

## A. Significance of the Focused Program of Research

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### **Focal Practical Education Problem for the Research**

High-quality educational research that could shed light on effective policies and practices is increasingly accessible to districts and schools. Since its establishment in 2002, the Institute of Education Sciences (IES) at the U.S. Department of Education has funded dozens of field-initiated efficacy and scale-up studies of interventions, released multiple evaluation studies of major policy initiatives, supported rigorous studies of programs through the Regional Educational Laboratories, and funded training grants to prepare new scholars to conduct more scientific research in education. Efforts such as the What Works Clearinghouse, Doing What Works web site, and syntheses of research presented in practice guides, are all efforts to increase access to scientific research.

Providing access is only the first step to improving student outcomes. Districts and schools must then use this research to improve the quality of learning opportunities they provide to students. At present, there is a small body of inquiry on how district and school leaders use research. The results from such studies are consistent: research is rarely used, and not in the linear fashion imagined by most (Coburn, Honig, & Stein, 2009). Research use involves *interactive* processes, including contention, persuasion, negotiation, and sensemaking (Amara, Ouimet, & Landry, 2004; Contandriopoulos, Lemire, Denis, & Tremblay, 2010; Earl, 1995). It requires leaders to make sense of conclusions, deliberate about their relevance to the current context, and create policies that reflect agreements about what the research suggests they should do in that context.

We need to understand much more about the interactive processes involved in research use, or what Tseng (2007) has called “the demand side” of research use before we can improve district and school leaders’ research use. We need measures of research use to track progress at both the central office and school levels. We also need to understand better how school and district leaders currently use research. It is only by understanding how these local leaders actually make decisions, and the role of research in this process, that we can begin to design interventions that promote more effective uses of research. And, finally, we need more research on existing strategies to promote research use. Today, there are a number of efforts to foster stronger partnerships between researchers and practitioners as a strategy to increase research use (Coburn, Penuel, & Geil, 2013), but little is known about the role of partnership research in decision making.

### **Overview of Research and Leadership Activities**

Our proposed *Center for the Study of Interactive Knowledge Utilization* will address these gaps in our knowledge. Our center will:

**Develop a set of tools for measuring and observing research use** in schools and districts. These tools will include a survey instrument, interview protocols and observation scoring guides that will facilitate studies on research use in districts and schools. We will employ rigorous methods to develop each tool and generate evidence of validity and reliability of different intended score interpretations and uses. The measurement studies will address the following questions:

*Measurement Question 1: To what extent can surveys be used to validly and reliably characterize school and district leaders with respect to their use of research to inform policy and practice?*

*Measurement Question 2: How do district and school leaders from a representative sample of 600 large and mid-sized districts vary in the way they describe their use of research in decision-making practices?*

*Measurement Question 3: Can trained observers reliably and validly identify types or applications of research use within meetings where district leaders make decisions?*

**Conduct a descriptive study** of the extent to which and how research is used in instructional decision making in four large urban districts. We will also investigate the individual, organizational, and environmental factors that enable or inhibit this use. We ask the following research questions:

*Study 1 Question 1: What role does research evidence play in how district leaders make decisions about instructional policy and programs in mathematics and reading?*

*Study 1 Question 2: What individual, organizational, and environmental factors enable or constrain research use by district and school leaders?*

**Conduct a second descriptive study** that will investigate purposeful attempts to increase research use by promoting greater interaction between researchers and practitioners. Research-practice partnerships are collaborations between practitioners and researchers that are intentionally organized to investigate problems of practice and solutions for improving district outcomes. We plan to compare research use in three different types of partnerships: one whose primary purpose is to evaluate policies and programs (research alliances), a second where the purpose is to design for instructional improvement at scale in single districts (design research partnerships), and a third where the purpose is to support rapid, continuous improvement in a network (networked improvement communities). Our research questions are:

*Study 2 Question 1: How does participation in research-practice partnerships enable research use in district decision-making in mathematics and science, if at all?*

*Study 2 Question 2: How does research use vary by the design of the partnership?*

**Promote findings through leadership and outreach activities.** We will partner with national organizations of mathematics and science—The National Council of Supervisors of Mathematics (NCSM) and Council of State Science Supervisors (CSSS)—to reach district leaders in mathematics and science via their existing networks and conferences. We will collaborate with the Center Education Policy Research (CEPR) at Harvard to develop a training module for district assessment and evaluation leaders related to research use that synthesizes findings from the descriptive studies into cases for their own professional learning and reflection. CEPR will organize a research conference designed to promote partnerships to plan research studies that extend our own research.

The Center's studies and leadership and outreach activities are intended to complement one another. Our measurement and observation work will provide common data collection tools for both descriptive studies, while the descriptive studies will provide rich qualitative data to help us evaluate the strengths and weaknesses of instrumentation developed in the measurement studies. Study 2 builds from Study 1 by moving from an exploration of possible mechanisms that enable or constrain the use of research when decision-makers interact, to examining research-practice partnerships where the specific intent is to have a positive effect on research use.

## **Key Ideas Informing the Design of Research Studies**

The interlocking studies we propose here are rooted in five key ideas that emerge from the existing research base on decision making in schools and districts. These ideas provide a rationale for the constructs we propose to capture in the measurement study. They provide a foundation for the research designs in the two descriptive studies.

**Key Idea 1: There are multiple ways to use research productively.** When policy makers and others encourage school and district leaders to use research in their ongoing work, they often envision that they should use research directly and centrally to make decisions related to policy or practice (B. L. Johnson, Jr., 1999; Sharkey & Murnane, 2006; Weiss, 1980). Weiss (1980) describes this image, which she calls instrumental use, in the following way:

A problem exists; information or understanding is lacking either to generate a solution to the problem or to select among alternative solutions; research [or other forms of evidence] provides the missing knowledge; a solution is reached (pp. 11-12).

However, studies of research use indicate there are multiple ways that research findings can contribute productively to decision making. Research can influence decision making by focusing attention on issues that were previously unknown to decision makers (Penuel & Means, 2011), identifying opportunities for improving current programs and policies (Hubbard, 2010), or by providing information about the plausibility of policy theories of action (Dwyer & Makin, 1997).

Implications for Center Research: *Research use is a multidimensional phenomenon. Measurement of research use must attend to the multiple ways that decision makers use research.*

**Key Idea 2: Research use is an interactive process.** Empirical research on decision making in a range of settings suggests that it is a highly interactive process, involving many people in and across a series of meetings (e.g. task forces, committees, teams) and informal conversations (Hannaway, 1989; Kennedy, 1982; Majone, 1989; Weiss, 1980). Individuals interact across settings to define problems, interpret research, and identify solutions in a process that involves deliberation, negotiation, and persuasion (Asen, 2011; Coburn, Toure, & Yamashita, 2009).

Implications for Center Research: *Measurement studies must address the question of how well different sources of data can capture the interactive processes of research use. Descriptive studies are needed to characterize the dynamics of interaction when research is being used for decision making.*

**Key Idea 3: Attitudes and skill can support or impede research use.** Even the best practice guides and practitioner research syntheses cannot tell a decision maker exactly what to do. Decision makers must actively make meaning of the conclusions of research and construct implications for action in their own context. Research indicates that attitudes and skill of individuals can shape the meaning making process in ways that act as supports or barriers to research use.

*Attitudes.* Individuals differ in their attitudes about the value of using research to guide decision making. These include judgments about qualities that have been linked to research use: the relevance, usefulness, comprehensibility and trustworthiness or credibility of research (K. Johnson et al., 2009). In addition, an individual's disposition to seek out research is another potential support to research use. Studies of research use by government professionals in Canada

have linked research use to “acquisition effort,” which refers to an individual’s initiative to acquire research relevant to particular problems and to establish relationships with researchers (Landry et al., 2003).

*Skill.* The skills required to interpret research findings include the ability to find research that can answer leaders’ own questions, to distinguish different kinds of research designs with respect to their adequacy to answer those questions, to recognize issues related to sampling, to judge the appropriateness of measures, and to judge whether conclusions and recommendations are warranted by the evidence presented. In an ongoing study of research use by PIs Penuel and Coburn in three districts, district leaders report that one key barrier is the perception that others are more skilled in interpreting research than they are. A number of studies of data use show that school and district leaders’ skill in posing questions of and making sense of patterns in achievement data can either support or impede the use of data in decision making (e.g., Makar & Confrey, 2005; Means, Padilla, DeBarger, & Bakia, 2009).

*Implications for Center Research: Survey instruments must collect information about individual characteristics that are related to research use. Descriptive studies must explore how individuals’ contributions to interactions involving research vary in relation to individual characteristics.*

**Key Idea 4: The organizational context of schools and districts can support or impede research use.** Research use in schools and districts unfolds in complex organizational environments. Most districts have highly complex and departmentalized organizational structures. Decision making related to instruction is often stretched across multiple units in the central office and levels of the system. Different district subunits have individuals with different disciplinary backgrounds and connections to external sources of research (Spillane, 1998), resulting in attitudes toward research use that vary systematically by division and level (Coburn & Talbert, 2006). Patterns of within-level (e.g., district office) and cross-level (e.g., between districts and individual schools) interaction may support or impede research use. For example, Finnigan and colleagues (Finnigan, Daly, & Che, 2013) found that limited interaction between the central office and schools led to superficial uses of research at the school level.

We also know that the presence of organizational routines (e.g., meeting structures, procedures for selecting materials) and tools (e.g., protocols to guide deliberation, data displays) play an important role in influencing when and how evidence enters into decision-making deliberations (Corcoran, Fuhrman, & Belcher, 2001; Ikemoto & Honig, 2010; Spillane, Parise, & Sherer, 2011). While there is limited research on the role of tools and routines in enabling and constraining research use, research on data use provides a compelling argument for their import (Anderson, Leithwood, & Strauss, 2010; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Little, 2012).

There is also compelling evidence from studies of research utilization about the importance of the form in which research findings are presented. The translation of research findings into formats that are more comprehensible and useful to decision makers (e.g., IES Practice Guides) is a common strategy for increasing research utilization. Such products, or *artifacts* as we refer to them throughout this proposal, simplify knowledge, present findings in plain language, or provide precise recommendations for practice, which may help policy makers use them more easily (Choi, McQueen, & Rootman, 2003; National Research Council, 2012). In studies of evaluation utilization, when researchers created products specifically for stakeholders, use of evaluation findings was higher (K. Johnson et al., 2009). At the same time, research findings in

medicine are mixed with respect to the effectiveness of translation as a strategy for increasing research use among clinicians (Glasgow & Emmons, 2007; Green & Seifert, 2005; Lavis, 2006).

Implications for Center Research: *Descriptive studies must explore how organizational contexts—especially organizational structure, tools, and routines—enable or constrain research use. Descriptive studies must also analyze the form of research artifacts that district and school leaders use in decision making.*

**Key Idea 5: The nature and extent of interaction with researchers shape how school and district leaders use research.** Findings from a wide range of studies point to the importance of interaction between researchers and practitioners in facilitating research utilization. These studies suggest that engagement, interaction, and communication between the two groups are critical to the use of research evidence based on accurate interpretation of research findings (Contandriopoulos et al., 2010; National Research Council, 2012). One explanation for this is that interactions with researchers provide more direct access to outside knowledge of potentially relevant research findings, and such interactions can also help leaders make sense of those findings.

Interactions with researchers can vary in form and duration. For example, a district or school leader may interact with a researcher at a professional conference or listen to a presentation at a meeting. They may exchange email with a researcher about a specific study. Other forms of interaction may be of longer duration, but happen through intermediary organizations that filter, synthesize, summarize, or spread information to decision makers based on decision makers' expressed needs. Think tanks, evaluation firms, and policy organizations are often key players in this “brokering” strategy for increasing research utilization (National Research Council, 2012).

Of increasing interest to policymakers and decision makers are 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 (Coburn, Penuel & Geil, 2012). Policymakers and funders see promise in the potential of partnerships to enable greater use of research evidence in decision making (e.g., Tseng, 2012). Advocates from within the research community argue that such partnerships can address persistent problems of practice and improve educational outcomes (Bryk, 2009; Donovan, 2013).

Implications for Center Research: *A descriptive study is needed to generate hypotheses about research use within research-practice partnerships.*

Our team is uniquely positioned to conduct this series of research studies and leadership and outreach activities. We are some of the few researchers who bring substantive experience in studying research use, a deep understanding of district and school infrastructures for improvement, and a record of constructing and developing validity evidence for measures of multifaceted constructs. The studies planned build upon research currently being conducted by William R. Penuel (University of Colorado Boulder) and Cynthia Coburn (Northwestern University) on research use in three large urban districts, on in-depth studies of the tools and routines that leaders in schools and districts use to structure data use by James P. Spillane (Northwestern University), and on the measurement experience of Heather Hill (Harvard University) and Derek Briggs (University of Colorado Boulder).

## B. Research Plan for the Focused Program of Research

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### Measurement Studies

Our measurement studies will develop a set of survey measures, interview protocols, observation protocols, and qualitative coding guides that focus on research use and possible correlates of research use. The intended users of our instruments are research and evaluation staff within school districts as well as researchers in universities. Table 2 below summarizes both the intended interpretations and potential uses of scores that derive from our survey instrument and protocols.

*Table 2. Intended Interpretations and Uses of Scores from Survey and Protocols*

<b>Source</b>	<b>What We Will Measure</b>	<b>Intended Uses of Measures</b>
Survey	Variation in <i>individuals</i> with respect to research use  Correlates of individual use, including individual differences in attitudes, skill and perceptions of context	Description and comparison of the prevalence of different kinds of research use among district and school decision-makers.  Evaluation of interventions intended to improve research use
Interview Protocols and Coding Guides	Variation in <i>individuals</i> with respect to research use  Contexts of particular instances of research use, including type of use, reasons for use, and organizational routines where use occurs	Comparing information from survey measures to interview data (triangulation)  Characterization of the role of context in research use
Observation Protocols and Coding Guides	Describing use of research in district-level decision making	Characterization of the process of data use in actual district and school settings  Comparing information from interview data to observations (triangulation)

**Research questions.** We will address the following questions:

*Measurement Question 1: To what extent can surveys be used to validly and reliably characterize school and district leaders with respect to their use of research to inform policy and practice?*

*Measurement Question 2: How do district and school leaders from a representative sample of 600 large and mid-sized districts vary in the way they describe their use of research in decision-making practices?*

*Measurement Question 3: Can trained observers reliably and validly identify types or applications of research use within meetings where district leaders make decisions?*

To answer these questions, we will engage in an iterative cycle of survey, interview protocol and observation protocol development. In the second year of the study, we will paint a descriptive picture of research use practices among individual decision-makers in mid-sized and large urban school districts. We will adapt interview and observation protocols being used in an ongoing study of research use in three districts and pilot them in the first year of the study. Finalized surveys and protocols will be made available on a project web site.

**Key constructs to be measured.** Our review of the literature suggests we will need to elicit individual responses or make direct observations related to the way that school and district leaders:

- apply research in their decision-making processes;
- value research as an important component for decision-making; and
- exhibit skill in evaluating research quality

Together, we hypothesize that these three constructs constitute the core of “research use” as a phenomenon. To be clear, we use the term “construct” to denote a unique latent variable that is the object of measurement using a set of discrete item responses. Below, we further describe these constructs and the approaches—survey, interview protocol, observation coding guide—that we will take to develop measures of these constructs. For each construct, we identify at least two sources we will use to collect data.

***Application of research.*** The focus of this construct is on the type of research use. To measure this, we will develop items and questions that elicit or record information about how frequently leaders use research for different purposes: *instrumental use*, that is, application to inform a specific decision; *conceptual use*, that is, when research is applied to induce changes in the way a person views a problem or space of possible solutions; *symbolic use*, when research is applied as a political tool to influence a decision or legitimate a decision already made; and *imposed use*, which describes research use that is mandated by policy. (Sources: Survey, Interview, Observation)

***Attitude towards research.*** Here we consider two aspects of individuals’ attitudes toward research use: their perceptions of research and their disposition to use it. We will focus on perceptions identified in prior research as related to actual research use, that is, judgments of research’s relevance, usefulness, credibility, and comprehensibility (K. Johnson et al., 2009). Another important aspect of an individual’s attitude toward research is *acquisition effort*, that is, the extent to which individuals report having sought out research or researchers with information relevant to particular decisions. Individuals’ disposition to seek out research has been linked to greater levels of research use in past studies (Landry et al., 2003). (Sources: Survey, Interview)

***Skill in evaluating research quality.*** Our emphasis here is on differences between individuals in their skill in evaluating research quality. They include the ability to find research that can answer leaders’ own questions, to distinguish different kinds of research designs with respect to their adequacy to answer those questions, to recognize issues related to sampling, to judge the appropriateness of measures, and to judge whether conclusions and recommendations are warranted by the evidence presented. Differences in these sorts of skills can help explain how individuals use data for decision making in education (e.g., Makar & Confrey, 2005). (Sources: Survey, Interview)

**Research-use covariates.** In addition to the constructs listed above, we will also use individual survey items to identify some of the more manifest characteristics of individuals (e.g., role within the organization, area(s) of the curricular responsibility, and access to research). We conceive of these manifest characteristics as covariates that could be used to predict or explain differences in the three constructs described above. Survey responses can also be used to refine our sampling approach to identify individuals within districts to focus data collection in Studies 1 and 2.

***Individual roles and authority within the organization.*** We will capture individuals’ roles, as these may condition access to and use of research. By roles, we mean their formal position

(school principal vs. curriculum and instruction director), their content specialty (e.g., mathematics, special education directors) and the responsibilities of their position. We anticipate that a school principal must make a wide range of decisions about reading, science, and mathematics, but that a mathematics curriculum supervisor has authority only in mathematics but for some larger decisions, such as what programs to require schools to adopt district-wide. At the same time, this authority is likely to vary across districts. (Sources: Survey, Interviews)

***Connections with extra-district or extra-school sources of research.*** This family of covariates pertains to access to research. We will focus on district and school leaders' barriers to accessing research findings relevant to decision making, because studies indicate that limited access can be a significant barrier to use (Corcoran et al., 2001). We will also focus on supports to access. For example, in the survey, questions will be asked about the access district and school leaders have through membership in professional organizations, such as NCTM and NCSM, attendance at executive education efforts focused on schools (e.g., Harvard's *Programs in Professional Education*), participation in formal research-practice partnerships, and contact with organizations that disseminate research findings to practitioners, such as the Council on Great City Schools, Chief State School Officers. We will also elicit information related to the district and school leaders' direct interactions with researchers on matters related to decision making about reading, mathematics, and science. Finally, questions will be posed about the frequency of interaction, because syntheses of evidence from a wide range of fields suggests more intensive interaction is linked to increased research use (Contandriopoulos et al., 2010). (Sources: Survey, Interview)

***Organizational and environmental factors.*** We focus both on factors that enable or constrain research use by district and school leaders. Specifically, questions and codes will be designed about the organizational structures that are in place for decision making related to selecting, designing, and maintaining policies and programs in the district. There is evidence from studies of data use that decision-making structures or organizational routines help leaders link policy design and implementation more closely (Spillane et al., 2011). Data from observations will help us to understand how these factors play out in decision making in practice (Sources: Survey, Interview, Observation)

***Development of survey instruments.*** We will be applying a *construct modeling* approach (Wilson, 2005) to develop instrumentation for this study. The construct modeling process has three iterative stages. In the first stage, we define a specific measurement construct of interest and then use prior research and expert opinion to create a construct map. The purpose of the construct map is to delineate a priori qualitative distinctions among respondents in the target population with respect to the construct of interest. For example, when developing a construct map for skill in evaluating research quality, the goal would be to explicate the salient characteristics that could be used to order respondents into distinct locations on the construct map, from lower to higher. In the second stage, items are developed that, collectively, allow for inferences to be made about a respondents' most probable location along the construct map. To this end, items are written purposefully to represent the characteristics of individuals at different locations on the map. In the third stage, after collecting pilot data, we will model item responses using item response theory—specifically, the Partial Credit Model (Masters, 1982)—to examine the psychometric characteristics of the items and to thereby evaluate whether they are functioning as expected.

The process described above is iterative in the sense that lessons learned during later stages may cause us to return to and revise work done during earlier stages. For example, after



analyzing pilot data (Stage 3), it may become clear that certain items are not functioning as expected or that the available information is not sufficiently reliable to support the distinctions that had been hypothesized along the construct map. Before conducting a field test, developers may revise the construct map and/or develop additional items or revise existing items that can elicit information related to the revised map.

We propose to go through the full iterative process twice: once on a small scale with 200 respondents, and a second time with a representative sample of mid- and large-sized district and school leaders. To improve the likelihood that our initial 200-respondent pilot will yield items that accurately measure the full continuum expressed on our construct maps, we will engage in multiple activities to ensure the items are construct-relevant and comprehensible from the outset, including cognitive interviews, expert researcher (advisory board) review, and expert practitioner (district and school) review.

Our instruments will mostly consist of a combination of Likert-type selected-response options and frequency- or intensity-based response anchors. We may also use scenario-based prompts (i.e., vignettes), similar in nature to a recent study on data use by Means (2011), which presented teachers with data and examined their capacity to answer basic questions regarding that data. Choices regarding item format for each construct will hinge upon the way that the associated construct map has been elaborated.

**Sampling frame and survey administration.** Concurrent with survey design and initial piloting, we will take a sample of instructional policy-makers from mid- and large-size U.S. urban districts who are likely to be involved in instructional decisions at the K-8 level. We chose K-8 because there is both more research on effective programs and interventions at these grade levels, and because more variety exists in curriculum materials, assessments, and other instructional programs districts may adopt. Our survey instrument will be designed to draw inferences about a broad range of *individual district and school leaders*, but not about individual schools or school districts as organizations.

To accomplish this, we will use the most updated NCES Common Core data to identify the largest 1,000 districts at six months prior to fielding the study; the 2010-2011 version of NCES data suggest that the largest 1,000 all serve more than 9,000 students. This cut point is sensible because below this size, districts may not have the funds to staff many of the positions we include in our sampling frame. We will roster instructional policy-makers within each district via an internet search and confirmatory phone call, then select one at random per district to receive a survey. Positions (roles) that will be rostered include: (1) Mathematics and science coordinators; (2) Assistant superintendent(s) or others who supervise K-8 principals; (3) Assessment directors; (4) Special education directors; (5) Reading directors (6) One randomly selected elementary and middle school principal within each district. Assuming a 60% response rate, which is typical of well-designed survey research efforts with systematic follow-ups, we expect responses from 600 individuals. We chose these positions because we argue that research use may vary across division within districts. While we will be sampling only one individual per district, we will, however, be able to conduct cross-position (role) comparative analyses across districts. If our assumptions about response rate hold, we expected roughly 100 responses per category, which can form the basis for comparisons by position.

**Development of interview protocols and observation coding guides.** For the interview and observation coding guides, we plan to draw from an ongoing, three-district study of research utilization by district administrators in curriculum and instruction and leadership. This study is

being conducted by PIs Penuel and Coburn and employs the same broad conceptual framework as the proposed Center, enabling us to easily adapt the interview protocols for the purpose of this study. In addition, we will develop an observation coding guide for district meetings involving instructional decision making.

We address two of the overarching measurement research questions posed at the outset of this section through our development and refinement of interview protocols and observation coding guides. This work helps to address Measurement Question 1 by making it possible to triangulate different measures of the same survey constructs using coded scores from interviews and direct observation. The work uniquely addresses Measurement Question 3, by examining whether observers can reliably and validly identify applications of research use. Observations will also help describe research use at different case study sites, particularly organizational and environmental factors linked to research use.

**Observation protocol.** We will develop an observation protocol and protocol scoring guide beginning with a corpus of videotaped meetings of district leaders where (1) leaders are engaged in decision making, and (2) research is invoked or used in decision making. Our initial coding guide will be developed and tested on a sample of videotaped district meetings that will be collected in the final year of Penuel and Coburn’s study. We will use meeting data from Study 1 to iteratively refine this coding protocol.

**Interview protocols to support validity research on the survey.** We will develop two sets of interview protocols. The first will be used in conjunction with the survey development and will take the form of a cognitive interview. The purpose of this interview protocol will be to find out whether the items are understood in the way that was intended and whether they are eliciting the sorts of cognitive processing that was intended. We will conduct interviews with participants in the pilot ( $n = 50$ ) and field test ( $n = 50$ ). Between tests, we will iterate on the protocol, based on changes made to the survey itself.

A second protocol will be developed for use in conjunction with videotaped interactions of district decision making. The interview will take place after a participant has reviewed a brief videotaped meeting segment involving 2-3 participants. The interview will take place over 2-3 sessions and will focus on 20 different meeting segments. The purpose of the interview is to pose questions related to their perceptions of the meeting. The focus will be on their understanding of the meeting’s context, the organizational and environmental factors at play in the meeting, and the application of research within the meeting.

**Analyses.** Below, we elaborate on our approach to analyzing each research question.

**Measurement Question 1: To what extent can surveys be used to validly and reliably characterize school and district leaders with respect to their use of research to inform policy and practice?** To address the question of whether survey measures, taken individually or collectively, are a valid representation of research use, we will build an argument that pulls together multiple sources of evidence. We will begin by using contemporary validation theory (i.e., AERA, APA, & NCME, 1999; Kane, 2006) to help clarify the intended interpretations and uses of a score meant to measure a given construct. For example, consider the construct “skill in evaluating research quality.” We wish to make the interpretation that school and district leaders with high scores on the survey items designed to measure this construct will in fact be more skilled in their ability to evaluate the quality of research studies than leaders who score low. We will also want to use these scores to characterize and compare the distribution of these skills for certain types of leaders (i.e., principals vs. district staff). To support these interpretations and uses, three sources of evidence are especially critical.

1. It should be the case that the scores generated from survey responses in question are reliable enough to distinguish individuals who are qualitatively distinct from one another.
2. We should be able to demonstrate that inferences about a respondent's skill are not confounded by sources of construct-irrelevant variance in the ways that certain items have been written.
3. The scores should be associated with external information about respondents in a predictable manner.

The first two sources of evidence will stem from the application of what is known in Item Response Theory as the Partial Credit Model (PCM; Masters, 1982). The third source will come primarily from a focused study with a subset of respondents who will have taken the survey and also have been interviewed or observed in the context of meeting with school and/or district decision makers (as noted above).

The PCM is parameterized as follows. Let the variable  $X_{pi}$  take on one of  $K$  item categories (where  $k = \{1, \dots, K\}$  and 0 is an omitted reference category) for any given person,  $p$ , responding to any given survey item,  $i$ . These item responses can be modeled probabilistically as

$$\ln \left[ \frac{P(X_{pi} = k)}{P(X_{pi} = k-1)} \right] = \theta_p - \delta_{ik}$$

In the equation above,  $P(X_{pi} = k)$  represents the probability of a response by person  $p$  to item  $i$  in category  $k$  (e.g., the higher score category);  $P(X_{pi} = k-1)$  represents the probability of a response by person  $p$  to item  $i$  in category  $k-1$  (e.g., the lower score category). The left hand side of the equation represents the log odds (“logit”) of a response in a particular item category relative to a score in the lower item category. It is a function of the two parameters on the right hand side of the equation: the location of the respondent on the latent research use construct,  $\theta_p$ , and the difficulty,  $\delta_{ik}$  associated with attaining a score of  $k$  relative to a  $k-1$ . Note that when there are only two score categories for an item, the PCM reduces to what is known as the simple Rasch model (Rasch, 1980), in which each item is characterized by a single difficulty parameter.

The benefits of applying Item Response Theory in general, and the Partial Credit Model in particular, to modelling the responses to survey items has been well documented (Bond & Fox, 2007; Wilson, 2005; Wright & Masters, 1982). First, placing respondent ability and item difficulty onto a common scale (what Wilson, 2005 calls a “Wright Map”) makes it easier to notice locations of respondents where measures are likely to be imprecise because of gaps in the locations of items. In order to make reliable distinctions among individuals at all points on the scale, it is important to have items that vary in their location on the scale to the same degree that respondents vary in their location. Beyond visual inspection using a Wright Map and an information function, this can be also be diagnosed statistically through the computation of a person separation index, the number of distinct person strata, and a marginal reliability index. All of this will contribute to the first source of evidence listed above. Second, the process of checking the assumptions and intended properties of the Partial Credit Model (i.e., fit of functional form, local independence, parameter invariance) can lead to important insights about possible sources of construct-irrelevant variance that confound inferences about  $\theta_p$ . Across the

three different constructs, it will be important to look for evidence of multidimensionality within the survey responses (cf., Briggs & Wilson, 2003). All of this contributes the second source of evidence listed above.

For the third source of evidence we will take two approaches, both of which involve gathering external information about a given individual's use of research in practice. For all survey respondents, we will correlate estimates of  $\theta_p$  (for each of our construct measures individually, and for a composite measure created by taking a weighted average of the individual measures) with variables that should be predictive of respondents who regularly use research findings in their decision-making, value the role of research in this process and are skilled in evaluation its quality. Examples of such variables include educational background (e.g., has the respondent taken any coursework in statistics or research methods) and years of experience. In addition, for a convenience sample of 30 respondents for whom we will be able to conduct interviews and record observations as described above as part of Coburn and Penuel's William T. Grant-funded study of research use, we will conduct a study to triangulate the evidence from all three sources of data about research use in practice. A key question is whether the survey measure is an accurate representation of research use in practice. Some dimensions of research use, such as attitudes toward research, may not be elicited through direct observation, and thus interviews would be the most appropriate source of data for validating survey responses. Other dimensions, such as use of research and skill in evaluating research quality, may be more evident from direct observation than from surveys. Although we would not expect measures from different methods to provide precisely the same information, to the extent that each method is being used to elicit information targeted to the same construct, the inferences should at least have a moderate positive correlation after disattenuation for measurement error.

The mixed-methods process of analysis will begin by deploying the same coding approach for interview transcripts as described above for observation transcripts. A key goal of triangulation in our measures is to analyze patterns of anticipated convergence and divergence between different sources of data. Each data source can be expected to contribute different kinds of information (e.g., individual survey data versus observation), and we expect that there will be a pattern of divergent evidence that requires interpretation or a mixed-methods approach to triangulation (for a similar approach to triangulation, see Camburn & Barnes, 2004). Once data have been coded, a key next step will be to compare scores and inferences across all three modes of measurement. We will examine scatterplots comparing research use profiles produced through surveys vs. interviews, interviews vs. observations, and surveys vs. observations. We will also construct case profiles of individuals for whom we have coded observation data, interview data, and survey data. Using these profiles as an anchor, we will hold a series of analytic meetings across the different study teams, during which we will discuss the case profiles. During the meetings, a set of hypotheses will be articulated about the contributions of each data source to our understanding of research use and about the accuracy of survey measures. Following Yin's (2003) cross-case analysis method, these hypotheses will be refined with each case analysis. At the end of the process, we expect to produce a set of claims, supported by specific evidence from cases, about how and when survey measures can present a valid representation of actual research use.

***Measurement Question 2: How do district and school leaders from a representative sample of 600 large and mid-sized districts vary in the way they describe their use of research in decision-making practices?*** The analyses that will support this question will leverage our probability sample to draw inferences about a well-defined population of 600 district and school

leaders with respect to both individual items and the constructs measured by collections of items. Irrespective of what we find in our analyses supporting question 1, the results from this analysis will serve the purpose of providing a descriptive baseline. For example, if one of our items asked respondents “Have you ever consulted the What Works Clearinghouse to inform a decision about a new curriculum to be implemented in your district/school” and only 20% of respondents mark “yes”, this in itself would clearly be a notable and actionable finding. In addition, key comparisons of interest will focus on how research use varies by individual role within the district (leaders in the curriculum and instruction office or assessment office vs. school principals). Finally, correlational analyses will examine the relationship of our three research use constructs (application of research, attitude toward research, skill in evaluating research) to our collection of hypothesized research-use covariates. For example, do individuals who report more participation in professional networks tend to look favorably on research?

***Measurement Question 3: Can trained observers reliably and validly identify types or applications of research use within meetings where district leaders make decisions?***

Developing a persuasive argument about validity for any observation protocol is a multi-study undertaking. It requires researchers to generate evidence related to the validity and reliability of scoring, generalizability, and score use (Bell et al., 2012). In this study, we focus on validity and reliability of scoring, recognizing that this is only the first step toward developing an instrument that can be validly and reliably used to characterize research use for decision making. Moreover, we focus principally on the first aspect of the construct of research use, application of research, following Weiss and Bucuvalas’ (1980) typology of research use. We have chosen to focus on this aspect of research use, in part because a number of previous studies have used this framework. At the same time, we anticipate some challenges in identifying different applications of research use, making it a good candidate for validity research.

For scores or codes derived from observation protocols, the overarching validity question is whether scores mean as close to what was intended as possible (Bell et al., 2012). In this measurement study, we will develop preliminary evidence as to: (1) whether the coding rules can be appropriately applied; and (2) whether the coding rules can be consistently and accurately applied.

**Analyzing appropriateness of coding rules.** A key method for analyzing whether coding roles are appropriate is to compare stakeholders’ characterization of routines with researchers’ characterization. We will focus in this analysis on comparing meeting participants’ perspectives on decisions and the role of research in them with perspectives of researchers. Our initial coding scheme for researchers will draw upon research conducted by Coburn and colleagues (Coburn, Toure, et al., 2009) for characterizing different applications of research use in district instructional decision making. That study’s coding guide was developed from observations of 33 planning meetings at multiple levels of a district’s central office, from executive leadership meetings, to planning meetings at the department level, to design meetings between district staff and external consultants. Researchers began—as we will—by creating codes to track decisions across time, and then secondarily within deliberations about those decisions, to identify different applications of research, using Weiss’ (1980) typology for characterizing research use.

For each of the meetings we record, we will have interviewed 2-3 participants in a sample of meetings about decisions they observe in district meetings as noted above. A separate team of researchers will code their responses to interview questions, using the same coding categories as researchers use. We will then compare the two sets of researcher codes and analyze agreement levels between the two sets of codes for each of the decisions identified.

**Consistent and accurate application of coding rules.** As part of the measurement study, CU Boulder researchers will examine the inter-rater reliability of coding scheme for pairs of researchers on the study. We plan to use the cloud-based analysis software, *Dedoose*, as a tool for analyzing the reliability of the coding protocol we develop for videotaped meetings between district and school decision-makers. *Dedoose* includes a “training module” that facilitates the calculation of inter-rater reliability for a specific set of excerpts. We plan to use these modules to iteratively refine our initial coding schemes until we achieve adequate inter-rater reliability for each category ( $K > .70$ )

**Accuracy of coding.** CU Boulder researchers will test the accuracy of our coding scheme with a small sample of 15-20 researchers who work in school district research and evaluation offices, likely as part of a preconference workshop we propose to AERA. The goal of this particular test will be to compare newly trained coders’ application of codes with those of master coders’ application of codes. For purposes of this test, the master coders will be two researchers from the project. A key aim will be to assess whether training in the use of the protocol can lead to high levels of agreement between novice and master codes after a half-day workshop. We purposefully limit our test to a single half-day training at AERA, both because this is likely to be the outer limit of time a researcher can commit, and because resources for iterative refinement are too limited.

### **Study 1: Reading and Mathematics Instructional Decision-making *in Practice*: Enablers and Inhibitors of Research Use in Local Education Systems**

**Descriptive Study 1** will investigate *the extent to which* and *how* research is used in instructional decision making *practice* in the local school district and the factors that enable or constrain this use. Our research questions are:

*Study 1 Question 1. What role does research evidence play in how district and school leaders make decisions about instructional policy and programs in mathematics and reading?*

*Study 1 Question 2. What individual, organizational, and environmental factors enable or constrain research use by district and school leaders in instructional decision-making?*

Existing scholarship suggests that district leaders rarely use research directly and centrally to provide guidance to decisions related to policy or practice; that is, in instrumental ways (Birkeland, Murphy-Graham, & Weiss, 2005; Coburn, Honig, et al., 2009; David, 1981b; Kennedy, 1982; Nutley, Davies, & Smith, 2001). When they do use research instrumentally, it is used in superficial ways (Finnigan et al., 2013). We also know that introducing research into contentious decision contexts rarely changes district leaders’ positions (Coburn, Toure, et al., 2009; Kennedy, 1982). Overall, district leaders are more likely to use research symbolically (i.e., to justify existing decisions) or conceptually (to inform their definition of the problem, their thinking about solutions, or strategic approaches to instructional improvement) (Corcoran et al., 2001; David, 1981b; Kennedy, 1982; Weiss, Murphy-Graham, & Birkeland, 2005).

Still, it is possible, perhaps likely, that this state of affairs is not universal. Indeed, there is some evidence that there is great variability *within and between* districts in leaders’ knowledge of research and disposition for using it (Coburn & Talbert, 2006). Indeed some studies at the school level suggest that school principals tend to be favorably disposed to using research (Biddle & Saha, 2006), although others provide a more mixed portrait (Coburn & Talbert, 2006; Finnigan, et al., 2013). There are also documented cases of individual districts and individual schools where there appears to be active and ongoing research use (Biddle & Saha, 2006;

Corcoran et al., 2001; Hubbard, 2010), so while overall assessments of research use are grim, there are examples of settings where it plays a more significant role in decision making. Our research will examine what accounts for variability in research use in school districts and describe when and how it is used in district decision-making.

Study 1 focuses on decision-making *practice* about elementary school reading and mathematics instruction. This decision-making practice shapes the school district's instructional policies and programs including curriculum guides and materials, student assessments, teacher professional development, school improvement planning, instructional plans for particular populations of students such as special education and so on. Together these policies and programs form an infrastructure for instructional guidance that supports and guides classroom teaching and student learning. We focus on reading and mathematics because they are two foundational elementary school subjects that make up the bulk of instructional time, yet they differ in the level and quality of research available to inform instructional decision making.

All districts engage in instructional decision-making practices as they work to support and guide reading and mathematics instruction; they have wide-ranging consequences for students' opportunities to learn mathematics and reading. Further, as states adopt the Common Core State Standards in Mathematics and English Language Arts, instructional decision making is likely to intensify as school and district leaders endeavor to respond and support their schools in implementing these standards, creating an ideal opportunity to understand the role of research in school district instructional decision making.

School district instructional decision-making has several aspects. First, it involves *selecting* policies and programs from external sources, then planning the roll out of these programs district wide through piloting and professional development. Second, many school districts also build their own policies and programs by *designing* them locally. Moreover, districts have to work at *maintaining* their instructional policies and programs, adjusting and redesigning them over time. Study 1 will examine the *extent* to which and *how* district and school leaders use research in *selecting, designing, and maintaining* their policies and programs for elementary school mathematics and reading.

**Motivating and conceptualizing the study.** The available research provides some hints regarding variability in research use both between and within school districts. As discussed in the Measurement Study design, some research points to *individual factors*, suggesting that some school and district leaders lack the disposition to use research (Landry et al., 2003) or the technical skills to interpret and act on it even if they seek to use it (Kean, 1980, 1983; West & Rhoton, 1994). Other research points to *organizational factors*. We know, for example, that research use can vary considerably between different organizational units in the district office, and between districts and schools. Coburn and Talbert (2006), for example, documented starkly different attitudes toward research and patterns of use between curriculum and instruction, special education, assessment department, and senior leaders supervising principals, which they linked to different patterns of connection to external sources of information and different disciplinary training (see also Spillane, 1996). We also know that some districts and schools have *organizational structures in place for decision making* (meeting structures, procedures for selecting materials, protocols to guide deliberation, roles devoted to knowledge acquisition, etc.) that serve to bring research more routinely into deliberations and shape interpretation and debate (Corcoran et al., 2001; Ikemoto & Honig, 2010; Spillane, et al., 2011). Finally, existing research points to *connection with extra-district or extra-school sources of research*. Both district and school leaders report, for example, that they have limited access to research findings that are

timely and that address their immediate needs and questions (Corcoran et al., 2001; David, 1981b; West & Rhoton, 1994). We also know that connections to outside sources of research (including to universities, research intermediaries, consultants) can increase access to research (Coburn, 2010; Hubbard, 2010) and, under some conditions, facilitate its use (Bickel & Cooley, 1985; Hubbard, 2010; Palinkas et al., 2009).

Most existing qualitative studies of research use, however, are based on single case studies, which provides limited guidance for understanding how the organizational and environmental features of districts and schools enable and constrain research use due to the single case research design. Further, most studies focus on a single level of the local school district education system at a time, so we know little about how efforts to support research use by central office leaders enables and constrains research use among school leaders. Similarly, there are no studies that systematically examine research use across different curricular domains (e.g., language arts, mathematics) though we know that the school subject matters when it comes to decision-making about instruction (Spillane, 2005; Spillane & Hopkins, 2013). As a result, we have little information about how individual characteristics, organizational and political contexts of district, and the nature and extent of interaction with researchers influence whether and how research is used in district instructional decision-making.

Study 1 will address these limitations by focusing on how research is used in the *practice* of instructional decision-making, which we define in terms of the *interactions* among school and district leaders as enabled or constrained by aspects of their organizational context (Little, 2012). Consistent with the literature on research use, we frame decision-making practice as a function of individual attributes, organizational features, and environmental factors.

**Research design.** We propose an 18-month, comparative case study that will examine whether and how district and school leaders use research in their decision making practice about mathematics and reading instruction.<sup>1</sup> We will use a *nested multi-level design* in which we will treat district office divisions (e.g., curriculum and instruction, assessment, special education), sub-districts, and individual schools in each district as *nested* cases. This nested design will increase the number of cases for comparative analysis.

Our study is exploratory and theory building. Our goal is to identify key constructs and relationships between them that will guide future investigation in larger samples that employ methodologies that permit testing causal inferences (National Research Council, 2002; Strauss & Corbin, 1990; Yin, 2003). Our work will also inform the design of strategies that can foster research use in district decision-making.

We limit our focus to four districts for two key reasons. First, school districts are complex, multi-layered entities in which decisions about instruction are stretched across multiple divisions and units (Coburn, Toure, et al., 2009; Spillane, 1998). To characterize research use in school district decision-making it is essential to capture the complexity of this intra organizational practice. Second, instructional decision making can be politically contentious and these contentions are often glossed over or minimized in accounts of decision-making. Thus, the in-depth research afforded by a small number of strategically chosen cases provides a stronger research design to generate *new* hypotheses and build theory related to research use in district decision making.

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<sup>1</sup> By district office leaders we mean superintendents, assistant superintendents, directors of curriculum, professional development, assessment and evaluation, elementary education, special education, mathematics and reading. By school leaders we mean principals, assistant principals, coaches, and teacher leaders.



**Population and sample.** The population of interest is urban school districts with student enrollment of over 50,000 students. To maximize the likelihood that districts will be involved in decision making related to reading and mathematics instruction, we will identify all states that have adopted and are implementing the Common Core State Standards in Mathematics *and* English Language Arts. We will then identify the 30 largest urban school districts across these states.

Next, we will survey 12-15 individuals representing the divisions of elementary school principals, curriculum and instruction, assessment, and special education in each district for sampling purposes. Assuming moderate (0.20) interclass correlation coefficients on key variables, surveying 12-15 individuals per school district will help us develop a sense of within and between-district patterns regarding research use. The survey will include items intended to tap the individual, organizational and environmental predictors of research use. We will analyze this survey data alongside the representative sample from districts, to examine how reports from individuals from these districts compare to the larger set of mid- and large-sized urban districts. Based on our analysis of these survey data, we will sample four school districts according to the following sampling frame, rooted in our literature review:

	Organizational routines and tools enable research use	Organizational routines and tools inhibit research use
Low connections to outside sources of research	1	2
High connections to outside sources of research	3	4

Within each district, we will sample four elementary schools (n=16 schools) by surveying 4-8 school leaders (principals, assistant principals, teacher leaders) in 20–30 elementary schools in spring 2016. We will sample schools with a probability proportionate to the percent of students who are free- and reduced- price lunch eligible, to ensure the inclusion of a range of school types. We would analyze data in summer 2016 and select four schools based on the same sampling logic used in selecting districts.

**Measures.** Our district and school survey measures of individual, organizational and environmental factors will be identical to the ones used in the mid- and large-urban during the large-scale pilot conducted at the beginning of Year 2 (See p. 9). A benefit of using the large-scale pilot measures is that individual responses can then be placed in the context of the larger, more representative, sample.

To ensure comparable data is collected across types of informants and districts, we will plan to use the interview and observation protocols described above in the Measurement studies (pp. 9-10).

We will develop a rubric to assess quality of research by reviewing touchstone documents in the field (e.g., National Research Council, 2002). We will engage our panel of advisors in reviewing the indicators and ensuring that they accurately discriminate quality of research for different kinds of research questions. We will use this to analyze all research that is invoked or discussed in interviews and observations, as well as any that is shared or referenced in policy or planning documents, school improvement plans, or other district documents collected during the study.

**Data collection.** We will collect data in each district for 18 months (January 2016 – June 2017). Studying districts for 18 months will enable us to observe multiple cycles of decision

making in a given school district, providing the opportunity to do a more in-depth analysis of the factors that enable and constrain research use.

**Central office.** During our four visits to each district (see Appendix for timeline), we will interview 10 district office leaders per district who are involved in strategic decisions about mathematics and reading instruction. We will sample district leaders from curriculum and instruction, assessment, special education, and supervisors of elementary school principals at both the central office, and in large districts, the sub-district level.<sup>2</sup> In addition to focusing on constructs identified in the measurement study (e.g., attitudes and dispositions toward research, skill in interpreting research, and connections to external sources of research, the interview protocol will include a focus on how decisions are made about reading and mathematics instruction so as to identify key organizational routines.

As part of Study 1, to investigate connections to sources of research, we will also add questions related to central office leaders' professional social networks. We will take an egocentric approach, which maps networks that are centered around an individual (the ego). Egocentric networks are appropriate when the boundaries of the network cannot be specified in advance (Wellman & Berkowitz, 1988); it is impossible to pre-specify all the potential external sources of expertise that informants may be connected with. While we will know the overall levels of an individual's connections to sources of support from the survey, the qualitative social network data will enable us to identify the specific actors district leaders reach out to for information, and the nature and content of social network transactions (Coburn & Russell, 2008).

With information from first round interviews, we will sample six organizational routines per district related to decision-making about mathematics and reading instruction (e.g. textbook adoption task force, professional development design committee). In each subsequent visit, we will observe these routines in order to analyze how routines and tools shape district leaders' decision-making and the role of research therein. We will take detailed field notes, and will video- and audio-record meetings. We will use subsequent interviews with district leaders to gain their perspectives on the dynamics of the routines we observed and their thinking and understanding about the research used. We will also use interviews to understand how the observed routines fit into the district's decision-making practice and how the observed routines are similar and different from other routines. Finally, we will collect, scan, and catalogue all artifacts related to the six selected routines (e.g. agendas, minutes, resources consulted or referenced).

**School level.** We will make two trips to each of 16 schools (see Appendix for timeline). In each school, we will interview the principal and assistant principal first, using these interviews to identify 2 or 3 other formal school leaders such as a reading or mathematics coaches and teacher leaders (a total of 4 to 5 informants per school), interviewing each twice. Interviews will focus on school leaders' use, disposition to, familiarity with and knowledge about research in their decision-making about mathematics and reading. One interview will also involve a structured social network protocol, similar to that used in district interviews but also attending to their relations with district leaders, which prior research suggests may be scarce (Finnigan et al., 2013). We will collect and catalogue school artifacts relevant to decision-making about mathematics and reading instruction.

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<sup>2</sup> Increasingly, large urban districts are divided into sub-districts or zones to enable closer connections between central office personnel and schools in their charge. New York City, Los Angeles, Chicago and San Francisco are all examples of districts with this structure.

**Data analysis plan.** We will begin by using analysis of survey data from the representative sample of districts to validate survey measures. Given that we expect to have a sample of 12 – 15 individuals per district for thirty districts, we can perform an exploratory variance decomposition (e.g., ANOVA) to examine the between vs. within-district variation in research use practices. Next, we will investigate broad patterns between districts and between schools using survey data. Specifically, we will examine associations between variables in order to generate hypotheses for future work and to help focus our qualitative analysis. We will also use the analysis to place our case study schools and districts in the context of our larger representative sample, which will help contextualize findings at the district, school, and individual level. We will then investigate within-district patterns. The key analytic unit here will be the organizational routine in which decision-making practice happens.

**Study 1 Question 1. What role does research evidence play in how district and school leaders make decisions about instructional policy and programs in mathematics and reading?** To answer RQ 1.1, we will begin by gathering all data—observations, artifacts, and interviews—related to each routine we observed and array it chronologically, capturing the trajectory of the routine over time. We will then analyze how research is used (if at all) in each decision routine, drawing on a coding scheme developed by Coburn and her colleagues and refined during the measurement study that is designed to capture Weiss’ four categories of research use: instrumental, conceptual, symbolic, and imposed. This analysis will enable us understand how research is used in decision-making practice.

**Study 1 Question 2. What individual, organizational, and environmental factors enable or constrain research use by district and school leaders?** To answer this question, we will begin by identifying the main actors involved in a given routine determining their *disposition and skill* using the validated measures from the survey. We will then compare research use in routines that involve individuals with high levels of research skill and positive dispositions toward research with those without to see if there is an association.

To analyze the degree that participants in a given routine have *connections to sources of research* that provide greater access to research, we will use data from the social network protocol. We will use UCInet software to analyze each individual’s egocentric network in mathematics and reading, analyzing such dimensions as tie span (within district, to outside sources of expertise, to schools), tie strength, type of actor, and ego-net density. We also will analyze the nature and content of interaction with their ties (e.g. what research is actually exchanged), using techniques developed by Coburn and colleagues (Coburn & Russell, 2008; Coburn et al, in press; Coburn, under review). Using the coded data, we will investigate whether the presence of individuals with greater access to research via their social network is associated with more research use in a routine.

In order to identify those *features of the routines and tools* that are associated with greater research use, we will use video and audio-recordings of routines to engage in the fine-grained analysis of the features themselves. Working inductively, we will “open code” the data to describe, with minimal interpretation, the phenomenon of interest. By grouping together emerging coding categories and using the constant comparative method (Strauss & Corbin, 1990), we will then move to progressively higher levels of abstraction until we end up with a final set of codes. With this and the other qualitative measures, we will establish inter-rater reliability by randomly selecting 10% 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), then engage in “closed coding” of the full data set.

To investigate differences by subject area, we will compare routines in reading with those in mathematics, identifying the research referenced in decision-making deliberations and associated artifacts. We will analyze the level of research that comes into play (high/low), assess its quality using the construct maps related to research use discussed above (p. 7), and analyze how it is used. Finally, we will use matrices and other data displays (Miles & Huberman, 1994) to engage in systematic comparison of routines within districts across district divisions and between the four districts.

School level analysis will focus on how district research use is associated with school research use, and how that may be mediated by individual skills and dispositions, connections to the district, and school level routines. We will begin by conducting descriptive analysis of the key dimensions in our model using the survey data. We will then use our qualitative interview and artifact data to investigate the relationship between these dimensions at the school level, similar to that described above, paying particular attention to connections between schools and districts. We will analyze the social network data for the degree to which school leaders seek out district leaders for sources of research. We will also analyze the degree to which schools use district-designed routines for their own decision making (e.g. school improvement planning) and analyze the level and quality of research provided or invoked as part of district documents and tools that school leaders use in their decision making. We will also use matrices and other data displays (Miles & Huberman, 1994) to compare schools by district and to investigate whether patterns vary systematically by district. In this way, we will analyze both cross-district and within-district variability in school leaders’ use of research. Using data from the 20 – 30 schools in which leaders were surveyed in each district we will triangulate the patterns identified using our qualitative data.

Throughout the data analysis process, we will use several techniques to ensure the credibility of our findings and enhance the validity and reliability of our data: 1) train researchers to use interview and observation protocol, using videotape from Coburn and Penuel’s William T. Grant-funded study of research use, to ensure reliability in the use of instruments across researchers; 2) select a random sample of interviews (10%; stratified by researcher) to check for interview effects; 3) maintain an audit trail of data collected and analysis performed; 4) triangulate across multiple sources of data (Bogdan & Biklen, 1998); 5) examine outliers, returning to data to understand districts or researchers whose patterns did not match the overall trends (Miles & Huberman, 1994); 6) consider and check alternate explanations (Miles & Huberman, 1994); and 7) use member checks to verify our inferences and to surface possible alternative explanations (Goetz & LeCompte, 1984).

## **Study 2: Descriptive Study of Research Use in Research-Practice Partnerships**

Our **second descriptive study** will investigate purposeful attempts to increase research use by promoting greater interaction between researchers and practitioners. We plan to compare research use in different types of partnerships: those whose primary purpose is to evaluate policies and programs (research alliances), design for instructional improvement at scale in single districts (design research partnerships), and support rapid, continuous improvement in a network (networked improvement communities). Because the Institute of Education Sciences provides support for all three types of partnerships through multiple initiatives, these case studies

will inform IES' mission and help to build an understanding of the nature of current investments in research utilization. Our research questions are:

*Study 2 Question 1. How does participation in research-practice partnerships enable research use in district decision-making in mathematics and science, if at all?*

*Study 2 Question 2. How does that vary by the design of the partnership?*

### **Motivation for studying research use in district 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 (Coburn et al., 2013). At present, despite their increasing importance to policymakers and funders, there is little research on them in education.

The best evidence for their promise comes from outside education. For example, a model called Communities that Care developed by the Social Development Research Group at the University of Washington is a successful model for comprehensive, multi-institutional partnerships in public health. In this model, partners begin by conducting a comprehensive needs assessment grounded in principles of community youth development. Next, researchers and agency staff collaborate to select and adapt research-based strategies that address those identified needs and fit the local context. Evidence from a large, cross-community randomized controlled trial shows the model is effective in reducing risky behaviors of adolescents (Hawkins et al., 2009). Similar findings have been documented within health care (Institute for Healthcare Improvement, 2003), social services (McKay et al., 2011), and criminology (Braga, Kennedy, Waring, & Piehl, 2001). These examples from outside education provide indirect evidence for the promise of research-practice partnerships in education because professionals in these fields—like educators and educational leaders—are engaged in human improvement work in complex, dynamic, and politically charged environments (Cohen, 2011).

In spite of major investments from funders (including IES) to develop and support research-practice partnerships, there has been little research that investigates if and how they actually enable research use among school and district leaders (Coburn et al., 2013). Instead, the literature consists mainly of first-person accounts from researchers, focused on challenges they experience creating and sustaining partnerships. Furthermore, the small body of existing empirical research are primarily single case studies (Coburn, 2010; Coburn, Bae, & Turner, 2008; D'Amico, 2010; Hubbard, 2010; Ikemoto & Honig, 2010) or studies of a single type of partnership. Thus, we know little about how variation in partnership design influences the degree to which participation in partnerships fosters research use among district decision makers.

We—PIs Penuel and Coburn—are currently engaged in a study of two research-practice partnerships in three districts, funded by the William T. Grant Foundation. This research, still in its early stages, has found that research partners regularly bring research (their own and others') directly into district decision-making processes. The partnerships have also helped foster conceptual use of research, and, to a lesser degree, instrumental use. For example, we find evidence in both partnerships that discussions between researchers and district leaders have, over time, shifted district leaders' views of the problems they face and avenues for potential solutions (conceptual use). We also find that one partnership has been successful in embedding new routines for engaging with research into ongoing district decision making. And, we find some evidence of increased skill in interpreting research, though this skill is uneven within districts.

A limitation of this inquiry is we are not able to locate these two partnerships in the broader population of research-practice partnerships. Furthermore, both of the partnerships we

investigate use the same broad approach to partnership design. Thus, while we are finding evidence that research-practice partnerships foster research use and will be able to document the process by which this occurs by virtue of our longitudinal design, we are not able to fully investigate what features of partnership design account for the patterns we see. Investigating features of design is crucial to inform the development of new strategies to foster research use.

Existing research does provide guidance about the features of partnerships that may foster research use. First, research-practice partnerships provide a direct pathway between school and district leaders and an outside source of research. But, access to research does not necessarily lead to appropriate use (Coburn, 2010). We know that structured opportunities to engage with others is associated with greater use (Coburn, Toure, et al., 2009). We also know that interpretation is influenced by the skills and dispositions of those engaged in deliberation (David, 1981a; Estabrooks, 1999). This suggests that partnerships that involve sustained engagement between researchers and district administrators may encourage greater understanding of the research and more appropriate use.

We know that when decision makers do not view research as credible, they are less likely to use it (K. Johnson, et al., 2009). Elements of partnership design may influence perceptions of credibility. Some partnerships focus on experimental design, while others use design research methodologies or those borrowed from improvement research in health care. At the same time, some partnerships position themselves as outside the district they are working with to ensure they are seen as independent and objective, while others eschews notions of objectivity, positioning themselves as co-designers or co-researchers alongside district administrators. District administrators may view independent research as more objective and therefore more credible (Coburn et al., 2013). Those with greater knowledge of research may also view experimental designs as more credible as well.

Third, we know from research on data use that organizational routines and tools influence how people attend to, interpret, and use data in decision processes (Brunner et al., 2005; Horn & Little, 2010; Spillane et al., 2011). Preliminary research suggests this may be true with research as well (Baxter, 2010; Ikemoto & Honig, 2010). Some partnerships employ well-designed tools and routines to structure their work together that foster attention to and engagement with research. For example, a strain of research-practice partnerships in health care involves careful specification of routines for incorporating research into planning, acting, studying, and iterating on innovations (Berwick, 2008). However, partnerships likely vary substantially in this regard.

**Research design.** We will use a mixed-method, cross-case design. Given limited extant research, case study research is an appropriate strategy for an exploratory study to answer these questions (National Research Council, 2002). We will collect all data in year 4, so that we can benefit from the development of instruments in the measurement study and preliminary findings from study 1. As with study 1, study 2 is intended to be exploratory and theory building. Our goal is to identify and explore key dimensions of partnership design that appear to enable research use. These dimensions can later be tested in studies that employ systematic variation in elements of partnership design.

**Population and sample.** In earlier work for the William T. Grant Foundation, we developed a research-based typology that characterizes existing research-practice partnerships (Coburn et al., 2013). We identified three distinct kinds of research-practice partnerships that are currently active in school districts: *research alliances*, *design research partnerships*, and *networked improvement communities*.

**Research Alliances (RA).** A research alliance is a partnership between a district and an independent research organization focused on investigating questions of policy and practice that are central to the district. RAs negotiate research questions with districts and other youth serving organizations, conduct the research, and funnel findings back to the district, the community, and other stakeholders with the goal of informing policy and improving practice in the district. There are two types of RAs: (1) those that construct partnerships with youth-serving organizations across multiple sectors (education, health and human services, youth development) in a given region and (2) those that work with local school districts. The partnership between Redwood City 2020 initiative and the John W. Gardner Center for Youth and Their Communities is an example of the first type. This partnership focused on improving education and youth development outcomes in that San Francisco Bay Area community. The Consortium on Chicago School Research, which conducts independent studies of policies and programs in the Chicago Public Schools, is an example of the second type.

**Design Research Partnerships (DRPs).** DRPs aim is to develop, test, and redesign new policies and programs with districts and then study the results of these programs using a range of research methodologies. Researchers also study fundamental questions related to student learning, teacher learning, and/or organizational change in the context of the innovations. Thus their goal is to impact practice and contribute to research knowledge. For example, the Middle-school Mathematics and the Institutional Setting of Teaching (MIST) Project involves partnerships between researchers and leaders in two large urban school districts. In one of the districts, researchers are co-designing professional learning opportunities for district coaches, principals, and professional learning communities in schools with the aim of supporting and developing theories about instructional improvement at scale.

**Networked Improvement Communities (NICs).** NICs are networks of districts that seek to leverage diverse experiences in multiple settings to advance understandings about what works where, when, and under what conditions. They draw on research techniques developed from improvement efforts in health care to engage researchers and practitioners in rapid cycles of design and redesign. NICs use these cycles to develop new approaches that address well-defined problems of practice or adapt existing research-based practices to local conditions. The Carnegie Foundation for the Advancement of Teaching's Building a Teaching Effectiveness Network (BTEN) is an example of a NIC. In BTEN, a network of researchers, intermediary organizations, district leaders, and school leaders facilitated by Carnegie are developing and testing strategies for improving the quality and retention of teachers.

These partnerships use different designs meant to foster research. First, they vary in the nature and intensity of interaction between researchers and district leaders. In RAs, researchers and district leaders typically interact at the start of the research process to negotiate the focus of the research, and at the end, when they present findings and provide opportunities for discussion. By contrast, DRPs and NICs involve more intensive collaboration throughout the entire research, design, and development process. Second, the different types differ in the kinds of research they tend to do and the way researchers are positioned in relation to practitioners. RAs typically maintain independence, viewing their role as contributing research to inform district' problem solving efforts, not engaging in those efforts themselves. By contrast, both DRPs and NICs are involved in designing and iteratively refining solutions with district leaders. Regarding research methodologies, RAs and DRPs both conduct research that spans from experimental design to descriptive studies and (in the case of DRPs) design-based research methodologies (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Cobb, Henrick, & Munter, 2011). By contrast,

NICs, while drawing on a range of research to inform their design work, focus most attention on design and development work. Third, while most partnerships have developed tools and routines for structuring interaction between researchers and practitioners, they likely vary in the degree to which these routines bring research more centrally into policy deliberations. NICs also tend to be much more likely to have intentional strategies to embed routines that foster research use into the settings with whom they work (Dolle, Gomez, Russell, & Bryk, in press). Thus, the three types of partnerships provide a useful basis for investigating the relationship between partnership design and research use.

**Sampling plan.** We will use a combination of snowball (Goodman, 1961) and theoretical (Cresswell, 2009) sampling to select partnerships. We will begin by using techniques from snowball sampling to generate the complete population of partnerships in urban districts in the US. Next, we will conduct interviews and review artifacts from each partnership we identify. We will then use theoretical sampling to identify partnerships that are *paradigmatic* of each type of research-practice partnership (Flyvbjerg, 2006). We will select one partnership from each category of our typology that best reflects the definitions of partnership and that are focuses on issues of mathematics and/or science. We focus on mathematics and science because both the U.S. Department of Education and the National Science Foundation have invested heavily in developing research-practice partnerships in these domains. The Common Core State Standards in Mathematics and the Next Generation Science Standards also will likely create a press for districts to improve instruction in these areas, creating a press to focus the work of research-practice partnerships on these areas. There are also a number of existing partnerships that focus on both mathematics and science (e.g. SERP and a new NIC in Washington State). Finally, because it takes a long time for partnerships to become established and begin to engage in joint work (Coburn & Stein, 2010), we will select partnerships that have been in existence for at least 3 years by the start of our study.

**Measures.** We will employ each of the measures developed and tested as part of the measurement study. This includes the survey measure of research use, interview protocols, and the observation protocol we will use for analyzing research use in meetings.

**Data collection.** We will travel to each district three times over the course of the study year. In each school district, we will interview 10-15 district leaders, two times. Our sample will include all district personnel who are involved in the partnership, as well as key instructional decision makers in either mathematics or science (depending upon the focus of the partnership work), even if they are not directly involved in the partnership (for example, chief academic officer, director of curriculum and instruction, director of special education, executive level leadership that supervise principals, etc.). One part of the protocol will include questions developed as part of the measurement study, including attitudes toward research use, skill in using research, roles, and organizational factors in research use. In addition, these interviews will focus on: 1) the role of partnership in the district's overall instructional agenda; 2) the nature of interaction with researchers in the partnership (who they interact with, when, and how); 3) perceptions of the credibility of research produced by the partnership; and 4) how they use the research processes, products, and findings from the partnership, if at all. Initial interviews will also be used to develop a history of partnership work, so that we can situate the activities we observe in the study year in ongoing trajectory of the partnership. All interviews will be audio-recorded, transcribed, and uploaded in a qualitative software package (e.g. *Dedoose*).



We will also conduct observations of meetings during each visit (6-8 per district). A subset will be of meetings when researchers and district personnel come together to review research, do co-design work, if applicable, and plan future work together. (Our visits will be timed accordingly.) Observing meetings where district leaders and researchers come together is essential for understanding the nature of routines and tools that partnerships use to structure their work together and the degree to which these routines and tools foster greater attention to research and shape interpretation, and the implications of both of these for instructional decision making. We will also observe all district meetings related to mathematics or science (depending upon the partnership focus) that occur during each visit, including but not limited to: cabinet meetings, meetings among leaders of curriculum and instruction and the district leaders supervising schools, and planning meetings for professional development or other forms of teacher support in mathematics and science. Here, we will also attend to if and how district leaders use research in their decision making. In particular, we will pay attention to references to research, research-based designs, or research processes that emerge from the partnership. We will take detailed field notes for each observation, videotaping or audiotaping where possible. We will also collect *artifacts* pertaining to decision making in mathematics or science (e.g. meeting agendas, minutes, in-process policy documents) from both meetings we attend and those that happen in our absence. These artifacts will help us understand the degree to which research is referenced or consulted during meetings we are unable to attend.

We will conduct two phone interviews with researchers involved in each partnership (4-6 per partnership). These interviews will focus on: 1) their strategy for fostering research use in the district; 2) the nature of interaction with district leaders (who they interact with, when, and how); and 3) their perceptions of researcher-practitioner meetings that we have attended. Initial interviews will also be used to develop a history of partnership work, so that we can situate the activities we observe in the study year in ongoing trajectory of the partnership. All interviews will be taped and transcribed. We will also collect a complete set of artifacts related to their partnership work with the district (e.g. grant proposals, MOUs, presentations on findings, design plans, articles reporting results, etc.)

Finally, we will administer the survey developed through the measurement study to those involved in mathematics and science instructional decision making in each district. Our sample will be the mathematics and science leaders in the district, including any coaches or instructional support staff that serve multiple schools. The purpose of the survey is to situate our observations of research use in the context of research use in instructional decision making in districts in our sample. While observation is useful for investigating research use related to research partnerships, our observations necessarily limit us to developing an understanding of research use within a few decision making events; the survey can help us understand how typical or atypical the dynamics we observe are. In addition, by surveying a broader range of decision makers in the district, we can compare active partnership participants' and nonparticipants' perceptions of use, credibility, and utility of research findings. We will also use the survey to situate the districts in study 2 in the broader sample of districts that are part of Study 1.

**Data analysis plan.** To investigate if and how participation in research-practice partnerships enables research use in mathematics or science (Study 2 Question 1), we will start with within-case analysis, characterizing the nature of research use in district decision making in mathematics and science. To do so, we will identify all references to research, research-based designs, or research processes that emerge from the partnership in interviews, artifacts, and observations. We will use the protocol developed in the measurement study to analyze the nature

of research use (instrumental, conceptual, symbolic, imposed use, no use) in observations. We will adapt an interview and artifact coding guide designed to analyze information about research use derived from interview data and artifacts and developed in the context of Coburn's earlier work (cf. Coburn et al., 2009). We will design it to be consistent with the observational protocol and use it to analyze all interview and artifact data. For all qualitative measures in the study, we will establish inter-rater reliability by randomly selecting 10% of all relevant data, 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).

To answer Study 2 Question 2, we will engage in cross case analysis, we will begin by using matrices or other data displays (Miles & Huberman, 1994) to systematically comparing use of partnership research products, processes and designs across partnerships (analyzed above). This will establish the degree to which there are differences in patterns of use by partnership. We will then investigate the three dimensions of partnership design that existing research suggests might be associated with differences, while being attentive to any new dimensions that emerge during the course of the study.

To investigate the relationship between level of interaction between research and practitioners and use of research, we will begin by analyzing researcher interviews and partnership artifacts to assess the overall level of interaction. We will then analyze our observations of partnership meetings to investigate how different individuals involved in discussions interpret research findings, paying close attention to differences in interpretation among and between researchers and district leaders. We will then draw on observation and interview data to investigate the degree to which interpretations offered by researchers, or shared interpretations developed in the course of deliberation, inform district leaders' decision making. We will then use matrices and other data displays (Miles & Huberman, 1994) to investigate the relationship between levels of interaction and how research is interpreted within and across partnerships.

To investigate the relationship between a given partnership's approach to research (nature of research; role of researcher), we will analyze interviews with partners and all partnership documents to characterize each partnership in terms of nature of research and researcher role. Next, we will draw on data from interviews with district leader to code for their perceptions of the credibility of research produced in the context of the partnership. We will then use matrices to investigate the relationship between partnership's approach to research and perceptions of credibility.

To investigate the relationship between partnership tools and routines and research use, we will conduct a close-in analysis of routines used to structure interaction in the partnership. We will use the coding scheme developed in study 1 to analyze the presence of features of tools and routines that study 1 found to be associated with research use. We will then investigate the relationship between the use of tools and routines with these design features and research use, as determined in our analysis of Study 2 Question 1.

We also plan to compare results across different designs for research partnerships to address Study 2 Question 2. These comparisons are intended principally to generate hypotheses about the potential role of participation in different types of research partnership in enabling research use.

Survey analysis will facilitate these comparisons across partnerships. We will construct partnership-level profiles that present mean scores with respect to different constructs from the survey (see p. 7), as well as standard deviations for those scores. We will also prepare descriptive

statistics for partnership participants with non-participants within districts. Where there are sufficient sample sizes of respondents, we will examine associations between covariates of use

To generate our hypotheses, we will focus on associations between participation levels in partnerships and scores on constructs from the survey, including application (type) of research use, attitudes toward research, and skill in interpreting research. We will generate hypotheses as well as to how participation is related to covariates of use, especially environmental factors. Through these comparative analyses, our goal is to generate hypotheses that can be tested in future intervention studies.

Throughout the data analysis process, we will use same techniques as Study 1 to ensure the credibility of our findings and enhance the validity and reliability of our data.

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### C. Leadership and Outreach Activities

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The purpose of our leadership and outreach activities build field capacity to use research relevant to implementation of standards, principally in the areas of mathematics and science. We focus on these two areas in particular, because state and local leaders are likely to have to make many decisions in the upcoming years regarding curriculum materials, intervention programs, and professional development. The recent adoption of the Common Core State Standards in Mathematics by 45 states, and the adoption process now underway of the Next Generation Science Standards provides us with a context not only for the study of research use, but for making use of what we know about the need for sustained interaction to support research use. Our outreach activity will involve a range of strategies, some of which promote such interaction, but other activities that involve brokering and translation of our findings into user-friendly formats.

#### **Partners**

We have identified three organizations that have agreed to assist with our leadership and outreach activities:

**The Center for Education Policy Research (CEPR) at Harvard University.** CEPR is a partnership among districts, states, foundations, and university-based researchers designed to leverage the overwhelming amount of newly available school-, teacher-, and student-level data to address previously intractable policy questions in education and improve educational outcomes for all students. CEPR will develop a web site for the Center, work with researchers on the project to develop a module on promoting use that targets district research and evaluation staff, and host a conference at the end of the project that brings together researchers and district leaders to design follow-on studies from those identified in this proposal. CEPR is an especially appropriate outreach partner, because of their strong commitment to improving data use in education. CEPR has partnered with school districts, charter school networks, state education agencies, and nonprofit organizations to bring high-quality research methods and data analysis to bear on strategic management and policy decisions.

**Council of State Science Supervisors (CSSS).** CSSS is a professional organization composed of science education specialists who serve at the state, territorial, or the protectorate educational agency in the United States and U.S. Territories. It holds an annual conference, and it has been active in promoting research use in planning for implementation of the *Next Generation Science Standards*. Researchers have been regular presenters at CSSS and BCSSE conferences, and PI Penuel is on the Advisory Board for BCSSE. A cadre of five CSSS members will serve as members of the advisory group to the project. We will develop presentations for CSSS' annual conferences in Years 3-5, to share findings from our research studies.

**National Council of Supervisors of Mathematics (NCSM).** The National Council of Supervisors of Mathematics (NCSM) is a mathematics leadership organization for educational leaders that provides professional learning opportunities necessary to support and sustain improved student achievement. It aims to foster a professional and diverse learning community of educational leaders that ensures every student in every classroom has access to effective mathematics teachers, relevant curricula, culturally responsive pedagogy, and current technology.

### **Supplemental Study of State Science Team Research Utilization**

As part of its Building Capacity in State Science Education initiative, the Council of State Science Supervisors has organized teams comprised of state education agency leaders, district leaders, and other service providers (e.g., for professional development) to prepare for implementation of the Next Generation Science Standards. At the BCSSE conferences, in which some 45 states have participated, state teams meet to hear about research findings. Many state teams continue their planning when they return home. This particular context provides an opportunity to study the circulation of and sensemaking related to specific research studies that teams find valuable. Because teams include state education agency representatives, such a study enables us to learn more about how state education agencies and district leaders share research with one another and use it in their respective roles to support standards implementation.

For this supplementary study, we would propose an interview study with a district leader and a state education agency representative. We would design a structured interview protocol that elicits information about (1) particular research studies they have found useful in their work related to standards implementation and why they are useful; (2) interactions with other state team members around research; (3) the perceived role of state-district leader interaction in shaping research use. As part of analysis, we would gather and analyze research articles or reports cited in interviews with respect to quality and examine the degree to which state and district leaders differ in the kinds of research they use. We would also analyze interviews for evidence of differences and similarities between district leaders' and state leaders' perceptions of utility and state-district leader interaction. Finally, we would describe the nature and frequency of reported interactions on teams related to research.

### **Supplemental Study: Research Flow in Teachers' Instructional Advice and Information Networks**

We propose to examine how research findings flow within school district and school leaders' instructional advice and information networks. For this analysis, we will use survey data from Study 1 related to mathematics and reading. A key purpose is to investigate how research use might be related to the composition of these networks and substance of leaders' interactions with one another. Recent research on social networks in schools indicate that such networks can vary by school subject (Spillane, 2006; Spillane & Hopkins, 2013), shape sensemaking and implementation of policies and programs (Coburn & Russell, 2008; Penuel, Frank, Sun, Kim, & Singleton, in press).

If we pursue this study, we would add questions to our district office and school surveys for Study 1 that asks respondents from the 30 districts and 20-30 schools in *each* of these districts whom they seek advice and information about mathematics and reading instruction in order to document these decision-makers' access to research. We will adapt social network survey questions, piloted and used in prior work (Finnigan, Daly, & Che, 2013; Penuel, Riel, Krause, & Frank, 2009; Penuel, Sun, Frank, & Gallagher, 2012; Pustejovsky & Spillane, 2009; Spillane,

Kim, & Frank, 2012), adapting questions to focus specifically on ties between leaders that involve sharing of research findings to inform decision making. We will administer a parallel set of questions for reading and mathematics.

We will take an egocentric approach in our analysis, which maps networks that are centered around an individual or organization or organizational sub-unit such as a district office division (i.e., the ego). Egocentric networks are appropriate when the entire population of the network cannot be specified in advance (Wellman & Berkowitz, 1988). We will then calculate measures such as tie strength (importance or salience to decision making) and tie span (the range of individuals' networks) for individual nodes – an individual leader and/or district office division or school. Then we can systematically analyze similarities and differences between different sub-divisions (e.g., special education, assessment, curriculum and instruction) across all districts, and between different school subjects across both districts and schools. This supplemental study would enhance Study 1 and Study 2 in two key ways. First, it would enable us to explore how individual decision-makers and decision-making organizations or divisions access research across a much larger sample of large urban school districts. Second, it would enable us to move beyond the number of ties an individual person or organization has to analyze the strength of their ties (i.e., frequency and relative influence on practice of particular ties) as well as explore in more depth the substance or what of these connections.

We will engage Professor Megan Hopkins at Penn State to work on this supplemental study. Professor Hopkins will consult with the project in the first year helping design of our network questions. She will then commit time in Year 03 to analyzing and writing about our network data.

### **Leadership and Outreach Strategies**

There are four components to our leadership and outreach strategy: (1) use of special meetings to build ownership among prospective users of our research findings; (2) leveraging existing conferences to disseminate findings to educational decision makers and researchers; (3) a web site for disseminating resources and findings to decision makers and researchers; and (4) a training module targeting research and evaluation staff focused on helping build capacity for research use in districts.

**Convening special meetings to build ownership and foster utilization of findings.** We aim to convene two special meetings over the course of the project focused on leadership and outreach. The first, to take place in the first year of the project, will be focused on building awareness of the project and seeking feedback on our measurement and study designs. This meeting will be divided into two parts, one focused on soliciting input from research advisors, and a second part on soliciting input from members of our outreach team.

The second meeting, to be hosted by CEPR, will be a conference in the last year of the grant. CEPR has in the past brought district teams together with researchers to develop research studies focused around issues of district concern regarding use of data. Plans developed at these conferences have resulted in funded intervention research studies that documented a positive impact of data use on student outcomes by district leaders (Jenkins & Wisdom, 2012). For our Center, CEPR will host a conference focused on designing studies to improve research use that are follow-up studies to the Center studies proposed here. Findings from the descriptive studies and validity evidence from the measurement studies will be presented as part of the conference, as guides to help teams of district leaders and researchers plan studies. We will invite as participants district representatives from the case study sites for Studies 1 and 2, as well as research teams that are part of research-practice partnerships that are included in Study 2.

**Leveraging existing conferences for dissemination.** Two of our partners, CSSS and NCSM, have strong involvement of policy makers and leaders at the state and local level and hold annual conferences that draw hundreds of attendees. Early in the project, we will attend these conferences as a means to help identify the kinds of research policy makers and leaders say they need and that they actively seek out. We will also solicit feedback at conferences on early versions of our survey instruments, to ensure the relevance of protocols for members of these organizations. Beginning in year 3, we will develop proposals to present initial findings at these organizations' conferences. We will use the occasion of developing presentations to create practitioner-friendly presentations that also include short video clips of presenters that can be shared through the websites of these organizations and our own website.

For presentations to research audiences, our aim will be to assemble symposia presentations that include both researchers and district leaders. Such symposia will not only provide opportunities for researchers and decision makers to be involved in joint analysis and reflection; they will also provide research audiences with an important practitioner perspectives on the needs for research that district and school decision makers have. We anticipate developing proposals for presentations at meetings of AERA, the National Association for Research in Science Teaching (NARST), and the National Council for Teachers of Mathematics (NCTM).

**Building and maintaining a web site for dissemination.** We will build and maintain a web site that targets district leaders, principals, and researchers; the structure will provide for different entry points for each of these different audiences, since their needs are likely to be different. The web site will include findings from research in practitioner-friendly formats and language and in the form of academic working papers. It will also include links to published research and serve as a repository for measures developed as part of the study. For graduate students, the web site will include links for them and other novice researchers to key readings in the field of research use.

**Training module for research and evaluation personnel in districts.** CEPR's Strategic Data Project Fellowship is a two-year program that places and develops data strategists in partner districts where they can influence policy decisions that affect student outcomes. Fellows recruited into the program receive professional development now in measurement and analysis, leadership and change management, and education policy. For the Center, CEPR and PI Penuel will collaborate to develop a training module for fellows in the project that can be implemented by CEPR with future cohorts of fellows. The module's aim will be to support improved skill in using research in decision making. A key feature will be a case-based approach to teaching, where the cases will be based on findings from the descriptive research studies. Another feature will be training in use of the measures developed by the Center.

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## D. Management and Institutional Resources

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### Management

The principal investigators for the research study will comprise a **leadership team** for the study. The leadership team will be responsible for overall study direction and accomplishment of the Center's objectives. The team will meet by telephone conference every 2-3 weeks, at a regularly scheduled time. In addition, the team will meet in person on an annual basis for a 1-2 day study planning and review meeting.

PI Penuel will convene this team, both in regular and annual meetings. He has led several large, multi-institutional research studies, including for grants, cooperative agreements, and

contracts with the U.S. Department of Education. He has extensive experience in the role he will play for the project.

A **project management team** at the University of Colorado Boulder will support the leadership team. This team will be responsible for building infrastructures for data collection and analysis for the descriptive studies, maintaining an archive of data across studies, and supporting meeting logistics for team meetings. In addition, they will support individual study teams' study planning and implementation. The team will be comprised of a project director and part-time project manager.

A **technical advisory board** with expertise in research will support the leadership team of the study. The technical advisory board will meet in Year 1 and Year 5 of the project. In the first meeting, the advisory board will review instruments and research designs for each of the studies and provide feedback on them. On the basis of their input, our team will develop a detailed report of changes we make in response to their feedback. We will invite their further feedback on their proposed changes. In Year 5, we will present emerging findings of the studies, and we will also present a detailed leadership and outreach plan for their review. We will solicit their input on venues for dissemination of findings and feedback on the leadership and outreach plan at this second meeting. Each of the PIs will participate in these meetings.

Three researchers have accepted our invitation to serve as advisors:

**Dr. Larry Hedges** is Board of Trustees Professor of Statistics and Policy Research at Northwestern University. Dr. Hedges' expertise is in the areas of statistics and research methodology, especially the design and analysis of experimental studies in education and in methods for research synthesis.

**Dr. Lawrence Palinkas** is the Albert G. and Frances Lomas Feldman Professor of Social Policy and Health at the University of Southern California. A medical anthropologist, Dr. Palinkas' primary areas of expertise are in preventive medicine, cross-cultural medicine and health services research.

**Dr. Tom Smith** is Associate Professor, Department of Leadership, Policy and Organizations at Vanderbilt University. Dr. Smith's expertise is in the areas of school and district reform and the relation of policy and teaching quality.

A **practice advisory board** will be comprised of 10 representatives from two partner organizations for our leadership and outreach activities. The purpose of this board will be to provide reviews of instruments and leadership and outreach activities for the purpose of improving the likely relevance and utility of study findings to district and state leaders. Five representatives from the National Council of Supervisors of Mathematics and five representatives from the Council of State Science Supervisors will participate on this board. We will convene this group via teleconference in Years 2 and 4 and meet separately with them at their annual conferences.

### **Institutional Resources**

Each of the partner institutions has the requisite facilities, equipment, supplies, and other resources required to support the proposed activities for the Center. The programs in Educational Psychology and Learning Sciences and Research, Evaluation, and Measurement (REM) at CU Boulder have facilities, equipment, and other resources that can support the project's goals. CU's School of Education has a dedicated office space for design and collaboration with both formal

and informal meeting spaces, videoconferencing facilities, and innovative learning technologies. This space will be ready in fall 2013. REM students have access to IRT software, Stata and SPSS for survey response analysis. For video coding and analysis, students have access to a variety of qualitative coding software. The School of Education provides general grant administration in support of sponsored research, including assisting with arrangements for all grant-related travel.

The School of Education and Social Policy (SESP) at Northwestern University has its own IT resources and staff committed to support the research effort described in this proposal. IT services available to SESP researchers include high quality technologies to support data storage, analysis, and communication among collaborators. Northwestern University's Information Technology (NUIT) group also has resources and staff in place to support high availability goals such as 24/7 realtime monitoring, database design support and maintenance, and a network topology that can easily respond to rapid changes in website traffic and user registrations. NUIT provides domain-specific research support from its Academic and Research Technologies (A&RT) group and basic computing, storage and communication services from its Office for Cyberinfrastructure.

The Harvard Graduate School of Education (HGSE) and its Center for Education Policy Research (CEPR), offer a combination of infrastructure and resources to support the work of this project. Both institutions, as well the wider Harvard community, boast world-class quantitative and qualitative research expertise. Harvard offers critical core support, including grant management and assistance with computing and website needs. CEPR itself has generous research resources, including adequate office and meeting space, a financial manager, and support staff able to assist with project events. CEPR also houses a secure data lab for storing Only authorized users are granted physical access to the lab via a logged key card system.

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### E. Personnel

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The Principal Investigator for the Center is **William R. Penuel**, Professor of Educational Psychology and Learning Sciences. Penuel has expertise in the areas of learning sciences, assessment, and policy. He has conducted scores of multi-method evaluation studies of innovations in literacy, mathematics, and science education, including a number of randomized controlled trials. Most recently, his research has focused on the development and study of new approaches to relating research and practice. With co-PI Cynthia Coburn, he developed a white paper for the William T. Grant Foundation that describes the landscape of research-practice partnerships (Coburn et al., 2013). Together, they are investigating research use within three such partnerships. With his colleague Barry Fishman, Penuel has organized meetings and edited a volume of case studies of *Design-Based Implementation Research* (Fishman, Penuel, Allen, & Cheng, in press), an approach to broadening the impact of potentially effective interventions through the design and testing of supports for implementing interventions. Penuel serves on the advisory board for the Building Capacity for State Science Education (BCSSE), which is focused on implementation of the Next Generation Science Standards (NGSS) and on a National Research Council committee on assessment and NGSS.

Penuel will serve as overall Principal Investigator for the project, a deputy leader of the measurement studies, and deputy leader of Descriptive Study 2. As Principal Investigator, he will oversee management of the project, convene regular project meetings and meetings with the advisory group, coordinate with outreach partners, and lead communications with ED. He will supervise the Project Director and a part-time project assistant, providing them with necessary guidance and assistance for their duties. As a deputy leader for measurement studies, Penuel will co-supervise a graduate research assistant in collecting and analyzing validity evidence for the



study and work closely with the two other co-PIs on the measurement work, Heather Hill and Derek Briggs. As a deputy leader for Study 2, Penuel will assist co-PI Cynthia Coburn with development of instruments, data collection, analysis, and writing. As overall coordinator of outreach activities, Penuel will work closely with CEPR, CSSS, and NCSM to develop content for policy makers and leaders and to identify opportunities for presentations of research at conferences. Penuel will engage in regular correspondence with ED regarding Center progress on a timetable agreed upon with ED project officers. Penuel will devote 10% time to the Center on an annual basis.

**Heather C. Hill** is a professor at the Harvard Graduate School of Education. Her primary work focuses on developing measures of instruction, then using these measures to evaluate public policies and programs. She is co-director of the National Center for Teacher Effectiveness and also principal investigator of a five-year cluster-randomized trial examining the effects of Marilyn Burns Math Solutions professional development on teaching and learning. She has extensive experience measuring educational phenomena via surveys (of teacher instruction, teacher professional development, beliefs, and work habits), via assessments (*Learning Mathematics for Teaching Student Assessment* and the *Mathematical Knowledge for Teaching* instruments), and via observations (the *Mathematical Quality of Instruction* instrument). In each project, a focus of work has been on validating instruments using multiple methods and sources of evidence. She received a Ph.D. in political science from the University of Michigan in 2000 for work analyzing the implementation of public policies in law enforcement and education. Her work appears in *American Educational Research Journal*, *Educational Evaluation and Policy Analysis*, *Journal of Policy Analysis and Management* and *Cognition and Instruction*.

Hill's work on this project will focus on managing the development of measures of research utilization. She will participate in and supervise all project work at Harvard, including writing draft items, pilot design, data collection and analysis, and fielding the main survey. She will collaborate on technical reports and writing products for publication; she will also assist in dissemination efforts to professional associations such as the National Council of Supervisors of Mathematics. She will also contribute to the development of web materials for measures dissemination. She will devote 1.8 academic months to the project in year 1 and 1 summer month to the project in Years 2 and 3 and one-quarter month to the project in Year 4 and Year 5.

**Cynthia E. Coburn** is professor at the School of Education and Social Policy at Northwestern University. She specializes in policy implementation, the relationship between research and practice, data use, and scale up of innovation. She has studied research use in schools and districts since 2002, including co-directing a six-year cross-case study of innovative approaches that reconfigured the relationship between research and practice for educational improvement funded by the John D. and Catherine T. MacArthur Foundation. This project resulted in multiple publications, including the book *Research and practice in education: Building alliances, bridging the divide* (with Mary Kay Stein). She has also led two empirical studies of research use at the district level, including a current study (with William Penuel) of research-practice partnerships in three districts funded by the William T. Grant Foundation. She has consulted with the William T. Grant Foundation and the Spencer Foundation to assist them in developing initiatives related to research use and data use respectively. Her work with the Spencer Foundation included co-editing two special issues on data use (in *Teachers College Record* and *American Journal of Education*) and producing a comprehensive conceptual framework for research on data use, published in *Measurement: Interdisciplinary Research and*

*Perspectives*. In 2011, Coburn received the Early Career Award from the American Educational Research Association in recognition of her achievements in the first decade of her career.

On this project, Coburn will lead study 2, with responsibility for hiring and supervising Northwestern staff, protocol development, data collection, data analysis, and writing. Dr. Coburn will serve as deputy lead of study 1, participating in protocol development, design of data collection, design of data analysis, data analysis, and writing. Finally, Coburn will participate, as needed, in the measurement study, providing feedback on item design and the development of the observation instrument and interview protocols. She will devote 1 summer month in years 1 and 1.35 academic months in years 2-5.

**James P. Spillane**, the Spencer T. and Ann W. Olin Professor in Learning and Organizational Change at Northwestern University where he is also a professor of Human Development & Social Policy, Learning Sciences, and Management & Organizations. Spillane's work explores relations between policy and local practice at the school district, school, and classroom levels. He is principal investigator of the Distributed Leadership Studies, a program of research that investigates school leadership and management practice for English Language Arts, mathematics, and science. Spillane is author of several books including *Standards Deviation: How Local Schools Miss-Understand Policy* (Harvard, 2004), *Distributed Leadership* (Jossey-Bass, 2006), *Distributed Leadership in Practice* (Teacher's College Press, 2007), and numerous journal articles. Spillane's research program over the past two decades has been funded by grants from the National Science Foundation, the Institute of Education Sciences, the Spencer Foundation, the Sherwood Foundation, and the Carnegie Foundation of New York.

On this project, Spillane will lead Study 1, with responsibility for protocol development, data analysis, and writing for the project. He will also advise Study 2 and the Measurement Study, lending specific expertise to the development of survey, interview, and observation items for eliciting information related to organizational and environmental covariates of research use. For this project, he will devote 4.17% effort in year 1; 13.96% effort in years 2 and 3; and 8.33% effort in years 4 and 5.

**Anna-Ruth Allen** is a research associate at the University of Colorado Boulder. She is currently a lead researcher for PIs Coburn and Penuel's study of three research-practice partnerships. She is also a researcher for the Research+Practice Collaboratory, an NSF-funded study of new models for relating research and practice. With PI Penuel, she is co-editor of a forthcoming volume on Design-Based Implementation Research. She brings expertise in reading and literacy studies, case study methodology, and discourse analysis. Her research publications focus on teacher and youth identities and on the role of institutional change in producing new pathways for youth. She holds a Ph.D. in education from the University of Wisconsin – Madison.

For this project, Allen will conduct data collection and analysis for cognitive interviews for the measurement study and be a data collection leader for Studies 1 and 2. In addition, in Year 5, she will develop case studies for policymakers and district leaders based on the study findings as part of outreach activities. She will devote 30 percent of her time to the project in Year 1, 60% in Years 2, 4, and 5, and 80% in Year 3.

**Jon Fullerton** is the executive director of the Center for Education Policy Research. Jon has extensive experience working with policymakers and executives in designing and implementing organizational change and improvements. Before coming to Harvard, Jon served as the Board of Education's director of budget and financial policy for the Los Angeles Unified School District. In this capacity, he provided independent evaluations of district reforms and helped to ensure that the district's budget was aligned with board priorities. From 2002 to 2005 he was vice-

president of strategy, evaluation, research, and policy at the Urban Education Partnership in Los Angeles, where he worked with policymakers to ensure that they focused on high impact educational strategies. Jon previously worked for five years at McKinsey & Company as a strategy consultant. He has a PhD in government and an A.B. in social studies from Harvard.

For this project, Fullerton will conduct leadership and outreach activities, including hosting a conference to plan follow-on studies from the Center's research. He will devote 20% of his time to the project.

### **Center Proposal Summary**

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Our proposed Center will advance understanding of research use in four key ways. First, our measurement studies will provide the field with instruments for analyzing multiple aspects of research use for decision making. These survey, interview, and observation tools will enable researchers to study research use as an interactive process. They will be particularly useful in future evaluation research comparing alternate strategies for enhancing research use. Second, our first descriptive study will generate refined, testable hypotheses about the organizational and environmental factors related to research use. The work is strongly grounded in theoretical constructs the researchers leading the study have helped to develop empirically in past research on data use. Third, the research-practice partnership study will generate refined hypotheses that can guide the design of future partnerships. This study leverages ongoing research by its leaders into the dynamics of partnerships. Finally, our leadership and outreach studies lay the foundation for future intervention research on research use, by engaging researchers and leaders in joint sensemaking of our findings and planning for extending the Center after IES funding ends.

## Appendix A: Timelines for Research Studies

<i>Study/Task</i>	Year (Month # in Rows for Activity)				
	Y1 2014- 15	Y2 2015-16	Y3 2016- 17	Y4 2017- 18	Y5 2018-19
<i>Measurement Study</i>					
Initial item writing and coding guide development	Jul-Sep				
Cognitive interviews and analysis	Oct-Dec				
External review and finalization of pilot form	Jan				
Small pilot ( <i>n</i> = 200 pilot)	Feb-Apr				
Pilot analysis and revise form	Apr-Jun				
Field test ( <i>n</i> = 600)		Jul-Nov			
Data entry/cleaning		Dec-Jan			
Analyses to produce final measures		Feb-Jun			
Internal and ED review of measures		Jun			
Develop technical materials for web distribution			Jul-Aug		
<i>Study 1</i>					
Identify candidate districts	May				
Survey to identify sample		Jul-Aug			
Analyze survey, documents, and identify four candidate districts		Sept-Oct			
Negotiate access to districts		Nov-Dec			
Initial data collection (central office)		Jan-Feb			
Survey data collection		Apr-May			
Second data collection (central office)		May			
Analyze surveys and select schools		Jun	Jul-Aug		
Third data collection (central office)			Sept		
Initial school data collection			Oct-Dec		
Fourth data collection (central office)			Jan-Mar		
Second school data collection			Apr-Jun		
Data analysis			Jun	Jul-Jun	
Feedback to districts				Apr	
<i>Study 2</i>					
Identify population of partnerships			Sept-Dec		
Select case study sites and negotiate access			Jan-Mar		
Wave 1 of data collection in partnerships				Aug-Oct	
Wave 2 of data collection in partnerships				Jan-Feb	
Wave 3 of data collection in partnerships				Apr-May	
Data analysis				June	Jul-Mar
Feedback to partnerships					Mar

# **APPENDIX C: LETTERS OF SUPPORT**

# CAMBRIDGE PUBLIC SCHOOLS

159 THORNDIKE STREET CAMBRIDGE, MASSACHUSETTS 02141



August 8, 2013

William R. Penuel  
Professor Educational Psychology  
Educational Psychology and Learning Sciences  
School of Education  
University of Colorado  
UCB 249  
Boulder, CO 80309

Dear Dr. Penuel,

I am writing to express my support for your proposed Center for the Study of Interactive Research Utilization. Our school district, like many districts, seeks to use research and knowledge of best practices to guide decisions, and we welcome the opportunity to help your team develop methods for understanding how district administrators use research. With the wealth of educational research and data that exists, as well as current pressures to use data and provide evidence for decisions, we are always looking to find ways to make research relevant and useable for policy makers and practitioners.

To support your important work, our district will help you pilot your survey about research use in our district. I understand that you plan to pilot your survey with about 25 district administrators and principals, and will follow up with each person for a short interview with them about survey items. I commit to helping you find volunteers in our district to assist with your survey pilot, and look forward to the feedback you can offer about our own research use as part of the piloting process.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jessica Huizenga".

Jessica Huizenga, Ed.D  
Assistant Superintendent  
For Curriculum & Instruction

**President**

Valerie L. Mills  
[Valerie.Mills@oakland.k12.mi.us](mailto:Valerie.Mills@oakland.k12.mi.us)

**Past President**

Suzanne Mitchell  
[suzmitch@comcast.net](mailto:suzmitch@comcast.net)

**First Vice President**

Kathleen A. Rieke  
[krieke@fayette.k12.in.us](mailto:krieke@fayette.k12.in.us)

**Second Vice President**

Connie Schrock  
[cschrock@emporia.edu](mailto:cschrock@emporia.edu)

**Canadian Regional Director**

Carol A. Matsumoto  
[cmat1@mymts.net](mailto:cmat1@mymts.net)

**Central 1 Regional Director**

Gwen Zimmermann  
[gzimmermann@d125.org](mailto:gzimmermann@d125.org)

**Central 2 Regional Director**

Laura Godfrey  
[lgodfrey@madison.k12.wi.us](mailto:lgodfrey@madison.k12.wi.us)

**Eastern 1 Regional Director**

Suzanne Libfeld  
[Suzanne.libfeld@gmail.com](mailto:Suzanne.libfeld@gmail.com)

**Eastern 2 Regional Director**

Eric Milou  
[milou@rowan.edu](mailto:milou@rowan.edu)

**Southern 1 Regional Director**

Wanda Butler Audrick  
[wandaaudrick@hotmail.com](mailto:wandaaudrick@hotmail.com)

**Southern 2 Regional Director**

Linda K. Griffith  
[lindag@uca.edu](mailto:lindag@uca.edu)

**Western 1 Regional Director**

Mona Toncheff  
[toncheff@phoenixunion.org](mailto:toncheff@phoenixunion.org)

**Western 2 Regional Director**

Hope Bjerke  
[shcowboy@frontiernet.net](mailto:shcowboy@frontiernet.net)

**Affiliate Group Coordinator**

Cheryl Avalos  
[randca@roadrunner.com](mailto:randca@roadrunner.com)

**Awards Chair**

Nanette Seago  
[nseago@wested.org](mailto:nseago@wested.org)

**Communications Chair**

Mike Hall  
[mhall@astate.edu](mailto:mhall@astate.edu)

**Conference Coordinator: LA-MA**

Dianne L. DeMille  
[drdianne@roadrunner.com](mailto:drdianne@roadrunner.com)

**Journal Editor**

Angela Barlow  
[angelatillbarlow@gmail.com](mailto:angelatillbarlow@gmail.com)

**Membership & Marketing Chair**

Sharon Rendon  
[Sharon.rendon@k12.sd.us](mailto:Sharon.rendon@k12.sd.us)

**NCTM Representative**

Donna Karsten  
[karstend@gov.ns.cs](mailto:karstend@gov.ns.cs)

**Newsletter Editor**

Lynn Columba  
[Lynn.columba@gmail.com](mailto:Lynn.columba@gmail.com)

**Nominations Chair**

Nanette Seago  
[nseago@wested.org](mailto:nseago@wested.org)

**Position Papers Editor**

Linda Fulmore  
[lmfulmore@yahoo.com](mailto:lmfulmore@yahoo.com)

**Secretary**

Mariane Srock  
[msrock@misd.net](mailto:msrock@misd.net)

**Sponsor Partner Liaisons**

Sherry Lane  
 Jim Wohlgehagen  
[ncsmadvertise@mathedleadership.org](mailto:ncsmadvertise@mathedleadership.org)

**Treasurer**

Jon Manon  
[ncsmtreasurer@aol.com](mailto:ncsmtreasurer@aol.com)

August 12, 2013

William R. Penuel  
 Professor of Educational Psychology and Learning Sciences  
 School of Education  
 University of Colorado  
 UCB 249  
 Boulder, CO 80309

Dear Bill,

On behalf of the National Council of Supervisors of Mathematics, I am pleased to offer my support to your proposed *Center for Interactive Knowledge Utilization*. This particular proposal effort helps support a key aspect of our work in providing resources and research to our members, who include mathematics leaders in districts around the country.

We are pleased to be able to contribute to the center as a dissemination partner and advisor to the Center's research.

The focus on use of research to inform decision-making in mathematics is especially important today, because many states and districts will be making important decisions related to the implementation of the *Common Core State Standards* in Mathematics. In the coming years, we will be prioritizing formative assessment, an area where there is much research that could inform decision making related to the demands of *CCSS-M*. I am hopeful that the Center's research will contribute to our understanding of ways district leaders and principals can make use of research.

I understand as part of the Center, we will provide input into selected aspects of research and assist with dissemination. We will provide input on needs of school and district leaders for research related to mathematics teaching, learning, and professional development. We will provide expert review on survey and observation instruments and help identify potential sites for early field tests of measures. With respect to dissemination, we'll provide ongoing input on how best to communicate results of studies to our membership. We will also help present with researchers in the final year of the grant at research 1-2 conferences.

Thank you for inviting us to be part of this effort. We look forward to working with you and your team on the Center if it is funded.

Sincerely,



Valerie L. Mills

The voice and vision of science education  
for the states.

### **2013-2014 Board**

Juan-Carlos Aguilar, President  
GA Department of Education  
1754 Twin Towers East  
205 Jesse Hill Jr. Drive, SE  
Atlanta, GA 30334  
404-657-9072  
[jaguilar@doe.k12.ga.us](mailto:jaguilar@doe.k12.ga.us)

Peter McLaren, Past-President  
RI Department of Education  
255 Westminster Street  
Providence, RI 02903  
401-222-8454  
[peter.mclaren@ride.ri.gov](mailto:peter.mclaren@ride.ri.gov)

Matt Krehbiel, 3<sup>rd</sup> Year Director  
KS State Department of Education  
120 SE 10<sup>th</sup> Avenue  
Topeka, KS 66612-1182  
785-296-8108  
[mkrchbiel@ksde.org](mailto:mkrchbiel@ksde.org)

Ellen Ebert, 2<sup>nd</sup> Year Director  
WA Office of Superintendent  
of Public Instruction  
Old Capitol Building  
PO Box 47200  
Olympia, WA 98504-7200  
360-725-4962  
[Ellen.ebert@k12.wa.us](mailto:Ellen.ebert@k12.wa.us)

Sean Elkins, 1<sup>st</sup> Year Director  
Science Academic Program Consultant,  
KY Department of Education  
500 Mero Street, Frankfort, KY  
(502) 564-2106 (voice)  
(502) 564-9848 (fax)  
[sean.elkins@education.ky.gov](mailto:sean.elkins@education.ky.gov)

Anita Bernhardt, Secretary  
ME Department of Education  
29 wild Way  
Augusta, ME 04021  
207-624-6835  
[Anita.bernhardt@maine.gov](mailto:Anita.bernhardt@maine.gov)

Linda K. Jordan, Executive Secretary  
TN Department of Education  
710 James Robertson Parkway  
Nashville, TN 37243-0379  
615/532-6285  
[linda.k.jordan@tn.gov](mailto:linda.k.jordan@tn.gov)

C.J. Evans, Treasurer/PA Coordinator  
614 Indian Hills Drive  
St. Charles, MO 63301-0561  
314/614-7707  
[jeceivans@charter.net](mailto:jeceivans@charter.net)

Federal ID# 23-7136071

August 2, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences  
School of Education  
University of Colorado  
UCB 249  
Boulder, CO 80309

Dear Bill,

On behalf of the Council of State Science Supervisors, I am pleased to offer my support to your proposed Center for Interactive Knowledge Utilization. We are especially pleased to be able to contribute to the center as a dissemination partner and advisor to the Center's research.

The focus on use of research to inform decision making in science is especially important today, because many states and districts will be making important decisions about curriculum, assessment, and professional development in the next few years. The *Next Generation Science Standards* demands that students meet ambitious new performance expectations. The Center's research will contribute to our understanding of ways district leaders and principals can make use of research to inform decisions about how to help students meet those standards.

I understand as part of the Center, we will provide input on needs of school and district leaders for research related to science teaching, learning, and professional development. We will provide expert review on survey and observation instruments and help identify potential sites for early field tests of measures. With respect to dissemination, we'll provide ongoing input on how best to communicate results of studies to our membership and facilitate researchers' presentation of findings at our CSSS and BCSSE conferences. We will also help present with researchers in the final year of the grant at research 1-2 conferences.

We very much look forward to working with you and your team on this effort if it is funded.

Sincerely,



Juan-Carlos Aguilar, President  
Council of State Science Supervisors  
GA Department of Education  
1754 Twin Towers East  
205 Jesse Hill Jr. Drive, SE  
Atlanta, GA 30334  
404-657-9072  
[jaguilar@doe.k12.ga.us](mailto:jaguilar@doe.k12.ga.us)





August 10, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences  
University of Colorado Boulder  
UCB 249  
Boulder, CO 80309

Dear Bill,

Thank you for inviting the Consortium on Chicago School Research to be considered as a possible case study site in your proposed *Center for the Study of Interactive Knowledge Utilization*. We are pleased to accept the invitation and excited about the possibility of being part of your study.

The Consortium is one of the earliest examples of a research-practice partnership between a district and research organization, and it is a model for other partnerships. Since the beginning of the 1990s, we have helped Chicago Public Schools monitor the organizational supports for reform present in schools, evaluate district programs and policies, and develop indicator systems to help track student progress toward graduation. We have seen evidence our partnership with CPS fosters research use, and we see promise for the research alliance more broadly for supporting the search for solution to persistent educational problems.

We understand that in providing this letter of support, we may be selected as a case study site for your proposed Center in the 2016-17 school year. We agree to facilitate entrée with our partners as well. We understand that our own and partners' commitment will be to participate in interviews and a survey of research use, as well as to allow for observations of joint meetings.

We look forward to working with you if the project is funded.

Sincerely,



Melissa Roderick  
Co-Director, Consortium on Chicago School Research



Institute for Policy Research  
Northwestern University  
2040 Sheridan Road  
Evanston, Illinois 60208-4100

Larry V. Hedges  
Board of Trustees Professor of  
Statistics and Policy Research  
l-hedges@northwestern.edu  
Phone 847-491-8899  
Fax 847-491-9916



August 12, 2013

William R. Penuel, Professor  
School of Education  
University of Colorado  
UCB 249  
Boulder, CO 80309

Dear Bill,

I would be happy to serve as a member of the advisory board for your proposed *Center for the Study of Interactive Research Utilization*. The focus on productive knowledge utilization in school and district settings is of great importance and to the field, and this project has great potential to contribute to the field.

My expertise in research methodology and statistic fits well with the goals of your project, and I am excited to participate as an advisor and partner in helping to inform the purpose and design of your set of studies, as well as to communicate about findings and contributions. I have had a longstanding interest in the ways that research findings can be synthesized accurately and in ways to inform policy and practice. I understand that the proposed project will carry out three studies focused on developing measures of research use in practice, a study of research use by districts, and a study of thriving partnerships between researchers and districts. This set of activities is just what is needed for the field, both to grow the empirical base and to contribute substantively to theory and methodology of studying research use.

As an advisor, I understand that I am committing to attend two advisory board meetings in Boulder over the life of the project and provide guidance to the project team on issues related to measurement and research design as needed by the Principal Investigators.

Your team is well very positioned to do this work well, and I enthusiastically look forward to participating in the project if it is funded.

Sincerely,

A handwritten signature in black ink that reads 'Larry V. Hedges'.

Larry V. Hedges  
Board of Trustees Professor of Statistics and Policy Research



August 05, 2013

William R. Penuel, Professor  
Educational Psychology and Learning Sciences  
School of Education  
University of Colorado  
UCB 249  
Boulder, CO 80309

August 1, 2013

Dear Bill,

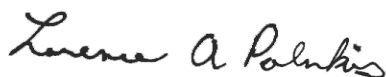
Your proposed *Center for the Study of Interactive Research Utilization* would be a major contribution to understanding and promoting research utilization, and I wholeheartedly endorse this project. I would be happy to serve as an advisor to you and your team as you develop, implement and share findings from this important work.

The multi-strand strategy of your proposed center is what is needed for the field because it will assist in developing methods for different dimensions of research use in practice. My work using mixed method designs in studies of research utilization in health and social services, and studying cultural exchange between researchers and practitioners, calls for exactly these kinds of next steps. I am excited to see the growing interest and development of studies of research utilization in the field of education, and believe that interdisciplinary engagement is essential for making research participatory and understanding how it is used in multiple fields of practice.

As an advisor, I understand that I am committing to attend two advisory board meetings in Boulder over the life of the project and provide guidance to the project team on issues related to measurement and research design as needed by the Principal Investigators.

I fully support the proposed project and would be happy to be an advisor to and supporter of this work.

Sincerely



Lawrence A. Palinkas, Ph.D.

Albert G. and Frances Lomas Feldman Professor of Social Policy and Health





VANDERBILT UNIVERSITY

---

*Department of Leadership, Policy and Organizations*  
230 Appleton Place, Peabody College #514  
Nashville, TN 37203-5721

(615) 322-5519  
(615) 343-7094 fax

August 30, 2013

William R. Penuel, Professor  
School of Education  
University of Colorado  
UCB 249  
Boulder, CO 80309

Dear Bill,

Thank you for inviting me to join the advisory board for your proposed *Center for the Study of Interactive Research Utilization*. I am delighted to accept the invitation. You have assembled a great team to study research use in districts and schools.

The Center's proposed focus on an interactive analysis of knowledge utilization in school and district settings resonates strongly with what we have learned in recent years on the Middle-school Mathematics and the Institutional Setting of Teaching (MIST) project. In that project, my colleagues and I have partnered with districts to support research on districts' strategies for improving instruction at scale. We have found that our partnerships with districts have facilitated sustained conversations about how research can inform decision making.

I understand that your project team will implement three studies focused on developing survey and observation measures of research use, a study of research use by districts, and a study of partnerships between researchers and districts. This set of activities will benefit our understanding of research use.

As an advisor, I understand that I am committing to attend two advisory board meetings in Boulder over the life of the project and provide guidance to the project team on issues related to measurement and research design as needed by the Principal Investigators.

Your team is well very positioned to do this work well, and I enthusiastically look forward to participating in the project if it is funded.

Sincerely,

A handwritten signature in cursive script that reads "Thomas M. Smith".

Thomas M. Smith  
Associate Professor of Public Policy and Education  
Director, National Center on Scaling Up Effective Schools



Department of Curriculum and Instruction  
The Pennsylvania State University  
Chambers Building  
University Park, PA 16802-3205

814-865-1500  
Fax: 814-863-7602  
<http://www.ed/psu.edu/ci/>

August 26, 2013

Dr. Bill Penuel  
Professor of Educational Psychology and Learning Sciences  
School of Education  
University of Colorado  
UCB 249  
Boulder, CO 80309

Dear Dr. Penuel:

This letter serves to document my participation and collaboration in the Research and Development Education Center proposed by you and Drs. Cynthia Coburn, Heather Hill, and James P. Spillane. Specifically, I will engage in the project's supplemental study, "Research Flow in Teachers' Instructional Advice and Information Networks," as a consultant in Year 01 in the development of a social network survey to be administered to district and school staff across 30 school districts, and as an analyst of this social network data in Year 03.

Based on my work in social network analysis to date, I am excited to engage in this study, as it will build on my prior work that has shown how advice and information related to instruction is distributed across the school organization, and that this distribution of advice and information depends on factors such as the school subject and school leadership and management. In this new line of work, we will move beyond the mere presence of ties among school staff members to examine the strength as well as the substance of those ties. At a time when the knowledge development of teachers and leaders is crucial in implementing instructional reform, these efforts will help school administrators design mechanisms that facilitate the spread of research that guides leadership and instruction, and that strengthens school staff ties around empirically sound practices. Such work is necessary to bridge what is often a research/practice divide and to promote the use of research in the design of school systems that support teacher learning and student achievement.

I look forward to engaging with an outstanding team of researchers in this important work.

Sincerely,

A handwritten signature in cursive script that reads "Megan Hopkins".

Megan Hopkins, Ph.D.  
Assistant Professor  
Pennsylvania State University  
College of Education



**B·E·R·C**

**Baltimore Education Research Consortium**  
2701 N Charles St, Suite 300  
Baltimore, MD 21218

August 12, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences  
University of Colorado Boulder  
UCB 249  
Boulder, CO 80309

Dear Bill,

Thank you for inviting the Baltimore Education Research Collaborative (BERC) to be considered as a possible case study site in your proposed *Center for the Study of Interactive Knowledge Utilization*. We are pleased to accept the invitation.

There is much to learn about the factors that encourage and enable district and school leaders to use research in their planning and policy making. BERC is a partnership of the Baltimore City Public Schools, Johns Hopkins University, Morgan State University, and other civic and community partners. Our mission is to conduct and disseminate strategic data analysis and research that informs decisions about policy and practice to improve the educational and life outcomes of children in Baltimore. At BERC, we work closely with the Baltimore City Schools to provide them with high quality research on issues that are pressing and immediate for them. BERC assembles a diverse coalition of partners to formulate questions worth asking, contribute to conversations worth having, and highlight policy implications worthy of action.

The district leaders we work with care deeply about improving outcomes for children in their charge. They seek information and answers that scientific research provides. But conditions do not always enable them to use it as much as we—or they—would like. The Center you propose would help BERC and research-practice partnerships across the country improve our ability to support district leaders in using research more centrally in their ongoing work.

Your team is in a strong position to do this work and is one of the few in the country that has investigated research use at the district level empirically. They have a broad knowledge of the different kinds of research-practice partnerships currently working in

the country and the issues and challenges they face. And, your work to synthesize and publicize the existing research on research-practice partnerships creates a strong platform for future research. We are eager to be part of such an effort.

We understand that in providing this letter of support, we may be selected as a case study site for your proposed Center in either the 2015-16 or 2016-17 school years. We agree to facilitate entrée with our partners as well. We understand that our own and partners' commitment will be to participate in interviews and a survey of research use, as well as to allow for observations of joint meetings.

We look forward to working with you should the project be funded.

Sincerely,

A handwritten signature in black ink, appearing to read "Faith Connolly", followed by a long horizontal flourish.

Faith Connolly, Ph.D.  
Executive Director  
Baltimore Education Research Consortium  
Johns Hopkins University  
2701 N Charles Street, Suite 300  
Baltimore MD 21218



August 10, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences  
University of Colorado Boulder, UCB 249  
Boulder, CO 80309

Dear Bill,

Thank you for inviting the John W. Gardner Center for Youth and Their Communities to be considered as a possible case study site in your proposed *Center for the Study of Interactive Knowledge Utilization*. We are pleased to accept the invitation.

We are particularly excited about your study's focus on research-practice partnerships, because we view it as a vital strategy for educational improvement. The Gardner Center is itself involved in facilitating exchanges between researchers and practitioners through partnership: we are hosting a meeting this fall with America's Promise that will bring together some 100 youth development specialists from around the country to focus on what we know and need to learn about research-practice partnerships.

For more than a decade, the Gardner Center has been part of a long-term research-practice partnership with Redwood City. A key feature of our partnership is that it is a cross-sector partnership that brings together the school district and a number of community agencies. Over the years, the partnership has been successful both in identifying and addressing persistent problems faced by young people and identifying supports to help them thrive both in and out of school. Ours is a good example of a special kind of research alliance, in which we serve as a key research and evaluation partner for the overall partnership. A large Youth Data Archive includes data from the partners and is a powerful tool for addressing the questions our partners have about how best to support youth in the community.

We understand that in providing this letter of support, we may be selected as a case study site for your proposed Center in either the 2015-16 or 2016-17 school years. We agree to facilitate entrée with our partners as well. We understand that our own and partners' commitment will be to participate in interviews and a survey of research use, as well as to allow for observations of joint meetings. We look forward to working with you if the project is funded.

Sincerely,



Amy Gerstein, Executive Director

The **Research Alliance** for  
**New York City Schools**

**New York University**

Steinhardt School of Culture, Education, and Human Development

August 12, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences  
University of Colorado Boulder  
UCB 249  
Boulder, CO 80309

Dear Bill,

Thank you for inviting the Research Alliance for New York City Schools to be considered as a possible case study site in your proposed *Center for the Study of Interactive Knowledge Utilization*. I am pleased to accept the invitation on behalf of the Research Alliance.

We are particularly excited about your study's focus on research-practice partnerships, because we view it as a vital strategy for educational improvement. The Research Alliance for New York City Schools conducts rigorous studies on topics that matter to the city's public schools. We strive to advance equity and excellence in education by providing non-partisan evidence about policies and practices that promote students' development and academic success. While independent of the New York City Department of Education (DOE), we work with DOE and other stakeholders to identify important questions for research and to provide valid and reliable evidence to help solve problems and build capacity in schools throughout NYC. In addition, the Research Alliance collaborates with researchers at NYU and other universities and organizations across the city and country. Finally, we are deeply committed to communicating actionable research results to an audience of New York City's education decision makers and stakeholders including policymakers, administrators, teachers, parents, and community organizations, businesses, and funding agencies.

I believe that you and your team are ideally suited to take on this investigation. The white paper you wrote with Cynthia Coburn is the definitive piece to date on research-practice partnerships. Furthermore, we have gained a lot from interacting with Cynthia Coburn in her role as a consultant to the network of research-practice partnerships convened by the William T. Grant Foundation. We see this study—and the Center overall—as an opportunity for you and your partners to learn more about how decision making unfolds in school district central offices and provide guidance to our organization and others that seek to work with districts to enable them to make more and better use of high quality scientific research in the high impact decisions they make that affect opportunities for children and youth in public schools.

I understand that in providing this letter of support, we may be selected as a case study site for your proposed Center in either the 2015-16 or 2016-17 school years. I agree to facilitate entrée with our partners as well. I understand that our own and partners' commitment will be to



**NEW YORK UNIVERSITY**

285 Mercer Street, 3rd Floor | New York, New York 10003-9502  
212 992 7697 | 212 995 4910 fax  
research.alliance@nyu.edu | www.steinhardt.nyu.edu/research\_alliance

participate in interviews and a survey of research use, as well as to allow for observations of joint meetings.

I look forward to working with you if the project is funded.

Sincerely,

A handwritten signature in cursive script that reads "James Kemple".

James Kemple  
Executive Director, Research Alliance for New York City Schools  
Research Professor, Steinhardt School of Culture, Education, and Human Development

August 10, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences  
University of Colorado Boulder  
UCB 249  
Boulder, CO 80309

Dear Bill,

Thank you for inviting the Strategic Education Research Partnership Institute (SERP) to be considered as a possible case study site in your proposed *Center for the Study of Interactive Knowledge Utilization*. We are very pleased to accept the invitation. We have benefited from working with you and Cynthia Coburn on your current study of research-practice partnerships funded by the William T. Grant Foundation and would be delighted to be a part of your work in the future.

As you know, SERP develops and supports highly productive collaborations to solve intractable problems of education practice identified as priorities by our district partners. To accomplish this goal, SERP has established a set of field sites. Our “field sites” are school districts that enter into long-term partnerships with SERP-recruited researchers to engage in joint problem-solving and continuous improvement rooted in scientific research and the expertise of practitioners and designers. We currently have field sites in three urban districts—Boston, San Francisco, and Oakland—as well as a multi-district field site with district members of the Minority Student Achievement Network.

We are particularly excited about the current study’s focus on research-practice partnerships, because we view them as a vital component of our country’s strategy for educational improvement. The study you propose here will provide valuable insights into the consequences of different partnership approaches on the use of research by district leadership. Furthermore, there is tremendous interest among funders, policy makers, and school district leaders in exploring features of different research-practice collaboration models. Your research has the potential to shed light on when and under what conditions such partnerships effectively spur innovation and catalyze instructional improvement.

We understand that in providing this letter of support, we may be selected as a case study site for your proposed Center in either the 2015-16 or 2016-17 school years. If selected, we agree to facilitate entrée with our partners as well. We understand that we and our partners will be committing to participating in interviews and a survey of research use, and allowing for observations of joint meetings.

We look forward to working with you if the project is funded.

Sincerely,



M. Suzanne Donovan  
Executive Director  
SERP Institute

August 30, 2013

William R. Penuel  
Professor of Educational Psychology and Learning Sciences University of Colorado Boulder  
UCB 249  
Boulder, CO 80309

Dear Bill,

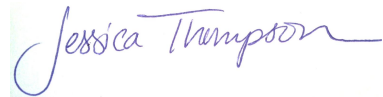
I appreciate your invitation to the *Developing Networked Improvement Communities for High Quality Mathematics and Science Teaching* project to be a possible case study site in your proposed *Center for the Study of Interactive Knowledge Utilization*. We would welcome the opportunity to work with your team on this study.

The University of Washington is working with high needs schools in Highline, Seattle and Edmonds to develop a networked improvement community that supports high quality science teaching practices. Our project will investigate how teams of teachers, teacher educators, administrators, and researchers to inquire into the development of ambitious and equitable practices that support learning the scientific practices (such as developing and using scientific models, and building evidence-based scientific explanations and arguments, communicating findings, etc.) and creating scaffolds for the special language demands of the scientific practices, particularly for English Language Learners. The PIs will implement a model for change referred to as a Networked Improvement Community, or NIC (Bryk, Gomez, Grunow, 2011). This community will link Local Improvement Networks (LINs are groups of teachers, teacher educators administrators and researchers) through a web-based technological infrastructure to support the continual improvement of rigorous and equitable forms of classroom instruction. The LINs are all working with high ELL populations are committed to improving science instruction for all students. PIs will help LINs define a problem space using the standards, performance progressions for ambitious teaching practices, and data on students' performance on assessments. As a community we will use these resources to ask: *What works? For whom? And under what conditions?* More than just sharing tools or training teacher developers, we plan to engage the NIC in rapid prototyping of tools and practices with a specific focus on improving instruction for English Language Learners. The Networked Improvement Community will afford the opportunity for members to share and empirically test tools and other curricular resources so that productive variations of practices and tools can be generated. The system will accelerate the development of both teaching practices and professional learning models aligned with the college and career ready standards in science and we will begin to understand how to develop and sustain NICs that are oriented specifically around the improvement of instruction.

We understand that one strand of the *Center* proposes to study different forms of research-practice partnerships. These kinds of collaborations are essential for trying out new ways to bring together researchers and instructional leaders in districts to support instructional improvement and sustained professional learning. The team you have assembled for the *Center* includes leading scholars in the areas of research use and research-practice partnerships, and we are happy to be considered a possible case study site for this work. We understand that in providing this letter of support, we may be selected as a case study site for your proposed *Center*

in the 2017-18 school year. If we are invited to be a case study site, we will facilitate access to our partners, and commit to participate in observations, interviews, and surveys of research use. With our full support, we look forward to working with you if the proposed *Center* is funded.

Sincerely,



Jessica Thompson, Ph.D.  
Research Assistant Professor  
University of Washington, College of Education  
Curriculum & Instruction, Science Education  
122M Miller Hall, Box 353600  
Seattle, WA. 98195