FOSTERING RESEARCH USE IN SCHOOL DISTRICTS THROUGH EXTERNAL PARTNERSHIPS: THE ROLE OF DISTRICT CAPACITY

Proposal to the William T. Grant Foundation Use of Research Evidence Priority Area

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The Common Core State Standards (CCSS) for mathematics and English language arts are arguably the most significant policy initiative related to education in more than a decade. As states adopt these standards, school district leaders face unprecedented new challenges—major decisions about new instructional materials and assessments, how to support teachers in learning new instructional approaches, and how to reorganize and resequence content. Yet district offices suffer from both limited resources and limited capacity to undertake these tasks. As a result, many districts are turning to external

organizations and individuals for assistance (Coburn, Bae, & Turner, 2008; Datnow & Honig, 2008; Honig, 2004b). An increasing number of these external organizations draw research in their work (e.g., Sherer, Israel, & Resnick, 2013); others actually conduct their own research on district programs as part of their assistance (Coburn, Penuel, & Geil, 2013). In support of the aim of research-based assistance to school districts, more and more public and private funders are investing in these organizations (e.g., the Institute of Education Science and the National Science Foundation). However, we know little about when and under what conditions districts take up and use research-

The Foundation welcomes descriptive studies that examine the mechanisms of how, why and when research is used to learn how to enable the conditions to improve research use. This proposal clearly identifies how study fits within existing research in this area, including how it builds on prior empirical work around the use of research evidence.

based guidance from external organizations in their instructional decision making.

Only a handful of studies have investigated this issue. Some provide evidence that districts' *internal capacity* influences their ability to use research in substantive ways (Coburn, Toure, & Yamashita, 2009; Honig, Venkateswaran, McNeil, & Myers-Twitchell, in press; Hubbard, 2010). However, they do not provide a robust conceptualization of internal capacity or a clear articulation of how capacity influences research use specifically. Other studies focus on how *the relationship between the external organization and the district* influences the degree to which districts use research-based guidance (D'Amico, 2010; Hubbard, 2010; Honig et al., in press; Ikemoto & Honig, 2010; Scott & Jabbar, 2014). These studies are limited in that they typically investigate only one of the many kinds of organizations that provide research-based guidance to schools and school districts (e.g., Coburn et al., 2009; Hubbard, 2010; Ikemoto & Honig, 2008). As a result, we understand little about how the qualities of varying external organizations or their relationships to the district matter for research use. Finally, most studies focus on the district as a single, monolithic entity. Yet school districts, with their complex organizations, often have substantial internal variability. Different subunits within a district have different degrees of capacity (Burch & Spillane, 2005; Spillane, 1998) and, often, independent engagements with external organizations (Farrell & Coburn, under review).

In this study, we will bring together theories of organizational learning—especially the concept of *absorptive capacity*—with existing scholarship on research use to investigate when, under what conditions, and how districts use research knowledge garnered from external organizations as they respond to CCSS, with what consequences for organizational learning. Our study will build systematically on lessons from our earlier William T. Grant–funded study of the role of research-practice partnerships in fostering research use in mathematics. During that investigation, we realized that different districts, and even subunits within districts, had varying ability to engage with the external organizations we were studying. We turned to research on absorptive capacity to help understand this phenomenon, drawing on that literature and others to develop the conceptual framework that undergirds this study (Farrell & Coburn, under review).

Here, we propose to investigate absorptive capacity in a thirty-month, mixed-methods study of two strategically sampled urban school districts engaged in implementing CCSS in both mathematics and English language arts (ELA). Given the scope and intensity of the changes demanded by CCSS, districts will be required to make many consequential instructional decisions and may be especially likely to reach out to external providers for assistance. The advent of CCSS thus creates an ideal opportunity to investigate when and under what conditions districts use research-based guidance from external providers in their policy making, planning, and decision making.

We address the following overarching question: *When and under what conditions do districts learn from external organizations, integrating research-based guidance into district policies, routines, and collective knowledge?* By addressing this question, we will extend the field's understanding of the organizational conditions that enable research use, a key priority for the William T. Grant Foundation. Our focus on investigating what capacity to engage with research guidance entails promises to elucidate

a missing piece of the research use puzzle. This study also contributes to our understanding of the role of external organizations in fostering research use— another Foundation priority—identifying key features of external organizations as well as the nature of their interaction with practitioners that foster research use. Finally, the study will inform policy makers, practitioners, and external organizations by identifying points of leverage for building district capacity to engage productively with research-based guidance.

This section identifies gaps and limitations in the existing literature to set up the value of the proposed study and how the study can be used to meet the Foundation's priority on identifying ways to improve the use of research evidence.

Empirical and Theoretical Rationale

Policy makers and funders are increasingly interested in leveraging external organizations to support research use (Finnigan & Daly, 2014; Tseng, 2012). Government and private funders have required engagement with external providers as conditions for receiving funding (Supovitz, 2008), have funded technical assistance centers with a mission of translating research for practice (Lagemann, 2002), and have provided support to develop new partnerships (e.g., Institute for Education Science) and to sustain existing ones (e.g., Spencer Foundation). Indeed, there is a dizzying array of external organizations providing research-based guidance to schools: university researchers working one on one with districts (e.g. Bickel & Hattrup, 1995), organized partnerships between researchers and school districts (Coburn et al., 2013; D'Amico, 2010; Honig et al., in press), state and federal technical assistance centers, and county offices of education charged with translating research into practice (Barton, Nelsestuen &

Mazzeo, 2014). Many urban areas have local or regional nonprofits that seek to bring research-based guidance to schools and school districts (Hubbard, 2010; Trujillo & Woulfin, 2014), and an increasing array of contract research firms and advocacy organizations are active in this space, as well (Debray et al., 2014; Lubienski et al. 2014; Scott & Jabbar, 2014).

Given the proliferation of and increased investment in these organizations and actors, there is remarkably little research on when and under what conditions engagement with external organizations actually enables district leaders to use research in their decision making. A handful of studies provide hints. A few scholars provide evidence that school districts require a certain degree of capacity to use research in decision making, pointing to the importance of district leaders' prior knowledge (Honig et al., in press), their ability to work with one another across divisions (Coburn et al., 2009), and conducive organizational cultures and routines (Moynihan & Landuyt, 2009). Others point to features of the relationship between external organizations and school districts, showing that sustained engagement (Coburn et al., 2009; Hubbard, 2010), structures to support joint work (D'Amico, 2010; Ikemoto & Honig, 2010), and relations of trust (Hubbard, 2010) foster more substantive use by district leaders. Studies of research partners in social work suggest that informal interaction between agency staff and external partners plays a crucial role as well (Palinkas et al., 2009; Palinkas & Soydan, 2012).

While studies point to the importance of district capacity, few provide robust theorizations of what capacity to use research entails. Second, most existing research focuses on a single class of external organization (e.g., Coburn et al., 2013; Scott & Jabbar, 2014; Honig, 2004a) or even a single external organization (e.g., Coburn et al., 2009; Hubbard, 2010; Ikemoto & Honig, 2008). External organizations vary greatly in the ways they work with school districts (Honig, 2004b), and so we have only partial insight into how an organization's features or its relationship with districts influence research use. Third, existing studies do not offer a conceptualization of how internal capacity and features of external organizations. Finally, most studies do not acknowledge the degree to which school districts are complex and variegated organizations with varying capacity across departments or subunits and, at times, independent engagements with external organizations in one or more parts of the organization.

We draw on theories of organizational learning and existing scholarship on research use to build a conceptual framework for studying the role of district capacity, qualities of the external provider, and the nature and structure of interaction between the two in district leaders' use of research from external organizations. We define research as an activity in which people employ systematic, empirical methods and analysis to answer a specific question. The products of research findings do not speak for themselves; they are summarized, synthesized,

Successful proposals draw on the existing empirical and theoretical work on research use (as this proposal does above) and, if needed, draw from other empirical and theoretical bodies of work (as this proposal does around organizational learning).

and then presented in range of different ways to inform various audiences (Davies & Nutley, 2008).

We draw on the concept of absorptive capacity from organizational learning theory to develop a more robust conceptualization of the organizational capacity to use research. Given the great variability *within* districts, we focus on the district subunit as the key unit of analysis. As shown in figure 1, we posit that the degree to which school district leaders use research knowledge from external providers in their decision making about planning and implementation of CCSS depends upon the subunit's absorptive capacity as well as features of the external partner. The nature and structure of the interactions between the subunit and the external partner then mediates the subunit's research use, with consequences for its learning. We describe each element of the framework in turn.

Here the proposal explicitly defines research use for this specific project (i.e. the degree to which research from external providers is used in district decision-making.

Including a clear conceptual framework is extremely useful to reviewers.

Figure 1. Conceptual framework



District subunit absorptive capacity

Absorptive capacity is an organization's ability to recognize the value of new information, assimilate it,

transform it, and apply it in productive ways (Cohen & Levinthal, 1990). In this view, research use is a *process of learning*; organizations engage with research ideas, develop new knowledge and know how, and, if they have sufficient absorptive capacity, transform their collective knowledge, policies, and routines. Existing research outside education provides evidence that absorptive capacity contributes to increased performance (Volberda, Foss, & Lyles, 2010), innovation (Stock, Greis, & Fischer, 2001), and organizational learning (Levitt & March, 1988). These

This section identifies a key concept, defines the concept, and connects it to the definition of research use in the proposed study. Reviewers appreciate seeing a clear connection between key concepts and sub-concepts and how they are reflected in the proposed measurement plan for the project.

benefits are cumulative and path dependent; the more absorptive capacity an organization has, the more it benefits from engagement with new knowledge in the future (Cohen & Levinthal, 1990).

Research on absorptive capacity identifies several organizational conditions that foster absorptive capacity: prior knowledge, communication pathways, strategic leadership, and resources. First, relevant prior knowledge in a district subunit is crucial because knowing something about a given issue enables a subunit to better recognize the value of external knowledge and be able to incorporate it into organizational practices (Cohen & Levinthal, 1989, 1990). Second, absorptive capacity depends on the presence of *communication pathways*: formal and informal structures within and between subunits that enable people to share, make meaning of, and use knowledge to problem solve, in this case about instructional policy (Lane, Koka, & Pathak, 2006). To date, most researchers have focused on how formal structures (meetings, task forces, etc.) facilitate communication and thus provide opportunities for organizational members to learn from one another. Yet informal structures as manifested in social interactions, or social networks, are also important (Burt, 2001; Hansen, 1999; Hargadon & Sutton, 1997; Powell & Grodal, 2006). However, not all social networks are created equal when it comes to facilitating organizational learning. Those with greater network range, or the extent to which social networks span multiple knowledge pools (e.g., across district subunits) enable access to diverse knowledge sources (Burt, 2001; Reagans & McEvily, 2003). Network density, or the overall level of connectedness in a social network, is also critical to knowledge flow across an organization (Adler & Kwon, 2002; Hansen, 2002; Reagans & Zuckerman, 2001). Knowledge flow and joint problem solving are also facilitated by strong ties, particularly when knowledge is complex or tacit (Hansen, 1999; Reagans & McEvily, 2003; Uzzi, 1997).

Third, scholars suggest the importance of *strategic leadership*. Leaders who seek out external knowledge, are able to identify productive sources of knowledge, and think strategically about how to synthesize and apply new knowledge within the organizational setting contribute to a subunit's absorptive capacity (Van den Bosch, Volberda, & de Boer, 1999; Volberda et al., 2010). Fourth, *resources* are necessary to support district leaders' ability to productively make use of what external partners have to offer. These resources include a budget that supports staffing to interface with external partners and time dedicated to partnership coordination, learning, and meaning making around new knowledge (Farrell & Coburn, under review).

External partners: Nature of guidance and organizational characteristics

A wide range of external partners potentially influence decisions-makers' access to and use of research (Debray, et al., 2014; Honig, 2004b; Lubienski et al., 2014; Scott et al., 2014). We focus on the subset of individuals and organizations that engage directly with school districts, sharing research-based guidance to inform instructional improvement efforts. We define research-based guidance as encompassing the following activities: sharing or discussing their own or others' findings,

This paragraph clearly identifies the target population for the project and definitions of key concepts around research use.

providing research-informed advice, or engaging district leaders with research-based tools (e.g. walkthrough tools that prompt leaders to focus on features of high quality instruction).

Nature of guidance. The degree to which engagement with external partners fosters knowledge use depends, in part, on the nature of the guidance they provide (Cohen & Levinthal, 1990; Lane et al.,

2006; Szulanski, 1996). The degree of shared knowledge between the external organization and district subunit—or *knowledge complementarity*—plays a role in a subunit's ability to engage productively with research-based guidance. Researchbased guidance that is similar enough to enable communication and facilitate learning but dissimilar enough to add value to the subunit is most likely to foster use (Cohen & Levinthal, 1990). A complementary, shared knowledge base also enables district administrators to frame studies and interpret their results more

Similar to above, this paragraph clearly identifies the kind of research use anticipated. Successful proposals then connect the definition of research use and the proposed measurement for the project.

easily, making the "uptake" of findings more likely (Hubbard, 2010). Research- based guidance may also be *explicit, tacit*, or *embedded*. Explicit knowledge ("know-what") includes research findings shared in writing, orally, or in formal presentations (Brown & Duguid, 1998). Tacit knowledge ("know-how") can include research-informed advice about how to orchestrate change, or how to adjust and adapt research-based findings for a specific setting (Nutley, Walter, & Davies, 2003). Explicit knowledge is more easily communicated than tacit knowledge, which is more difficult to capture and express across organizational boundaries (Nonaka, 1994; Polanyi, 1966). Research knowledge can also be embedded into tools (Pea, 1993), such as protocols for classroom observation, curricula, or assessments. Tools often function as mediating devices, shaping action and interaction as people engage with them (Norman, 1988; Sherer & Spillane, 2011). District leaders may engage in research-informed practices as they use the tools in their work.

Organizational characteristics. Two characteristics of external organizations also likely matter. First, organizational learning is improved when the external partner is able to be *flexible and adaptable* to the needs of the "learner" organization. When an external partner is inflexible and rigid in its approach, it limits the trust necessary for knowledge sharing and learning (Lane, Salk, & Lyles, 2001; Volberda et al., 2010; Knoppen, Saenz, & Johnston, 2011). Second, successful cross-institutional partnerships require similar *norms and work practices*. This is often difficult to enact, as practitioners and their research-oriented partners may work in different cultural worlds, with contrasting practices and norms (Bickel & Hattrup, 1995; Brookhart & Loadman, 1992; Gifford, 1986; Keating & Clark, 1988; Palinkas et al., 2009; Schlecty & Whitford, 1988). These differences can shape the dynamics of partnership in profound ways, leading to confusion, uncertainty, and even conflict (Coburn & Stein, 2010), all of which constrain learning opportunities.

Nature of interaction between external partner and district subunit

As we show in Figure 1, the influence of both the district subunit's absorptive capacity and the features of the external partner on research use is mediated by the *nature and structure of the interactions* between district subunits and their partners. An external organization may be flexible and adaptable and have complementary expertise, but it may not foster research use if the their interactions with district subunits are not conducive to learning. Similarly, some interactions may be more productive than others given a district unit's level of absorptive capacity and the features of external partners. We focus on two dimensions of interaction: inter- organizational routines and informal social interaction.

First, *inter-organizational routines* may influence what and how district subunits learn from engagement with outside organizations (Dyer & Sing, 1998; Lane et al., 2001; Zahra & George, 2002). Inter-organizational routines are designed or emergent structures, created by the subunit, the partner, or both,

that foster interaction between district staff and external partners. Routines shape who is involved in the discussion, around what forms of research and other sources of knowledge, and in what ways (Coburn & Turner, 2012; Horn, Kane, & Wilson, under review; Little, 2012; Marsh, Farrell, & Bertrand, 2014). They play a large role in what people notice, the meaning they make of research guidance, and the implications they draw for their work.

Routines also create very different conditions for learning. For example, an inter-organizational routine in which the external partner presents an update on their work is likely less conducive to district learning than those involving co-planning, coaching together, or co-design work.

Second, opportunities for knowledge exchange and sensemaking may happen outside of formal meetings. The structure of *informal social interaction* between district leaders and staff at external organizations is also likely important for subunit learning (Ghoshal, Korine, & Szulanski, 1994; Walter, Lechner, & Kellermanns, 2007). That is, while district leaders have opportunities to learn about research use in formal meetings with external partners, they also have on-the-job learning opportunities when they receive guidance from partners informally (Eraut & Hirsch, 2007). Specifically, the greater the number of ties between district leaders and external partners and the greater the diversity of those ties, the more centrally connected a district subunit becomes. If a district subunit has a central location in the overall network, leaders in that subunit likely have greater access to new and diverse knowledge resources, a key to subunit learning (Powell, Koput, & Smith-Doeer, 1996). In addition, tie strength, especially the level of

trust between district leaders and external partners, is important for enabling collaboration that facilitates inter-organizational learning (McEvily, Perrone, & Zaheer, 2003). The greater the trust fostered by the external partner, the more willing all parties will be to share and exchange information in situations that require them to be vulnerable and take risks (Lane et al., 2001).

Role of research in district deliberation

The nature of interaction between district leaders and external partners likely influences if and how districts use research as they deliberate about decisions related to the implementation of CCSS. Decision making is a highly interactive process, involving many people in and across a series of meetings (task forces, committees, teams, etc.) and informal conversations (Hannaway, 1989; Kennedy, 1982; Majone, 1989; Weiss, 1980) that stretch across units and levels of the system (Weiss, 1980). Decisions "accrete," to use Weiss's term, over time in a gradual, nonlinear process (Weiss, 1980; Cohen, March & Olsen, 1988). Throughout, individuals engage with research and other forms of information, define problems,

develop plans, confer, debate, and consider and design solutions in a process that involves deliberation, negotiation, and persuasion (Asen et al., 2011; Coburn et al., 2009). This process is fundamentally interpretative because the meaning and implications of research and other forms of information are not given. Rather, people make meaning of information by drawing on their prior beliefs and understandings, as well as shared or situated understandings (Weick, 1995). Because people come to new ideas with a diversity of understandings, meaning making can be contested and shaped by relations of status and authority (Johnson, 1999; Coburn et al., 2008).

Here is another example where the proposal connects the use of research to the mechanism that supports research use that is under study along with existing theoretical and empirical work connecting the specified mechanism to improved use of research evidence.

Research may enter into district deliberation in a range of ways, or not at all. Research use is not an event. Rather, it is the process by which research influences and informs the deliberation that lies at the core of decision making. Engagement with research-based guidance can play a role in deliberation by influencing knowledge and understandings in ways that shape emerging ideas about the nature of the problems they face or potential solutions to pursue. In this way, interaction with external providers outside the decision context may influence district leaders' thinking informing the ideas, assumptions,

and approaches they bring to deliberation. Scholars refer to this phenomenon as conceptual use (Weiss, Murphy-Graham & Birkeland, 2005).

Research may also be used explicitly in a decision context to weigh the costs and benefits of different solutions or otherwise persuade or argue for a solution. Scholars refer to this process as instrumental use (Weiss et al., 2005). In a final example, this paragraph again explicitly defines how the team is conceptualizing research use within the proposed project.

Research can also be used symbolically; that is, invoked to justify or legitimize a decision that has already been made (Weiss et al., 2005). Interaction with external providers can influence these processes by providing access to research findings, research-informed advice, and research-based tools, and shaping the meaning that individuals and groups make of them.

Organizational learning

These deliberations, and the role of research therein, may have consequences for organizational learning at the subunit level. Organizational learning involves encoding information—in this case, research-based findings, advice, and tools—into collective knowledge, routines, and policies that guide behavior (Levinthal & March, 1981; Levitt & March, 1988; Feldman & March, 1981). We will focus on three elements of organizational learning: (1) collective knowledge, (2) shifts in policies, and (3) shifts in routines.

Collective knowledge. At the subunit level, district leaders' engagement with research and with one another may shift the way that knowledge is distributed throughout a given subunit. Research on absorptive capacity suggests that not everyone in a given subunit needs to know the same things; rather, it is the distribution of knowledge resources in a given subunit that matters for learning (Cohen & Levinthal, 1990). Engagement with research and with colleagues may also influence shared understandings about the nature of a problem or the solutions to be pursued (Coburn, 2006; Weick, 1996). Indeed, Leavitt and March (1988) argue that one of the most powerful consequences of engagement with new ideas and experiences is the "transformation of the givens," or the "redefinition of events, alternatives, and concepts" (p. 324). Shifts in the distribution of knowledge and in shared understanding may be especially likely when district leaders engage in the conceptual use of research in their decision making and deliberation.

Policy and routines. We define *policy* broadly, including formal policies (e.g., a new policy on course pathways), but also rules, plans, and guidelines. For example, we would consider it learning if a district subunit drew on research on the features of high quality professional development as they designed a professional development plan or coaching initiative (both being policies). By *routines*, we mean the patterned ways that actors (in this case district administrators) interact with one another in the course of their ongoing work. Routines can be designed or emergent. Designed routines include protocols for meetings, standard operating procedures, and processes. For example, we would consider a district subunit to have learned if it incorporated research-based guidance on indicators of high quality mathematics instruction into the way that they did school walkthroughs, or if the district altered the

standard operating procedure for providing support to struggling schools. Emergent routines are evolved but not specifically articulated ways of interacting with others in the ongoing flow of interdependent work (Cohen, 1994). For example, if district leaders began to share relevant research articles with one another in the course of their work even though doing so was not built formally into meetings, this would be evidence of learning. We also would consider it learning if district leaders began regularly sharing new plans to support instructional improvement with representatives from other district units that are implicated in the work.

Organizational learning at the subunit level may, in turn, contribute to the development of greater absorptive capacity, as is indicated in figure 1 by the arrow from subunit learning to subunit absorptive capacity. For example, the distribution of new knowledge within a subunit or new formal or informal communication channels can create new organizational conditions that foster absorptive capacity (the box on upper left of figure 1). In this way, absorptive capacity is path dependent and cumulative. Subunits with absorptive capacity are better able to develop more absorptive capacity over time (Cohen & Levinthal, 1989, 1990; Zahra & George, 2002).

Research Questions

Successful proposals have clearly articulated research questions that can be directly linked to the background discussed above. The connection should clearly connect why these questions are the right questions to be asking and how prior theory or empirical work supports these specific research questions.

Our study will address five research questions:

- 1. What is the absorptive capacity of district subunits?
- 2. What are the organizational characteristics of and the nature of guidance given by the external providers involved with the district in mathematics and ELA?
- 3. What is the nature of the interaction between external organizations and district subunits?
- 4. How do subunit absorptive capacity, the qualities of the external provider, and the nature of the interaction between subunits and providers influence how district leaders use research in their efforts to respond to CCSS?
- 5. What are the consequences of research use for organizational learning?

We propose to address these questions in a thirty-month, in-depth, mixed methods study. In Phase I, we will draw on data from our earlier William T. Grant–funded study to operationalize key concepts and refine our measures. In Phase II, we will collect data related to our research questions across eighteen months in two new strategically sampled urban school districts in states that have adopted CCSS in both mathematics and ELA, followed by six months for additional data analysis and writing.

Phase I: Research Design, Methods, and Analysis Plan

From July 2015 to August 2016, we will analyze the robust dataset collected during our earlier William T. Grant–funded study to operationalize key concepts, refine the conceptual framework, develop instruments for data collection in Phase II, and prepare at least one manuscript for publication. We will

draw on data we collected in two of the three districts from our earlier study: the San Francisco Unified School District (SFUSD) and Jefferson County Public Schools (JCPS) in Louisville, Kentucky.¹ (See attached letters of support.) We have collected a wealth of observation, interview, and survey data with which to refine and further develop our conceptual framework, including (1) 106 interviews with 70 district leaders across multiple levels of the central office and multiple subunits, (2) 74 interviews with 42 individuals affiliated with external providers, (3) 98 hours of observations in which partners and district personnel collaborated, and 286 hours of district-only meetings related to mathematics and of shadowing district personnel, (4) a biannual survey, and (5) 2,824 artifacts related to mathematics decision making and the work of external partners.

Our earlier William T. Grant-funded study was not designed to investigate the interaction between absorptive capacity and the nature of external partners. However, several features of our extensive dataset will enable us to use data we collected to operationalize constructs and refine the conceptual framework. First, the two districts in question were involved with multiple external organizations in mathematics that differed substantially in the guidance they offered and the nature of their interaction with the district. In response to a request from a district leader in SFUSD, we interviewed representatives from the fourteen external partners in SFUSD. We also observed some external partners' interactions with district subunits and collected relevant documents in both districts. Second, because variation in subunits' capacity to engage with external guidance emerged so strongly in the first year of data collection, we added items related to absorptive capacity to our final survey and interview protocols. Third, we have extensive observational data of district leaders' discussion, planning, and problem solving about mathematics across multiple subunits, providing the opportunity to analyze when and under what conditions research-based guidance from external partners entered into their deliberations.

¹ The third district did not have multiple external partners.

Phase I Analysis Plan

From July to December 2015, we will analyze qualitative data to operationalize key constructs, refine our conceptual framework, and develop and refine qualitative and quantitative instruments.

Operationalizing key constructs, refining conceptual framework. We will use a hybrid approach to coding interview, observation, and artifact data (Miles &

Successful proposals include a detailed analysis plan that makes clear to the reader what data will be used, how it will be analyzed, and connects the proposed analysis to the proposed research questions.

Huberman, 1994). For example, to operationalize organizational conditions that foster absorptive capacity, we will begin with a set of codes derived from the literature reviewed above, but adjust and refine these codes using the constant comparative method (Strauss & Corbin, 1990). In instances where there is limited existing empirical work, we will begin with codes that describe, with little interpretation, the phenomenon of interest. By grouping together categories and using the constant comparative method, we will move to progressively higher levels of abstraction until we end up with a final list of codes.

Once we have developed codes for key dimensions in our framework, we will use matrices and other data displays (Miles & Huberman, 1994) to investigate the relationships between these dimensions as a way to refine our propositions. For example, we will systematically compare subunit–external partner dyads to investigate how the qualities of the external partner, the subunit absorptive capacity, and the nature of their interaction are associated with the ways that district subunits use research-based guidance in their deliberations. If this analysis surfaces dimensions or relationships that are not accounted for in our conceptual framework, we will adjust the conceptual framework accordingly.

Refining qualitative instruments. Given that our earlier study was not designed to investigate these questions, in the course of these analyses, we likely will find that there are aspects of our conceptual framework for which we have limited data. The analysis may also reveal where our instruments worked quite well at eliciting information. We will use these insights to inform our instrument development for Phase II.

We will refine questions on our existing interview protocols and construct new ones, piloting new protocols with four to six individuals in each role group (i.e., district administrators and external partners). We will use slightly different processes to develop our two observation protocols. First, for the protocol that we will use to capture interaction between external partners and district leaders, we will adapt the protocol from our earlier study to address new dimensions in our conceptual framework. We will pilot the adapted protocol using video and fieldnotes from our earlier study and adjust it accordingly. Second, for the observation protocol that we will use to observe subunit deliberations, we will adapt an observation protocol that we are in the process of developing for another project (IES-funded NCRPP, described below). Designed to investigate research use in video recordings of district meetings, this protocol will capture when and how research is referenced and engaged by leaders in deliberation. Between now and the start of the study proposed here, the instrument will be tested through a process of inter-rater reliability coding using Dedoose. During Phase I, we will adapt this protocol for our study, for example, adding elements that enable us to trace specific research ideas from external providers into subunit deliberations. We also will ensure that we can use the protocol with field notes as

well as video recordings. We will test the adapted protocol using video recordings and field notes from our earlier William T. Grant-funded study and adjust accordingly.

By January 2016 when we launch data collection for Phase II (see below), we will have developed a refined set of propositions about how district subunit absorptive capacity, the nature of external providers, and the interactions between the two influence research use in decisions about CCSS. We also will have developed a refined set of qualitative instruments to investigate these propositions.

Refining quantitative instruments. From June through August 2016, we will engage in survey development. We will begin by adapting items related to absorptive capacity from our earlier William T. Grant–funded study. We developed these items by drawing on our initial conceptual framework for absorptive capacity (Farrell & Coburn, under review), with the intent to develop subscales related to prior knowledge, communication pathways, strategic leadership, and resources. Though we have

preliminary evidence of good internal consistency from our earlier study, we do not yet have confidence that respondents are interpreting items in ways consistent with the concepts as articulated in our framework. For this reason, we do not know whether our items can adequately discriminate different levels of absorptive capacity. Therefore, in Phase I, we will conduct cognitive interviews (Desimone & Le Floch, 2004) with a sample of seven to nine district leaders to ensure that our survey measures are valid means for eliciting individual perceptions of absorptive capacity. On the basis of these analyses and additional analyses of our initial pilot data, we will develop a multidimensional construct map (Wilson, 2005) that hypothesizes a set of ordinal levels of absorptive capacity from low to high. Then, we will develop additional items that aim to distinguish individuals with respect to levels on the map, depending on their response to those items.

This proposal does a nice job of building from the methods and measures used previously in research on the use of research evidence. The proposal includes a careful description of the proposed methodology. Reviewers will look to ensure the team has the skills and expertise required to conduct any measurement work. When applicants propose new measures the proposal should include a strong justification why new measures are needed.

We also will develop new items related to other aspects of our conceptual framework: the nature of research-based guidance, perceptions of external organizations, inter-organizational routines, and social network items to measure intra- and inter-organizational social networks. These items will be included in the cognitive interviews discussed above. We also will collect additional data in Phase II that will allow us to fit Rasch models to survey data to explore whether survey measures can accurately locate individuals within our hypothesized construct map for absorptive capacity and to examine the reliability of any new scales we develop. This analysis will provide us with evidence of construct validity for the measure. Item- and person-level statistics will be calculated to provide evidence of reliability within an IRT framework.

Phase II: Research Design, Methods, and Analysis Plan

From January 2016 to December 2017, we will draw on concepts and instruments from Phase I to investigate our research questions in two new school districts that are engaged in making decisions related to the implementation in CCSS in mathematics and ELA. The goal for Phase II is to move from theory generation to theory elaboration (Vaughan, 1996); by extending our inquiry into two new school

districts, we will be able to investigate the propositions developed in Phase I in new districts with different contextual conditions and a broader range of external partners, facilitating theory elaboration. Extending our study beyond mathematics to include ELA provides us with a greater number of district subunits for each district that facilitates contrasts in existing subunit absorptive capacity. We also know that local school and school district work related to instruction differs by school subject (Burch & Spillane, 2005; Spillane & Hopkins, 2013); it is possible that elements of absorptive capacity will vary by subject area as well. Finally, we will focus on decision making related to *elementary* ELA and mathematics, which will likely result in more stark subject matter differences, given the greater expertise in and the overwhelming focus on elementary literacy compared to mathematics in most districts.

The study we propose here will leverage resources from the National Center for Research in Policy and Practice (NCRPP), a five-year research and development center that we were recently granted from the Institute of Educational Sciences (IES). (For more information about NCRPP, see appendix A.) We will undertake our research in two districts that are part of one of three Center studies. Conducting research in NCRPP districts will enable us to leverage IES's substantial investment in a measurement study designed to develop and validate survey items and the observational protocol, a large-scale survey of school districts from which we will select districts for study, and the Center's extensive and inventive dissemination capacities.

Sample

We will select two districts that are involved in one of the NCRPP studies: an eighteen-month mixed-methods study to investigate the extent to which and how school and district leaders use research in instructional decision making. In fall 2015, NCRPP will select sites by surveying the thirty largest urban school districts in all states that have adopted and are implementing CCSS in mathematics and ELA. In each district, NCRPP researchers will survey twelve to fifteen individuals representing the leadership divisions, curriculum and instruction, assessment, and special education. The survey is currently under development and will be subject to a rigorous validation study by our team along with collaborators Derek Briggs (University of Colorado Boulder,

This proposal includes a detailed description of the sampling plan and the rationale for the proposed sample. Often reviewers examine the appropriateness of the sample to answer the proposed research questions and obtain highquality data. Reviewers will also look for a discussion of the feasibility for recruiting and retaining the proposed sample.

a measurement specialist) and Heather Hill (Harvard University, a survey and measurement specialist). It includes items on research use and a range of individual, organizational and environmental factors that predict it. After analyzing data from the 30 districts, NCRPP will select 4 urban school districts of similar size but with a minimum of 50,000 students using the sampling frame shown in table 1.

Table 1. Sampling Frame

	High connections to outside	Low connections to outside			
	sources of research	sources of research			
Organizational conditions	1	3			
conducive to research use					
Organizational conditions not	2	4			
conducive to research use					

NCRPP researchers will measure connections to outside sources of research with survey items related to engagement with external organizations, sources of research knowledge, and grants with external researchers. They will measure organizational conditions conducive to research use using items related to the presence of formal meetings in the district where research is used. This dimension captures one of the four organizational features conducive to absorptive capacity: communication pathways.

We will conduct the study we propose here in the two districts with high levels of connections to outside sources of research (districts 1 and 2). Sampling the two districts that have high levels of connection to external sources of research makes it more likely that districts will have multiple external partners, enabling us to investigate how features of the external organizations and the nature of their interactions with district subunits influence research use. Although our study is particularly interested in the variability in absorptive capacity between subunits *within* districts, selecting two districts that vary in one dimension of absorptive capacity makes it more likely that absorptive capacity will vary not only within districts but between them as well. Further, the NCRPP team will not only survey 30 major urban school districts to select these districts, they also will survey a nationally representative sample of district and school leaders in 1,000 school districts. As a result, we will be able to locate the two districts we select for our study in a nationally representative sample of districts across the country.

Methods

In both districts, we will collect data for eighteen months beginning January 2016. This time frame will enable us to observe multiple cycles of decision making in a given district and provide the opportunity to investigate work with external partners over time. To address our research questions, we will draw on interviews, ethnographic observations, artifact analysis, and a survey that includes social network analysis (see table 2).

It is often an effective practice to include a way for reviewers to clearly see how the research questions map to the proposed data collection and analysis.

Table 2.	Research	Questions,	Data	Sources,	and	Analysis
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	Research Questions	Data Source/Method	Analysis
1.	What is the absorptive capacity of district subunits?	 Interviews with district leaders Survey Artifacts 	• Triangulate qualitative coding of observations, artifacts, and interviews with quantitative analysis of survey data, including intra-district social network analysis
2.	What are the organizational characteristics of and the nature of guidance given by external providers involved with the district in mathematics and ELA?	 Interviews with external providers and district leaders Observations of meetings between district leaders and providers Survey Artifacts 	Triangulate qualitative coding of observations, artifacts, and interviews with quantitative analysis of survey data, including inter-organizational social network analysis
3.	What is the nature of the interaction between external organizations and district subunits?	 Interviews with external providers and district leaders Observations of meetings between district leaders and providers Survey Artifacts 	 Qualitative coding of observations, artifacts, and interviews Survey and social network analysis
4.	How do subunit absorptive capacity, the qualities of the external provider, and the nature of the interaction between subunits and external providers influence how district leaders use research in their efforts to respond to CCSS?	 Interviews with district leaders and external providers Observations of district meetings and meetings between district leaders and providers Survey Artifacts 	 Qualitative coding of observations, interviews, and artifacts Survey analysis Qualitative Comparative Analysis (QCA) to integrate quantitative and qualitative analysis
5.	What are the consequences of research use for subunit learning?	 Observation of district meetings Interviews from district leaders Survey Artifacts 	• Triangulate qualitative coding of observations, artifacts, and interviews with quantitative analysis of survey d

Interviews. We will begin by interviewing all district leaders in each district who are engaged in elementary mathematics and ELA. These leaders likely include representatives from curriculum and instruction offices, assessment, special education, English Language learners, and state and federal

programs, as well as divisions or zones that directly supervise elementary schools. They may include front-line professional development providers, directors of departments, and cabinet-level leaders, including the superintendent. Based on our earlier William T. Grant study, and given the size of districts we intend to sample, we estimate that there will be between twenty-five and thirty-five leaders per district that meet this criterion.

Successful proposals with qualitative work include details on the rationale for sampling, data collection processes, and proposed analytic techniques.

Interviews will be semi-structured (Patton, 1990) and address district leaders' work on CCSS implementation in mathematics and ELA at the elementary level, the four organizational conditions conducive to absorptive capacity, perceptions of external organizations, nature of interaction with external providers, and reflections on meetings that we observe (research questions 1–4). We also will design a set of questions related to the focus of subunits' work related to CCSS to elicit each leader's knowledge and understanding of subject matter, teacher learning, and district change (research questions 1 and 5). We will ask this same battery of questions at three points across the study to track shifts in knowledge and understanding about the elements of CCSS implementation in which they are engaged (research question 5). In our earlier William T. Grant–funded study, this strategy was quite effective in eliciting and charting the distribution of knowledge and development of shared understanding related to middle school mathematics instruction (the focus of that study). Finally, we will ask district leaders about policies and formal and informal ways of working across subunits for insight into shifts in routines and policies (research question 5). We will audiotape and transcribe all interviews.

During initial interviews, we will ask each leader to identify external providers involved in the district subunit related to elementary ELA and mathematics. Based on our earlier William T. Grant study and the fact that we are sampling districts with high levels of connection to external sources of research, we estimate that there will be up to six external partners per subject area spread across different subunits (n=12 per district). We then will interview the lead staff person at each external partner organizations, asking questions about the organization's work with the district related to CCSS and the nature of the guidance that they provide (research question 2). We then will sample three external organizations per subject area per district for more in-depth study (n=6 per district). We will eliminate any providers that do not provide research-based guidance and then select providers such that we have multiple providers who work with the same unit (to investigate the role of the characteristics of the external provider while holding subunit capacity constant) and providers that work with multiple units (to investigate the role of subunit absorptive capacity while holding providers constant). If possible, one of the six providers will work with subunits in both mathematics and ELA. We will interview sampled external providers and district leaders who work with them three more times throughout the study to gain information about their work together, the structures in place for interacting with each other, their organizational norms and ways of working, and reflections on interactions that we observe (research questions 2 and 3). Conducting multiple interviews is an important data collection strategy as it builds trust with informants who then open up more over time. It also provides an opportunity to track the work as it unfolds over time.

Ethnographic observations. We will travel to each district seven times across eighteen months. Ethnographic observations will focus on two sets of interactions: (1) when the subunits are working with the external providers (research question 3); and (2) district meetings related to CCSS planning and implementation (research question 4). We will videotape observations when possible; however, our experience in the earlier study was that district leaders are not always comfortable with videorecording given the sensitivity of the discussion. To enable access to a greater number of meetings, we will use ethnographic field notes during those meetings in which videotaping is inappropriate (Goetz & LeCompte, 1984; Lofland & Lofland, 1995).

We will observe up to three interactions between district leaders and each sampled external partner (depending upon how frequently external providers meet with district leaders). We will observe such occasions as planning meetings, professional development sessions, or when external partners attend district meetings. Observations will focus on how the interaction is structured (who plays what role), the nature of the task that they are doing together (e.g., providing feedback, coordinating, co-designing), and the content of the interaction (e.g., substance of guidance). We will observe in-person meetings between external partners and district leaders if they happen while we are in the district. However, we also will observe planning meetings that happen via Skype or conference call, something we did with great success in our earlier William T. Grant study.

During each visit, we will observe any planning meetings related to mathematics and ELA, including but not limited to cabinet meetings, meetings among leaders of curriculum and instruction and the district leaders supervising elementary schools, and planning meetings for professional development or other forms of teacher support in mathematics and ELA. We will attend to the kind of evidence that is invoked, focusing on when and how district administrators invoke research-based advice that emerged during interaction with partners as part of discussions related to mathematics or ELA (research question 4).

Artifact Collection. We will collect a full range of district artifacts related to mathematics and ELA instruction, including policy and planning documents and agendas and materials from meetings we observe. We also will collect the full range of artifacts from external providers, including any materials they provide to district personnel, background information about their organization and approach, research or research summaries, and agendas and materials used when they meeting with district leaders. These documents will help us understand the guidance they provide to the district and contribute to our understanding of the nature of their interaction with the district (research questions 2 and 3). Artifacts also will help us triangulate meeting observation and interview data (research questions 3 and 4) and contribute to our ability to track the ways in which guidance from external providers make their way (or not) into districts' policies and routines (research question 5).

Survey. In January 2017, we will administer a survey to all district staff involved in decision making related to elementary ELA and mathematics. The survey will include measures of research use and formal meetings from the NCRPP survey administered as part of site selection (research questions 1 and 4). These items are currently in development by NCRPP researchers. To ensure that scores from the research use items can be validly used to characterize and compare the distribution for district and school leaders, NCRPP researchers (led by Derek Briggs, measurement specialist at the University of Colorado Boulder) will use a Partial Credit Model (PCM; Masters, 1982) to ensure that the scores generated from a nationally represented survey of 1,000 school and district leaders are reliable enough to

distinguish individuals who are qualitatively distinct from one another. To ensure that the score on items are associated with external information about respondents in a predictable manner, NCRPP researchers also will undertake a focused study with a subset of respondents who take the survey and are also interviewed or observed in district meetings.

In addition to the NCRPP survey items, the survey will include the measures related to subunit absorptive capacity, the qualities of external partners, inter-organizational routines, and collective knowledge, routines, and policies developed or refined in Phase I (research questions 1-5). Finally, it will include two sets of social network items. One set will explore intra-district social networks (within and between district subunits), an important dimension of absorptive capacity. Here, we will provide district leaders with a roster of all district-level staff members involved in elementary ELA and mathematics decision making and ask them to identify the individuals whom they have worked with to plan and make decisions about CCSS implementation (research question 1). A second set of social network items will gather information on social networks between district leaders and the full range of external partners present in the district (beyond those we sample). This analysis is necessary to investigate the nature of social interaction between district leaders and external providers (research question 3). For this part of the survey, we will provide district leaders with a roster of relevant personnel from each external provider active in the district and ask them to select who they seek out for guidance related to CCSS implementation. For each person identified in both sets of items, we will ask questions designed to determine the subject area focus of their interactions (i.e., mathematics or ELA), the strength of interactions (i.e., tie frequency and trust), the types of knowledge or information exchanged, and why they turn to this person for guidance (i.e., flexibility, adaptability).

We also will administer a survey to all staff from the external organizations that interact in any way with the district (beyond those external organizations in our subsample). We will include items related to the nature of guidance they provide to the district, the organization's characteristics (e.g., flexibility/adaptability, norms), and interorganizational routines with the district (research questions 2, 3). Like the survey for district leaders, this one will include social network items as well. Each person from the external organizations will be provided with a roster that includes all the district leaders and staff from all other external

Reviewers appreciate "guideposts" to clearly connect specific items to relevant research questions.

providers active in the district. They will be asked to select the individuals to whom they have provided assistance related to CCSS implementation (research question 3). For each person they identify in both sets of items, we will ask questions designed to determine the subject area focus of their interactions (i.e., mathematics or ELA), the strength of interactions (i.e., tie frequency and trust), and the types of knowledge or information exchanged.

We will obtain human subjects approval from our respective universities and from the district research offices in accordance with their requirements. We will draw on fieldwork strategies developed in our earlier study, in which we successfully built productive and trustworthy relationships with district leaders and gained access to a variety of internal district meetings. In the survey administration, we will use IRB-approved incentives to maximize response rates, including gift cards and inclusion in a lottery. To ensure confidentiality, we will not name any individuals, districts, or external providers. We will take care to mask the identity of individuals when the findings are challenging or sensitive. As Coburn has done in the past in these situations, we also will share direct quotes with particular respondents when it

is likely that others will be able to identify the respondent from the quote. If respondents are uncomfortable with the quotes, we will find another way to represent the finding that will put individuals at lower risk. Overall, our strategy will be to be open and transparent with project participants throughout the research process so that they are aware of the findings we uncover and so that we have a better understanding of which findings may put participants at risk so that we can take steps to protect them in any written or oral representations of findings.

Phase II Data Analysis Plan

Data analysis and data collection will be iterative. All interviews transcripts, field notes from observations, and artifacts will be loaded into Dedoose qualitative data analysis software program. We will use Stata, UCINET, and ORA-NetScenes to analyze survey data. Because there is likely to be variability in capacity and connections to external providers by subunit, the district subunit–external organization dyad will be our main unit of analysis.

Research questions 1 & 2. To answer the first two research questions (subunit absorptive capacity and the qualities of the external provider), we will analyze each district subunit and external organization individually. To analyze interviews and artifacts, we will use a hybrid approach to coding (Miles & Huberman, 1994). That is, we will begin with a priori codes developed during Phase I but also derive emergent codes inductively for new understandings that were not anticipated prior to new data

collection. To do so, we will begin with codes that describe, with little interpretation, the phenomenon of interest. By grouping together categories and using the constant comparative method (Strauss & Corbin, 1990) we will move to progressively higher levels of abstraction until we end up with a final list of codes. We will establish inter-rater reliability by randomly selecting 10 percent of all relevant data and having two analysts code separately. We will engage in further training and refining of coding guides until coders are able to gain acceptable rates of inter-rater reliability (.70 or higher).

Successful proposals include detailed information on the elements such as the proposed data coding.

As described earlier, we will begin our survey analysis by using item response modeling (Wilson, 2005) to investigate the fit of our survey measures related to absorptive capacity and qualities of external partners to the construct map. Since item response modeling is not an appropriate tool for social network analysis, we will examine social network items separately by calculating knowledge diversity (i.e., network range), density, and tie strength within and between subunits for both ELA and mathematics. We then will calculate descriptive statistics for all measures related to research questions 1 and 2. We will triangulate survey measures with our qualitative analysis for each subunit–external partner dyad.

Research question 3. To answer the third research question (the nature of the interaction between district subunits and external partners), we will again focus on the district subunit– external organization dyad. For each dyad, we will conduct descriptive analysis of survey items related to inter-organizational routines from the district leaders and external partner surveys to identify their frequency and focus. We then will analyze our observations of these routines to investigate these patterns in more depth, using one of the two observation protocols refined during Phase I. We will identify when and how research-based guidance is invoked, as well as the nature of the task, rules and roles of external partners and district participants, and norms of interaction. All data will be coded by two researchers. We will ensure inter-rater reliability of .70 or higher, using procedures described above. We will draw on interviews of

district leaders and external partners for insight into their experiences of and reflections on the interorganizational routines we observe. An analysis of all artifacts invoked or used during the meeting will deepen our understanding of the nature of research-based guidance in play during the routines.

To investigate informal social interaction, we will analyze social network items to examine network density, network range, centrality, and tie strength separately for ELA and mathematics networks. We will block-partition the data into district subunits and external partners and compare the density of ties between each dyad. We will examine network range based the diversity of external partners to which each subunit is connected. We will calculate degree centrality for all district leaders, generating subunit averages to assess how well connected subunits are to external partners. We will examine the strength of ties for each dyad by calculating the average reported tie frequency and levels of trust present among actors in the network, standardized for network size.

Research question 4. To answer research question 4 (how does subunit absorptive capacity, qualities of the external provider, and the nature of interaction between subunits and external providers influence how district leaders use research in their efforts to respond to CCSS?), we will rely on descriptive survey analysis of the NCRPP measures of research use to ascertain the level of research use in each subunit. We will calculate individual measures of research use for all district leaders in the sample and then estimate the mean level for each subunit.

To understand the role that research plays in the deliberative process in more detail, we will leverage our qualitative data to trace the ways that research-based guidance from external partners enters into district deliberation and debate. For each dyad, we will identify major research-based guidance that was promoted by the external organization. To do this, we will analyze artifacts collected from the external organizations, interviews with both external partners and district leaders about the nature of their work with one another, and observational data from interaction between the subunit and external partners to identify key findings, research-informed advice, or research-based tools invoked or used. We then will investigate the degree to which and how these ideas and recommendations figure into district leaders' discussions, planning, and deliberation related to CCSS, using the second observation protocol developed in Phase I. We will first code each meeting observation separately. However, we know that decisions are made, policy is formed, and plans are developed in nonlinear ways that unfold over multiple meetings (Weiss, 1980). Therefore, we will link analyses of individual observations in a given subunit together so that we can understand how engagement with research-based guidance in one meeting fits into an overall decision trajectory (Coburn, Allen, Penuel & Farrell, 2014). This strategy, which we used successfully in our earlier William T. Grant-funded study, will enable us to account for the fact that invocations of research in one meeting may become salient only much later, or research that appears influential in one meeting may later recede from view. This approach promises to yield a much more accurate assessment of the nature of research use in district decision making than is possible with the analysis of single meetings. We then will draw on interview data for insight into the attitudes and assumptions that district leaders brought to the deliberation, which will be useful for identifying conceptual use of research. All observation data will be coded by two researchers. We will ensure interrater reliability of .70 or higher, using the procedures described above.

Once we have identified patterns of research use in a given subunit–external partner dyad, we will use an analytic technique called Qualitative Comparative Analysis (QCA) to investigate the relationships between subunit absorptive capacity, the qualities of external partners, the nature of interaction between district leaders and external partners, and research use by district leaders.

QCA uses Boolean algebra to investigate complex social phenomenon when there are a small number of cases and a large number of relevant dimensions (Ragin, 1987; Rihoux & Ragin, 2009). The approach is also useful for integrating data from multiple sources and methods. QCA is rooted in an assumption of multiple conjunctural causation. That is, it assumes that more than one configuration of conditions can lead to a given outcome. As such, it seeks to identify multiple, unique combinations of conditions that are associated with a given outcome (Rihoux & Ragin, 2009). By using QCA, the researcher does not "specify a single causal model that fits the data best," but instead "determine[s] the number and character of the different causal models that exist among comparable cases" (Ragin 1987, p. 167).

QCA uses the *fs*QCA software to facilitate analysis. For each dyad, we will include in the model our qualitative and quantitative assessments of absorptive capacity and qualities of the external partner from research questions 1 and 2, our analysis of inter-organizational routines and informal social networks from research question 3, and whether the dyad is focused on reading or mathematics. We will use *fs*QCA to investigate the relationship between these constructs and the use of research in subunit deliberation. We then will compare results across subunits and across districts. QCA is designed to facilitate a continual dialogue between theory and data to inform each analytic step. As such, it is especially useful for drawing on case-study data to generate or elaborate theory (Rihoux & Ragin, 2009). Therefore, we will move between findings from QCA and our full corpus of data, generating analytic memos that draw on data to explain and illustrate the patterns that emerge from the QCA analysis (Miles & Huberman, 1994).

Research question 5. Finally, we will analyze the relationship between research use and collective knowledge, policy, and routines at the subunit level to ascertain the consequences of research use for subunit learning. We will build on our analysis of the nature of guidance offered by external provider to the subunit (described earlier), investigating if and how these ideas, and the meaning that district leaders made of them in deliberation, are reflected in collective knowledge, policies, and routines. To investigate if and how key ideas are reflected in district leaders' knowledge and understandings, we will compare district leaders' answers to questions related to CCSS implementation designed to elicit knowledge and understanding related to mathematics/ELA instruction and CCSS at the three different time points. We will investigate if and how any shifts in answers reflect key research-based guidance or recommendations from external partners. To investigate the relationship between research-based guidance from a given provider and district policies, we will conduct systematic analyses of subunit documents, analyzing the presence or absence of key ideas and recommendations from external providers.

For example, by analyzing successive versions of a policy document in our earlier William T. Grant foundation study, we were able to show how research-based guidance from one external provider was reflected in district deliberation we observed and then appeared in subsequent iterations of the policy. We will triangulate our analysis of artifacts with information on the development of new policies, rules, and guidelines from interviews with district leaders.

To investigate the degree to which research-based guidance is associated with shifts in subunit routines, we will analyze interviews, artifacts, and observations to identify any shifts in the way that district leaders work with one another and schools to implement CCSS. We then will investigate the degree to which these shifts reflect research-based guidance. For example, if the district subunit spent time working with an external provider on developing new processes for school walkthroughs, we would

analyze the degree to which the new walkthrough process reflected subunit deliberation and the guidance from the external provider.

We then will situate this micro-level analysis of our qualitative data within broader patterns from the surveys. After conducting principal factor analysis on survey items related to collective knowledge, policy, and routines, we will calculate an average for each construct per subunit. We will explore the relationship between measures of research use from research question 4 and learning at the subunit level using Spearman's rank order correlation given the small sample size (n<15). We then will use matrices and other data displays to systematically compare the association between district research use and shifts in knowledge, policies, and routines across subunit–external organization dyad within a district, between those focused on ELA and those focused on mathematics, and between districts.

Potential Impact

This study will contribute to scholarship on research use by investigating the role of organizational capacity. This key condition of research use has rarely been the focus of systematic empirical study (Coburn & Stein, 2010), remaining a missing piece in the growing body of scholarship on research use (Davies & Nutley, 2008). By drawing on and elaborating the concept of absorptive capacity, this study not only brings a more robust conceptualization of what the capacity to use research entails, it also will identify specific organizational conditions that foster it, thus providing points of leverage for practitioners, policy makers, and external organizations that seek to build this capacity.

Second, this study highlights the learning dimensions of the research use process. Rather than conceptualizing research use as knowledge translation or adoption of research-based innovations (Whitehurst, 2003), we investigate research use as an interactive process in which organizations make sense of information and construct new knowledge through activity and social interaction (Zahra & George, 2002). In so doing, this study promises to open the black box to investigate the nature of external provider–school district interaction and the microprocesses of meaning making among district leaders, processes that are obscured by the linear, unidirectional metaphors that dominate scholarly studies of research use.

Third, this study will contribute to our understanding of the role of external organizations in fostering research use in instructional decision making. By investigating and systematically comparing a diverse set of organizations that provide research-based guidance to school districts, we will uncover how features of an external organization and the nature of its interaction with the district influences the district's ability to draw on and use external knowledge in productive ways. This analysis will also contribute to scholarship on absorptive capacity more broadly.

Most research on absorptive capacity in organizational studies treats all external knowledge as equal (Jansen, Van den Bosch, & Volberda, 2005; Volberda et al., 2010), failing to investigate how features of the external partner matter for an organization's ability to use knowledge. By investigating how absorptive capacity interacts with variation in the source of external knowledge and the nature of the relationship between organization and external partner, we will extend research and theory in this domain.

Fourth, this study will contribute to scholarship on the implementation of instructional policy. Common Core State Standards is an ambitious policy that likely will impact schools and school districts for years

to come. We know from prior research that school districts play a crucial role in mediating state and federal policy, shaping how implementation unfolds in schools (Hightower, Knapp, Marsh, & McLaughlin, 2002; Marsh, 2002; Spillane, 1996, 1998; Rorer, Skrla, & Scheurich, 2008). Our research will shed light on the role played by external partners and their research-based guidance in this mediation process, further explicating how and why districts make the choices they do as they make and implement policies that have consequences for teaching and learning in schools and classrooms.

Finally, this study will impact practice. By identifying specific organizational conditions in school districts that promote absorptive capacity, this study highlights key points of leverage for practitioners and policy makers that seek to increase districts' ability to engage with research knowledge—or, indeed, any source of external guidance—in productive ways. By investigating the specific features of external organizations and of inter-organizational routines that support learning, this study provides valuable insight to external organizations seeking to design new ways of working with school districts. Insight into these elements also promises to help district leaders think strategically about when and under what conditions work with an external partner is likely to be productive, given their existing capacity.

Anticipated Products and Communication Plan

We will leverage our leadership in two funded Centers for our outreach and dissemination efforts. First, we will tap into outreach efforts for the IES-funded NCRPP Center. We will develop case materials based on study findings that share lessons and examples of organizational learning and partnering with intermediary organizations that we will post on the NCRPP website. We will participate in and provide material for an NCRPP conference for practitioners, hosted by Center for Education Policy Research (CEPR) at Harvard University. The goal of the conference is to share findings from the Center's studies, work collaboratively with practitioners to set an agenda for future research, and design dissemination strategies intended for a broader audience of policy makers and practitioners. Second, our research team will leverage participation in the NSF-funded Research + Practice Collaboratory. We will share findings and case materials on the Collaboratory website. We will also participate in professional meetings and networks that the Collaboratory convenes. These initiatives are specifically focused on assembling and sharing resources for bridging research and practice.

Beyond work with NCRPP and the Collaboratory, we will submit manuscripts to peer-reviewed journals such as the *American Educational Research Journal, Educational Evaluation and Policy Analysis, American Journal of Education,* and *Teachers College Record.* We will use conference papers and presentations at AERA (a research audience), APPAM (a policy audience), UCEA (a leadership audience), and W.T. Grant grantee meetings to develop and refine the ideas that will form the core of these manuscripts. To reach practitioners, we will develop companion pieces to academic journal articles for publications that reach district leaders, like *Educational Leadership* and *Phi Delta Kappan.* We also will produce at least two policy briefs aimed at policy makers and funders.

Finally, we will use social media and other communication strategies to disseminate findings and lessons learned. Both Penuel and Farrell are active on Twitter. Coburn and Penuel will write blogs, lead webinars, and meet with policy makers as they have done as part of their earlier William T. Grant–funded project.

Timeline

In Phase I of the project (July 2015–August 2017), we will analyze data from our earlier William T. Grant-funded study in order to operationalize key constructs, refine our conceptual framework, and develop and refine instruments. In Phase II of the project (January 2016 – December 2017), we will collect and analyze data in two new strategically sampled districts. This new data collection will take place from January 2016 through June 2017. In the final six months of the study, starting July 2017, we will analyze data, write final reports to sites, and prepare final articles for publication. The project will be completed by December 2017. See table 3 (next page) for additional detail.

Staffing Plan

Redacted from this proposal is a detailed description of the proposed research team and the skills and experiences they bring to the specific activities in the project.

Table 3: Timeline

	Jul-Sept	Oct-Dec	Jan–Mar	Apr–June	Jul-Sept	Oct-Dec	Jan–Mar	Apr–June	Jul-Sept	Oct-Dec
	2016	2016	2017	2017	2017	2017	2018	2018	2018	2018
Phase I										
Analyze qualitative data from earlier study	Х	Х								
Develop and pilot iv protocol	Х	Х								
Adapt and pilot obs protocol	Х	Х								
Analyze survey data from earlier study				Х	Х					
Develop and pilot new survey items				Х	Х					
Prepare manuscript		Х	Х	Х	Х					
Phase II										
Initial interviews with district leaders			Х							
Initial interviews with external partners			Х							
Sample external partners for in-depth study			Х							
Additional interviews with district leaders and external partners				Х		Х		Х		
Observations			Х	Х		Х	Х	Х		
Survey							Х			
Data analysis				Х	Х	Х	Х	Х	Х	Х
Conference presentations				Х		Х		Х		
Feedback to districts										Х
Prepare manuscripts for publications					Х	Х	Х	Х	Х	Х
Prepare case materials for websites					X	X	Х	Х	Х	X
Reports to Foundation					X				X	X

Appendix A: The National Center for Research in Policy and Practice

The IES-Funded National Center for Research in Policy and Practice (NCRPP), launched on July 1, 2014, is a 5-year project to develop and validate measures to document research use in schools, understand the conditions under which research is used in schools and districts, and identify and examine researcher practices that are associated with greater use of research in schools and school districts. The Center will also engage in leadership and outreach activities that will help school and district leaders apply study findings, including interactive meetings and use of technology to foster meaningful exchange among researchers, practitioners, and other stakeholders on how research can best be used to improve school performance and student outcomes. The focused program of research for the Center comprises three studies.

1. Measurement Study. The purpose of the measurement study is to develop tools for observing and measuring research use in schools and school districts. The Center will develop a set of survey measures and observation protocols that will focus on research use. All measures will be iteratively developed. Both a small pilot test and a field test will be used to validate the survey measures. For the small pilot test, 200 school instructional policy decision-makers will complete the survey. For the field test, 1000 school instructional policy decision-makers from the largest districts in the U.S. will complete the final version of the survey. The research team will assess the validity and reliability of the survey instruments in measuring school and district leaders' research use, and the variation in the ways district and school leaders use research in their decision-making practices. They will assess the validity and reliability of the observational protocol by generating inter-rater reliability scores, and triangulating evidence from protocol coding and interviews with participant.

2. Reading and Math Instructional Decision-making in Practice: Enablers and Inhibitors of Research Use in Local Education Systems. In this descriptive study, the Center will examine both the extent to which and how research is used in instructional decision making in local school districts. In this 18-month comparative case study, researchers will select four districts to investigate their decision-making processes using the survey developed in the measurement study. Each district will have different research use characteristics: (1) one will be low on connections to outside sources of research and low on organizational conditions that enable research use; (2) the second will be low on connections to outside sources of research and high on organizational conditions that enable research and low on organizational conditions that enable research use; and (4) the fourth will be high on connections to outside sources of research and high on organizational conditions that enable research use. In addition to the survey used for site selection, data collection will include interviews and observations with central district office personnel and school level personnel.

3. Research Use in Research-Practice Partnerships. In this descriptive study, the Center will examine purposeful attempts to increase research use in research-practice partnerships. Research-practice partnerships are long-term collaborations between practitioners and researchers that are organized to investigate problems of practice and solutions for improving the

outcomes of educational systems. The Center will use a mixed-method, cross-case design to examine three different types of research-practitioner partnerships: research alliances; design research partnerships; and networked improvement communities. Data collection will include interviews with district personnel, observations of meetings, phone interviews with researcher partners, and surveys developed in the measurement study.

The Center also involves leadership and dissemination activities. In 2017, the Center will hold a conference (hosted by the Center for Education Policy Research [CEPR)] at Harvard University) to present findings from the Center's studies and to consider future directions for research. The Center will also build a website that targets the needs of district leaders, principals, and researchers, which will include findings from research presented using practitioner-friendly formats, and academic working papers. The website will also include links to published research and a repository of measures developed as part of the study. Finally, the website will include links for novice researchers and graduate students that include readings in the field of research use.

Finally, the Center, in cooperation with CEPR, will develop a training module to support the use of research in decision making. The training module will use a case-based approach to teaching based on the findings from the Center's studies. The training module will also include training in using the measures developed by the Center. CEPR will use the training module for the current and future cohorts of fellows in their Strategic Data Project Fellowship program. The training module will also be available on the Center website.

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