Research-Practice Partnerships

A Strategy for Leveraging Research for Educational Improvement in School Districts

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Supporting research to improve the lives of young people

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ABOUT THE FOUNDATION

Since 1936, the William T. Grant Foundation has been committed to furthering the understanding of human behavior through research. Today, the Foundation supports research to understand and improve the settings of youth ages 8 to 25 in the United States. We are interested in studies that strengthen our understanding of how settings work, how they affect youth development, and how they can be improved. We also fund studies that strengthen our understanding of how and under what conditions research is used to influence policies and practices that affect youth. Important settings include schools, youth-serving organizations, neighborhoods, families, and peer groups.

FOREWORD

In keeping with our interest in the use of research, the Foundation has developed an interest in learning more about the burgeoning community of research-practice partnerships. These partnerships shift the predominant producer-push dynamic of research to practice. Instead, they foster reciprocal interaction in which practice informs research and vice versa. At their best, these partnerships facilitate the development of more relevant, actionable research and its use within the practice community. We want to follow these partnerships to see where they go and what implications or lessons they have for connecting research and practice in order to improve the lives of young people. The goal of this paper is to assess the predominant types of research-practice partnerships in education—and the benefits and challenges of each—so those seeking to form or fund such a group can make informed decisions about how best to do so.

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INTRODUCTION

Pressures are increasing on educational policy and practice to use research to guide improvement. In recent years, federal programs such as No Child Left Behind, Reading First, and Race to the Top have all provided strong incentives for the use of research in decision-making. Educators, however, may not have the skills or the time to produce, gather, and apply research to meet their improvement goals. The available research may not be useful or credible because researchers are not always focused on answering questions relevant to school districts' most pressing needs. And, too often, research findings aren't accessible to educators or arrive too late to make a difference.

Recently, though, there have been concerted efforts to forge new and different kinds of relationships between researchers and practitioners. School districts across the country are developing a new kind of partnership with researchers. These research-practice partnerships are long-term collaborations, which are organized to investigate problems of practice and generate solutions for improving district outcomes. Advocates argue that educators will better understand the research and its implications because they help develop it and have ready access to the researchers. Partnerships may also produce research and innovations that are more useful to practice because they are rooted in districts' needs. District leaders are likely to see the research that partnerships produce as more credible because studies are done with local students and take into account local conditions. All these factors may increase the likelihood that districts will use the research findings and tools produced in the partnerships to support their efforts to improve outcomes for children and youth.

Evidence is beginning to accumulate in support of these claims. When research-practice partnerships develop new educational innovations, districts adopt these new innovations in ways that can result in changes in teacher and administrator practice and increased student learning.[1] Research-practice partnerships have also developed promising track records in fields as diverse as health care, social services, urban planning, and community policing.[2]

There remains much to learn, though. For example, there is mixed evidence that districts involved in research-practice partnerships use research more consistently in their decision-making.[3] We also know little about the different forms partnerships can take, particularly what distinguishes one kind of partnership from another and how that matters for the work.

In this white paper, we will:

1. Define research-practice partnerships.

2. Identify the major types of partnerships that operate at the district level.

3. Describe challenges partnerships face and strategies for addressing these challenges.

To do so, we draw on a review of existing research and interviews with participants in research-practice partnerships across the country.[4] Throughout, we illustrate the work of research-practice partnerships with portraits of partnerships in action.

Research-practice partnerships are bold new initiatives. We are beginning to learn about the challenges they encounter and strategies they use to ensure productivity and success. We want to provide insight into the strategic trade-offs partnerships face and the resources they need to be successful. We hope that this paper can be a guide for those seeking to develop or maintain research-practice partnerships as well as for funders of such partnerships.

WHAT IS A RESEARCH-PRACTICE PARTNERSHIP AT THE DISTRICT LEVEL?

People use the term "partnership" to refer to many different things: consulting relationships; university-school partnerships in which local schools send prospective teachers to a university to be trained and the university, in turn, places student-teachers in local schools; traditional research projects in which studies or interventions take place in districts with limited participation by district personnel; etc. The term is so widely used, in fact, that it has come to have little meaning.

We use the term "research-practice partnerships" to denote something very specific. We define research-practice partnerships at the district level as: "Long-term, mutualistic collaborations between practitioners and researchers that are intentionally organized to investigate problems of practice and solutions for improving district outcomes."

Research-practice partnerships differ from the conventional ways researchers and district leaders work together in five significant ways.

Research-Practice Partnerships:

1. Are long-term,
2. Focus on problems of practice,
3. Are committed to mutualism,
4. Use intentional strategies to foster partnership, and
5. Produce original analyses.

Long-Term: In research-practice partnerships, researchers and district leaders commit to form and maintain a long-term working collaboration. These open-ended commitments involve more than a single consulting agreement or grant. The work can span a few years, or, as is true for some partnerships, more than a decade, shifting focus as the work develops over time.[5]

The long-term nature of partnerships contributes to several key elements of their success. First, time invested in a partnership can help develop trust.[6] Trust developed over time can help mitigate the inevitable bumps in the road.

Working together over time also enables partners to take on larger questions and explore issues in depth.[7] One district leader said: "the partnership … is a long-term partnership, [so] I think we can go deep on some really meaty questions with them." Long-term partnerships also enable research organizations to serve as a repository for institutional memory, which can be important in districts with high rates of leadership turnover. They can be a source of stability and continuity in districts characterized by frequent change. One district leader in a partnership with the University of Chicago Consortium for Chicago School Research (CCSR) explained:

> "I think an organization like the Consortium can be the keeper of a lot of that history. Especially because of their longevity and stability in the district, they bring a point of view that is really unique and incredibly helpful."

Focused on Problems of Practice: Research-practice partnerships start with a focus on problems relevant to practice.[8] These are issues and questions that districts find pressing and important. They can involve student learning, classroom instruction, or how to organize a district for improvement. By starting with a problem of practice, research priorities are set in response to district needs, rather than to address gaps in existing theory or research. Starting with district needs increases the likelihood that will district leaders find research useful and apply it to their ongoing work.[9]

Committed to Mutualism: Research-practice partnerships are characterized by a commitment to mutualism—sustained interaction that benefits both researchers and practitioners. A researcher described this:

> "Everything from whose questions we pursue, how we define those questions, what methodologies, the authorities and control over the activity are much, much, much more shared … [There has to be] a common goal, common aims, shared values, equal authority, and real work to do."

Typically, when researchers and practitioners work together, one group or the other holds the authority for setting the agenda. The researcher may develop a policy or an intervention and then attempt to persuade schools and school districts to adopt and implement it. Or, the district may hire researchers as consultants to do a specific piece of work or evaluation, which the district will then use or not as it sees fit. In research-practice partnerships, by contrast, the focus is jointly negotiated and responsibility for how the work unfolds is shared.[10]

Mutualism is important because it helps ensure that different perspectives—practitioners' and researchers'—contribute to defining the focus of the work that research-practice partnerships do. All parties share ownership and are able to learn from one another. By working closely with researchers, district leaders can clarify their goals and gain insights into the implementation of district policies and programs. By working closely with practitioners, researchers can gain a deeper understanding of classrooms, schools, and districts and just what it might take to make change.

Use Intentional Strategies to Foster Partnership: Research-practice partnerships use intentional strategies to organize their work with one another.[11] For example, the Research Alliance for New York City Schools and the New York City Department of Education have a formal data-sharing agreement detailing how they conduct research together.

Partnerships have developed strategies for supporting mutualism in other aspects of the work as well—negotiating the focus of joint work, uncovering key drivers for improvement, structuring co-design processes, and sharing and interpreting findings from research studies. Some partnerships have specific structures that bring together a broad range of stakeholders to review and make sense of research results. One of the leaders of the University of Chicago Consortium on Chicago School Research (CCSR) has developed a network of principals focused on the use of data to inform school improvement. Initially the network examined "on-track indicators," which serve as an early-warning system to identify students at risk of dropping out. CCSR staff members hold breakfast meetings with principals in this network to help them interpret the on-track indicators and, later on, other data. A CCSR researcher described the process:

> The way to get to the solution is to have the evidence and the opportunities for the people working on the problem to really talk about it, internalize it, understand it ... Out of that process, you start to develop ideas about what to do.

Produce Original Analyses: Research-practice partnerships go beyond the focus of many current organizations on making data accessible to district leaders.[12] The partnerships instead produce original analyses of data to answer research questions posed by the district. The Baltimore Education Research Consortium, for instance, analyzed the relationship between early-elementary achievement and attendance in that city's pre-kindergarten and kindergarten programs. The motivation for the study was to understand the effects of early chronic absence on later outcomes. Other partnerships collect their own data as part of studies of programs, interventions, or reform strategies the district is pursuing.[13] For example, the John W. Gardner Center for Youth and Their Communities collected its own data to help the Redwood City 2020 partnership study the association between after-school programming and youth development outcomes important to the partnership. The Strategic Education Research Partnership (SERP) has done extensive data collection and analysis on the development, impact, and scale-up of Word Generation, a middle school program co-designed by researchers and practitioners in their Boston site, which builds academic language necessary to comprehend subject area texts.

THREE TYPES OF RESEARCH-PRACTICE PARTNERSHIPS

While research-practice partnerships share a long-term focus on problems of practice, use intentional strategies to support their commitment to mutualism, and prioritize original analysis, they differ in the ways they go about their work. We have identified three distinct kinds of research-practice partnerships that are currently active in school districts.

Three Types of Research-Practice Partnerships

1. Research Alliances
    a. Cross-sector research alliance
    b. District-focused research alliance
2. Design Research
3. Networked Improvement Communities (NICs)

Research Alliances

A research alliance is a long-term partnership between a district and an independent research organization focused on investigating questions of policy and practice that are central to the district. These alliances 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. Perhaps the best-known research alliance is the Consortium on Chicago School Research, which was formed in 1990 as a partnership between researchers from the University of Chicago, Chicago Public Schools, and other local organizations. In recent years, the perceived success of the Consortium has spawned the development of research alliances in cities across the country.

THE JOHN W. GARDNER CENTER FOR YOUTH AND THEIR COMMUNITIES AND REDWOOD CITY 2020

The John W. Gardner Center for Youth and Their Communities (JGC) at Stanford University is an example of a cross-sector research alliance: one that creates long-term partnerships between researchers and organizations in multiple sectors of a community. Its goal is to improve the lives of youth by conducting research, developing leadership, and effecting change. Its work is rooted in the principles of community youth development—young people prosper when their community prospers, and vice versa. JGC works in several communities and, in each, they work with school districts, city and county public agencies, and community-based organizations that serve youth.

One of JGC's longest partnerships is with Redwood City, California. It has spanned more than a decade and supported a major, community-wide effort focused on youth development called Redwood City 2020 (RWC 2020). RWC 2020's mission is to help local children and families be safe, healthy, and nurtured in a stable, caring environment. The partnership aims to improve outcomes by, as one partner put it, "build[ing] the community's capacity to better meet the needs of the youth."

JGC's role in the partnership is to investigate the relationship between different kinds of youth experiences (e.g., participation in school and community programs) and the outcomes that Redwood City 2020 targets. This research then informs partners' ongoing work. JGC also developed and maintains the Youth Data Archive (YDA), a comprehensive resource that links data from youth service providers, government agencies, community-based organizations, and schools in several counties in California. JGC staff use this archive to follow youth's experiences across a wide variety of settings, including after-school programs, juvenile justice, parks and recreation, and health and social services.

A core governing principle of this partnership is that research questions must be agreed upon by the partners. This results in intensive collaboration at the beginning and end of each study. Each year, the coordinating committee addresses the questions: What is our focus? What questions should we pursue?

Do we have the data or not? Then, JGC researchers work with different agencies and their colleagues internally to find data sources to answer the questions. There is generally less interaction between JGC and its partners as data collection and analysis proceeds. Near the end of the process, however, JGC staff work with partners to make sure that the findings ring true. As one partner explained:

> "When there's a draft of a report, [the JGC researcher] sends this draft to us so we can look at it and ask questions, look back at the data, if there's something that really sounds off. As a matter of fact, we do that even before the data is all analyzed. Once [he] is able to put the data all together, he would shoot me an email with a chart and say, "Look at this and see if there's any major discrepancy"... Then we work on the draft. We have discussions about the draft, get to ask questions, get to question some of the assumptions that are being made."

Community partners view JGC's analyses as important and valuable resources for bringing to light issues that no single agency could investigate on its own and for evaluating community programs. One district leader involved in Redwood City 2020 described work with the JGC in this way:

> "To me, it's a pretty amazing relationship. I was testifying before a Senate subcommittee last year in Sacramento. It was on community schools and a comment was made that 'Well, you really can't measure community schools.' I was able to share some of the research that, through the Gardner Center, shows the efficacy of community schools."

For more information about Redwood City 2020 and the John W. Gardner Center, see Case Study I.

There are two types of research alliances: (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. Both share certain characteristics.

Place-based: Research alliances form partnerships with specific school districts or regions and focus research on issues relevant to local policy and practice. Focusing on a particular place over time enables researchers to develop a thorough understanding of the district and the community. A director of one research alliance explained:

> "I think there is a very high premium placed on what's relevant and meaningful in the specific context of a [district] as big and eclectic and diverse as [the district we partner with] is. The place-based nature there really makes a big difference. A national organization … has to make sure that it's building relationships across the country, and [is going to] have multiple districts or multiple states or multiple cities participating in a study. [As a result] it can't be as deeply committed to understanding and working within a specific context."

When research takes place within a single district, political pressure on districts and the researchers is often high.[14] This may lead to the production of more timely research. In addition policymakers may pay greater attention to the findings, since the research is relevant to local education stakeholders' concerns about which investments are working and which are not.

Focus on local policy and practice first: Most research alliances' primary goal is to produce research that informs local policy and practice. Research alliances have investigated district policies related to a range of pressing issues. For example, the Consortium for Chicago Schools Research studied college readiness in local high schools. The Research Alliance for New York City Schools investigated NYC's turnaround schools. The San Diego Education Research Alliance studied the effects of introducing diagnostic testing on student mathematics learning in San Diego. And, the Baltimore Education Research Consortium investigated the quality of classroom instruction in district elementary schools.[15]

Though secondary to informing local policy and practice, contributing to the national debate on educational policy issues is also a goal for many research alliances. They circulate findings beyond their local settings, creating policy briefs to inform the national conversation and publishing their findings in academic books and journals. To meet both of these goals, most research alliances maintain academic standards of quality, particularly with strong study design and rigorous methods. They argue that this lends external credibility to the work, which then adds to researchers' internal credibility with district stakeholders.

Develop and maintain data archives: Most research alliances develop and maintain longitudinal data archives. By developing data-sharing agreements with local districts and other youth-serving agencies, research alliances are able to assemble large datasets that they use to do longitudinal analysis of issues facing districts or regions.[16] The John Gardner Center for Youth and Their Communities has linked data from a local elementary school district, high school district, and human services agency to investigate who is chronically absent and truant, the extent of the problem, and the consequences of missing school for a range of in-school and out-of-school outcomes.

RESEARCH ALLIANCE FOR NEW YORK CITY SCHOOLS

The Research Alliance for New York City Schools is an example of a research alliance that works primarily with its local school district. Since 2008, the Research Alliance has worked with the New York City Department of Education (DOE) and other key stakeholders in New York City to "advance equity and excellence in education by providing non-partisan evidence about policies and practices that promote students' development and academic success." A leader of the Research Alliance elaborated: "Our goal is really to conduct rigorous studies of questions that matter to policymakers, practitioners, and other stakeholders in New York City schools."

Housed in New York University's (NYU) Steinhardt School of Culture, Education, and Human Development, the Research Alliance's work is guided by a governance board that represents the DOE, NYU, and representatives of key stakeholder groups in the district and community-based organizations. This governing board sets the research agenda, which recently has centered on four issues: (1) high school achievement, attainment, and post-secondary preparation; (2) achievement and development in the middle grades; (3) contexts that support effective teaching; and (4) data use for practice and policy.

Since its inception, researchers at the Research Alliance have worked with the district in three main ways. First, they have conducted evaluation studies. Recent studies have investigated how teachers use the city's Achievement Reporting and Innovation System (ARIS), students' transitions in and through middle school, and the impact of various organizational conditions in small schools of choice on student outcomes. Second, they have developed a longitudinal data archive. A district administrator explained:

> "We have a very broad and deep data-sharing relationship ... We've arranged to give them access to just about everything that we are functionally and legally allowed to give them, with the purpose of allowing the Research Alliance to do independent research on New York City schools."

The extensive data archive enables the Research Alliance to draw on a broad range of data to address its research questions and be flexible and responsive to the district's requests for analysis on short notice.

Third is descriptive and formative work, including a collaboration between researchers and DOE administrators to improve the measures of school environment on the DOE's annual survey. This work is consequential since individuals at the school and district level use this survey to inform their improvement work. It is also important because measures from the survey, along with attendance figures, comprise up to 10–15 percent of the grade that schools get on their annual school progress report.

As is typical for research-practice alliances, the Research Alliance works most intensively with the local district at the early and late stages of a study. Both the Research Alliance and the DOE can initiate a study. Researchers might identify a funding opportunity and approach administrators at the DOE to discuss questions about the focus of the initiative. The DOE may also approach the Research Alliance to evaluate a new initiative.

After collecting and analyzing the data, the researchers return to the DOE to discuss the findings before their release to the public. This advanced notice allows the Research Alliance to solicit feedback and confirm accuracy, and for the district administrators to prepare a response or reaction to the release. This is especially important when the research involves issues that are politically charged.

While the primary goal of the Research Alliance is to inform policy and practice in New York City, it also seeks to inform policy debates nationwide. So, it addresses questions that have been studied in other districts in order to extend research findings to a new and different context. The Alliance also disseminates its findings widely in white papers and policy briefs. The district feels that it benefits from having an outside party providing feedback on its work:

> "I think the way we see it in the [DOE is that] although the work that they're doing is not on our behalf in a "contractor" sense, it is on our behalf in that it's really valuable to us as policymakers to find out the answers to the questions that they're posing. We have a real interest in ensuring that they have the [ability to] do their projects and produce really solid research about our schools."

For more information on the Research Alliance for New York City Schools, see Case Study II.

Distinct roles for researchers and practitioners: Research alliances maintain distinct and fairly conventional roles for researchers and practitioners. They rarely involve district personnel in data collection or analysis. Deliberations around policy responses to the research rarely involve researchers. Some research alliances argue that practitioners, not researchers, should come up with solutions. The researchers' role is contributing information to inform districts' problem-solving efforts or "creating conditions so people on the ground are given the incentives, resources, and feedback they need to search for solutions."[17]

Collaborate primarily at the beginning and end of the research process: Given these distinct roles, collaboration happens most intensively at the start and end of a given study. At the start, researchers and district administrators work together to negotiate the focus of the research. While conducting studies or analyses, however, alliance researchers maintain independence from district staff so as not to compromise the objectivity of research findings. Alliance researchers argue that this independence is also appropriate because researchers are in the best position to make decisions about research methods.

The two parties come together again before researchers release their findings to the public so that district leaders have the opportunity to respond and react to the substance of the report, and have time to prepare for the public's response.

Design Research

Design research is a form of educational research that is similar to engineering research. In design research, the aim is to build and study solutions at the same time in real world contexts. It usually focuses on developing and testing instructional activities and curriculum materials, while investigating how they can best support student learning.[18]

In recent years, some design researchers have begun to focus on designs for improving the implementation of instructional activities and curricula at scale. To do so, they have forged partnerships with school district leaders to design and test strategies for helping school districts implement these new innovations.[19] For example, the Strategic Education Research Partnership (SERP) has developed infrastructures to support collaborations between researchers and school districts to design, study, and scale innovations in teaching and learning. SERP focuses on designing innovations for the classroom, large-scale impact studies in districts, and working with central offices to create conditions that foster scale-up. Design-research partnerships that work at the district level typically share the following characteristics.

Place-based: As with research alliances, design-based partnerships are usually focused on long-term, in-depth work with a single district. When researchers are involved with multiple districts, each district's priorities shape the work in significant ways, resulting in different designs and partnership trajectories in each district. For example, in the Middle-School Mathematics in the Institutional Setting of Teaching (MIST) project, researchers at Vanderbilt University partnered with four different school districts. However, each partnership followed a different trajectory, depending upon the unique needs and context of each district.

Focus on informing practice and research: Design-research partnerships typically have two goals of equal importance. They aim to develop materials and instructional approaches that can be implemented in classrooms, schools, and districts.[20] At the same time, they want to advance research and theory. For example, researchers in the MIST program are developing an "actionable theory of change" for bringing about instructional improvement at scale within middle school mathematics.[21] MIST uses the theory to guide selection of strategies for improving instruction at scale, and partners refine the theory in light of evidence related to the success of those strategies, helping guide changes to practice. At the same time, the MIST researchers see the project as an opportunity for developing more sophisticated and practical theories of learning

BELLEVUE SCHOOL DISTRICT AND UNIVERSITY OF WASHINGTON

This design-research partnership involves two complementary research groups from the University of Washington, both of which have been working in the Bellevue School District to redesign elementary science units. The partnership is currently funded by the National Science Foundation, and there are three co-principal investigators—one from each research team and a third representing the school district. The three have joined to redesign, deliver, and evaluate elementary science units that incorporate both student choice and culturally relevant teaching strategies.

As with most design-research partnerships, this one is long-term. The partners have maintained the work since the mid-2000s across multiple grants and gaps in funding. The partnership is also place-based, with a focus on the Bellevue School District. At present, the partnership has two goals: (1) to develop curriculum units and professional development that are attuned to local issues and contexts and (2) to contribute to research knowledge by developing theories of and evidence related to individual, group, and organizational learning.

The partnership has systems in place to make sure that the design process incorporates diverse perspectives and expertise. A weekly steering committee consisting of researchers and district staff in curriculum and science works through all issues related to the grant. A subset of this team is charged with redesigning each unit. Teachers are actively involved in redesign efforts, and researchers believe the teachers have much expertise to contribute. According to one member of the university's research team:

> "I certainly respect what my partners know because ... I can't do that. I'm not a practitioner. I don't have that expertise and ... I'm lousy at writing lesson plans. I've tried, but I can't make it right for teachers, and we have to have that input. And ... I think our partners respect what we know about ... learning and research."

Although only a few teachers are involved with the design process and writing curriculum materials, all teachers who use the curriculum provide feedback—through the professional development process—which the design team then uses to improve the unit. Professional development was created and is conducted primarily by the partnership's district staff.

The partnership also does research, which it integrates into the design process. For example, the initial research focused on students' inquiry skills and content knowledge, using a combination of district- and researcher-developed assessments. Researchers are also studying the degree to which students identify more with science as a result of participating in the units. And, the team is studying the roles of professional development and curriculum in supporting more student-centered teaching in science.

Most recently, the partnership has focused on redesigning science units and collecting data related to teaching and learning. Researchers have collected many hours of video, student and teacher interviews, student assessments, and survey data. Data analysis has begun in earnest, and early evidence suggests that students are indeed participating more actively in the learning process in activities that are personally relevant to them. One district staff person elaborated:

> "The level of excitement and the ease at which students use evidence to support thinking in those Go Publics [final presentations of learning] is one indicator to me, as a former fifth grade teacher and a science curriculum developer, that there is some real buy-in. There is something to be said for students being able to really become excited about and at ease talking about supporting their claim with evidence and reasoning. That is pretty powerful, that students don't really have an opportunity to do in the FOSS units as they're written."

For more information about the partnership between the Bellevue School District and the University of Washington, see Case Study III.

along with the organizational structures necessary to support these theories. They publish their findings in publications that target researchers as well as those more useful to practitioners.

Emphasize co-design: Central to design research is the principle of co-design. Co-design is a highly facilitated process that engages people with diverse expertise (e.g., research, curriculum, professional development, teaching) in designing, developing, and testing innovations. These innovations can include curriculum materials, professional development to better equip school and district leaders for supporting classroom-based reforms, and new approaches for system-wide change.[22]

Collaborate at every stage in the process: District leaders and researchers work together to define the challenge or problem to be addressed. They also work together to develop design parameters or requirements for instructional activities and curriculum, test them in classrooms, and assist with revisions. Close collaboration in the context of co-design represents one way to bring diverse kinds of expertise to bear on persistent problems of educational practice. Participation by teachers and educational leaders is especially important, because they bring insight into the needs and interests of students and the fit of an innovation with current practices and curriculum materials.

Networked Improvement Communities

The software engineer and inventor Douglas Engelbart coined the term "networked improvement communities (NICs)" to apply to groups engaged in collective pursuits to improve a capability, such as that of schools to provide effective teaching and learning opportunities to students.[23] Research-practice partnerships using the NIC structure draw on Engelbart's ideas and improvement research from the health care field.

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.[24] NICs use these cycles to develop new approaches that address well-defined problems of practice or adapt existing research-based practices to local conditions. Networked improvement communities in education have the following characteristics:

Involve networks of schools, districts, or universities: A core feature of NICs is that they are formed as networks that are not tied to a single district or community. Though districts and researchers from the local area may be partners, a NIC forms to address a problem that is common to many different communities. The University of Washington's Developing Networked Improvement Communities program, for example, is using the NIC model to foster high-quality mathematics and science teaching, connect schools with each other, and spread best practices around the state. In this and other NICs, project leaders are interested in the contrasting ways that different sites implement solutions to common problems. They use this information strategically to improve the scalability of solutions and reliability of implementation. Tony Bryk from the Carnegie Foundation for the Advancement of Teaching explains:

> "In any human resource intensive enterprise, such as schooling, variations in performance are the natural state of things. We have ample testimony to this from decades of educational innovations. That a practice, program, or service can work is of little value unless we discern how to make it work at scale in the hands of many different individuals working under diverse circumstances."[25]

CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING AND THE BTEN PROJECT

The Carnegie Foundation for the Advancement of Teaching has a long tradition of developing and studying ways to improve teaching practice. The current president has put organizing NICs at the center of Carnegie's work. At present, the Foundation is cultivating three major NICs, two focused on community college developmental mathematics, and a third on new teacher effectiveness and retention. We will discuss the third NIC—Building a Teacher Effectiveness Network (BTEN). All three initiatives are in their early stages and are far less mature than the other partnerships featured in this paper.

BTEN focuses on developing and retaining teachers in their first three years. It is a network of different institutional partners, including the Carnegie Foundation, the Institute for Healthcare Improvement (IHI), the American Federation of Teachers, New Visions for Public Schools, the Austin Independent School District, and the Baltimore City Schools. Carnegie staff act as the primary facilitators of the work, guiding the overall improvement process.

The NIC has adapted a model of improvement research that IHI developed in previous work to define problems and identify root causes. One tool is a "driver diagram" that describes the objectives and a set of "primary drivers" or levers for change that, in the case of BTEN, is hypothesized to improve the effectiveness and retention of new teachers.

Each district has selected a primary driver on which to focus initially that reflects its local constraints and opportunities. One district, for example, is focusing on improving the quality and coherence of feedback from principals, administrators, and coaches to new teachers. The NIC provides opportunities for districts to share ideas with one another in order to facilitate cross-district learning.

Each district also engages in PDSA (Plan, Do, Study, Act) cycles that are a hallmark of IHI improvement research. The district that focused on feedback to new teachers, for example, used a series of PDSA cycles to develop a protocol for a feedback interaction involving a principal and teacher. Each PDSA focused on testing a small change to the protocol; discoveries from one informed testing done in subsequent PDSAs.

Partners collect data on BTEN at two levels—at the district and for the network as a whole. At the district level, the improvement teams collected data as part of the Do phases of PDSA cycles. For example, in the feedback PDSA, the team collected information on how many steps of the protocol were executed reliably, which steps were modified, and in what ways. The purpose of these data was to help the team refine their change strategies and test their potential before spreading them more widely across the system. They also routinely collected data to determine whether changes that were tested and refined led to the outcomes the team sought to achieve. The team also collected data to make sure that desired improvements did not cause any unexpected harm.

Partners also plan to collect data in the network as a whole; specifically, they will collect "on-track" or leading indicators, such as job satisfaction and commitment to the profession, to determine if work on the primary drivers is having the anticipated impacts. These data are also intended to serve as an early-warning system to identify teachers who may be at risk of leaving. In addition, the partners will collect lagging indicators to measure progress toward the ultimate aims, such as teacher retention.

While it is too early to judge the success of this work, participants in districts said they see value in the approach. Though they find the work time-consuming, one district leader described BTEN as "hugely valuable because we're doing so much work around measurement and thinking about assessing teacher performance, what that looks like, and how to use it." This leader also said he appreciated Carnegie staff, who "are taking this construct of research and practice and really focusing on creating venues where practitioners are coming forward with ... technical experts to create something very practical and to make sure the research community is responding to real-world implementation issues—questions from practitioners, designers, people like me who are building these systems and want tools."

For more information about the BTEN project, see Case Study IV.

Use systematic methods for continuous improvement: NICs in health care have pioneered an approach to research called "improvement science." Improvement science is a method of research and development focused on translating research findings into practice in real-world settings.[26] In health care, improvement science focuses on helping medical professionals improve their day-to-day work by drawing on available evidence about what works and learning from adaptations of research-based practice.

Some NICs, including those supported by the Carnegie Foundation for the Advancement of Teaching, use a technique common to improvement science that emphasizes cycles of Plan, Do, Study, Act (PDSA).[27] In these cycles, the NICs decide on a small change to be tested, define the steps needed to test it, and determine the measures that will be used to gauge its success (Plan). Next, they carry out the plan (Do), analyze data collected to see if their predictions were borne out (Study), and determine what changes need to be made for the next cycle (Act).

PDSA cycles are meant to happen rapidly—as short as two weeks—to facilitate rapid improvements to designs that are better timed to the needs of practice settings than typical research.[28] In principle, rapid cycles make it possible to test and refine changes and then expand to multiple sites within a single school year. Rapid cycles allow teams to uncover major problems with a planned change quickly, as well as to get things "mostly right" before taking a change to scale. According to one leader in a NIC, the idea is to:

> "Try it with one person in one place, a couple of times. Then, take it up in five places to study and learn the impact of context. Once you know that, and have tailored it and differentiated into a collection, expand to 25 places, study how to make it a permanent change. Then take it to 'spread.'"

Other NICs follow slightly different methods for continuous improvement. For example, the Strive Network was formed to improve regional outcomes for young people from "cradle to career." It is comprised of foundations, employers, district superintendents, and universities in select cities. Strive uses data to "improve, rather than prove." Local communities select priority areas for their work, develop strategies together in those areas, and monitor outcomes regularly to gauge progress and refocus efforts when needed. Network staff also provide consultation to help community collaboratives identify, adopt, and scale practices. For example, they help sites create detailed action plans for adopting and adapting effective practices and for supporting implementation.[29]

Put researchers and district staff in non-traditional roles: In NICs, researchers and practitioners assume roles that depart significantly from their usual work. Practitioners do the primary data collection and analysis related to small tests of change. Researchers act principally as facilitators, guiding the network members through the improvement process. Both researchers and practitioners are likely to need time to adjust to their new responsibilities, which may conflict with those they have at their respective organizations. One district leader described an issue faced by a principal involved in the work of a networked improvement community:

> "To invest the time, when he's pulled in so many directions, to stop and do data gathering is proving to be really challenging. Even when he schedules it, things change, a teacher may be out—things routinely happen to throw it off."

Primary focus on developing local capacity: NICs aim to improve schools' and districts' capacities to engage in a sustained, disciplined effort at improvement. For example, staff at the Carnegie Foundation for the Advancement of Teaching use the PDSA cycle to shift business-as-usual in districts. Districts often implement new programs district-wide before they have evidence that they are effective. By starting small and systematically testing and refining a small change in several different settings, Carnegie hopes to foster changes that, in the words of one staff member, become "permanent" and "embedded in the system." The Strive Network refers to its efforts to build capacity as promoting "civic infrastructure." According to the Network:

> "'Civic infrastructure' is not a program, but a way in which a community comes together around a common vision and organizes itself to identify what gets results, improves and builds upon those efforts over time, and invests the community's resources differently in order to increase impact."[30]

Some NICs, like those related to the Carnegie Foundation, do not place a priority on contributing to the research literature or theories of learning or change. In fact, although the approach is highly disciplined, improvement science would not in many instances meet the standards of research required for publication in research-oriented journals. Ultimately, these NICs are more focused on developing an approach to improvement that fosters the capacity of network participants to improve their own outcomes over time than conducting original research.

Emerging Types of Partnerships

We have identified the three main types of research-practice partnerships that are active in education in the United States. Partnerships, however, can and do evolve and it is likely that new forms will develop over time. For example, in 2011, the Institute for Education Sciences created new guidelines for the Regional Education Laboratories (RELs), which it funds to provide research and support to school districts and states. The RELs help states and districts improve student outcomes by better using data and analysis to guide decisions on policy and practice. The new guidelines required the RELs to adopt several qualities of research-practice partnerships, including forming long-term relationships with school districts and focusing on a few core problems identified by district staff in order to make sound, evidence-based decisions to improve outcomes. The hope is that these alliances will also build the capacity of states and districts to conduct research on innovations.[31] It is not yet clear what form these newer partnerships will take. It is possible that, over time, the RELs may evolve into conventional research alliances, or another of the current types of research-practice partnerships. Alternatively, the RELs and other organizations that are currently designing partnerships may develop into something completely new. It will be important to look to these organizations for fresh ways of configuring the roles and relationships of researchers and practitioners in support of district improvement.

Alliances
Networked Improvement Communities
Design-Research

CHALLENGES TO DEVELOPING AND MAINTAINING RESEARCH-PRACTICE PARTNERSHIPS

Building and maintaining research-practice partnerships can be challenging. Working across institutional boundaries to produce high-quality research and innovation that is useful to schools and districts is not easy, particularly during times of increased policy pressure and reduced resources. Here, we tackle common challenges that research alliances, design-research partnerships, and networked improvement communities face and describe the strategies experienced partnerships have taken to address them. Understanding how and when difficulties arise is important to inform efforts to design, fund, and nurture research-practice partnerships over the long-term.

Bridging the Different Cultural Worlds of Researchers and Practitioners

Building and maintaining successful research-practice partnerships can be challenging because researchers and practitioners come from different cultural worlds. They have very different ways of working and incentive systems.[32] For example, district leaders feel a strong sense of urgency; they want solutions quickly so that they can put innovations or policies in place to meet students' needs now. By contrast, research proceeds slowly, and researchers are often uncomfortable recommending action in the absence of a strong research base.

Researchers and practitioners may also have different priorities and agendas.[33] This can lead to divergent ideas about the steps a district should pursue. For example, one district leader involved in a research-practice partnership lamented the fact that researchers often promoted solutions that were not usable:

> "Some of the recommendations are just not as realistic as I would hope. The one challenge would be the conflict, or potential conflict, between the best [approach from researchers] and the most realistic [approach from us]."

This is further complicated by the status accorded to researchers in the broader society, which can foster resentment by practitioners and hubris among researchers.

Some partnerships have developed strategies for finding common ground. For example, NICs rely on formal processes for coming to agreement on the key causes of problems and drivers of potential solutions. These processes help to level the playing field, ensuring that all voices are heard and all viewpoints considered. Co-design teams working in design-research partnerships have sought to repurpose district-adopted materials, rather than create completely new materials.[34] The results build upon materials that are familiar to teachers and valued by districts, creating common ground.

Developing and Maintaining Trust

Developing and maintaining trust is a persistent challenge faced by research-practice partnerships. Research organizations have not always enjoyed positive relationships with schools. Research often seems "evaluative" to practitioners, which can lead to defensiveness and apprehension about collaborating with researchers and letting them into their schools. Many district leaders have experienced instances in which researchers make promises about the benefits of their research but leave before following through on those promises or even sharing their findings.[35]

Yet, trust is essential to the compromises required for partnerships to function effectively; negotiating problems of practice and developing solutions always involves a give and take. Trust is also needed if partners are using data collected by districts as the data frequently relate to outcomes for which schools and districts are held accountable.[36] And, a negative finding about a program or policy's impact can appear in the local media, creating a difficult situation for the district.

Some research-practice partnerships have developed trust by asking participants to follow through on simple commitments before tackling more complex challenges.[37] Research alliances try to moderate the risk that districts experience by committing to a "no surprises" policy. Researchers agree not to release any report to the public before giving key district stakeholders an opportunity to review it. Sharing reports with district personnel ahead of their public release provides districts with time to respond and interact with research staff concerning the substance of the report. For many research alliances, the aim is not to permit district staff to rewrite reports, but to have time to develop a thoughtful—as opposed to reactive—response.[38] Trust can also be developed through long-term engagement. District personnel are used to researchers coming and going, so the sustained presence of researchers builds trust in their commitment to the community and to the work. As one partner explained: "the researchers have to be hanging out in the community. Then, there's a real opportunity for true partnership."

BUILDING TRUST

The John W. Gardner Center for Youth and Their Communities (JGC) invests much time and effort in building trust with its partners. The communities that partner with JGC entrust it with sensitive administrative data for its analyses. At the beginning of each research effort, a coordinating committee decides which questions will be addressed and JGC researchers address only those questions. Near the end of the process, after the data has been collected and the analysis begun, partners work together with JGC researchers on drafts of findings before they are released more broadly. The director of the Community Schools Initiative describes the process:

> "We have discussions about the draft, get to ask questions, get to question some of the assumptions that are being made, and then we always have [a] presentation.... We bring together a group of coordinators and extract what we believe would be the most interesting part for them or something that we would like to get feedback on, and we have a conversation about that. "Okay, what do you see here? Do you think this is accurate? Do we need to work on improving the data collection?" ... Then we have conversations about the meaning of the data."

The JGC takes an unusual additional step to ensure that its partners feel comfortable trusting the Center with potentially sensitive data—the JGC will not publish anything unless the partners have approved it. A JGC researcher explains:

> "We're responsive to our partners. They read everything that we produce before it goes public. I think we've had a chance to prove to them that their best interest is our best interest, and we don't have a separate hidden agenda. ...We really needed to show that we honor their ownership of the data."

Maintaining Mutualism

It can also be challenging to maintain mutualism in research-practice partnerships. Differences in status mean that not all voices have equal weight in discussions. Practitioners, especially teachers, can fall silent in rooms filled with researchers. At the same time, district leaders have ultimate authority for the direction that the district takes. So, while they may listen politely to what researchers have to say, they may not consider the information or advice in their decision-making.[39]

Funding can impact mutualism, too. Funding is typically awarded to either the researchers or the district; so, one party has authority about how the grant funds are used. They are also responsible for ensuring that funders' requirements and expectations are met.[40] Those who receive the grant funding often have greater voice in decisions related to the focus of the work, the joint products developed, and the nature and timelines of those products. As one research leader in a partnership observed, "maintaining a level playing field" between research and practice is always a challenge. This person observed that when the work was funded by research grants, "in all the cases I know, [researchers] began to dominate."

Partnerships have devised a number of strategies to maintain mutualism. Some have governing boards composed of stakeholders that help set the research agenda. For example, both the Consortium on Chicago School Research and the Research Alliance for New York City Schools have boards that periodically help revise the focus and agenda of these organizations. Strategic Education Research Partnership (SERP) uses this approach, but it has also designed the SERP organization to act as a neutral intermediary that brokers relationships between researchers and practitioners in ways that maintain mutualism.[41] Still other partnerships maintain mutualism by ensuring adequate time for face-to-face meetings so that district leaders and researchers can go back and forth with each other proposing ideas and then challenging and refining them. According to one district leader, having sufficient funding for meetings of this type is crucial:

> "The people from the districts and researchers get to know each other. They begin to support each other, as well as feel like they can hold their own in a conversation with researchers. Say, 'Oh, yes, this will work; no, that won't and here's why.' Then work through a solution or, 'No, that's not really the problem. You're defining it in a way that doesn't match. Here, let me give you the experiences.'"

Balancing Local Relevance with Scalability

Because many research-practice partnerships are committed to doing research or developing new innovations that meet the needs of the districts with whom they are working, they try to be deeply responsive to local contexts. But, a tool or practice that is effective in one context cannot always be adopted successfully elsewhere. The more tightly linked an innovation is with the contextual conditions of a specific place, the more challenging it may be to scale it up to other sites.[42]

Some research-practice partnerships—especially NICs—address this issue by involving multiple sites in the early stages of development. NICs assume that each site will need to adapt the proposed change to their local context and that by studying the local adaptations, the network can refine the change so that it can become more reliable across different contexts. This strategy also presents challenges. Other research-practice partnerships that have tried this approach have found that, as they work with larger numbers of schools or districts, they no longer have the capacity to truly be responsive to local issues and multiple entities with diverse needs.[43]

BALANCING LOCAL RELEVANCE AND SCALABILITY

In the Center for Learning Technologies in Urban Schools (LeTUS), a partnership between learning scientists and two school districts, the main focus of the work was developing and testing curriculum units in middle school science. Over several years, a small group of teachers from Detroit Public Schools worked with researchers from the University of Michigan to co-design the units and tested early versions in their classrooms. When the team wanted to spread the units to other schools, they faced the challenge of how to do so. The units fit the needs of students in the co-design teachers' classrooms, but the team did not know how well they would meet the needs of students in other classrooms in the district. And, the units did not have the look and feel of the polished curriculum that many teachers were accustomed to using.

To increase the scalability of the units, the LeTUS team took several steps. First, they worked closely with the district director of science to ensure that the curriculum units fit with the district standards in science. Second, they trained co-design teachers to become professional developers capable of preparing other teachers to implement units. This step enabled the team to reach many more teachers, and it gave the teachers access to expert colleagues who understood and could navigate the challenges of implementation. The team then embedded additional supports into the materials to help teachers with implementation, based on lessons that co-design teachers had learned about student difficulties with the activities in the units. These supports included background knowledge about the content, as well as student ideas that teachers might encounter in implementing the materials. Finally, the team sought publishers for the curriculum materials. Today, the units are available widely in revised form through two publishers. Even after the curricula were published, they retained a local flavor. In one set of materials (Project-based Inquiry Science), a unit on water quality features an investigation of the Rouge River, a local river that students in the region can visit and use as a site for science investigations.

Other organizations have addressed the challenge of scaling up by hiring staff or developing partnerships with outside organizations that have skills specifically tailored to issues of scale-up.[44] A study of the Boston Public Schools (BPS) and its work with the evaluation firm Education Matters found that BPS was more likely to use results from evaluation studies when the two organizations partnered with a third—the Boston Plan for Excellence—that brought additional capacity that enabled the district to respond to the findings in the study at scale.[45]

Meeting District Timelines While Maintaining Depth and Quality of Research

Timelines for research are typically much longer than those for district decisions, making it difficult for district leaders to use research, even when it is relevant.[46] One researcher remarked:

> "When you engage in partnerships in an effort to be relevant, you want to do work that's a very high priority for the district, which means they probably need the information yesterday. They need data or an analysis that can be done on fairly short order, and the more nuance you add into that, the less relevant it may feel."

At the same time, high-quality research can take a long time to unfold, especially when research questions require depth of analysis, longitudinal designs, or repeated cycles of design and redesign.

Partnerships struggle to find ways to meet districts' need for timely research, without sacrificing thorough, systematic analyses of policies and programs. They have taken different strategies to address this issue. Some partnerships maintain research studies that are long-term and in-depth, but incorporate interim products and reports for the district. Others do short-term analyses that respond to districts' immediate needs in addition to their long-term research projects. For instance, the Baltimore Educational Research Collaborative (BERC) balances long-term research projects with what they call Rapid Response work— requests for data analysis made by the Baltimore City Schools that can be completed in a month or less. The directors of BERC explain:

> "These shorter projects advance the district's understanding of key issues and buy BERC goodwill through our willingness to provide support in instances where the university researchers know the work will not result in publications or products for dissemination beyond City Schools briefings."[47]

Still other partnerships, especially NICs, address the problem by having multiple layers of research. Small tests of change provide data that is intended to provide quick feedback on the potential and problems of reforms. Researchers then use a different set of measures to track long-term outcomes.

Aligning Partnership Work with Academic Norms and Incentives

Researchers working at universities can find it difficult to participate as active contributors to partnerships. Faculty—especially untenured faculty—are not rewarded for many of the central activities related to partnership work. Design and development do not "count" toward research productivity, steering researchers away from this sort of work. Similarly, writing for publications more accessible to practitioners is rarely valued for promotion decisions.[48]

Researchers face other issues as well. Some universities do not value research on a single location because of concerns about generalizability.[49] In addition, universities do not always support or appreciate the time it takes to do collaborative work with practitioners, reward collaboration, or engage in efforts to provide information to the public.[50]

Not all universities devalue partnership service, and not all researchers who partner with districts work in university settings. Many research-practice partnerships are located in centers outside of traditional academic departments and involve researchers who are not on the faculty (e.g. The John W. Gardner Center for Youth and Their Communities, Research Alliance for New York City Schools, Consortium on Chicago School Research).

Challenging School and District Contexts

School and district partners can find participating in long-term research-practice partnerships difficult. They may not have the time to devote to intense design and development efforts. Districts may also lack capacity to use the research in decision-making.[51] That is, they do not have the infrastructure and expertise to interpret findings and implement solutions consistent with evidence.

The policy context can also work against adoption of innovations developed in partnerships.[52] A partnership focused on improving instruction through professional development and coaching may find itself at odds with a policy environment that is focused on improving instructional quality through better selection of teachers. Also, policies regarding the purchase of materials and technologies can inhibit scale-up efforts of innovations that require teachers to use new curricula or digital tools.[53]

Turnover in districts is a persistent challenge. The average tenure of a superintendent in urban schools remains short. When superintendents leave, there can also be turnover in district offices with the closest ties to instruction (e.g., curriculum offices). Because new relationships must be formed, trust rebuilt, and focus maintained in the face of significant change, this turnover can be difficult for partnerships.[54]

MULTI-LEVEL PARTNERSHIPS TO SUPPORT CONTINUITY IN THE FACE OF CONTINUAL CHANGE

The partnership between Bellevue School District and the University of Washington (UW) has faced more than its share of turnover of district leadership. The superintendent who initiated the partnership passed away soon after it began. As the work progressed, leadership in science curriculum changed twice. Yet, the partnership survived through thoughtful organizing and luck.

One of the strategies the partnership used was to have researchers develop relationships with multiple leaders in the schools. This included a cadre of instructional coaches charged with supporting teachers. When the first science curriculum leader left her position, the replacement came from within that group. He knew the researchers and valued their contributions to district improvement efforts. The partnership also benefited from the many ties that a key researcher had with teachers in the district. Early on, she was involved in the project as a teacher in the district. She then left her teaching position to become a graduate student at the University of Washington, where she began working on the project as a researcher. Her connection to the district and her perspective as a former practitioner were valuable additions to the work.

IMPLICATIONS

Research-practice partnerships are bold new initiatives that seek to create institutional relationships to support the development of timely, relevant, and useful research for educational improvement. In the last two decades, research-practice partnerships have been initiated across the country, garnering interest from policymakers, funders, and communities interested in leveraging research into educational opportunities for children and youth. The work is not easy, but we are beginning to accumulate evidence from existing partnerships about strategies to make that work productive. Here, we outline the implications for those seeking to develop, maintain, or fund research-practice partnerships.

Implications for Partnership Members

Research on research-practice partnerships points to steps that researchers and practitioners can take to develop productive partnerships. The research does not indicate that these strategies will eliminate the challenges. Rather, it points to key things to consider when making strategic decisions about partnership work.

Anticipate challenges associated with new roles and responsibilities: Many research-practice partnerships, especially design research and NICs, require that researchers and practitioners take on new roles and responsibilities. In the design-research model, researchers and practitioners co-design innovations together, something that stretches the boundaries of roles for all. Some design-research partnerships also involve practitioners in data collection and analysis, which is typically outside their normal job responsibilities. NICs take this even further. They have the practitioners take the lead in developing measures and collecting data while researchers mainly act as facilitators of the research process.

Engaging practitioners centrally in the research and development process in this way may foster greater mutualism. Practitioners can develop a sense of ownership with respect to reforms, and they sometimes use their enthusiasm to convince other practitioners of the value of new solutions to difficult problems.[55] This approach may also serve a capacity-building mission, enabling researchers to benefit more from practitioner knowledge and fostering greater understanding of and respect for the research process for practitioners.

However, learning these new and non-traditional roles may involve a steep learning curve, requiring extensive lead time before individuals have enough capacity to perform tasks well. Furthermore, new roles and responsibilities are often layered on top of old ones, intensifying work and, at times, creating conflicts.

Partnerships should anticipate the learning curve that new roles and responsibilities require and provide opportunities and support for it. Partnerships should also strategize about ways to enable school and district personnel to integrate these new responsibilities into their existing work routines. Ultimately, though, partnerships need to be realistic about what is possible for district personnel and others to take on, given how stretched they already are.

Devote resources and staffing to maintaining the partnership: Maintaining the partnership takes ongoing work and attention.[56] Building and maintaining trust are crucial for successful partnerships. Negotiation and communication are central to maintaining mutualism; they ensure that all parties are on the same page. Such efforts are intensified when high rates of turnover require that roles, relationships, trust, and directions for the work need to be re-established over and over again. One commentator observed: "Coordination takes time, and none of the participating organizations have any to spare. The expectation that collaboration can occur without a supporting infrastructure is one of the most frequent reasons why it fails."[57]

Partnerships should anticipate the central importance and the time-consuming nature of this work and devote adequate resources and staff time—adequate infrastructure—to maintain the collaboration. Existing research-practice partnerships vary greatly in the resources they devote to this aspect of the work. At one end of the spectrum are organizations like Strategic Education Research Partnership (SERP) and the John W. Gardner Center for Youth and Their Communities, which have staff members whose explicit responsibility is to coordinate and manage the work of the partnership. SERP, for example, has full-time staff members on site in several of the districts with which it works. These individuals are charged with bringing researchers and practitioners together, facilitating collaboration, and maintaining open channels of communication. Similarly, the Strive Network requires its initiatives to have an "anchor organization" that devotes staff time to program implementation and takes primary responsibility for any initiative. On the other end of the spectrum are partnerships, typically in a university setting, in which the researchers do this work in addition to their other responsibilities. In these examples, there are often few resources in the budget to support maintenance work.

Since successful research-practice partnerships hinge on their ability to maintain ongoing communication, trust, and collaboration, they must be intentional in the way they devote staffing and other resources to this important, but frequently overlooked, work.

Weigh pros and cons of starting small or big: Most research-practice partnerships, regardless of type, want to bring about improvements at scale. However, they go about it in different ways. Some partnerships, especially NICs, emphasize starting small. While the problems that the Carnegie Foundation for the Advancement of Teaching addresses in its work are big in scope—teacher quality, community college success—it starts by investigating relatively minor changes in a small number of sites. The idea is to learn from successes and failures and gradually build out or scale up solutions to problems. By contrast, research alliances study policies that implicate entire districts and design-research projects often focus on designing for district-wide implementation. This approach is based on the premise that improvements to teaching and learning require the coordination of supports at multiple levels of districts, which is more readily accomplished by working at scale from the start.

At present, we know little about which approach is more effective, though both have potential advantages. Starting small could allow researchers and practitioners to work without much exposure to those in the district and community who might not agree with the direction of a policy or program being pursued. It can also allow researchers to gather data on the potential of a program, which can later be used as evidence to support scaling up. By contrast, starting big might enable district staff to build political support for large-scale changes early on and obtain the resources needed to make big changes through the process. Over time, the relative value of one approach to scaling may become apparent through experience or research. In the meantime, however, partnerships should weigh these trade-offs carefully, thinking through how different approaches may be more or less applicable given the problem of practice they are addressing and the local conditions.

Acknowledge the tension between research independence and joint work: Research-practice partnerships take varying stances about the importance of maintaining independence for researchers. Research alliances typically embrace independence, while design-research partnerships and NICs are more concerned with collaboration and joint accountability.

Positioning researchers as independent may help preserve the integrity of the research process. When researchers are independent, they are not as vested in the results of a study of a policy or program since they are not responsible for designing or implementing it. This stance may also create credibility in the eyes of a broader range of stakeholders, including critics of policies and programs. As one district leader explained:

> "Their independence is very important. It lends credibility to their work. It allows them to take on projects that are important generally, even if they're not as much of a focal point for us. I think it's valuable for us to have this outside group that … exercise[s] some independent judgment in what they do and how they do it."

Independence can also create a measure of distance, making it more difficult to maintain high levels of trust. It can also limit the degree to which researchers and the research process can help build capacity. Research in the absence of capacity to interpret it or implement its recommendations only goes so far. Furthermore, independence can be difficult to maintain. Many organizations become more intertwined and interdependent over time as they come to rely on one another for access to data and external funding.[58]

In contrast, maximizing collaboration and joint accountability may foster increased trust as practitioners and researchers see each other as critical to the success of the endeavor. Close collaboration may also foster greater learning and capacity-building on the part of both researchers and practitioners. It can also enable all parties to gain insight into one another's motivations and needs, increasing buy-in and use. One district leader involved in a design-research project explained:

> "There is a collaborative give-and-take on what the district needs and what the researchers need … I feel like I understand better what research questions are being addressed [and] what the overall outcome or agenda is."

But, such close involvement challenges traditional standards of research. Design researchers have faced skepticism from the broader research community, including questions about whether the approach is adequate for testing claims about interventions.[59] And, when partners are heavily invested in a strategy, it takes tremendous discipline to look at what is working and what is not.

Whether researchers seek independence or not, partnership work takes place in a political environment in which the questions that researchers study can be hotly debated. By studying problems that matter to districts, researchers place themselves firmly within that political context. Researchers' desire for independence is borne of a real concern that research integrity can be compromised by working in partnership. At the same time, the desire for joint accountability is a reminder that research in the context of partnerships is in the service of helping solve district problems. As research-practice partnerships mature and spread, we need to develop new norms and practices for maintaining high-quality research in settings in which researchers—even those involved in research alliances—are linked to the districts and projects that they are studying.

Implications for Funders Supporting Research-Practice Partnerships

Funders play an important role in developing and sustaining research-practice partnerships. Private foundations have provided seed money to establish research-practice partnerships and they, along with federal agencies, have supported a large percentage of research projects the partnerships undertake. A small number of research-practice partnerships have endowments (e.g. Carnegie Foundation for the Advancement of Teaching, John W. Gardner Center for Youth and Their Communities), but this is relatively rare. For this reason, funders and the decisions they make about how to support partnerships play a key role in their success. Here, we outline implications of our analysis for funders that support research-practice partnerships.

Consider providing general operating support: Research-practice partnerships typically find it challenging to attract funding for general operating support or project infrastructure.[60] Some funders are hesitant to fund core operations because it falls outside their missions. Others are hesitant because it can be difficult to measure the impact of an investment in core support or infrastructure. As one funder told us: "We haven't demonstrated that [stable funding for infrastructure] is important" for the long-term success of partnerships.

However, we know that general operating support enables partnerships to devote staff time to maintain the relationships that are essential to getting the work done. It also helps partnerships maintain and keep focused on a longer-term agenda. And, it allows projects to be more flexible and responsive to district needs, rather than to the requirements of individual grants. All of these tasks are very difficult if participants must knit together a series of short-term grants to fund the partnership over time.[61]

Of course, funding specific projects is also essential. Projects are a key way partnerships get off the ground; they organize activity around concrete goals. They also create accountability for achieving goals for external funders. But, funding individual research and development projects in the absence of adequate general support makes it difficult for partnerships to reach their goals.

Require potential grantees to provide details about both the products they will produce and the processes for producing them: Most funding for research and development, especially with design-research partnerships, is organized around a product development cycle. The idea is that education is similar to industries in which up-front investment in creating a quality product is expected to pay off once the product is ready to be sold. It is difficult for research-practice partnerships to find funding for development and design work unless it is tied to a specific product or innovation.

Most funders expect details about the features of products that partnerships will produce in the grant proposal. They expect far less when it comes to descriptions about how partnerships will organize their work to develop these products. For example, partners may need only to provide letters of commitment as evidence of their involvement, while funders require project narratives describing the details of the programs that teams will develop. If partnerships are working collaboratively and are responsive to data on implementation, though, it is just as important that proposals describe how the researchers and practitioners will go about working with one another. This includes details about how partnerships will negotiate which problems to focus on (or how they already have), how they will go about the design process, and what forms of evidence will be used to inform ongoing design.[62]

Identify innovative ways to co-fund researchers and practitioners: At present, most funding for research-practice partnerships is awarded to the researcher or intermediary organization. Many funders prefer to give grants for specific studies to researchers, because they perceive them as the experts in research activities. Some funders are also concerned about school districts' capacities to use the money well, given challenging bureaucracies and the difficulty of ensuring that spending is used to support the partnership work rather than districts' other financial needs.

Yet, the decision about who to fund has implications for the dynamics of the partnership and how the work unfolds. Funding only one party makes it challenging to maintain mutualism in partnerships. The group that wins funding controls decisions about how monies are allocated and is also ultimately accountable to the funder for results.

Some grant programs have attempted to address this issue by including the requirement that practitioner partners be co-principal investigators on the grant. However, this may not go very far if that title does not come with a subcontract of funds to support the work. Given that the work is fundamentally rooted in the notion of "partnership," funders should consider how their funding strategies can empower various stakeholders.

Consider supporting capacity-building activities: Working in research-practice partnerships often requires the development of new roles and capacities. Researchers must develop the ability to negotiate problems of practice with individuals in local districts. They must learn new skills related to partnership development and maintenance. In design-research partnerships and NICs, they must also develop skills in new forms of design, such as techniques that support practitioners' participation in design and facilitation of Plan, Do, Study, Act cycles.

Districts are also challenged to develop new capacities. They must learn how to find researchers who are capable of helping them address their needs. In design-research partnerships and NICs, district staff may need to learn how to develop measures, collect data, and participate in structured approaches to design and development. Many partnerships may also benefit from identifying and training key staff who can serve as go-betweens in the partnership. They need to "translate" the work of partners to other practitioners and mobilize support for partnership activities within districts.

At present, there are virtually no organized opportunities to learn these skills. Most universities are not set up to train researchers to work with school districts in this way.[63] And, most school districts do not have the resources or infrastructure to support their teachers, principals, and district leaders in learning new roles. To the degree that capacity emerges, it is an unacknowledged by-product of individual grants and projects. Funders may want to build into funding requirements explicit attention to building the capacity of researchers and practitioners to do this boundary-spanning work. They should also consider providing funds specifically for capacity-building activities.

CONCLUDING THOUGHTS

In the last two decades, researchers and practitioners have worked to forge new ways to bring research and practice together to improve schools and districts. District leaders and researchers have crafted new models for developing research-based innovations and creating conditions in schools and districts that are more conducive to the ongoing use of research in policymaking and practice. Research-practice partnerships move away from the conventional ways of doing business. Researchers engage with district leaders in long-term partnerships, focused on doing research and development that meets districts' pressing needs. There is a new commitment to mutualism to ensure that original analysis is informed by the unique knowledge and perspective of both researchers and practitioners and benefits both. And, care is taken to structure the partnerships, using intentional strategies to foster the collaboration needed to bring different perspectives to the table in productive ways.

Research-practice partnerships are a promising strategy for improving schools and districts. But, it is often difficult for researchers and district administrators involved in partnerships to learn from one another. It can also be challenging for those interested in developing new partnerships to learn about different ways they might organize their work or anticipate and address the issues they may face. What is needed is a more robust dialogue in which district leaders, researchers, policymakers, and funders speak candidly about the strategic trade-offs partnerships face and the resources that are required for success. This white paper is an important part of moving this conversation forward.

Practice

END NOTES

1. Barry J. Fishman, Ronald W. Marx, S. Best, and R. Tal, "Linking Teacher and Student Learning to Improve Professional Development in Systemic Reform," *Teaching and Teacher Education* 19, no. 6 (2003); Louise Yarnall, Nicole Shechtman, and William R. Penuel, "Using Handheld Computers to Support Improved Classroom Assessment in Science: Results from a Field Trial" (paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec, Canada, April 2005); Elaine Allensworth and John Q. Easton, "The on-Track Indicator as a Predictor of High School Graduation," (Chicago, IL: Consortium on Chicago School Research, 2005); Elaine Allensworth and John Q. Easton, "What Matters for Staying on-Track and Graduating in Chicago Public High Schools: A Close Look at Course Grades, Failures, and Attendance in the Freshman Year. Research Report," (Chicago, IL: Consortium on Chicago School Research, 2007); Patricia F. Campbell and Nathaniel N. Malkus, "The Impact of Elementary Mathematics Coaches on Student Achievement," *Elementary School Journal* 111, no. 3 (2011); Robert Geier, Phyllis Blumenfeld, Ronald W. Marx, Joseph Krajcik, Barry J. Fishman, and Elliot Soloway, "Standardized Test Outcomes for Students Engaged in Inquiry-Based Science Curricula in the Context of Urban Reform," *Journal of Research in Science Teaching* 45, no. 8 (2008); Kari Shutt, Rachel S. Phillips, Nancy Vye, Katie Van Horne, and John D. Bransford, "Developing Science Inquiry Skills with Challenge-Based, Student-Directed Learning" (paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO, April 2010); Catherine E. Snow, Joshua F. Lawrence, and Claire White, "Generating Knowledge of Academic Language among Urban Middle School Students," *Journal of Research on Educational Effectiveness* 2, no. 4 (2009).
2. Sybil M. Madison, Mary M. McKay, Roberta Paikoff, and Carl C. Bell, "Basic Research and Community Collaboration: Necessary Ingredients for the Development of a Family-Based HIV Prevention Program," *AIDS Education and Prevention* 12, no. 4 (2000); Mary M. McKay, Geetha Gopalan, Lydia M. Franco, Kosta Kalogerogiannis, Mari Umpierre, Orly Olshtain-Mann, William Bannon, Laura Elwyn, and Leah Goldstein, "It Takes a Village to Deliver and Test Child and Family-Focused Services," *Research on Social Work Practice* 20, no. 5 (2010); Lawrence A. Palinkas and Haluk Soydan, *Translation and Implementation of Evidence-Based Practice*, ed. Joan Levy Zlotnik, *Building Social Work Research Capacity* (New York: Oxford University Press, 2012); Jeff Rojek, Geoffrey P. Alpert, and Hayden P. Smith, "The Utilization of Research by the Police," *Police Practice and Research: An International Journal* (2012); Jeff Rojek, Hayden P. Smith, and Geoffrey P. Alpert, "The Prevalence and Characteristics of Police Practitioner-Researcher Partnerships," *Police Quarterly* (2012).
3. Melissa Roderick and John Q. Easton, "Developing New Roles for Research in New Policy Environments: The Consortium on Chicago School Research," (Chicago, IL: The Consortium on Chicago School Research, 2007); Lea Hubbard, "Research to Practice: The Case of Boston Public Schools, Education Matters and the Boston Plan for Excellence," in *Research and Practice in Education: Building Alliances, Bridging the Divide*, ed. Cynthia E. Coburn and Mary Kay Stein (Lanham, MD: Rowman & Littlefield, 2010); Cynthia E. Coburn and Mary Kay Stein, eds., *Research and Practice in Education: Building Alliances, Bridging the Divide* (Lanham, MD: Rowman & Littlefield, 2010); Cynthia E. Coburn, Soung Bae, and Erica O. Turner, "Authority, Status, and the Dynamics of Insider-Outsider Partnerships at the District Level," *Peabody Journal of Education* 83(2008).
4. The paper draws on three sources of data. First, we interviewed 17 national leaders of research-practice partnerships. We drew on these interviews to derive our definition and common features of research-practice partnerships. Second, we reviewed existing research on research-practice partnerships inside and outside education. This literature review was used to identify challenges of research-practice partnerships and support the definition and typology. Third, we conducted case studies of four research-practice partnerships. Each partnership was selected because it was a good example of a given type of partnership. We selected two partnerships that exemplified research alliances: one that was a district-focused alliance and the other that was a cross-sectoral alliance. For each case study, we did three to six interviews with district leaders and researchers, and collected and analyzed project artifacts, project reports, and publications. We used these case studies to illustrate partnerships of each type.
4. Laura D'Amico, "The Center for Learning Technologies in Urban Schools: Evolving Relationships in Design-Based Research," in *Research and Practice in Education: Building Alliances, Bridging the Divide*, ed. Cynthia E. Coburn and Mary Kay Stein (Lanham, MD: Rowan & Littlefield, 2010).
5. Melissa Roderick, John Q. Easton, and Penny Bender Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform," (Chicago, IL: Consortium on Chicago School Research, 2009); for similar arguments outside education, see Madison, McKay, Paikoff, and Bell. "Basic Research and Community Collaboration: Necessary Ingredients for the Development of a Family-Based HIV Prevention Program"; Suzanne Christopher, Vanessa Watts, Alma Knows His Gun McCormick, and Sara Young, "Building and Maintaining Trust in a Community-Based Participatory Research Partnership," *American Journal of Public Health* 98, no. 8 (2008).
6. Hugh Burkhardt and Alan H. Schoenfeld, "Improving Educational Research: Toward a More Useful, More Influential, and Better-Funded Enterprise," *Educational Researcher* 32, no. 9 (2003); Barry J. Fishman, Ronald W. Marx, Phyllis Blumenfeld, Joseph Krajcik, and Elliot Soloway, "Creating a Framework for Research on Systemic Technology Innovations," *The Journal of the Learning Sciences* 13, no. 1 (2004).
7. Suzanne Donovan, Alexandra K. Wigdor, and Catherine E. Snow, *Strategic Education Research Partnership* (Washington, DC: National Research Council, 2003); Anne E. Kazak, Kimberly Hoagwood, John R. Weisz, Korey Hood, Thomas R. Kratochwill, Luis A. Vargas, and Gerard A. Banez. "A Meta-Systems Approach to Evidence-Based Practice for Children and Adolescents." *American Psychologist* 65, no. 2 (2010).
8. Roderick, Easton, and Penny Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."
9. Anthony S. Bryk, Louis M. Gomez, and Alicia Grunow, "Getting Ideas into Action: Building Networked Improvement Communities in Education," in *Frontiers in Sociology of Education*, ed. Maureen Hallinan (Dordrecht, the Netherlands: Verlag, 2011); Donovan, Wigdor, and Snow, *Strategic Education Research Partnership*; Anthony S. Bryk, Sharon G. Rollow, and Gay Su Pinnell. "Urban School Development: Literacy as a Lever for Change." *Educational Policy* 10, no. 2 (1996).
10. William R. Penuel and Louise Yarnall, "Designing Handheld Software to Support Classroom Assessment: An Analysis of Conditions for Teacher Adoption," J*ournal of Technology, Learning, and Assessment* 3, no. 5 (2005); for a similar argument outside education, see Palinkas and Soydan, *Translation and Implementation of Evidence-Based Practice*; Brian J. Reiser, James P. Spillane, Franci Steinmuler, Don Sorsa, Karen Carney, and Eleni Kyza, "Investigating the Mutual Adaptation Process in Teachers'

Design of Technology-Infused Curricula," in *Fourth International Conference of the Learning Sciences*., ed. Barry Fishman and S. O'Connor-Divelbiss (Mahwah, NJ: Erlbaum, 2000); Nina Wallerstein and Bonnie Duran, "Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health Equity," *American Journal of Public Health* 100, no. S1 (2010).

11. e.g., the Grow Network; Cornelia Brunner, Chat Fasca, Juliette Heinze, Margaret Honey, Daniel Light, Ellen B. Mandinach, and Data Wexler, "Linking Data and Learning: The Grow Network Study," *Journal of Education for Students Placed at Risk* 10, no. 3 (2005).
12. William R. Penuel and Barbara Means, "Using Large-Scale Databases in Evaluation: Advances, Opportunities, and Challenges," *American Journal of Evaluation* 32, no. 1 (2011); Faith Connolly and Linda S. Olson, "Early Elementary Performance and Attendance in Baltimore City Schools' Pre-Kindergarten and Kindergarten," (Baltimore, MD: Baltimore Education Research Consortium, 2012).
13. Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."
14. Vanessa Coco, David Johnson, Thomas Kelley-Kemple, Melissa Roderick, Eliza Moeller, Nicole Williams, and Kafi Moragne, "Working to My Potential: The Postsecondary Experiences of CPS Students in the International Baccalaureate Diploma Programme," (Chicago, IL: Consortium on Chicago Schools Research, 2012); Rebecca A. London and Oded Gurantz, "State and Local Data Infrastructure for Tracking Secondary to Postsecondary Educational Outcomes," (Stanford, CA: John W. Gardner Center for Youth and Their Communities, 2010); Adriana Villavicencio, and Justina K. Grayman, "Learning From "Turnaround" Middle Schools: Strategies for Success," (New York: Research Alliance for New York City Schools, 2012); Julian R. Betts, Youjin Hahn, and Andrew C. Zau, "Does Diagnostic Math Testing Improve Student Learning," (San Francisco, CA: Public Policy Institute of California, 2011); Stephen B. Plank and Barbara Condliffe, "Pressures of the Season: A Descriptive Look at Classroom Quality in Second and Third Grade Classrooms," (Baltimore, MD: Baltimore Education Research Consortium, 2011).
15. Donovan, Wigdor, and Snow, *Strategic Education Research Partnership*.
16. Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform": 22.
17. Daniel C. Edelson, "Design Research: What We Learn When We Engage in Design," The Journal of the Learning Sciences 11, no. 1 (2002); Allan Collins, Diana Joseph, and Katerine Bielaczyc, "Design Research: Theoretical and Methodological Issues," *The Journal of the Learning Sciences* 13, no. 1 (2004); Paul A. Cobb, Jere Confrey, Andrea A. diSessa, Richard Lehrer, and Leona Schauble, "Design Experiments in Educational Research," Educational Researcher 32, no. 1 (2003).
18. e.g., Paul A. Cobb, Kay McClain, Teruni Salva Laumberg, and Chrystal Dean, "Situating Teachers' Instructional Practices in the Institutional Setting of the School and District," *Educational Researcher* 32, no. 6 (2003); Lauren B. Resnick and James P. Spillane, "From Individual Learning to Organizational Designs for Learning," in Instructional Psychology: Past, Present and Future Trends. Sixteen Essays in Honor of Erik De Corte, ed. Lieven Verschaffel, Filip Dochy, Monique Boekaerts, and Stella Vosinadou, Advances in Learning and Instruction (Oxford: Pergamon, 2006); Snow, Lawrence, and White "Generating Knowledge of Academic Language among Urban Middle School Students."
19. Sasha Barab and April L. Luehmann, "Building Sustainable Science Curriculum: Acknowledging and Accommodating Local Adaptation." *Science Education* 87, no. 4 (2003); Barry J. Fishman and Joe Krajcik, "What Does It Mean to Create Sustainable Science Curriculum Innovations? A Commentary," *Science Education* 87, no. 4 (2003); Fishman, Marx, Blumenfeld, Krajcik, and Soloway, "Creating a Framework for Research on Systemic Technology Innovations"; William A. Sandoval and Philip Bell, "Design-Based Research Methods for Studying Learning in Context: Introduction," *Educational Psychologist* 39, no. 4 (2004).
20. Paul A. Cobb and Kara Jackson, "Analyzing Educational Policies: A Learning Design Perspective," *Journal of the Learning Science*s 21, no. 4 (2012).
21. e.g., William R. Penuel, Jeremy Roschelle, and Nicole Shechtman, "The Whirl Co-Design Process: Participant Experiences," *Research and Practice in Technology Enhanced Learning* 2, no. 1 (2007); Elizabeth A. Davis and Joseph Krajcik, "Designing Educative Curriculum Materials to Promote Teacher Learning," *Educational Researcher* 34, no. 3 (2005); Jane Bowyer, Libby Gerard, and Ronald W. Marx, "Building Leadership for Scaling Science Curriculum Reform," in *Designing Coherent Science Education*, ed. Yael Kali, Marcia C. Linn, and Jo Ellen Roseman (New York: Teachers College Press, 2008); Resnick and Spillane, "From Individual Learning to Organizational Designs for Learning."
22. Douglas C. Engelbart, "Toward High-Performance Organizations: A Strategic Role for Groupware" (paper presented at the GroupWare '92 Conference, San Jose, CA, August 1992).
23. Donald M. Berwick, "The Science of Improvement," *The Journal of the American Medical Association* 299, no. 10 (2008).
24. Anthony S. Bryk, "Support a Science of Performance Improvement," *Phi Delta Kappan* 90, no. 8 (2009): 598.
25. Berwick, "The Science of Improvement"; Kaveh G. Shojania and Jeremy M. Grimshaw, "Evidence-Based Quality Improvement: The State of the Science," *Health Affairs* 24, no. 1 (2005).
26. William E. Deming, *Out of the Crisis* (Cambridge, MA: MIT Press, 1986).
27. Jennifer Zoltners Sherer and Alicia Grunow, "90-Day Cycle: Exploration of Math Intensives as a Strategy to Move More Community College Students out of Developmental Math Courses," (Palo Alto, CA: The Carnegie Foundation for the Advancement of Teaching, 2010).
28. "The Strive Network," www.strivenetwork.org.
29. "Strive," http://knowledgeworks.org/impacting-schools-communities/strive.
30. Institute of Education Sciences, "Regional Educational Laboratories 2012 - 2017, Solicitation Ed-Ies-11-R-0036," (Washington, DC: Department of Education, 2012).
31. William E. Bickel and Rosemary A. Hattrup, "Teachers and Researchers in Collaboration: Reflections on the Process," *American Educational Research Journal* 32, no. 1 (1995); Susan M. Brookhart and William E. Loadman, "School-University Collaboration and Perceived Professional Rewards," Journal of Research in Education 2, no. 1 (1992); Bernard R. Gifford, "The Evolution of the

School-University Partnership for Educational Renewal," *Education and Urban Society* 19, no. 1 (1986); Pamela J. Keating and Richard W. Clark, "Accent on Leadership: The Puget Sound Educational Consortium," in *School-University Partnerships in Action: Concepts, Cases and Concerns*, ed. Kenneth A. Sirotnik and John I. Goodlad (New York: Teachers College Press, 1988); Philip C. Schlecty and Betty Lou Whitford, "Shared Problems and Shared Vision: Organic Collaboration," in *School-University Partnerships in Action: Concepts, Cases and Concerns*, ed. Kenneth A. Sirotnik and John I. Goodlad (New York: Teachers College Press, 1988); for similar findings outside education, see Lawrence A. Palinkas, Gregory A. Aarons, Bruce F. Chorpita, Kimberly Hoagwood, John Landsverk, and John R. Weisz, "Cultural Exchange and the Implementation of Evidence-Based Practices: Two Case Studies," *Research on Social Work Practice* 19, no. 5 (2009).

32. William A. Firestone and Jennifer L. Fisler, "Politics, Community, and Leadership in a School-University Partnership," *Educational Administration Quarterly* 38, no. 4 (2002); Paul E. Heckman, "The Southern California Partnership: A Retrospective Analysis," in *School-University Partnerships in Action: Concepts, Cases and Concerns*, ed. Kenneth A. Sirotnik and John I. Goodlad (New York: Teachers College Press, 1988); Les Vozzo and Jack MacFadden, "A School-University Partnership: A Commitment to Collaboration and Professional Renewal," in *The Many Faces of School-University Collaboration: Characteristics of Successful Partnerships*, ed. Ruth Ravid and Marianne G. Handler (Englewood, CO: Teachers Ideas Press, 2001).

33. e.g., Nancy Vye, Philip Bell, Carrie T. Tzou, and John D. Bransford, "Instructional Design Principles for Blending and Bridging Science Learning across Formal and Informal Environments" (paper presented at the National Association for Research in Science Teaching Annual International Conference, Philadelphia, PA, March 2010).

34. McKay, Gopalan, Franco, Kalogerogiannis, Umpierre, Olshtain-Mann, Bannon, Elwyn, and Goldstein, "It Takes a Village to Deliver and Test Child and Family-Focused Services"; Palinkas and Soydan, *Translation and Implementation of Evidence-Based Practice*; Pamela Gates-Duffield and Carol Stark, "Recipes for Professional Development Schools: A Metaphor for Collaboration," in *The Many Faces of School-University Collaboration: Characteristics of Successful Partnerships*, ed. Ruth Ravid and Marianne G. Handler (Englewood, CO: Teachers Ideas Press, 2001); Robin Hasslen, Nancy Bacharach, Judy Rotto, and Jonathan Fribley. "Learning Connections: Working toward a Shared Vision." In *The Many Faces of School-University Collaboration: Characteristics of Successful Partnerships*, edited by Ruth Ravid and Marianne G. Handler, 60-69. Englewood, CO: Teachers Ideas Press, 2001); Ann Lieberman, "The Metropolitan School Study Council: A Living History," in *School-University Partnerships in Action: Concepts, Cases and Concerns*, ed. Kenneth A. Sirotnik and John I. Goodlad (New York: Teachers College Press, 1988); Lisa Rosen, "Deconstructing the Rhetoric of Rigor: Evidence-Based Policy and the Politics of Representation," (Chicago: Center for School Improvement, in preparation); David Dwayne Williams, "The Brigham Young University-Public School Partnership," in School-University Partnerships in Action: Concepts, Cases and Concerns, ed. Kenneth A. Sirotnik and John I. Goodlad (New York: Teachers College Press, 1988).

35. Phyllis Blumenfeld, Barry J. Fishman, Joseph Krajcik, Ronald W. Marx, and Elliot Soloway, "Creating Usable Innovations in Systemic Reform: Scaling up Technology-Embedded Project-Based Science in Urban Schools," *Educational Psychologist* 35, no. 3 (2000); Suzanne Donovan and James W. Pellegrino, "Learning and Instruction: A SERP Research Agenda," (Washington, DC: National Research Council, 2003); Roderick and Easton, "Developing New Roles for Research in New Policy Environments: The Consortium on Chicago School Research"; Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."

36. Julie Reed Kochanek, *Building Trust for Better Schools: Research-Based Practices* (Thousand Oaks, CA: Corwin Press, 2005).

37. Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."

38. Coburn, Bae, and Turner, "Authority, Status, and the Dynamics of Insider-Outsider Partnerships at the District Level."

39. Penuel, Roschelle, and Shechtman, "The Whirl Co-Design Process: Participant Experiences."

40. Donovan, Wigdor, and Snow, *Strategic Education Research Partnership*.

41. Barbara Means and William R. Penuel, "Research to Support Scaling up Technology-Based Educational Innovations," in *Scaling up Success: Lessons from Technology-Based Educational Improvement*, ed. Christopher Dede, James P. Honan, and Lawrence C. Peters (San Francisco, CA: Jossey-Bass, 2005); D'Amico, "The Center for Learning Technologies in Urban Schools: Evolving Relationships in Design-Based Research"; for a similar finding outside education, see Palinkas and Soydan, *Translation and Implementation of Evidence-Based Practice*.

42. Donovan, Wigdor, and Snow, Strategic Education Research Partnership; Gina Schuyler Ikemoto and Meredith I. Honig, "Tools to Deepen Practitioners' Engagement with Research: The Case of the Institute for Learning," in *Research and Practice in Education: Building Alliances, Bridging the Divide*, ed. Cynthia E. Coburn and Mary Kay Stein (Lanham, MD: Rowman & Littlefield, 2010).

43. D'Amico, "The Center for Learning Technologies in Urban Schools: Evolving Relationships in Design-Based Research"; Hubbard, "Research to Practice: The Case of Boston Public Schools, Education Matters and the Boston Plan for Excellence"; Ikemoto and Honig, "Tools to Deepen Practitioners' Engagement with Research: The Case of the Institute for Learning"; Lisa Rosen, "Examining a Novel Partnership for Educational Innovation: Promises and Complexities of Cross-Institutional Collaboration," in *Research and Practice in Education: Building Alliances, Bridging the Divide*, ed. Cynthia E. Coburn and Mary Kay Stein (New York: Rowman & Littlefield Publishing Group, 2010).

44. Hubbard, "Research to Practice: The Case of Boston Public Schools, Education Matters and the Boston Plan for Excellence."

45. For a review, see Cynthia E. Coburn, Meredith I. Honig, and Mary Kay Stein, "What's the Evidence on Districts' Use of Evidence?" in *The Role of Research in Educational Improvement*, ed. John D. Bransford, Deborah J. Stipek, Nancy J. Vye, Louis M. Gomez, and Diana Lam (Cambridge, MA: Harvard Education Press, 2009).

46. Faith Connolly, Stephen Plank, and Tracy Rone, "Baltimore Education Research Consortium: A Consideration of Past, Present, and Future," (Baltimore, MD: Baltimore Education Research Consortium, 2012): 4.

47. Ikemoto and Honig, "Tools to Deepen Practitioners' Engagement with Research: The Case of the Institute for Learning"; Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."

48. Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting

Urban School Reform"; for a similar finding outside education, see Susan Thering and Victoria Chanse, "The Scholarship of Transdisciplinary Action Research: Toward a New Paradigm for the Planning and Design Traditions," *Landscape Journal* 30, no. 1 (2011).

49. Palinkas and Soydan, *Translation and Implementation of Evidence-Based Practice*; Burkhardt and Schoenfeld, "Improving Educational Research: Toward a More Useful, More Influential, and Better-Funded Enterprise"; Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."

50. Blumenfeld, Fishman, Krajcik, Marx, and Soloway, "Creating Usable Innovations in Systemic Reform: Scaling up Technology-Embedded Project-Based Science in Urban Schools"; Cynthia E. Coburn, "Partnership for District Reform: The Challenges of Evidence Use in a Major Urban District," in *Research and Practice in Education: Building Alliances, Bridging the Divide*, ed. Cynthia E. Coburn and Mary Kay Stein (New York: Rowman & Littlefield Publishing Group, 2010); Fishman, Marx, Blumenfeld, Krajcik, and Soloway, "Creating a Framework for Research on Systemic Technology Innovations"; Hubbard, "Research to Practice: The Case of Boston Public Schools, Education Matters and the Boston Plan for Excellence"; Roderick, Easton, and Sebring, "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform."

51. J. Curtis McMillen, Shannon L. Lenze, Kristin M. Hawley, and Victoria A. Osborne, "Revisiting Practice-Based Research Networks as a Platform for Mental Health Services Research," *Administration and Policy in Mental Health and Mental Health Services Research* 36(2009).

52. William R. Penuel, Barry J. Fishman, Ryoko Yamaguchi, and Lawrence P. Gallagher, "What Makes Professional Development Effective? Strategies That Foster Curriculum Implementation," *American Educational Research Journal* 44, no. 4 (2007).

53. Thomas E. Glass and Louis A. Franceschini, *The State of the American School Superintendency: A Mid-Decade Study* (Lanham, MD: Rowman & Littlefield, 2007); Hannele Kerosuo, "'Boundary Encounters' as a Place for Learning and Development at Work," *Outlines: Critical Social Studies* 6, no. 1 (2001).

54. e.g., Penuel and Yarnall, "Designing Handheld Software to Support Classroom Assessment: An Analysis of Conditions for Teacher Adoption."

55. John Kania and Mark Kramer, "Collective Impact," *Stanford Social Innovation Review* 9, no. 1 (2011); Robert E. Kraut, Jolene Galegher, and Carmen Egido, "Relationships and Tasks in Scientific Research Collaboration," *Human-Computer Interaction* 3, no. 1 (1987).

56. Kania and Kramer, "Collective Impact": 40.

57. Mark A. Smylie and Thomas B. Corcoran, "Nonprofit Organizations and the Promotion of Evidence-Based Practice," in *The Role of Research in Educational Improvement*, ed. John D. Bransford, Deborah J. Stipek, Nancy Vye, L. Gomez, and Diana Lam (Massachusetts: Harvard Educational Press, 2009).

58. Richard J. Shavelson, Dennis C. Phillips, Lisa Towne, and Michael J. Feuer, "On the Science of Education Design Studies," *Educational Researcher* 32, no. 1 (2003).

59. Blumenfeld, Fishman, Krajcik, Marx, and Soloway, "Creating Usable Innovations in Systemic Reform: Scaling up Technology-Embedded Project-Based Science in Urban Schools"; Burkhardt and Schoenfeld, "Improving Educational Research: Toward a More Useful, More Influential, and Better-Funded Enterprise"; Coburn and Stein, eds., *Research and Practice in Education: Building Alliances, Bridging the Divide*; Donovan, Wigdor, and Snow, Strategic Education Research Partnership; for discussion of similar issues outside education see McMillen, Lenze, Hawley, and Osborne; Rojek, Smith, and Alpert, "The Prevalence and Characteristics of Police Practitioner-Researcher Partnerships."

60. Blumenfeld, Fishman, Krajcik, Marx, and Soloway, "Creating Usable Innovations in Systemic Reform: Scaling up Technology-Embedded Project-Based Science in Urban Schools"; Burkhardt and Schoenfeld, "Improving Educational Research: Toward a More Useful, More Influential, and Better-Funded Enterprise"; Coburn and Stein, eds., *Research and Practice in Education: Building Alliances, Bridging the Divide*; Donovan, Wigdor, and Snow, Strategic Education Research Partnership; Hubbard, "Research to Practice: The Case of Boston Public Schools, Education Matters and the Boston Plan for Excellence"; Kazak, Hoagwood, Weisz, Hood, Kratochwill, Vargas, and Banez, "A Meta-Systems Approach to Evidence-Based Practice for Children and Adolescents."

61. Barbara Means and Christopher J. Harris, "Towards an Evidence Framework for Design-Based Implementation Research," in *Design-Based Implementation Research*, ed. Barry J. Fishman, William R. Penuel, Anna-Ruth Allen, and Britte Haugan Cheng (National Society for the Study of Education Yearbook, 112(1): in press).

62. Burkhardt and Schoenfeld, "Improving Educational Research: Toward a More Useful, More Influential, and Better-Funded Enterprise."

REFERENCES

Allensworth, Elaine, and John Q. Easton. "The On-Track Indicator as a Predictor of High School Graduation." Chicago, IL: Consortium on Chicago School Research, 2005.

———. "What Matters for Staying on-Track and Graduating in Chicago Public High Schools: A Close Look at Course Grades, Failures, and Attendance in the Freshman Year. Research Report." Chicago, IL: Consortium on Chicago School Research, 2007.

Barab, Sasha, and April L. Luehmann. "Building Sustainable Science Curriculum: Acknowledging and Accommodating Local Adaptation." *Science Education* 87, no. 4 (2003): 454-67.

Berwick, Donald M. "The Science of Improvement." *The Journal of the American Medical Association* 299, no. 10 (2008): 1182-84.

Betts, Julian R., Youjin Hahn, and Andrew C. Zau. "Does Diagnostic Math Testing Improve Student Learning." San Francisco, CA: Public Policy Institute of California, 2011.

Bickel, William E., and Rosemary A. Hattrup. "Teachers and Researchers in Collaboration: Reflections on the Process." *American Educational Research Journal* 32, no. 1 (1995): 35-62.

Blumenfeld, Phyllis, Barry J. Fishman, Joseph Krajcik, Ronald W. Marx, and Elliot Soloway. "Creating Usable Innovations in Systemic Reform: Scaling up Technology-Embedded Project-Based Science in Urban Schools." *Educational Psychologist* 35, no. 3 (2000): 149-64.

Bowyer, Jane, Libby Gerard, and Ronald W. Marx. "Building Leadership for Scaling Science Curriculum Reform." In *Designing Coherent Science Education*, edited by Yael Kali, Marcia C. Linn and Jo Ellen Roseman. New York: Teachers College Press, 2008:123-152.

Brookhart, Susan M., and William E. Loadman. "School-University Collaboration and Perceived Professional Rewards." *Journal of Research in Education* 2, no. 1 (1992): 68-76.

Brunner, Cornelia, Chat Fasca, Juliette Heinze, Margaret Honey, Daniel Light, Ellen B. Mandinach, and Data Wexler. "Linking Data and Learning: The Grow Network Study." *Journal of Education for Students Placed at Risk* 10, no. 3 (2005): 241-67.

Bryk, Anthony S. "Support a Science of Performance Improvement." *Phi Delta Kappan* 90, no. 8 (2009): 597-600.

Bryk, Anthony S., Louis M. Gomez, and Alicia Grunow. "Getting Ideas into Action: Building Networked Improvement Communities in Education." In *Frontiers in Sociology of Education*, edited by Maureen Hallinan, 127-62. Dordrecht, the Netherlands: Verlag, 2011.

Bryk, Anthony S., Sharon G. Rollow, and Gay Su Pinnell. "Urban School Development: Literacy as a Lever for Change." *Educational Policy* 10, no. 2 (1996): 172-201.

Burkhardt, Hugh, and Alan H. Schoenfeld. "Improving Educational Research: Toward a More Useful, More Influential, and Better-Funded Enterprise." *Educational Researcher* 32, no. 9 (2003): 3-14.

Campbell, Patricia F., and Nathaniel N. Malkus. "The Impact of Elementary Mathematics Coaches on Student Achievement." *Elementary School Journal* 111, no. 3 (2011): 430-54.

Christopher, Suzanne, Vanessa Watts, McCormick, and Sara Young. "Building and Maintaining Trust in a Community-Based Participatory Research Partnership." *American Journal of Public Health* 98, no. 8 (2008): 1390-1406.

Cobb, Paul A., Jere Confrey, Andrea A. diSessa, Richard Lehrer, and Leona Schauble. "Design Experiments in Educational Research." *Educational Researcher* 32, no. 1 (2003): 9-13.

Cobb, Paul A., and Kara Jackson. "Analyzing Educational Policies: A Learning Design Perspective." *Journal of the Learning Sciences* 21, no. 4 (2012): 487-521.

Cobb, Paul A., Kay McClain, Teruni Salva Laumberg, and Chrystal Dean. "Situating Teachers' Instructional Practices in the Institutional Setting of the School and District." *Educational Researcher* 32, no. 6 (2003): 13-24.

Coburn, Cynthia E. "Partnership for District Reform: The Challenges of Evidence Use in a Major Urban District." In *Research and Practice in Education: Building Alliances, Bridging the Divide*, edited by Cynthia E. Coburn and Mary Kay Stein, 167-82. New York: Rowman & Littlefield Publishing Group, 2010.

Coburn, Cynthia E., Soung Bae, and Erica O. Turner. "Authority, Status, and the Dynamics of Insider-Outsider Partnerships at the District Level." *Peabody Journal of Education* 83 (2008): 364-99.

Coburn, Cynthia E., Meredith I. Honig, and Mary Kay Stein. "What's the Evidence on Districts' Use of Evidence?" In *The Role of Research in Educational Improvement*, edited by John D. Bransford, Deborah J. Stipek, Nancy J. Vye, Louis M. Gomez and Diana Lam, 67-87. Cambridge, MA: Harvard Education Press, 2009.

Coburn, Cynthia E., and Mary Kay Stein, eds. *Research and Practice in Education: Building Alliances, Bridging the Divide*. Lanham, MD: Rowman & Littlefield, 2010.

Coca, Vanessa, David Johnson, Thomas Kelley-Kemple, Melissa Roderick, Eliza Moeller, Nicole Williams, and Kafi Moragne. "Working to My Potential: The Postsecondary Experiences of CPS Students in the International Baccalaureate Diploma Programme." Chicago, IL: Consortium on Chicago Schools Research, 2012.

Collins, Allan, Diana Joseph, and Katerine Bielaczyc. "Design Research: Theoretical and Methodological Issues." *The Journal of the Learning Sciences* 13, no. 1 (2004): 15-42.

Connolly, Faith, and Linda S. Olson. "Early Elementary Performance and Attendance in Baltimore City Schools' Pre-Kindergarten and Kindergarten." Baltimore, MD: Baltimore Education Research Consortium, 2012.

Connolly, Faith, Stephen Plank, and Tracy Rone. "Baltimore Education Research Consortium: A Consideration of Past, Present, and Future." Baltimore, MD: Baltimore Education Research Consortium, 2012.

D'Amico, Laura. "The Center for Learning Technologies in Urban Schools: Evolving Relationships in Design-Based Research." In *Research and Practice in Education: Building Alliances, Bridging the Divide*, edited by Cynthia E. Coburn and Mary Kay Stein, 37-53.

Lanham, MD: Rowan & Littlefield, 2010.

Davis, Elizabeth A., and Joseph Krajcik. "Designing Educative Curriculum Materials to Promote Teacher Learning." *Educational Researcher* 34, no. 3 (2005): 3-14.

Deming, William Edwards. *Out of the Crisis* Cambridge, MA: MIT Press, 1986.

Donovan, Suzanne, and James W. Pellegrino. "Learning and Instruction: A SERP Research Agenda." Washington, DC: National Research Council, 2003.

Donovan, Suzanne, Alexandra K. Wigdor, and Catherine E. Snow. Strategic Education Research Partnership. Washington, DC: National Research Council, 2003.

Edelson, Daniel C. "Design Research: What We Learn When We Engage in Design." *The Journal of the Learning Sciences* 11, no. 1 (2002): 105-21.

Engelbart, Douglas C. "Toward High-Performance Organizations: A Strategic Role for Groupware." Paper presented at the GroupWare '92 Conference, San Jose, CA, August 1992.

Firestone, William A., and Jennifer L. Fisler. "Politics, Community, and Leadership in a School-University Partnership." *Educational Administration Quarterly* 38, no. 4 (2002): 449-93.

Fishman, Barry J., and Joe Krajcik. "What Does It Mean to Create Sustainable Science Curriculum Innovations? A Commentary." *Science Education* 87, no. 4 (2003): 564-73.

Fishman, Barry J., Ronald W. Marx, Stephen Best, and Revital Tal. "Linking Teacher and Student Learning to Improve Professional Development in Systemic Reform." *Teaching and Teacher Education* 19, no. 6 (2003): 643-58.

Fishman, Barry J., Ronald W. Marx, Phyllis Blumenfeld, Joseph Krajcik, and Elliot Soloway. "Creating a Framework for Research on Systemic Technology Innovations." *The Journal of the Learning Sciences* 13, no. 1 (2004): 43-76.

Gates-Duffield, Pamela, and Carol Stark. "Recipes for Professional Development Schools: A Metaphor for Collaboration." In *The Many Faces of School-University Collaboration: Characteristics of Successful Partnerships*, edited by Ruth Ravid and Marianne G. Handler, 45-57. Englewood, CO: Teachers Ideas Press, 2001.

Gawande, Atul. *The Checklist Manifesto: How to Get Things Right*. New York: Metropolitan Books, 2010.

Geier, Robert, Phyllis Blumenfeld, Ronald W. Marx, Joseph Krajcik, Barry J. Fishman, and Elliot Soloway. "Standardized Test Outcomes for Students Engaged in Inquiry-Based Science Curricula in the Context of Urban Reform." *Journal of Research in Science Teaching* 45, no. 8 (2008): 922-39.

Gifford, Bernard R. "The Evolution of the School-University Partnership for Educational Renewal." *Education and Urban Society* 19, no. 1 (1986): 77-106.

Glass, Thomas E., and Louis A. Franceschini. *The State of the American School Superintendency: A Mid-Decade Study*. Lanham, MD: Rowman & Littlefield, 2007.

Hasslen, Robin, Nancy Bacharach, Judy Rotto, and Jonathan Fribley. "Learning Connections: Working toward a Shared Vision." In *The Many Faces of School-University Collaboration: Characteristics of Successful Partnerships*, edited by Ruth Ravid and Marianne G. Handler, 60-69. Englewood, CO: Teachers Ideas Press, 2001.

Heckman, Paul E. "The Southern California Partnership: A Retrospective Analysis." In *School-University Partnerships in Action: Concepts, Cases and Concerns*, edited by Kenneth A. Sirotnik and John I. Goodlad, 106-23. New York: Teachers College Press, 1988.

Hubbard, Lea. "Research to Practice: The Case of Boston Public Schools, Education Matters and the Boston Plan for Excellence." In *Research and Practice in Education: Building Alliances, Bridging the Divide*, edited by Cynthia E. Coburn and Mary Kay Stein, 55-72. Lanham, MD: Rowman & Littlefield, 2010.

Ikemoto, Gina Schuyler, and Meredith I. Honig. "Tools to Deepen Practitioners' Engagement with Research: The Case of the Institute for Learning." In *Research and Practice in Education: Building Alliances, Bridging the Divide*, edited by Cynthia E. Coburn and Meredith I. Honig, 93-108. Lanham, MD: Rowman & Littlefield, 2010.

Institute of Education Sciences. "Regional Educational Laboratories 2012 - 2017, Solicitation ED-IES-11-R-0036." Washington, DC: Department of Education, 2012.

Kania, John, and Mark Kramer. "Collective Impact." *Stanford Social Innovation Review* 9, no. 1 (2011): 36-41.

Kazak, Anne E., Kimberly Hoagwood, John R. Weisz, Korey Hood, Thomas R. Kratochwill, Luis A. Vargas, and Gerard A. Banez. "A Meta-Systems Approach to Evidence-Based Practice for Children and Adolescents." *American Psychologist* 65, no. 2 (2010): 85-97.

Keating, Pamela J., and Richard W. Clark. "Accent on Leadership: The Puget Sound Educational Consortium." In *School-University Partnerships in Action: Concepts, Cases and Concerns*, edited by Kenneth A. Sirotnik and John I. Goodlad, 148-66. New York: Teachers College Press, 1988.

Kerosuo, Hannele. "'Boundary Encounters as a Place for Learning and Development at Work." *Outlines: Critical Social Studies* 6, no. 1 (2001): 53-65.

KnowledgeWorks. "Strive." (http://knowledgeworks.org/impacting-schools-communities/strive).

Kochanek, Julie Reed. *Building Trust for Better Schools: Research-Based Practices*. Thousand Oaks, CA: Corwin Press, 2005.

Kraut, Robert E., Jolene Galegher, and Carmen Egido. "Relationships and Tasks in Scientific Research Collaboration." *Human-Computer Interaction* 3, no. 1 (1987): 31-58.

Lieberman, Ann. "The Metropolitan School Study Council: A Living History." In *School-University Partnerships in Action: Concepts, Cases and Concerns*, edited by Kenneth A. Sirotnik and John I. Goodlad, 69-86. New York: Teachers College Press, 1988.

London, Rebecca A., and Oded Gurantz. "State and Local Data Infrastructure for Tracking Secondary to Postsecondary Educational Outcomes." Stanford, CA: John W. Gardner Center for Youth and Their Communities, 2010.

Madison, Sybil M., Mary M. McKay, Roberta Paikoff, and Carl C. Bell. "Basic Research and Community Collaboration: Necessary Ingredients for the Development of a Family-Based HIV Prevention Program." *AIDS Education and Prevention* 12, no. 4 (2000): 281-98.

McKay, Mary M., Geetha Gopalan, Lydia M. Franco, Kosta Kalogerogiannis, Mari Umpierre, Orly Olshtain-Mann, William Bannon, Laura Elwyn, and Leah Goldstein. "It Takes a Village to Deliver and Test Child and Family-Focused Services." *Research on Social Work Practice* 20, no. 5 (2010): 476-82.

McMillen, J. Curtis, Shannon L. Lenze, Kristin M. Hawley, and Victoria A. Osborne. "Revisiting Practice-Based Research Networks as a Platform for Mental Health Services Research." *Administration and Policy in Mental Health and Mental Health Services Research* 36 (2009): 308-21.

Means, Barbara, and Christopher J. Harris. "Towards an Evidence Framework for Design-Based Implementation Research." In *Design-Based Implementation Research*, edited by Barry J. Fishman, William R. Penuel, Anna Ruth Allen and Britte Cheng. National Society for the Study of Education Yearbook, 112(1), in press.

Means, Barbara, and William R. Penuel. "Research to Support Scaling up Technology-Based Educational Innovations." In *Scaling up Success: Lessons from Technology-Based Educational Improvement*, edited by Christopher Dede, James P. Honan and Lawrence C. Peters, 176-97. San Francisco, CA: Jossey-Bass, 2005.

NYU Steinhardt School of Culture. "Research Alliance for New York City Schools." http://steinhardt.nyu.edu/research_alliance/.

Palinkas, Lawrence A., Gregory A. Aarons, Bruce F. Chorpita, Kimberly Hoagwood, John Landsverk, and John R. Weisz. "Cultural Exchange and the Implementation of Evidence-Based Practices: Two Case Studies." *Research on Social Work Practice* 19, no. 5 (2009): 602-12.

Palinkas, Lawrence A., and Haluk Soydan. *Translation and Implementation of Evidence-Based Practice. Building Social Work Research Capacity*, edited by Joan Levy Zlotnik. New York: Oxford University Press, 2012.

Penuel, William R., Cynthia E. Coburn, and Dan Gallagher. "Negotiating Problems of Practice in Research-Practice Partnerships Focused on Design." In *Design-Based Implementation Research: Theories, Methods, and Exemplars*, edited by Barry J. Fishman, William R. Penuel, Anna Ruth Allen and Britte Cheng. National Society for the Study of Education Yearbook, 112(1), in press.

Penuel, William R., Barry J. Fishman, Ryoko Yamaguchi, and Lawrence P. Gallagher. "What Makes Professional Development Effective? Strategies That Foster Curriculum Implementation." *American Educational Research Journal* 44, no. 4 (2007): 921-58.

Penuel, William R., and Barbara Means. "Using Large-Scale Databases in Evaluation: Advances, Opportunities, and Challenges." *American Journal of Evaluation* 32, no. 1 (2011): 188-33.

Penuel, William R., Jeremy Roschelle, and Nicole Shechtman. "The Whirl Co-Design Process: Participant Experiences." *Research and Practice in Technology Enhanced Learning* 2, no. 1 (2007): 51-74.

Penuel, William R., and Louise Yarnall. "Designing Handheld Software to Support Classroom Assessment: An Analysis of Conditions for Teacher Adoption." *Journal of Technology, Learning, and Assessment* 3, no. 5 (2005): Available from http://www.jtla.org.

Plank, Stephen B., and Barbara Condliffe. "Pressures of the Season: A Descriptive Look at Classroom Quality in Second and Third Grade Classrooms." Baltimore, MD: Baltimore Education Research Consortium, 2011.

Reiser, Brian J., James P. Spillane, Franci Steinmuler, Don Sorsa, Karen Carney, and Eleni Kyza. "Investigating the Mutual Adaptation Process in Teachers' Design of Technology-Infused Curricula." In *Fourth International Conference of the Learning Sciences*, edited by Barry Fishman and Sam O'Connor-Divelbiss, 342-49. Mahwah, NJ: Erlbaum, 2000.

Resnick, Lauren B., and James P. Spillane. "From Individual Learning to Organizational Designs for Learning." In *Instructional Psychology: Past, Present and Future Trends. Sixteen Essays in Honor of Erik De Corte*, edited by Lieven Verschaffel, Filip Dochy, Monique Boekaerts and Stella Vosinadou. Advances in Learning and Instruction, 257-74. Oxford: Pergamon, 2006.

Roderick, Melissa, and John Q. Easton. "Developing New Roles for Research in New Policy Environments: The Consortium on Chicago School Research." Chicago, IL: The Consortium on Chicago School Research, 2007.

Roderick, Melissa, John Q. Easton, and Penny Bender Sebring. "The Consortium on Chicago School Research: A New Model for the Role of Research in Supporting Urban School Reform." Chicago, IL: Consortium on Chicago School Research, 2009.

Rojek, Jeff, Geoffrey P. Alpert, and Hayden P. Smith. "The Utilization of Research by the Police." *Police Practice and Research: An International Journal* (2012): First published online on March 30, 2012 as DOI:10.1080/15614263.2012.671599.

Rojek, Jeff, Hayden P. Smith, and Geoffrey P. Alpert. "The Prevalence and Characteristics of Police Practitioner-Researcher Partnerships." *Police Quarterly* (2012): First published online on April 11, 2012 as doi:10.1177/1098611112440698.

Rosen, Lisa. "Deconstructing the Rhetoric of Rigor: Evidence-Based Policy and the Politics of Representation." Chicago: Center for School Improvement, in preparation.

Rosen, Lisa. "Examining a Novel Partnership for Educational Innovation: Promises and Complexities of Cross-Institutional Collaboration." In *Research and Practice in Educatiton: Building Alliances, Bridging the Divide,* edited by Cynthia E. Coburn and Mary Kay Stein, 71-93. New York: Rowman & Littlefield Publishing Group, 2010.

Sandoval, William A., and Philip Bell. "Design-Based Research Methods for Studying Learning in Context: Introduction." *Educational Psychologist* 39, no. 4 (2004): 199-201.

Schlecty, Phillip C., and Betty Lou Whitford. "Shared Problems and Shared Vision: Organic Collaboration." In *School-University Partnerships in Action: Concepts, Cases and Concerns*, edited by Kenneth A. Sirotnik and John I. Goodlad. New York: Teachers College Press, 1988.

Schneider, Rebecca M., and Joseph Krajcik. "Supporting Science Teacher Learning: The Role of Educative Curriculum Materials." *Journal of Science Teacher Education* 13, no. 3 (2002): 221-45.

Shavelson, Richard J., Dennis C. Phillips, Lisa Towne, and Michael J. Feuer. "On the Science of Education Design Studies." *Educational Researcher* 32, no. 1 (2003): 25-28.

Sherer, Jennifer Zoltners, and Alicia Grunow. "90-Day Cycle: Exploration of Math Intensives as a Strategy to Move More Community College Students out of Developmental Math Courses." Palo Alto, CA: The Carnegie Foundation for the Advancement of Teaching, 2010.

Shojania, Kaveh G., and Jeremy M. Grimshaw. "Evidence-Based Quality Improvement: The State of the Science." *Health Affairs* 24, no. 1 (2005): 138-50.

Shutt, Kari, Rachel S. Phillips, Nancy Vye, Katie Van Horne, and John D. Bransford. "Developing Science Inquiry Skills with Challenge-Based, Student-Directed Learning." Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO, April 2010.

Smylie, Mark A., and Thomas B. Corcoran. "Nonprofit Organizations and the Promotion of Evidence-Based Practice." In *The Role of Research in Educational Improvement*, edited by John D. Bransford, Deborah J. Stipek, Nancy Vye, Louis Gomez and Diana Lam, 111-36. Massachusetts: Harvard Educational Press, 2009.

Snow, Catherine E., Joshua Lawrence, and Claire White. "Generating Knowledge of Academic Language among Urban Middle School Students." *Journal of Research on Educational Effectiveness* 2, no. 4 (2009): 325-44.

Strive Network. "The Strive Network." www.strivenetwork.org.

Thering, Susan, and Victoria Chanse. "The Scholarship of Transdisciplinary Action Research: Toward a New Paradigm for the Planning and Design Traditions." *Landscape Journal* 30, no. 1 (2011): 6-18.

Villavicencio, Adriana, and Justina K. Grayman. "Learning From 'Turnaround' Middle Schools: Strategies for Success." New York: Research Alliance for New York City Schools, 2012.

Vozzo, Les, and Jack MacFadden. "A School-University Partnership: A Commitment to Collaboration and Professional Renewal." In *The Many Faces of School-University Collaboration: Characteristics of Successful Partnerships*, edited by Ruth. Ravid and Marianne G. Handler, 223-33. Englewood, CO: Teachers Ideas Press, 2001.

Vye, Nancy, Philip Bell, Carrie T. Tzou, and John D. Bransford. "Instructional Design Principles for Blending and Bridging Science Learning across Formal and Informal Environments." Paper presented at the National Association for Research in Science Teaching Annual International Conference, Philadelphia, PA, March 2010.

Wallerstein, Nina, and Bonnie Duran. "Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health Equity." *American Journal of Public Health* 100, no. S1 (2010): S40-S46.

Williams, David Dwayne "The Brigham Young University-Public School Partnership." In *School-University Partnerships in Action: Concepts, Cases and Concerns,* edited by Kenneth A. Sirotnik and John I. Goodlad, 124-47. New York: Teachers College Press, 1988.

Yarnall, Louise, Nicole Shechtman, and William R. Penuel. "Using Handheld Computers to Support Improved Classroom Assessment in Science: Results from a Field Trial." Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec, Canada, April 2005.