse learners and developing new classroom tactics as an important part of their policy leadership in mathematics. In the organization of teacher professional development, these administrators challenged subject matter norms and generated new practices based on their views.

DISCUSSION AND CONCLUSION

In this article, we have investigated how subject matter acts as a context in the enactment of district-wide instructional reform, focusing on the views and actions of central office administrators with formal and informal responsibility for implementing content area initiatives. Based on this analysis, we sketch below what we consider to be important contours of subject specific policy research. The framework we propose shifts away from strict attention to the policy and organizational context of broad-scale improvement and towards the systems of meaning through which policy actors conceptualize the problem of student and teacher learning and the social contexts through which these meanings are constructed and transformed. Central to the framework is attention to how policy arrangements and strategies are deeply entwined with commonly held perspectives on the disciplines or school subjects and the consequences of this relationship for the nature of the support offered to classroom teachers under the banner of systemic reform.

School subjects as context for district policy

Most models of the policy process now acknowledge the importance of contextual factors in policy implementation. An informal review of these models suggests, however, that most take a subject-neutral approach to policy analysis; they fail to identify wider values and

cultural beliefs about knowledge in particular subjects as influences on policy design and its implementation. For example, the framework developed for investigating the influence of national standards identifies a generic slate of policy actors, businessmen, business and public industry as the context for understanding whether and how state standards influence classroom practice (NCTM, 2004). Alternately, a subject-specific framework for policy research makes subject matter central to investigations of how context impacts the implementation of instructional policy between the statehouse to the schoolhouse.

Policy researchers can make subject matter more central by grounding their analysis in research on subject area differences on the nature of teaching and learning. In our analysis, we attempted to understand and explain variation in administrators' practices in part from the standpoint of epistemological differences between mathematics and language arts. We focused specifically on two epistemological differences identified within research on teaching – the degree of definition within a discipline and the degree to which the subject is viewed as core or basic. Through this analysis, we surfaced important and relatively unexplored differences in the attention and priority that district administrators assigned reading and mathematics as part of their standards-based agenda. This analysis also led us to consider how the design of policy derives not simply from organizational or policy pressures but broader institutional understandings of the disciplines and school subjects as well as what counts as knowledge in these domains.

Subject-specific roles as channels of influence

Investigating relations between subject matter and local policy processes also involves paying attention to the subject-specific channels through which institutional environment and policy reforms interact. Subject-specific channels may refer not only to regulative channels, such as funding streams, but also to policy implementers who are involved in the implementation of subject specific reforms. Some of these individuals are easily identifiable by consulting district organizational charts. They have titles such as mathematics director, literacy consultant, science coordinator and reading specialist, among others. These individuals proved key in understanding variations in how districts organized and delivered instructional supports in our study. Their accounts revealed the unique practical challenges involved in reforming instruction across different content areas; for

example, they looked at the wisdom or risks of creating a general blueprint for reform to be applied across subject areas. Interviews with district staff involved in content area initiatives also illuminated the views about teacher learning and student learning that subject matter specialists bring to their work. These are individuals upon whose shoulders the details of systemic instructional reform weighs. Ironically, despite their importance, we found that nearly half of the directors we interviewed had never been interviewed before as part of a research study, despite the fact that all three school districts have been the subjects of numerous studies. We interpreted this as a reflection of policy researchers' inattention to the importance of subject matter in policy design and reform enactment.

While content area directors figured prominently in the implementation of district instructional reforms, district offices abound with other kinds of staff who exercise important leadership for reading and mathematics reforms. Our sample of administrators who self identified as participants in instructional reforms included budget managers, directors of research and accountability, standards consultants and technology coordinators, among others. Rather than generalists, many of these individuals held strong opinions about the importance of math and literacy as content areas – views that for literacy reflected current knowledge about that subject area. These administrators enacted and in some instances transformed views of subject area in their interactions with colleagues with direct oversight for content area reforms and also into their interactions with school staff (Burch & Spillane, 2004). Therefore, understanding how subject matter acts as a context for broad scale instructional improvement must include attention to district staff who assume informal responsibility for instructional improvement.

As described above, considering subject as an important variable in policy implementation involves more than examining how subject matter serves as a context for macro organizational structures such as district-wide staffing priorities and/or the design of teacher professional development opportunities within the district. It requires examining these organizational structures and practices within an instructional context and recognizing that improving instruction involves different dimensions. It involves the teaching of academic content, using particular materials and teaching strategies, perhaps under different conditions, or through the deployment of different discourse activities (Spillane & Burch, in press). Differences across subject matter are reflected in how local policy makers attempt to

address the problem of teacher learning and what aspects of instruction they target. For example, in our sample, district administrators defined improving instruction primarily in terms of strengthening teachers' mastery of mathematical content knowledge and paid relatively little attention to issues of instructional delivery. In contrast, in literacy, district policy focused mostly, though not exclusively, on teachers' instructional strategies and deemphasized the intellectual content behind those teaching strategies. Looking carefully at different dimensions of instruction within district policy design can help illuminate patterns of tight and loose coupling in instructional reform. Within particular subject areas, while policy and administration may be tightly coupled with one dimension of practice (such as the conceptual understanding understood as important for teachers in math) it may be loosely coupled with another dimension (such as teaching strategies and techniques implied in districts' broad vision for reform).

A subject-specific approach then involves not only comparative analysis of different subject areas but also disaggregating data by subject area. While our own analysis focused primarily on differences and similarities, there is much here for scholars to investigate by focusing on a single subject area. One way to sharpen investigations of subject area is to engage in more systematic analysis about how policymakers organize supports within a subject area around different dimensions of instruction. How are districts trying to build teacher capacity within mathematics and around what dimensions of instruction, for example, teaching strategies, tools, may policies be less elaborated?

Finally, investigating the role of subject matter in the policy process requires attending to the beliefs and attitudes that subject area leaders have about policy beneficiaries or targets. How does the design and administration of reforms reflect the priorities that districts assign to teachers' needs vis a vis students' needs? How, if at all, does this pattern vary across different content areas? What implications do these patterns have for how reforms reach students? This analysis involves close examination of the language and rituals that policymakers use in communicating the intentions of content area initiatives to educators. In this paper, we began to explore these issues by considering the degree of attention policymakers afforded to students' learning activities in their vision for instructional improvement. Through this analysis, we surfaced subtle but potentially important differences in how policymakers construct the problem of

student learning in mathematics relative to literacy. These patterns revealed subject-specific differences in district-level understandings of what it means to improve instruction for reading and mathematics – differences, that while largely masked by the reform rhetoric of senior district administrators and the macro policy designs, are impossible to ignore in an analysis focused on *policy practices*.

As policymakers' attention becomes focused on instruction, researchers have called for programs that build administrators' subject-specific knowledge. However, the progress of current instructional reforms requires deep understanding of how existing subject matter views influence the organization of current district practices. A subject specific lens on broad scale instructional improvement opens new windows of understanding into the factors that shape the implementation of systemic instructional reforms. Concurrently, it presses for more attention in policy research to how subject matter matters.

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AUTHORS' BIO

Patricia Burch is an assistant professor in the Educational Studies Department at the University of Wisconsin - Madison. Burch's research explores

the policy process at the Federal, state, school district, and school levels, focusing on intergovernmental relations and connections between policy, practice and research.

James Spillane is Professor of Education and Social Policy, and a Faculty Fellow at the Institute for Policy Research, Northwestern University, where he teaches in both the Learning Sciences, and Human Development and Social Policy graduate programs. Spillane's work explores the policy implementation process, focusing on intergovernmental relations and policy-practice relations and leadership practice. He is author of *Standards Deviation* (Harvard University Press, 2004), *Distributed Leadership* (Jossey-Bass, forthcoming) and numerous journal articles and book chapters. Spillane is Principal Investigator of the Distributed Leadership Study.

PATRICIA ELLEN BURCH
Education Policy Studies,
University of Wisconsin-Madison
213 Education Building
Madison, WI 53706
USA
E-mail: pburch@wisc.edu