

Research Brokerage: How Research Enters and Moves through Schools

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Linking research and practice

Decades of research have documented a disconnect between the research and practice 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 engagement structures promote across that communities (Broekkamp & van Hout-Wolters, 2007; Burkhardt & Schoenfeld, 2003; Farley-Ripple, et al., 2018). 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. Of central importance, therefore, is tracing how research-based ideas, which are largely external to schools, find their way into decision-making and, ultimately, practice.

In this brief, we approach the study of research-use through the lens of diffusion of innovation, as others in this field have done previously (e.g., Neal et al., 2015), which emphasizes the pathways by which information and ideas flow. Prior literature documents persistent challenges to the flow of information from research to practice, pointing to the need to improve educators' capacity to use research as well as researchers' ability to disseminate it. However, these suggestions demand large-scale systemic change—change that we support, but are realistic about.

Alternatively, we can leverage *indirect* links between research and practice. In fact, literature on schools' use of research suggests that most access to research is mediated through other sources, which are often described as brokers, intermediaries, boundary spanners, or linking agents (Malin et al., 2018; Neal et al., 2015; Neal et al., 2019; Spencer & Louis, 1980).

The importance of brokerage

We use the term *research brokerage* to capture the dynamic and complex system of brokers, their knowledge mobilization activities, and motivations for their work that move ideas and information between research and practice (Farley-Ripple et al., 2017). This system is widely recognized as having

potential to bridge the two communities (Cooper & Levin, 2010; Massell, Goertz, & Barnes, 2012; Malin, et.al., 2018).

Within this system, brokers are positioned to span structural holes between research and practice – serving in roles not typical of researchers or educators and enabling the flow of information across boundaries. Understanding those organizations and individuals to which educators turn is critical in understanding the flow of research-based ideas into schools, yet *remarkably little is known about the resources educators turn to, and what the use of those resources might mean for individual and school use of research.*



However, those external ties present only a partial picture, leaving out how those ideas move *within* schools. Educators or schools with external ties to research may enjoy a sort of competitive advantage in finding research based ideas (or "good ideas" as described by Burt (2004)). At the individual level, educators' access to research-based ideas may influence the knowledge and skills they bring to their practice, but also make them a useful resource to their colleagues who lack similar access. At the organizational level, schools' ability to recognize the value of external information and put it into practice—often referred to as absorptive capacity—

depends on communications pathways, strategic knowledge leadership, and the qualities of external resources, among other factors (Farrell & Coburn, 2017). For these reasons, educators are positioned as brokers of external information and ideas within their school context.

In order to better understand research brokerage and its role in linking research and practice, it is important to not only understand external ties that facilitate research use but also to understand the role of internal ties that facilitate the diffusion of research across schools. In this brief, we explore this idea at scale, drawing on the work of the Center for Research Use in Education, an Institute for Education Sciencesfunded knowledge utilization center. We build on the emerging literature that has explored the role of networks, and knowledge brokerage in particular, in bridging the communication gap between researchers and practitioners (Daly et al., 2014; Debray et al., 2014; Neal et al., 2019). Specifically, we explore two dimensions of research brokerage - the ties which facilitate access to external research and the internal processes by which that information is shared within a school. In doing so, we answer the following research questions.

- 1. What resources do educators use to connect with research? (external ties)
 - a. What kinds of resources are most useful?
 - b. How do educators' networks for accessing research vary?
 - c. How is access to these resources distributed across schools?
- 2. How does research move within schools? (internal ties)
 - a. Who moves research in schools?
 - b. What activities do educators engage in when sharing research?

The present study

This paper reports analyses of quantitative data collected as part of a national study of school-based practitioners' use of research evidence. The Survey of Evidence in Education (SEE) survey was designed by the Center for Research Use in Schools to capture both researchers' and school-based practitioners' practices, beliefs, knowledge, and skills as they pertain to promoting research-use in schools (May et al., 2018). The practitioner version featured here (SEE-S) focuses on multiple dimensions of schoolbased decision-making and factors that shape the role of research in that process. There are five principal sections to the survey, of which two are salient to this brief: a section on educators' networks for accessing research information and a section on research brokerage within schools.

Sample. A total of 4,415 school-based practitioners responded to the survey during the 2018-2019 and 2019–2020 school years. This included all instructional staff in 154 schools across 18 states, inclusive of elementary, middle, and high schools and schools in urban, suburban, and rural areas. Schools served a mean of 680 students, 80% were eligible for Title I services, and, on average, half of students served were students of color. Response rates within schools ranged from 1% to 100%, with a mean of 56%, or 23 responses per school. Sixty percent of respondents were classroom teachers, 9% were special educators, 4% were administrators, and the remaining held other instructional positions, such as coach or interventionist. However, not all completed the multiple components. The sample included in the analyses presented here includes responses from 1,238 educators who completed the network and brokerage portions of the survey.

Data sources. We utilize two sets of items from SEE-S: 1) three open-ended items about the individuals, organizations, and media sources that educators reported using to access research (networks), and 2) four items that capture how often educators share different resources with others in their school and what activities they engage in as part of sharing. (brokerage) (see Table 1).

Network responses were recoded into broader types of resources. These are guided by prior literature and

theory and provide additional means for examining the composition of ego-networks.

Element	Measures					
Individual	School role					
attributes	Education level					
Network	Please list up to 10 [individuals, organizations,					
items	and media sources] you rely on for educational research. Please list the name and select their category.					
What gets	Frequency of sharing research products and					
brokered?	their format, frequency of sharing capacity-					
	building strategies, sources of research-based					
	information					
Brokerage	Frequency of the following activities when					
activities	sharing research, e.g.:					
	• evaluating quality,					
	 providing technical assistance, 					
	 developing products or programs, 					
	facilitating discussion					



First, prior literature on research-use suggests that engagement with research often happens as a result of relationships (e.g., Harrison, et al., 2017; Huberman, 1990), and therefore we sought to understand the extent to which educators' networks are comprised primarily of individuals. The second type created reflects whether the source was internal or external to the local education system. The literature on search, which is drawn primarily from organizational research, finds that the search for a solution is frequently compromised by several factors including desire to leave the work of the organization intact and preference for internal sources of evidence (Williams & Cole, 2007; Finnigan, Daly, & Che, 2012; Massell et al., 2012). Internal, or local, sources include members of one's own school or district staff as well as district level organizations (e.g., board of education, central office). The final type pertains to whether connections to the research community or to research are direct or mediated by other individuals, organizations, or media sources. Categories for external researcher, professor, independent research university-based organizations, research organizations, professors, peer reviewed journals, and research databases were coded as direct: resources external to the local education system but not considered within the research community were coded as externally mediated; and resources within the local education system were considered locally mediated.

Analysis. We approach analysis in two ways. To understand the range and type of resources educators use to connect with research, we first conduct a descriptive analysis of responses to the network items by category and type. We then use ego network analysis to develop statistics that describe individual educator networks in terms of size and composition.

To better understand the flow of research-based information within schools, we use responses to brokerage items to describe how research is shared within schools. We conduct descriptive analyses of brokerage items to identify which and how educators move research-based resources through schools, examining differences based on role and education level.

For both sets of analysis, statistics are examined at the individual and school level and compared across school roles and education levels using chi-square and ANOVA to test for statistically significant differences, using a Bonferroni correction to identify specific group differences.

What resources do educators use?

Figure 1 presents the proportion of all resources nominated in survey responses (black bars) alongside the mean proportion of educators' networks (grey bars) that are comprised of different categories. More than 9,000 resources were identified by the 1238 respondents, including more than 4,000 unique organizations and media sources. Ego network results reveal notable variability in the size (M=7.42, SD=5.88) of educator networks, as well as the predominance of ties to individuals within the education system (M=.60, SD=.31), and local resources (M=.55, SD=.32). Accordingly, we found educators had limited ties to researchers or traditional research organizations and outlets (M=.07, SD=.15).

These results affirm claims that research use is mediated by brokers. Brokers identified in these data include those in schools, such as the principals (14.1% of all resources, M=17.1% of educators networks) and teachers (15.2% of all resources, M=13.2% of educator networks) which represent the most influential sources for research information –s well as external intermediaries, of which professional associations stand out as particularly influential (9.3% of all resources, M=10.1% of educator networks).



Figure 1. Research resource categories and proportions of both all resources and individual networks

ANOVA results (Figure 2) did yield differences in the composition of networks based on school role. Specifically, when comparing classroom and special educators to principals, we found that principals were statistically significantly more likely to rely on district administrators (M=19.2% vs. 7.5%, p=.000), professional associations (M=13.7% vs. 8.2%, p=.019), professional magazines, and research databases.

Coaches were more likely than teachers to seek research from district administrators, professional development providers, researchers, and advocacy organizations. And teachers were more likely to have a greater reliance on local ties, coaches, and other teachers.



Figure 2. Statistically significant differences in network composition, by role group

Differences were also found in terms of educators' education levels. Those with Ed.D.s were more likely to have direct ties to research (M=.15) than those with masters (M=.08) or bachelors (M=.05, p=.001) degrees. In contrast, their networks had smaller proportions of local resources (N=.42) compared to those with masters and bachelors degrees respectively (M=.51 and M=.61, p=.000).

We also sought to understand the distribution of these networks across schools. To do so, we examined the intraclass correlation coefficient of educator networks at the school level, which provides a measure of the extent to which variance in network size and composition is explained by school membership. The results of this suggest that schools account for very little variation in educator networks, with ICCs ranging only from .008 to .06.

Aggregating ties to the school level, rather than to individual educators, reveal school networks are as variable as educator networks with similar proportions relying on local resources, external intermediaries, and direct ties to research. Figure 3 illustrates the variability along those dimensions. We note that some schools rely almost entirely on local sources of information, whereas others rely entirely on intermediary sources. Some have zero aggregate ties to the research community. Schools' differential, perhaps inequitable, access to different kinds of information has implications for schools' capacity to use research and for leveraging external resources to support improvement more broadly.

What are we learning about the resources educators use? Our first observation is that the diffuseness of educator-identified resources may pose a significant challenge for mobilizing research and systemic change. With so many individuals and organizations serving as brokers, it becomes difficult to both understand and evaluate the knowledge mobilization roles played across what appears to be a largely informal system. For example, each individual and organization may have a unique process, purpose, and skill set for brokering research. Furthermore, the fact that schools account for very little variability in network resources means accessing research is a highly individualized activity – a further challenge for leveraging this system.



In spite of this diffuseness, our findings do offer some starting points for action. We note that professional associations and districts are influential organizations, and that they may be important partners for researchers seeking to mobilize their work and reliable resources to which to direct We also find that educator networks educators. reflect school-based roles and responsibilities. For example, those with leadership roles, decisionmaking responsibilities, and serving as teacher and student supports seem to have greater probability of accessing research directly but are also more likely to serve as resources to colleagues. This means that strategically intervening to support individuals in these roles may enhance school capacity.

Lastly, we note that these data confirm the critical importance of intermediary organizations in linking research and practice. In spite of the challenges that such a large and informal system poses, there is an enormous sector of individuals and organizations that are positioned to help address persistent gaps between communities. The question remains how best to leverage it.

How does research move within schools?

Our first set of questions focused on the external ties that facilitate entry of research-based information into schools. Yet, this portrays only a partial picture of brokerage, as how information moves within a school provides greater insight about the potential for research to be taken up in practice.

Forty percent of our sample report that there is no expectation for them to share research in their school, and only 21% report this expectation as being moderate or very great. This suggests few have formal responsibilities for mobilizing research within their schools.

Nonetheless, educators also report that sharing research is common: 66.3% report sharing external research at least once per year (though only 8.7% report sharing more than five times). Other kinds of research move through schools too: 35.9% report sharing district research, 47.5% report sharing school research, and 28% report sharing student or youth-led research. These proportions are comparable to other kinds of evidence that inform decisions, such as local data, professional expertise, and information from professional learning materials, which puts external research square among the kinds of resources that are shared within schools. These results support our findings from the network data which indicate that educators are turning to one another for information, but that some may be more influential - or active as these data suggest – than others.

In addition to sharing research, educators support the flow of research within the school in other ways, including helping others access research (51.4% report doing this at least once per year), helping colleagues understand research (48.3%), helping implement research based practices (50.6%), and engaging others in discussing research (44.3%).

Among those who report sharing external research, we found a wide range of knowledge mobilization activities (Figure 4).



Figure 4. Proportion of school based brokers participating in various knowledge mobilization activities.

We note that there are some significant differences in brokerage activities by school role, as illustrated in Figure 5. As our network findings highlight other teachers, coaches/interventionists, and principals as highly influential, we focus on these categories here. Differences among teachers and principals are all statistically significant at the .000 level. Statistically significant differences between coaches and principals were found only for the ever share external research variable and for more frequent levels of activity (3-5 times or more than 5 times, not pictured) of helping others understand research. Statistically significant differences between teachers and coaches were found at higher levels of frequency for all variables. These patterns match reports of expectations to share research: teachers were much less likely to report moderate to extensive expectations to share research (19.7%) than coaches (33.7%) and principals (48.2%), differences which are statistically significant at the p<.000 level.

Among those that do share research, we found statistically significant role based differences in evaluating needs (favoring principals, p<.008), and in delivering formal learning opportunities, providing

support or technical assistance, disseminating research, and facilitating discussion of research (favoring coaches and principals, p<.000). These differences fit with traditional roles assigned to principals and coaches/interventionists and reflect more traditional expectations for classroom teachers.

We also examined difference by education level, which yielded fewer differences among bachelors, masters, and doctoral level degrees. Those with doctorates were more likely to engage in brokerage very frequently (more than 5 times per year) on all categories than those at the bachelors and masters levels (p<.05), with no statistically significant difference at other levels of activity. Among those who reported sharing research, knowledge mobilization activities exhibited some statistically significant differences:

- delivering formal learning opportunities, with increasing probability of engaging in the activity with each degree (p<.000)
- educators with doctorates more likely to provide support or technical assistance than those with bachelors (p=.048)
- educators with doctorates more likely to disseminate research and facilitate discussion than those with other education levels (p<.000)



Figure 5. Statistically significant differences in school-based broker activities, by role group

School-based brokerage, however, is not distributed evenly across schools. Figure 6 illustrates that variation, with each row representing a school and darker shading indicating higher levels of research brokerage activity and lighter shades indicating less. Additionally, correlational analyses produced coefficients between .5 and .9 among these variables. This means that some schools exhibit low levels of brokerage activity across all dimensions, creating significant barriers to the flow of research within schools.

Situring external interret	Expectations to engage to brotherage	research	Helping offers	Padping implement research	Engeging offers to discretions
_					
_					

Figure 6. Visual representation of school differences in key brokerage variables.

What are we learning about how research moves within schools? Network analyses point to the importance of local resources, including other educators, which tells us that school-based knowledge brokers are important mechanisms for moving research within schools. Here, we deepen our understanding of how that happens. We note that few have significant, explicit responsibilities to share research - yet another informal set of systems on which we rely to connect research in practice. While building leaders most often acknowledged this responsibility, not all felt that was their role, in spite of their colleagues' reliance on them. This presents an opportunity to support and develop leaders in new ways. However, many different educators are engaged in this work, which helps maximize those external ties we noted earlier and suggests that it is not only education leaders who are influential in school networks. Based on this finding we echo earlier calls we have made to formalize supports for school-based brokers through recognition, training, and staffing decisions (Farley-Ripple & Grajeda, 2017).

At the same time, we again found some patterns that were consistent with role and education which implicate those with formal leadership roles as important starting points for building and leveraging brokerage within schools.

A final takeaway from our analyses is that school brokers engage in what we might describe as local work – technical assistance and support, evaluating local needs, and delivering formal learning. These are often the most challenging for researcher or intermediary brokers to enact because of resources and scale, which suggests that there is some natural distribution of the work of brokerage happening. An implication of this finding is that other knowledge mobilization activities – translating, developing programs or products, disseminating, developing, and publishing – may need to be taken up by other actors in the system.

A look at the big picture

The purpose of this brief is to provide insight into two aspects of research brokerage – how educators connect with research information and how that information moves within schools. While each set of questions is instructive in terms of our understanding of these processes and how to strengthen them, by taking a step back to consider them simultaneously, we want to recognize a few "big picture" issues.

First, both sets of findings highlight the lack of formal systems and infrastructure to support connections between research and practice. The absence of recognized mechanisms – including widely resources, roles, and activities - puts the burden of linking research and practice on two communities historically ill-equipped for the task. On the other hand, this informality may be an opportunity for systems improvement and for innovation. We may be able to build the needed systems and structures in ways that are informed by these and other emerging lessons about brokerage. In other words, we can an evidence-informed develop approach to strengthening and leveraging the research brokerage system in education.

Second, we found evidence of some alignment within the education system in terms of principals' and other formal leaders' external networks, their internal roles and activities as brokers, and advanced degrees. This alignment suggests that capacity for research use, by way of research brokerage, may be strengthened by supporting building leaders as research leaders. Implications include leveraging preparation programs and in service support systems as capacity builders. At the same time, this alignment was fairly tenuous; most educators with doctorates in our sample were not principals but classroom teachers, and educators with a variety of school roles take on brokerage activities, and both internal and external capacity for brokerage varied widely by school. Again, we argue this is an opportunity to think about alignment across the system, taking into account differences in resources and supports across the education system. An example of systems level action might include linking Ed.D. or principal preparation programs with long term access to research resources, and promoting knowledge of mobilization training as part learning opportunities.

Lastly, we return to the importance of better understanding the role of intermediaries in linking research and practice. We observed here the breadth of the intermediary sector, and identified their particular importance in key knowledge mobilization activities such as translation and program development. Additional research about their work and effectiveness is much needed, but so is more immediately pragmatic information that can help educators understand what organizations exist, what their evidence use commitments are, and how to navigate the plethora of resources. Similarly. researchers need more information about how to engage the intermediary space to better communicate research and produce better informed research. And intermediaries themselves would benefit from tools that would foster strategic decision-making about their role and work, allow for coordination and collaboration, and result in more effective use of limited resources.

Overall our findings shed light on the complexity of the process of and conditions surrounding research use in education. They challenge assumptions of simple, linear pathways to using research and draw attention to the unavoidable fact that most research use is *mediated* through a largely informal system of brokerage. In order to improve the role of research evidence in educational decision-making, we must acknowledge the need for significant investment in the research-practice infrastructure and in strategies that build the capacity of researchers, intermediaries, and practitioners to engage with and leverage that system.

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The Center for Research Use in Education is "Rethinking Research for Schools" (R4S). Our mission is to expand the study of research use and produce a more holistic picture of what drives it, from the production of knowledge by researchers to the application of research in schools. We also seek to identify strategies that can make research more meaningful to classroom practice. At our center, we believe that education research is an important part of the educational process. We further believe that rigorous evidence, whether qualitative or quantitative, can foster better opportunities and outcomes for children by empowering educators, families, and communities with additional knowledge to inform better decision-making. For this reason, we seek to support strong ties between research and practice.

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