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Avenues of Influence: An Exploration of School-Based Practitioners' as Knowledge Brokers and Mobilizers

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Abstract

The need for evidence-based decision-making is more salient than ever before, demanding a deeper knowledge of the relationship between research and practice but also of the levers that can enable stronger ties. Knowledge brokers are a promising means for leveraging indirect relationships between research and practice, but to date are understudied in education. Drawing on related literature as well as research on teacher networks, this chapter explores the specific case of school-based knowledge brokers. Using survey data from more than a thousand educators in nearly 60 schools, we seek to understand the *who*, *what*, *why*, and *how* of knowledge brokerage in schools. We find that knowledge brokers make important contributions to schools' use of research by building skills, expanding the types of research that flows through schools, and strengthening a culture of research use. We conclude with opportunities to recognize and support new roles for educators, and to harness their potential for generating meaningful change and improvement in education.

Introduction

Ships passing in the night. It's a metaphor we might use to describe the relationship between research and practice in education. Decades of research have documented a disconnect between these two communities, often attributed to the different cultures, structures, and purposes of each. Bogenschneider and Corbett (2010) describe this as *community dissonance*, and it permeates not only education but other sectors such as health, social work, and others. Efforts to understand and reconcile this dissonance trace back to as early as the 1960s, with significant efforts to better link research and practice through research and policy. In education in the U.S., specifically, federal investments were made to build an infrastructure to support research, dissemination, development and utilization. For example, the Educational Research Information Centers (ERIC) system was initiated in 1966, the Regional Educational Laboratories system was established in the early 1960s, and the National Diffusion Network began operations in 1974.

In spite of these and other efforts, many would regard the gaps between research and practice decades later as persistent, with continued concerns about relevance, accessibility, conflicting findings, the need for research translation, and few system-wide structures that promote engagement across communities (Broekkamp & van Hout-Wolters, 2007; Burkhardt & Schoenfeld, 2003). This issue has garnered significant attention in recent years, in part because of accountability policy in the U.S. public education system. Beginning with No Child Left Behind in 2001, federal policy has set expectations for decisions at the school, district, and state levels to be informed by data and evidence. The need for evidence-based decision-making thus has become more salient than ever before, demanding a deeper knowledge of the relationship between research and practice but also of the levers that can enable stronger ties.

Two lines of work respond to this demand. First are efforts to create *direct* links between research and practice. Research-practice partnerships (RPPs) represent one promising strategy. Stemming from consistent findings that the use of research is a relational issue – that is, one in which shared interests,

trust, transparency, and continuous engagement across communities are important (Harrison, Davidson, & Farrell, 2017; Huberman, 1990)– effective RPPs offer a structure that surmounts typical barriers to research use, including relevance, timeliness, access, and actionability (Creaby, 2019; Henrick, et al, 2017; Farrell, et al, 2017). RPPs have been supported with federal funds as well as funds from local and foundation sources, and as they've become more widespread, some evidence suggests that research resulting from this work is useful and has had an impact on local decision-making, though significant additional research on outcomes of RPPs is needed (Coburn & Penuel, 2016).

A second set of efforts focuses on opportunities to leverage *indirect* links between research and practice. This includes knowledge brokerage (KB) and knowledge mobilization (KMb) – the foci of this book – widely recognized as potential levers for bridging the two communities (Cooper & Levin, 2010; Massell, Goertz, & Barnes, 2012; Malin, et.al., 2018). For example, individuals or organizations that engage in KB or KMb activities may serve as linkage agents (Louis, 1977; Hood, 1982), particularly when direct relationships between communities are difficult to establish or sustain, by engaging in translating, sharing, or otherwise communicating knowledge. In doing so, they may have the ability to draw from a broad range of research or researchers and can reach a broader set of practitioners, overcoming the challenges of scale that direct relationships might pose. In fact, recent research suggests that these indirect mechanisms are the primary means by which education leaders access research information (Penuel, et al, 2017).

Such mechanisms, however, aren't well understood in the context of education. And as is suggested in the goals of this book, there is a need to unpack the roles Bush (2017) identifies for knowledge brokers, as well as the *who*, *what*, *how*, and *why* components Ward (2017) sets out, to deepen our understanding of linkages between education research and practice. In this chapter, we use these frames to explore the specific case of school-based practitioners as knowledge brokers. We do this by bringing three sets of ideas together: knowledge brokerage and mobilization, teacher networks, and the use of research evidence in education.

Conceptualizing School-based Practitioners as Knowledge Brokers

Our interest in understanding the role of school-based practitioners as knowledge brokers positioned to bridge the gap between research and practice stems from work in the Center for Research Use in Education (CRUE). The CRUE conceptual framework (Farley-Ripple, et al, 2018) draws on early theories of two communities (Caplan, 1979; Dunn, 1980) and expands on the idea of community dissonance (Bogenschneider & Corbett, 2010) in the context of education. Central to its work is the premise that the use of research evidence is not merely an issue of increasing practitioner uptake or improving researchers' production and dissemination of knowledge. Rather, we argue this problem is *bidirectional,* demanding attention to mechanisms that coordinate or link research and practice in ways not currently supported by neither the educational system nor the research enterprise.

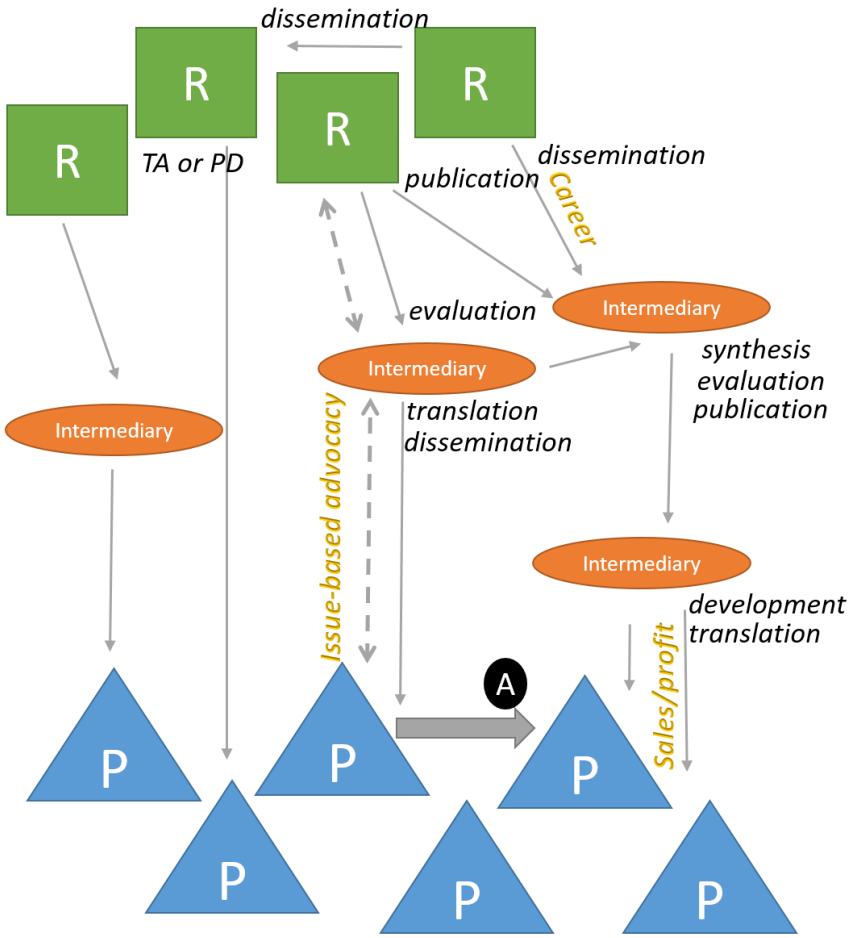
Literature suggests that there are roles and functions that are not inherent in either the work of educators or researchers that may improve the use of research evidence – roles and functions that may be played by knowledge brokers. Early work on "linking agents" in school improvement provides insight into those functions, including coordinating and boundary spanning, finding resources, providing individual technical assistance, serving as curriculum expert, and providing problem-solving or implementation support (Hood, 1982; Louis, 1977; Louis & Kell, 1981). More recently, Kochanek, Scholz,

and Garcia (2015) report important activities that brokers perform in addressing the gap, such as: identifying common goals, negotiating a research agenda, organizing alliance meetings, and facilitating alliance communication. Similar activities are reported by others (Lomas, 2000). Brokers also build and maintain relationships, provide "coaching" related to technical and administrative components of research use (Huberman, 1990), and translate research jargon into ordinary language that is more accessible to those who might put the research findings into action (Jackson-Bowers, Kalucy, & McIntyre, 2006).

Despite agreement about the potential value of knowledge brokers, in education, the concept has been understudied, undertheorized and often conceptualized narrowly. For example, Neal and colleagues (2015) find that the chain of brokerage between research and practice is more complex and much longer than prior theory suggests, and is likely to involve multiple kinds of participants with multiple kinds of roles. Further, literature to date has primarily focused on *brokers* as organizations or individuals, but prior work (Farley-Ripple, et al, 2017) suggests that understanding *brokers* provides a limited perspective on the ways in which research and relationships between research and practice occur. Rather, we are concerned with a broader set of ideas which we refer to as *knowledge brokerage* - a dynamic and complex set of actors, activities, motivations within which research is exchanged, transformed, and otherwise communicated. Implicit in this definition are Bush's (2017) and Ward's (2017) perspectives, as well the framework around which this book is organized (Malin & Brown, this volume).

Figure 1 provides an illustration of the complexity that underlies knowledge brokerage, constructed from preliminary qualitative work of our Center. In it, we recognize that the traditional idea of brokerage - featured at left with an arrow leading from researcher (R) to an intermediary to practitioner (P) - does not capture the multiple combination of actors, nor the direction of relations (solid versus dotted lines), the motivations that lead to relations (yellow text) nor the activities that occur in each knowledge transaction (black text). Fortunately, the study of research brokerage and knowledge mobilization is growing exponentially, and as evidenced in this book, we are developing useful knowledge about many of the actors, relations, and activities described in this figure.

Figure 1. Illustration of knowledge brokerage



Of particular interest in this chapter is the arrow marked A. This arrow denotes the role of an educator as a knowledge broker and knowledge brokerage as a process that can happen within schools. This phenomenon has gone largely unrecognized in the study of research use in education, which tends to focus on intermediary organizations, though a few studies note its presence. The most direct observation of school-based knowledge brokerage comes from Finnigan, Daly, and Che (2013), who found that the spread of research-based ideas within schools tended to be attributed to the principal. Additionally, Neal, et al, (2015) and Hopkins, et al, (2018) draw on Gould and Fernandez' (1989) typology of brokers to explore research brokerage, two types of which involve members of the same group (gatekeepers and coordinators) sharing information with peers. Applied to the context of education, these are cases where a member of the education community serves as a broker between colleagues and another internal actor or an external actor – such as a researcher or research organization.

Although understudied in the literature on research use in education, the idea of educators as brokers is well documented in the study of teacher networks and school improvement. Extant literature has established the importance of teacher networks in a variety of educational processes and outcomes (Coburn & Russell, 2008; Cole & Weinbaum, 2010; Penuel, et. al.., 2009; Daly & Finnegan, 2009; Daly &

Finnegan, 2011; Spillane et. al.., 2009; Yoon & Baker-Doyle, 2018; Moolenaar, 2012; Penuel, et. al.., 2012; Baker-Doyle, 2011; Frank, et. al. 2011).

These networks are powerful levers for social capital and organizational trust, but also for the flow of information and resources throughout the school community. Several studies have documented the role of advice networks in shaping teachers' instructional practice (Farley-Ripple & Buttram, 2015; Liou & Daly, 2018; Penuel, et al, 2018; Hopkins, et al, 2018; Daly, et al, 2010). Central actors – those to whom members of the school turn for advice or resources – may be highly influential in shaping the work of schools. Sometimes this influence is due to formal roles given to individuals. For example, a school might be organized to ensure instructional coaches are positioned to support (a form of influence) teachers at multiple grade levels (Farley-Ripple & Buttram, 2018). Other times this influence may be less formal or planned. Teachers may turn to someone based on trust, expertise, or even proximity.

Teachers also rely on sources external to their school or organization. For example, the growing literature on professional learning networks (Brown & Poortman, 2018) suggests that such networks help educators to develop new knowledge and skills which, in turn, can lead to improvement. Specific work on supporting teachers' engagement with research finds networks to be promising in developing research-based knowledge and building organizational capacity to use research informed practices (Brown, 2018).

Bringing together literature on the use of research evidence, the role of brokers in bridging the research-practice gap, and the power of teacher networks to shape school practice, we argue that school-based practitioners that engage in knowledge brokerage are positioned to influence the role of research in schools by mobilizing research-based information within school networks. In this chapter, we explore these ideas more deeply. Specifically, we seek to understand:

1) Who acts as knowledge brokers in schools?
2) Why do they engage in knowledge brokering?
3) What do they broker?
4) What activities do they engage in as brokers?

Our Approach

The Center for Research Use in Education (CRUE) is charged with measuring and studying research use in schools as guided by our conceptual framework (Farley-Ripple, et al, 2018). As a preliminary step in research design, we interviewed educators, researchers, and organizational leaders positioned to serve as research brokers about their work. These data were collected as part of the instrument development process for a larger research project on research use in education conducted through the Institute of Education Sciences (IES) funded Center. The sample consisted of 15 researchers, 16 intermediary organizations and 15 practitioners at the district and school levels across three states. The objective of this phase of our work was to compare and contrast an emergent set of concepts related to brokerage against existing frameworks to identify areas in need of further theoretical and empirical examination. Therefore although we do not present these qualitative data here, the results of this inquiry were instrumental in building of a conceptual framework employed here, including Figure 1 and the definition of brokerage that guides our inquiry (see Farley-Ripple, et al, 2017).

In order to understand the concepts we uncovered in more depth and on a broader scale, we developed a survey. The purposes of the survey were to be able to address some of the lingering questions from our qualitative results as well as to ask more about research use concepts from the perspectives of research, practice, and intermediary communities at scale. Here, we focus on our survey of practitioners. We built a blueprint from our framework that would capture these data through five separate sections of the survey intended to comprehensively measure research use. The survey has undergone two rounds of pilot data collection. After each pilot, the survey has undergone measurement analyses and many revisions to improve the clarity and validity of the findings.

For the purposes of this chapter, we focus on survey measures that address the elements of brokerage described earlier, including *what* gets brokered, brokerage *activities*, and *purposes and motivations*. Table 1 explains how our survey items map onto the brokerage framework, and the complete set of survey items is included in the appendix.

Table 1. Description of measures by dimension of conceptual framework.

Element	Measures
Individual characteristics	School role Experience Education level Research experience and training
Purposes and motivation	Agreement with statements about attitudes towards education research and the value of research use, e.g. • whether researchers understand the evolving problems in schools, • whether educators in their school are expected to use research, • whether they believe student learning improves when they use research-based strategies.
What gets brokered?	Frequency of sharing research products and their format, frequency of sharing capacity-building strategies, sources of research-based information
Brokerage activities	Frequency of the following activities when sharing research, e.g.: • evaluating quality, • providing technical assistance, • developing products or programs, • facilitating discussion

Data from the two pilots include 1,628 survey responses (54% response rate) from teachers and administrators in over 60 schools. Schools came from urban, suburban and rural areas and represented elementary, middle and high school grades. Across schools, the average proportion of students receiving free or reduced-price lunch was 48% and 15% of students were in special education programs. Four percent of students had limited English proficiency. Just over half (51%) of students belonged to racial minority groups with black students having the highest representation (31%). Of the practitioners who responded, most were classroom teachers (60%), or special education teachers (14%). Six percent of responses were from school or district administrators.

The full survey had around 400 questions and took between 30-45 minutes to complete. As such, not all respondents finished all sections of the survey, and 873 responses were able to be included in our analysis. Below we explain what we learned about each of our research questions from these data.

The Who, What, and How of Knowledge Brokerage in Schools

Who acts as knowledge brokers in schools?

Many people in schools engage in some form of knowledge brokering, though some are more active in that role than others. Brokerage items in our survey asked how frequently practitioners had shared certain types of research (e.g., articles, district evaluations, PD materials, expert opinions) in the past year. More than 85% of respondents reported sharing at least one of these types of materials with colleagues at least 1-2 times per year, suggesting that research, in its various forms, does move through schools through educator networks. However, other forms of knowledge brokering were less common. A second group of questions asked if practitioners shared strategies for accessing, understanding, or implementing research, or helped others connect to share or discuss research. In each category, approximately 50% of participants indicated that they never shared strategies or connected other people in the previous year and 35% reported never engaging in any of those activities.

In order to pull out the more active or potentially influential knowledge brokers in our sample, we combined questions about how often participants were sharing research or research related strategies in a latent class analysis (LCA). The results revealed a set of participants engaged in active brokering—sharing all types of research often, moderate brokering—sharing all types of research sometimes, or they were rarely sharing any research at all (-Loglikelihood = -9806.97, AIC = 19705.97, BIC = 19925.46, Entropy = 0.92). We focus on the class of *active knowledge brokers* (heretofore, simply knowledge brokers) as they are likely to be more central in school-based networks and to be influential in the diffusion of research and research-based ideas.

We found 96 knowledge brokers in our sample. Of schools with at least one knowledge broker, there were, on average, there were 2.2 knowledge brokers per school. However, 16 of the 59 schools who answered brokering questions had no (active) knowledge brokers. Though differences were small, schools with brokers tended to believe more strongly that school personnel were generally expected to use research to inform decisions, and they more often agreed that research changed the way they thought about practice and continually expanded practitioners' knowledge about teaching and learning. Our data do not permit deeper inquiry into these differences but we note that this issue warrants further attention.

The distribution of knowledge brokers across school roles matches the distribution of roles across the larger sample, and they have similar levels of experience and education. This suggests that there is no typical professional profile for a knowledge broker. However, knowledge brokers have had many different experiences than their peers. On nearly every measure of prior experience or training, knowledge brokers report greater exposure to and engagement with research as part of their professional learning opportunities, as indicated in Table 2. Across the board, knowledge brokers were more likely to have experience with research through undergraduate and graduate programs, PD around critically consuming research, engaging with research through PLCs, attending research conferences, and reviewing research and applying research to their own work.

Table 2. Differences in Research Training and Experience

Research Training and Experience	***All Educators***	***Knowledge Brokers***
Graduate program emphasized research use	32.3%	58.3%***
Conducted research in graduate program	33.3%	51.0%**
Participated in a research-practice partnership	5.4%	14.6%**
Participated in PD around critically consuming research	13.5%	33.3%***
Used research in PLCs	23.8%	42.7%***
Participated in a research conference	10.4%	21.9%**
Took an introductory statistics course	81.3%	78.9%
Took a course in research design	43.0%	60.5%**

Notes: Chi-square tests were conducted to determine whether differences were statistically significantly different. * indicates p<.05, ** indicates p<.01, and *** indicates p<.001.

Why do they broker research?

In order to get at purposes and motivations, we draw on questions about their role but also their beliefs about research and its utility in practice. Across the larger sample of practitioners, 43% said that sharing research was *not* expected as part of their role in their school or district, and only 3% said it was highly expected of them. However, among our knowledge brokers, 80% felt at least some expectation to share research as part of their professional responsibilities, with nearly half indicating moderate or greater expectations for their role. We note that 19% perceived no expectation at all and still shared research often. Higher expectations were reported across roles for knowledge brokers except for school administrators, who tended to polarize toward the two of extremes of no expectation and high expectation.

Knowledge brokers may engage in this work for different reasons as well. We asked participants to share some of their perspectives on education research including how they valued research and how they think research is used in their organization. We used a chi-square test for differences between knowledge brokers and the rest of the sample on 12 questions. In many aspects, knowledge brokers had similar perspectives to the rest of the sample—particularly in areas dealing with views on the research that is produced, research salience, and organizational support for incorporating research into practice.

Interestingly, knowledge brokers seemed more positive than their peers in the belief that using research translates into better practices. They also were more likely to report that there were general expectations across their organization to be using research in decisions. Finally, knowledge brokers are more likely to think that other teachers in their school are using research conceptually to refine their knowledge and perspectives of their practice. Knowledge brokers seem to have a more positive outlook on the potential of research to improve practice, even though they face some of the same challenges and frustrations as their peers with the state of research generally.

Table 3. Differences in perceptions related to purposes and motivation to broker knowledge

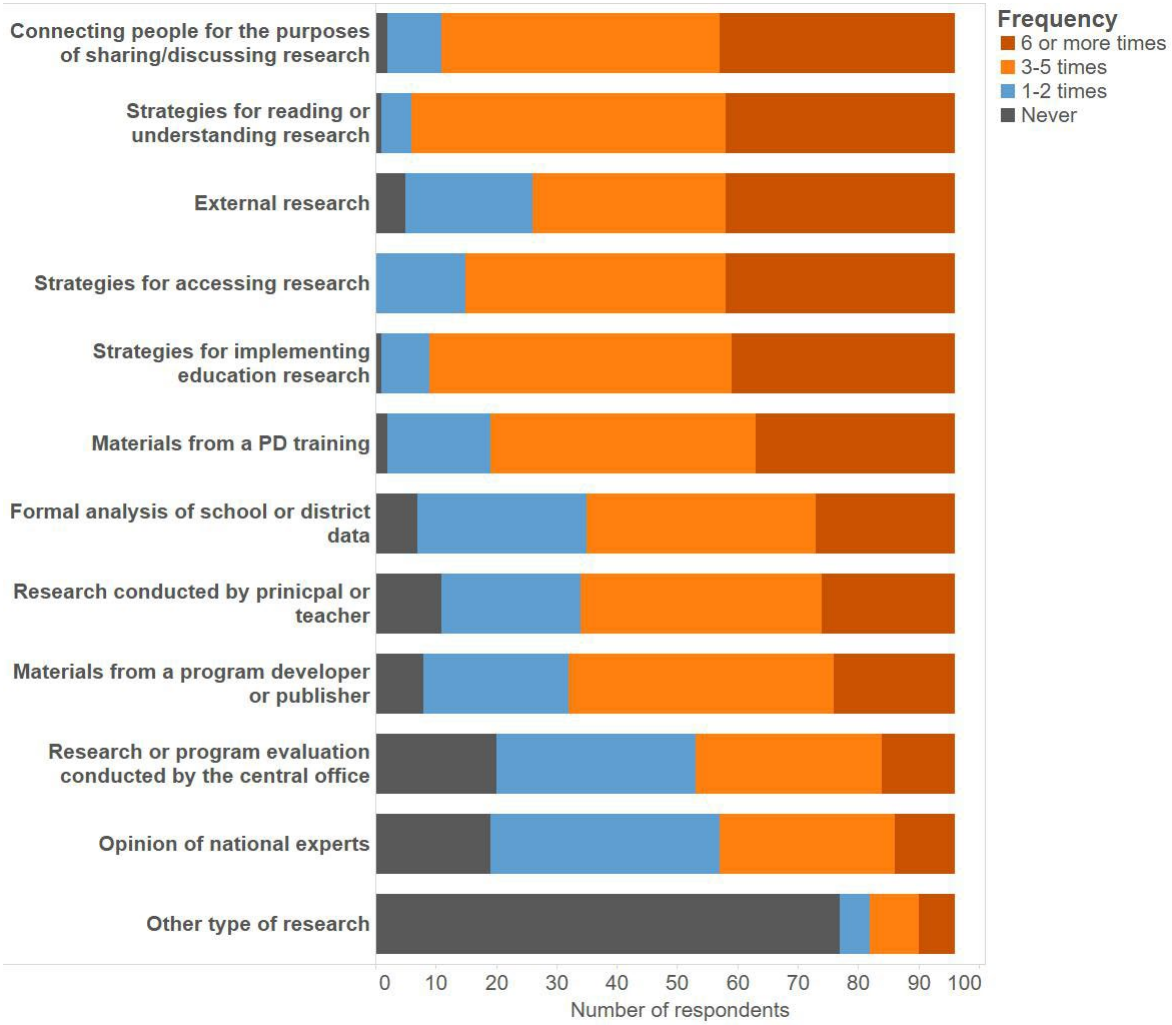
Purposes and Motivation	***All Educators***	***Knowledge Brokers***
Researchers have a solid grasp on evolving problems in schools.	44.0%	52.2%
Researchers need to do more to make their work relevant for my school.	75.1%	75.8%
Research addresses the most important issues schools face.	45.4%	51.5%
Most education research suggests actionable steps to take in practice.	53.8%	65.2%
Research takes into consideration the varying levels of resources available to schools to implement research findings.	35.4%	44.1%
Practitioners often struggle to find research on issues in their classrooms.	42.9%	47.8%
In general, we are expected to use research to inform decisions.	68.2%	80.3%**
Our school/district prioritizes research in decision making.	59.7%	70.8%
When I use research-based strategies, student learning improves.	80.0%	92.3%***
We use research because a supervisor or administrator requires it.	53.2%	56.1%
Research has changed the way I think about my practice.	67.9%	87.7%**
I have used research to continually expand my knowledge about teaching and learning.	71.6%	87.9%**

Notes: Chi-square tests were conducted to determine whether differences were statistically significantly different. * indicates p<.05, ** indicates p<.01, and *** indicates p<.001.

What do knowledge brokers share?

As described earlier, it is important to understand *what* knowledge brokers mobilize. We asked about two categories of brokerage – one in which research itself, in any number of forms, is shared and one in which research-related capacities were shared. Figure 1 indicates the frequency of those behaviors as reported by knowledge brokers. Evident in the image is the fact that capacities or strategies related to research use, including connecting people, strategies for reading/understanding, accessing, and implementing research, are among the most commonly brokered "items" in schools. External research (e.g. articles, reports) and materials from professional development rank highly as well. Less common but still noteworthy are formal analyses of data, school-generated research, and program or publisher materials. Opinions of national experts and central office research are least likely to be shared across a school.

Figure 3. Types of knowledge shared in schools



As a follow up, we asked in what format knowledge brokers share research. Practitioners primarily share the original research product, an interpretation of the findings, or strategies that were developed based on the findings. On average, knowledge brokers share these formats equally frequently, with between a quarter and third indicating they share each format often, and about half indicating they share research in that format sometimes.

As important as *what* knowledge is brokered is *whose* knowledge is brokered, as Ward (2017) notes. The professional networks – including individuals, organizations, and media sources – knowledge brokers rely on for research are likely to indirectly influence school practice and decision-making. We asked respondents to identify up to ten of each type of source and to categorize them to facilitate comparing and contrasting networks. We entered these data into UCINet's E-net software to generate ego networks – that is, data that captures the size (number of sources) and composition (types of sources, operationalized as the proportion constituted by each source) of their professional networks for connecting to research. We compare means between knowledge brokers and their peers on these two dimensions, using ANOVA to test for statistically significant differences.

Knowledge brokers' networks were larger (mean=8.4) than other educators' networks (mean=6.1, p=.003) but had about the same proportion of individuals, organizations and media sources. Overall, about half of educators' networks for connecting to research is through individuals, with organizations and media equally constituting the other half. Many of the most frequently relied upon sources are considered "local" (Rosenkopf & Almeida, 2003), or within the practice community (e.g. colleagues, professional associations). Knowledge brokers reported connections with the same types of sources with roughly the same frequency as other educators, with some notable exceptions. On average, knowledge brokers were five times more likely to have connections to independent research organizations (average network proportion 2 versus .4, p<.001). Additionally, they were twice as likely to identify research databases as important sources more than their peers (5.8 versus 2.6, p=.002).

Table 4. Summary of networks by which knowledge brokers access research

Type	Category	Avg. proportion of network	Examples
Individual	Teacher	11.44	
	Principal	7.88	
	Instructional coach	6.37	
	District Administration	4.76	
	Other school staff	4.22	
	External researcher	2.16	
	Program developer or professional developer	2.00	
Media	Research Database	5.82	ERIC; Google Scholar; EBSCO Host
	Social media	3.59	Facebook; Pinterest; Twitter; or following specifically; US News Education; NatGeo Education; Edmodo
	Magazine	3.33	Education Leadership; Scholastic Teacher; Time; NASSP; ASCD Smart Brief; Philadelphia Public School Notebook
	News	2.45	Ed Week; New York Times; "reliable sources"
	Peer reviewed journal	1.97	The Reading Teacher; Journal of Applied Behavioral Analysis; Journal of Chemical Education
	Book	1.70	Driven by Data; Guided Math; I Wish my Teacher Knew; Teach Like a Champion
	Other databases	1.30	Google; Ed Reflect
	Blog	1.30	Edutopia; Cult of Pedagogy; George, Curious Principal of Change
	Curriculum	0.00	N/A
	Website	0.00	N/A
Organization	Professional association	8.50	ASCD; National Education Association; Delaware State Education Association; National Science Teachers Association;
	School District	3.98	
	Program developer or PD organization	3.34	Compass Math; Lexia; McGraw Hill; Pearson; ReadWriteThink
	University-based research organization	2.92	Penn GSE; University of Delaware; Harvard; Millersville University
	Independent research organization	1.97	Research for Action; CLASP
	Government Agency	0.61	U.S. Department of Education, Pennsylvania Department of Education, NASA
	Foundation	0.52	Wallace Foundation; the Cross Foundation; Howard Hughes Medical Institute
	Advocacy Group	0.10	Art21 Educators; Autism Services, Education, Resoures, and Training (ASERT); Delaware English Language Learners Teachers and Advocates (DELLTA)

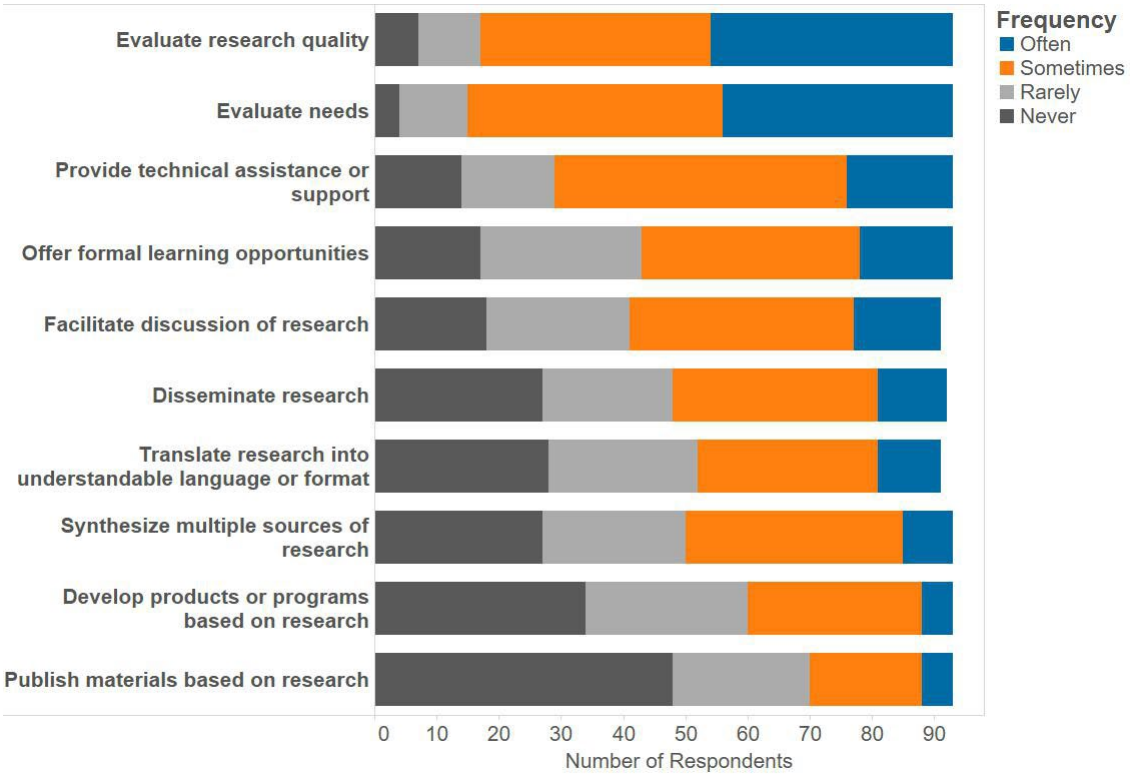
Note: Examples for individual sources and districts as organizations are not provided as to protect the confidentiality of respondents.

Avenues of Influence:
An Exploration of School-Based Practitioners' as Knowledge Brokers and Mobilizers

What do knowledge brokers do when they share research?

Our early qualitative data suggested that brokers don't merely pass information, but engage in specific activities in order to mobilize that knowledge – leading us to ask further questions about *how* they broker. We asked about 10 activities knowledge brokers might engage in, drawing on our preliminary qualitative data and prior literature to generate the list. In Figure 4, we present those results. Most often, knowledge brokers evaluate quality of research and the needs of the school or colleague when sharing research. They are also highly likely to provide technical assistance or support for using research as well as lead formal learning opportunities and facilitate discussion. Less common but still done at least "sometimes" by half the knowledge brokers are translation of research for practitioner audiences, synthesizing multiple sources of research, and simply disseminating research. The least common activities were to develop programs or publish products based on research.

Figure 4. Activities knowledge brokers report engaging in when sharing research



Recognizing and Supporting School-based Knowledge Brokerage

Literature to date has demonstrated the importance of teacher networks in a range of educational processes and outcomes, including the flow of information. Coupled with increased expectations for the role of research in educational decision-making, it is important to recognize and unpack the roles and activities of school-based knowledge brokers. Our data are an initial step toward this end. We find that research-based knowledge is, in fact, frequently shared in schools, but also through our LCA we find that a small percentage of educators are actively engaged in the work of knowledge brokering. An

examination of this group through the data above provide important insights related to recognizing their contributions and supporting knowledge-brokering capacity at the school level

Recognizing contributions

The knowledge brokers identified in this study are positioned to help bridge the gap between research and practice and they may do so in a number of ways: by building skills, by expanding the types of research that flows through schools, and by strengthening a culture of research use.

First, knowledge brokers were more likely to broker research-based ideas and information as well as strategies for using research than their peers. We especially note the latter contribution, which bears important resemblance to early work on external linking agents (Louis, 1977; Hood, 1982). Sharing strategies for accessing, interpreting, and implementing research as well as connecting people around research are among the most common resources knowledge brokers share with colleagues. This finding is consistent with the types of research-related experiences that knowledge brokers have had and now bring to their school. Further, sharing these skills may help build research use capacity school-wide and may, as observed by Brown (2018), ultimately make a difference in whether and how education research shapes decision-making in their context.

Additionally, our examination of knowledge brokers' professional networks finds that their networks are both larger than others' and include research-specific resources. Practically speaking, larger networks may mean increased access to research-based information and in general greater access to information and expertise (Honig & Coburn, 2008, Finnigan, Daly, & Che, 2013). Further, they were much more likely to tap into research-specific resources such as research databases and research organizations, which may be tied to knowledge brokers' prior experiences. Ties to these types of resources may increase *direct* access to education research or researchers. Although beyond the scope of our work here, direct access, as opposed to access through an intermediary organization or media source, may change the type and quality of research information that schools access as part of their decision-making.

Lastly, knowledge brokers' work appears to be related to their beliefs about research and their experiences using research. Although not statistically significantly different, knowledge brokers have more positive attitudes about research in general. Additionally, they assign significantly different value to the use of research, as they are more likely to believe its use improves student learning and positively influences their work as an educator. These findings hint at their motivation for serving as knowledge brokers. They are also more likely to report an expectation to use research in their schools. Thus, there may be an association between knowledge brokering and a schools' culture of research use. As this is a cross sectional study, we cannot assign directionality to the relationships we found; however, coupled with other research with similar findings (Brown, et al, 2018; Brown, this volume; Coldwell, et al, 2017) the potential influence of knowledge brokers on schools' decision-making cultures is promising and worthy of further study.

Supporting knowledge brokering capacity in schools

Results of our analyses suggest two sets of strategies for building and supporting capacity for knowledge brokerage at the school level. The first pertains to how we think about staffing schools, and the second pertains to how stakeholders in the educational system can support those that serve as knowledge brokers.

Staffing considerations. Evidence from our study suggests that knowledge brokers may make important contributions to the flow of information within schools, to the capacity of educators to engage with research, and to school culture. Given these potential contributions, two of our findings suggest that one way to support knowledge brokerage in schools is through staffing: the uneven distribution of knowledge brokers across schools and the notably different – and observable - experiences that knowledge brokers have had.

We noted earlier that 16 of 59 schools had no respondent classified as active brokers. This does not mean that no one shares research-based information in those schools or that there is no one whose job includes expectations for sharing research. Rather, it means that educators in these schools are less active in knowledge brokering, and, as a result, may miss out on some of the contributions identified above. Additional research is needed to understand the specific contexts in which knowledge brokers (as described here) work, in part to ensure access to their contributions is equitably distributed and available to benefit schools struggling to improve.

One way to address the distribution of knowledge brokers may be to explicitly seek out educators with the background or disposition to serve in such a capacity. Our data suggest that some of the differentiating characteristics of knowledge brokers are observable – that is, that they might be able to be captured during the hiring process, as opposed to soft attributes that are hard to evaluate without extensive interaction. For example, knowledge brokers were more likely to have been part of a research project or been in a program that emphasized research, as well as to have engaged with research in PLCs, professional development, or a research conference. They may also demonstrate different beliefs about the value and role of research. All of these may figure into hiring decisions, particularly for schools that lack active knowledge brokers or seek to build additional capacity.

Supporting knowledge brokers. Attending to knowledge brokering in the hiring process may depend on factors such as turnover, supply, and autonomy in staffing. However, capacity for knowledge brokerage in schools may be able to be built through intentional supports, whether from school leadership or from other stakeholders in the educational system. We emphasize *intentionality* here because we acknowledge that few knowledge brokers felt that this role was part of their formal expectations. We suspect that without formal recognition of this role or contribution, there are likely few supports explicitly targeting their needs. Relatedly, we suggest it may be important to have conversations within organizations to clarify, if not formalize, the work.

We found that basic background characteristics are not predictive of being a knowledge broker. It's not more likely with more education, and brokering doesn't come as you gain more teaching experience. Rather, brokering seems to be associated with increased exposure to research and research-related experiences through many venues. In fact, there was not just one experience that brokers were more likely to have; they were more likely to have all of the research-related experiences listed in the survey. Therefore, one way to bolster knowledge brokerage in schools is to make a concerted effort to give practitioners more direct experiences with research – a recommendation also issued by Drill and colleagues (2012) in one of the few studies of teachers' use of research in the U.S..

Relatedly, our findings related to *what* and *how* knowledge brokers share research also suggest opportunities for enhancing and supporting their work. Like others', knowledge brokers' networks tend to be "local" - I.e. be largely constituted by school or district colleagues and professional organizations related to their work. Knowledge brokers (and their schools) may benefit from opportunities that expand networks and remove constraints on the kinds of research that enter the school (Finnigan, Daly, & Che, 2013).

Both direct experience with research and opportunities to expand research networks might be supported by stakeholders within and outside of the education system. School leaders might consider giving financial support or release time to attend a research conference, providing professional learning opportunities to engage in research, or encouraging research use in PLCs. Outside of school, pre-service and in-service preparation programs are well-positioned to support knowledge brokerage and could incorporate opportunities to engage *with* research, *in* research, and with *researchers*. Additionally, professional associations appear to be important resources for accessing research-based information. Mobilizing these organizations to increase exposure to research, to build research-related skills, and to expand the types and quality of resources accessed by knowledge brokers may help maximize and/or expand the research resources that highly utilized organizations.

Second, knowledge brokers also frequently engage in evaluation of needs and of research, interpretation of research, and development of strategies based on research – activities that demand particular skills and deep knowledge of their context. These are time consuming, resource intensive, and context specific – which means they are hard for researchers or intermediary organizations to enact at scale. In contrast, activities such as synthesizing research, dissemination, and developing programs were less likely to be part of knowledge brokers' activities. This may mean that researchers or intermediaries can support school-based knowledge brokers by engaging in this aspect of the work, enabling knowledge brokers to focus efforts on applications in their own schools. Although preliminary, this division of responsibilities may move us toward coordinated and complementary work across communities.

Conclusion

Our purpose, shared with the other authors in this volume, has been to shed light on this "third space" between research and practice with a focus on one particular, often overlooked, type of knowledge broker. Uniquely situated within their organizations, school-based knowledge brokers create avenues of influence by occupying important roles in school networks and possessing experiences, skills, and motivations that differ from their peers. Evidenced in our data, these individuals take on roles and activities not inherent in the work of researchers or practitioners and may make important contributions to the capacity for research use in school decision-making – in short, they engage in the roles and activities that Bush (2017) argues characterizes knowledge brokers. This is undoubtedly a first step in understanding the *who, what*, *how*, and *why* of knowledge brokerage in schools, but even these early findings suggest opportunities to recognize and support new roles for educators, and to harness their potential for generating meaningful change and improvement in education.

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Avenues of Influence:
An Exploration of School-Based Practitioners' as Knowledge Brokers and Mobilizers

APPENDIX: Survey Items

Element	Survey Item	Response Scale
What gets brokered?	In the last year, have you shared any of the following types of research with others? • Articles, reports, books, or summaries based on independent research or program evaluation (paper or web-based) • Research or program evaluation conducted by central office staff • Materials from a program developer or publisher • Research conducted by teacher(s) or principal(s) • Materials from a professional development training • Formal analysis of a school-wide or district-wide data • Opinion of national expert(s) When you've shared these, how often have you shared... • An actual product (e.g. the article, a link to the article, etc.) • Your interpretation or summary of the findings • Practices or strategies you developed based on the research •	Never 1-2 times 3-5 times More than 5 times
Brokerage activities	When you've shared research, how often do you do any of the following? • Evaluate the quality of research prior to sharing • Evaluate needs of schools, teachers or others so that you select the most relevant research • Deliver formal learning opportunities (e.g., professional development, training) • Offer or provide support or technical assistance • Publish (i.e., produce or release for distribution) • Develop products or programs based on research • Disseminate (i.e., actively distribute research) • Synthesize multiple sources of research about a single topic, program, etc. • Translate research into understandable language and/or format • Facilitate discussion of research	Never 1-2 times 3-5 times More than 5 times
	To what extent is sharing research expected of you in your role in your organization?	Not at all Slightly Moderately Very
Purposes and motivation	Please rate your level of agreement with the following statements. • Researchers have a solid grasp on evolving problems in schools.	Strongly Disagree Disagree Agree Strongly Agree

Element	Survey Item	Response Scale
	• Researchers need to do more to make their work relevant for my school. • Research addresses the most important issues schools face. • Most education research suggests actionable steps to take in practice. • Research takes into consideration the varying levels of resources available to schools to implement research findings. • Practitioners often struggle to find research on issues in their classrooms. • In general, we are expected to use research to inform decisions. • Our school/district prioritizes research in decision making. • When I use research-based strategies, student learning improves. • We use research because a supervisor or administrator requires it. • Research has changed the way I think about my practice. • I have used research to continually expand my knowledge about teaching and learning.	
Networks	Please list up to 10 people whom you rely on for education research. Please list up to 10 organizations you rely on for education research. Please list up to 10 media sources you rely on for education research.	
Individual characteristics	Which best describes your current position?	Classroom teacher Special education teacher Instructional coach or specialist School administrator District administrator/staff Other school instructional staff

Avenues of Influence:
An Exploration of School-Based Practitioners' as Knowledge Brokers and Mobilizers

Element	Survey Item	Response Scale
	How many years of experience do you have working in a K-12 education setting, including district level positions?	Less than a year 1 yr 2-3 yrs 4-6 yrs 7-10 yrs 11-15 yrs 16-20 yrs 21+ yrs
	What's the highest degree you earned and when?	Associates Bachelors Masters Doctorate (select year)
	What training and/or experiences have you had related to using research? • I have conducted action research. • I was in a graduate program that heavily emphasized research use. • I was in a graduate program where I conducted research. • I have been involved in a formal research-practice partnership. • I have participated in other professional development around critically consuming research. • I have engaged with research through a Professional Learning Community. • I attend research conferences. • I review research and apply it in my own work I have participated in the following undergraduate/graduate level courses… • I have taken an Introduction to Statistics course. • I have taken a Research Design course.	(Check all that apply)
	Please rate how confident you feel to determine whether… • a research study conducted appropriate statistical analyses. • a research design was appropriate for the research questions posed. • a research study had an adequate sample size. • results from a research study might be dismissed because they are actually attributable to something that the study missed. • a program evaluation demonstrated real impacts versus improvement that would have happened even without the program.	Not at all Confident Somewhat Confident Mostly Confident Very Confident

Element	Survey Item	Response Scale
	• a comparison group is a good match to the treatment group. • research supported (or not) inferences about the causal effects of a new program. • the surveys and assessments used in a research study were reliable and valid. • Please rate how confident you feel to determine whether - results from a research study are generalizable to different schools, districts, etc. • results from a research synthesis (i.e., combining results across multiple research studies) are trustworthy. • research evidence provided by a vendor is trustworthy, versus slanted to support their products.	