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Beyond Sharing Knowledge: Knowledge Brokers' Strategies to Build Capacity in Education Systems

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Abstract

Purpose: The study analyzes how equity-focused knowledge brokers, working at different levels of the U.S. education system, understand and discuss capacity building in education systems, such as schools, districts, state and local education agencies, to answer this research question: *How do equity-focused knowledge brokers support capacity building in education systems?*

Methodology: Semi-structured interviews were conducted with five well-known equity-focused organizations that broker evidence-based knowledge and resources to educational systems, practitioners, and policymakers. The research team members qualitatively analyzed 18 hours of recordings, using their co-developed codebook based on the research questions and prior research on knowledge mobilization.

Findings: Four strategies to build capacity within the educational systems were identified. Pursuing sustainable educational change, brokering organizations built capacity with context-specific strategies: (a) engaging various roles within educational systems, (b) fostering communities and partnerships, (c) supporting educators and policymakers' agency and efficacy, and (d) creating a wider culture of external support beyond the systems themselves.

Originality: This study shows how knowledge brokers employed context-specific strategies targeting whole systems instead of individuals to ensure that the organization and individuals within had the mindsets, capability, and conditions to engage with and adapt the brokered knowledge and resources. Findings build on existing literature showing how knowledge brokers build capacity through well-known approaches, such as workshops/training, online tutorials, and other online resources.

Keywords: knowledge mobilization, social capital, knowledge brokers, capacity building

Beyond Sharing Knowledge: Knowledge Brokers' Strategies to Build Capacity in Education Systems

Many educational systems (i.e., schools, districts, local and state education agencies) are engaged in the difficult work of addressing long-standing systemic inequities. Change requires these systems to mobilize knowledge to improve the experiences and outcomes of underserved communities (OECD, 2022). Knowledge mobilization is the process of moving knowledge (i.e., evidence derived from research, data, or practical experience) to where it will be most useful (Ward, 2017). Accessing and implementing this scientific, technical, or practical knowledge for change necessitates capacity within systems¹ (Datnow et al., 2021; Fullan, 2016; Stoll, 2009).

Prior research provides insights into how education leaders within systems create sustainable change by building capacity through, for example, engagement of content area or data coaches (Datnow et al., 2021), distributed leadership (Harris, 2004), professional learning and development (Cooper, 2014), professional learning networks (Brown et al., 2020), or professional collaboration (Datnow & Park, 2019). Evidence suggests that knowledge brokers external to these systems build capacity within them as well (Cooper, 2014; Malik, 2020; Nutley et al., 2007). Knowledge brokers are entities that trade knowledge between individuals or organizations not immediately connected (Weber & Yanovitzky, 2021). However, less is known about how knowledge brokers that bring resources to educators and policymakers engage in capacity-building processes to support the uptake and implementation of their evidence-based practices and resources. A more robust understanding is critical to improving knowledge mobilization efforts to achieve educational change towards more equity and high-quality education for all (OECD, 2022) and for identifying potential gap areas.

¹ This article uses the term 'systems' when referring to complex sets of interconnected people and elements that access, mobilize, and implement knowledge, including schools, districts, and local and state education agencies.

Knowledge brokers are central to the profoundly relational process of knowledge mobilization (Phipps et al., 2016; Rickinson & Edwards, 2021; Ward, 2017). For example, educators and administrators often turn to trusted individuals with whom they have developed social capital (i.e., resources embedded in social relationships) and who can provide resources and evidence relevant to their work (Finnigan et al., 2021; Fraser et al., 2018; Lin, 2001). Additionally, brokering organizations that engage in a relational and multi-directional knowledge mobilization process frequently have a deep understanding of practitioners' contexts, challenges, and organizational capacities (Lockton et al., 2022) while also bringing an outsider's perspective and independence. Leveraging this intermediary position, they are uniquely positioned to support capacity building in systems they engage with.

To gain a deeper understanding of these processes, this qualitative study explores five knowledge broker organizations' capacity-building strategies to support equity and excellence in education for all students. This study focuses on knowledge broker organizations external to the systems they introduced knowledge into. While they varied in their type, including university institutes, policy institutes, intermediary or non-profit organizations, they had in common that they mediated between contexts in which knowledge was produced and the ones it was used (Levin, 2011). Some knowledge broker organizations mobilized knowledge produced by themselves, while others filtered and synthesized existing knowledge to then disseminate. This study analyzes how equity-focused knowledge brokers, working in different aspects of education in the United States, understand and discuss capacity building in education systems to answer this research question: *How do equity-focused knowledge brokers support capacity building in education systems?*

Literature Review

Knowledge Mobilization

Knowledge mobilization is the process of moving knowledge to where it will be most useful (Ward, 2017). For this study, we define knowledge broadly as scientific, technical, and practical knowledge, or evidence derived from research, data, or practical experience. While earlier terms, such as evidence use, implied a one-directional and linear translation, knowledge mobilization emphasizes the multi-directional, multi-dimensional, interactive nature of this work (Sá et al., 2011) and that the whole system needs to be activated to establish connections among its various actors (Campbell et al., 2017; OECD, 2022). Cooper (2014) described knowledge mobilization as an iterative and social process involving interactions among different groups or contexts (e.g., researchers, policymakers, practitioners, and third-party agencies) to improve the broader education system. The process of knowledge mobilization can be multi-directional, fluid, collaborative, and co-productive, and includes a continued shaping and re-shaping of knowledge between parties or even the co-production of knowledge (Phipps et al., 2016; Ward, 2017). Indeed, three interconnected and sometimes overlapping contexts shape the mobilization of knowledge: (a) the context in which knowledge is produced, (b) the one in which knowledge is used, and (c) the one in which all mediating processes between the former two exist (Levin, 2011).

Mobilizing knowledge includes supporting and accelerating evidence pathways between these three contexts (MacGregor & Phipps, 2020). This can be achieved through identifying and addressing barriers to mobilizing knowledge, including creating relevant and credible evidence, providing professional learning opportunities, making the evidence visible and accessible, incentivizing knowledge use, and building and extending networks to further the knowledge's reach (Campbell et al., 2017; Farley-Ripple, 2020; Nutley et al., 2007). Professional learning

networks where knowledge is shared and co-constructed among moderators and educators is another knowledge mobilization approach (Jesacher-Roessler, 2021; Schnellert & Butler, 2020). Further, access to journals and libraries, formal and informal relationships between researchers and practitioners and policymakers, and—most notable for this study—knowledge brokers facilitate knowledge mobilization by reducing barriers to accessing resources (Nutley, 2007).

Knowledge Brokers and Capacity Building

Knowledge Brokers

Knowledge brokers mediate the exchange between the context in which knowledge is produced and the one in which it is used (Levin, 2011) by enabling the trade of knowledge between individuals or organizations not immediately connected (Weber & Yanovitzky, 2021). As such, knowledge brokers can be a source of social capital, defined as the resources embedded in social relationships (Lin, 2001), since they connect educators, policymakers, and leaders to knowledge, resources, and experts relevant to their work. Knowledge brokers can be individuals or organizations and mediate by filtering and disseminating evidence (Nutley et al., 2007). They can be situated within systems that use evidence (e.g., schools, districts, legislative bodies) where they search, access, and filter evidence to disseminate it within their organization (e.g., Farley-Ripple & Yun, 2021; Finnigan et al., 2021; Purtle, 2021). For example, they can be part of a professional learning network and broker the knowledge from the professional learning network to their colleagues in their school (Poortman & Brown, 2017). However, they can also be external to systems and introduce evidence from the outside, including universities and researchers, policy groups, professional associations, and intermediary organizations such as think tanks, non-profits, and unions (e.g., Cooper, 2014; Hopkins et al., 2018; MacGregor &

Phipps, 2020; Malik, 2020; Malin et al., 2018; Rodway, 2019; Sá et al., 2011). This study focuses on knowledge brokers external to educational systems.

Knowledge broker organizations engage in various brokering functions when mobilizing knowledge (see Cooper, 2014). Some of these activities are deeply relational, such as (a) facilitating collaboration and connections among stakeholders, (b) assisting organizations in building strategic knowledge mobilization processes, and (c) consulting organizations and providing them assistance in implementing knowledge (Cooper, 2014). While there needs to be more evidence on the effectiveness of knowledge brokering in education, Rycroft-Smith's (2022) literature synthesis suggests that effective knowledge brokering involves relational approaches and social networks. Other functions center more on communication, including (d) increasing awareness of evidence, (e) increasing accessibility and tailoring resources to audiences, (f) influencing policy by using research, and (g) increasing engagement with evidence by "making it appeal to more of our senses" (Cooper, 2014, p. 47).

Additionally, knowledge brokers are often aware of the user communities' context as it matters to their knowledge mobilization success (Nutley et al., 2007). Indeed, educators and policymakers situated in these systems frequently experience barriers to mobilizing knowledge, including lack of time to access and engage knowledge and resources, lack of authority and autonomy to instigate evidence-based policy and practice changes, competing priorities, and lack of organizational, practical, and personal support (Nutley et al., 2007). Therefore, simply sharing resources is not likely to be effective without additional capacity building for using and adapting these resources to fit each context (Cooper, 2014; Farley-Ripple, 2020; Malik, 2020).

Capacity Building

A system's capacity is part of the context in which research is used (Levin, 2011) and determines whether and how new knowledge is accessed, understood, and implemented and, therefore, whether sustainable change can be achieved. Stoll (2009) defined capacity as “the power to engage in and sustain continuous learning ... for the purpose of enhancing student learning” (pp. 116). In contexts with high capacity, people consistently learn—individually and collectively— “from the world around them and to apply this learning to new situations” (Stoll, 2009, p. 125). As such, we argue that capacity building is closely related to fostering professional capital, defined as the systematic development and integration of human capital (i.e., individual talent), social capital (i.e., resources embedded in social relationships), and decisional capital (i.e., the competence to make decisions in complex contexts) (Hargreaves & Fullan, 2015).

When attempting to build capacity, three areas are relevant: (a) creating/ maintaining the necessary conditions, culture, and structures, (b) facilitating learning and skill-oriented experiences and opportunities, and (c) ensuring interrelationships and synergy between all the components (Stoll & Bolam, 2005, p. 52). Various capacity-building strategies within these areas exist, including collaborations with content area or data coaches (Datnow et al., 2021), distributed leadership (Harris, 2004), professional collaboration (Datnow & Park, 2019), and professional learning communities (Stoll & Bolam, 2005). Further, evidence suggests that knowledge broker organizations external to education systems sometimes build the “capacity to trust and understand research findings” (Malik, 2020, p. 11) to encourage evidence use among educators (Cooper, 2014). However, less is known about the strategies they apply beyond fostering learning among educators and policymakers about their experiences, findings, and resources to make sense of them. Hence, expanding upon this scholarship, this study explores

how knowledge brokers engage in capacity building while bridging contexts in which knowledge is produced and the ones in which it is used².

Methods

Participants

As described elsewhere (Lockton et al., 2022), we purposely selected knowledge broker organizations that were (a) equity-driven and shared the goal of improving education for students from historically marginalized communities, (b) were located in the United States (U.S.), and (c) were evidence-based. Further, all broker organizations were (d) well-known and recognized locally and nationally as experts in their respective fields, including science, mathematics, multilingual learners, instructional design, and project-based learning. In this sense, the educators and policymakers they worked with trusted their credibility, expertise, and knowledge, and we consider them as effective in mobilizing knowledge. Finally, (e) the brokering organizations differed in that they worked at different levels of the educational system, including K-12 classrooms, non-traditional education settings, and state-level policy contexts. Participants included:

- A policy institute founded by researchers to partner with policymakers and education leaders with the aim of increasing equity for students
- A university institute whose researchers develop research-based STEM teaching practices, create resources for educators, and share lessons learned with the broader education community

² While not the focus of this paper, knowledge brokers often also engage in activities to build capacity among themselves (e.g., MacGregor & Phipps, 2020).

- An informal STEM learning space involving a team of researchers and practitioners who share findings from their innovative youth work with the local and wider research, policy, and practice communities
- An intermediary organization working with administrators and practitioners to translate research into practice and promote successful models of educational design and decision making
- A teacher education and professional development organization of practitioners helping other practitioners to improve educational design and pedagogy

While all participants were recognized experts in their fields, they varied in their experience and organization to mobilize knowledge. Some had the infrastructure and expertise to support wide outreach activities that engaged large audiences and brought them into contact with extensive networks of educators and policymakers. Others prioritized conducting research and improving their own educational programs, and their wider knowledge mobilization efforts were in early stages. These latter organizations wanted to share lessons learned with others to create broader educational change. Consequently, the experience in mobilizing knowledge varied across our participants.

We conducted semi-structured interviews with a small group of one to five members of each organization; these individuals were selected because they were most directly responsible for knowledge mobilization in their respective organizations (see Table 1).

Data Collection

Data collection for this study consisted of 18 hours of semi-structured interviews that were recorded and transcribed verbatim (Merriam & Tisdell, 2016). Notably, we met with each participant organization for one hour to frame the research and gain initial background

information on the participants' knowledge mobilization experiences. We used the responses to structure the next round of semi-structured interviews, which lasted 1.5 hours with each participant. The interview questions were based on the existing literature on knowledge mobilization and were tailored to each knowledge broker organization's focus and activities. Still, the topics were the same across all participants, including organizational goals, current and desired audiences, types of resources they create, processes they engage in to produce their resources, resource sharing processes, and their current successes and barriers in resource sharing. With one participant, we conducted two additional one-hour follow-up interviews on the same topics because they needed more than 1.5 hours to answer all interview questions. After data analysis, a final round of hour-long interviews was conducted with each participant for member-checking and further input. For more detail about the content of the interviews beyond the findings reported here, see Lockton and colleagues (2022).

Data Analysis

Our analysis was iterative and concurrent with data collection (Miles et al., 2018). Members of the research team co-developed the codebook based on the research questions and prior research on knowledge mobilization. A priori codes included, among other things, organizational goals, barriers to knowledge mobilization, assets for knowledge mobilization, and measures of success. Next, using MAXQDA, each member coded the same segments of transcripts, noting questions, thoughts, and emergent codes. We then met to compare coding, discuss discrepancies, and adjust the codebook. Emergent codes were added, and the process was repeated until the research team reached consistent, reliable coding and agreed on the codes and definitions (Merriam & Tisdell, 2016; Miles et al., 2018). Then all transcripts were coded, and the research team compared themes across participants. To improve the accuracy and credibility

of the findings, we conducted member checks with all participants (Merriam & Tisdell, 2016). These one-hour member check meetings not only confirmed initial findings but also added more nuance and complexity.

For this manuscript, we further analyzed the a priori code on the participants' *organizational goals*. Within this broad code, several themes emerged progressively during the analysis, including the participants' aim to change teaching practices, change mindsets, recognition of their audiences' growth over time, and different strategies to build capacity. Table 2 shows the child codes of the code *capacity building*, which in turn is a child code of *organizational goals*.

Findings

By analyzing the five organizations' experiences as equity-focused knowledge brokers, the shared organizational goal of *building capacity in complex contexts* was identified. As aforementioned, a system's capacity determines whether and how new knowledge is accessed, understood, and implemented. Capacity can be described as "the power to engage in and sustain continuous learning" (Stoll, 2009, pp. 116). All five broker organizations recognized that to foster shifts in practices and mindsets toward more equitable teaching systems, policies, and practices (Lockton et al., 2022), they needed to support capacity building within systems, such as state and local education agencies, districts, and/ or schools. Doing so, knowledge brokers needed to consider the complex contexts and social structures of educators and policymakers. The five knowledge broker organizations described challenging and complex contexts concerning, for example, the ongoing COVID-19 pandemic and resulting staff shortages, shifted priorities, and increased usage of online professional development; an increasingly politicized education landscape; leaders and educators working in "silos," and being disconnected from

peers. Being aware of these challenging and complex contexts, knowledge brokers worked towards building capacity among educators, policymakers, and educational systems while mobilizing knowledge. This section begins with a brief overview of how the knowledge broker organizations in our study approached capacity building as part of their work. Subsequent sections describe each approach in more detail.

The knowledge brokers in our study applied four strategies to build capacity in these complex and challenging contexts. First, they engaged a variety of individuals filling different roles within their systems to facilitate increased capacity across the system as a whole. Second, they were aware that building partnerships and communities not only with but also among practitioners and policymakers was essential for ongoing resource sharing and mutual support to continue beyond people's involvement with the brokering organizations. Third, they bolstered educators' and policymakers' agency and efficacy to feel empowered to take action and enact changes within their own systems. Finally, they tried to create a wider culture of support by engaging with individuals outside the systems, such as parents, higher education institutions, and the broader public. While these strategies were distinct, they were also interconnected.

Engage a Variety of Roles within Systems

The first strategy among these organizations was to engage with and educate people with different roles, backgrounds, and perspectives within each system. The brokers were aware that, for example, teachers and administrators had to pull together to shift mindsets and change teaching practices toward more equitable student outcomes. Also, they understood that each role had different priorities, knowledge, and responsibilities within the systems. Therefore, and based on their intentions for these groups, they tailored resources, professional development, and ways

of engagement to varying stakeholders within each system. Each brokering organization implemented this strategy differently.

Provide Different Levels of Tailored Support for Different Roles

One approach was to provide tailored learning opportunities for people with different positions in schools and districts. For example, the intermediary brokering organization that translated research into practice and worked directly with people who “want to redesign schools” tailored some of their resources to the day-to-day challenges faced by the individuals directly involved in the redesign work, including hands-on tools, resources, and methodologies. The same brokering organization shared stories and insights at a more abstract level for superintendents and other educational leaders to foster mindset shifts by challenging “their beliefs about what school should look like.” Their reasoning was that “a superintendent isn’t going to need to think about . . . how to redesign” a curriculum, but needs encouragement for decisions and investments to create environments “that would make it easier for more schools to do” the work of redesigning schools. By sharing resources through their website, webinars, and workshops and making themselves available to personally walk educators and leaders through their frameworks and answer questions, they activated “the entire ecosystem” to “support communities [to] create and spread extraordinary equitable learning environments.”

Identify and Engage Roles that Constrain Change

The brokers from the university institute understood that administrators and school counselors could hinder improvements in educational practices, even when teachers were primarily responsible for implementing the changes. Therefore, they offered their content through a variety of means not only for teachers but for diverse audiences. For example, they started by having K-12 classroom teachers engage with and experience their research-based

teaching practices as “an open creative type of thing” to facilitate a shift in their mindsets about the content and how to teach it. Toward this end, they translated their research into practice-oriented resources for classroom teachers. They published teaching materials and videos on their website and in books, “giving something easy for teachers to implement.” Further, they provided one- and two-day in-person teacher workshops, where they guided teachers on learning journeys, and “online classes that help teachers learn how to teach differently.” While working with educators, they recognized that teachers were often on board with shifting to their evidence-based teaching practices, but some administrators were not, sometimes walking into teachers’ rooms, asking, “why aren’t you doing timed tests?” As a result, this organization “started doing leadership workshops” for school site, district, county, and state-level leaders. Later, school counselors were identified as “the real blocking point” since they were not as informed about changes to courses, and thus were unable to provide students with relevant guidance. Hence, the brokering organization engaged specifically with counselors as well. By engaging a large set of actors they had not readily considered, these knowledge brokers were responsive and adaptive to the entire system.

Bring Diverse Roles and Perspectives Into One Room for Joint Learning

Another way organizations engaged a variety of roles within educational systems was by bringing the ecosystem that surrounds students’ education into one room to engage in learning together. The university institute encouraged schools and districts to “come as a team” to their workshops, often resulting in “a superintendent sitting there with their K-8 leadership team in a ... workshop.” Another organization went a step further and *required* people to participate in their workshops as teams that “must include one school site level or district administrator, ... one college counselor, ...one classroom teacher.” As such, these broker organizations created

collaborative opportunities for mindset shifts and practice changes, thus, establishing connections among the systems' various actors.

Foster Shared Responsibility

Knowledge brokers focused on shifting mindsets about competence and responsibility to get more people involved in transformative processes. For example, the organization working with state policymakers tried to foster "shared responsibility" within state departments for policymakers to focus on equity for underrepresented student groups, even for individuals who do not have equity "in their title." This organization focused on strategies to engage a wide range of policymakers to become "champions" for equity. By shifting these actors' mindsets, they contributed to interrelationships and synergy between different actors, hence, building capacity for improving education for all students.

In sum, by engaging actors with different perspectives and facilitating learning among them, knowledge brokers established connections, activated the entire systems, and, thus, built capacity (i.e., "the power to engage in and sustain continuous learning" (Stoll, 2009, pp. 116)). Their tailored focus on capacity building in the context in which knowledge is used allowed them to support conditions for learning and change.

Foster Community and Partnerships With and Among Practitioners and Policymakers

Another strategy to build capacity was to foster the growth of lasting partnerships, networks, and "communities of practice" both with and among the educators and policymakers the brokering organizations served. This strategy involved intentionally fostering frequent, ongoing collaboration and partnerships among defined communities. This strategy differed from bringing different roles into one room for joint learning as these partnerships and communities were fostered to last, and community members met frequently.

Foster High-Trust, Focused Relations with Educators, Policymakers, and Researchers

The policy institute representatives explained that their community of practice, informed by “high trust [and] high engagement,” provided policymakers with “emotional support, political support, or content support.” By building “really strong relationships,” this knowledge broker aimed “to develop ... leadership capacity [for knowledge use] in ... state contexts.” Similarly, the teacher education and professional development organization tried to “make people feel seen and validated and heard... and position everyone as an ... equal group of potential leaders or actual leaders that are convening together and hopefully staying connected.”

Meanwhile, the informal STEM learning space invested in partnerships with other institutions because they learned that those partnerships “can help create an ecosystem that can support students and teachers and... youth develop into scientists.” They frequently met with other institutions “to bring problems, to share resources, and to together learn.” They also fostered ongoing community between scientists, their organization, and the youth they had served in the past. For example, they continually prompted both the youth and their mentors to reconnect. They found that this served a dual purpose of helping youth “network and leverage the people [they] met” while also facilitating learning for adult practitioners as they better understood the perspectives of the students they served. By supporting close connections among actors from different systems, these knowledge brokers contributed to structures that created opportunities for collaboration, collective learning, and mutual support. In doing so, they ensured exchanges and synergies between systems.

Connect Large Numbers of Educators in Collaborative Communities

Another knowledge broker built a virtual network of more than 2,500 educators, giving them “a space to connect [and] build relationships.” Through this online space, they supported

educators to “find their people ... to lean further into school innovation work” despite being “geographically separated,” resulting in “deep partnerships” that went beyond sharing resources and sometimes resulted in spearheading a project, writing a book, or opening a school together. The tactic here was not to build meaningful relationships between every individual in the online community, but instead to provide structures that foster small, trusting partnerships between groups of individuals. These groups could benefit from these more close-knit interpersonal relations beyond merely accessing resources from the larger community. Again, this knowledge broker contributed to structures that provided individual actors with various forms of support, including access to resources, opportunities for collaboration, and exchange of ideas.

In sum, these knowledge brokers understood that partnerships, communities, and relationships “really matter,” and they were thoughtful about the ways they helped build them. While brokering resources was one of their goals, so was creating communities that support each other to do challenging work. These structures created, inter alia, opportunities for collaboration, collective learning, access to resources, and new ideas.

Support Practitioners’ and Policymakers’ Agency and Efficacy

Knowledge brokers also built capacity by empowering educators to take action, change their practices, and enact changes within their systems (i.e., build agency), as well as to build educators’ belief that they can successfully accomplish certain tasks and achieve goals (i.e., build self-efficacy).

Foster Agency

Both the university institute and teacher education and professional development organization highlighted their workshops aimed at making their attendees feel “they [had] agency to take action” in addition to learning new teaching practices. The university institute

invested “in teachers being powerful” by, for example, showing them how they could establish the institute’s high school course at their own high school if just one teacher at the site pushed to teach it and get it approved, “and then it’s there.” This mechanism enabled the spread of their curriculum-based resources to reach more teachers and students. However, it was also important to them for educators to be their own agents and “choose not to or choose to” use any of their resources. Further, the policy institute described how policymakers were empowered by their partnership “to act on their knowledge, skills, and expertise, despite really complicated contexts.” This empowerment resulted in, for example, policymakers adapting resources for use in their own settings. Similarly, the intermediary organization “lifted up” insights, tools, and frameworks to “equip other people with the insights and tools” they had “to encourage them to make decisions [and] investments” in how they designed educational systems. As such, these knowledge brokers supported educators’ agency and positioned them as being able to enact lasting and transformative change.

Foster Self-Efficacy

For some knowledge brokers, empowerment was also linked to practitioners recognizing their competencies and—consequently—their self-efficacy. For example, the informal STEM learning space assisted its collaborators, including students and mentees, to “realiz[e] they have the capacity to participate in such work.” By providing hands-on experiences to teachers, the research institute also helped teachers to realize “I can do this” and fall in love with the subject and new ways of teaching. By building educators’ belief that they can successfully engage with content and learning in new ways, they created the conditions and mindsets for educators to engage in continuous inquiry to enhance student experiences and outcomes.

Create a Wider Culture of Support beyond the Systems’ Boundaries

The knowledge brokers acknowledged and engaged the complexity of the contexts in which practitioners and policymakers worked, recognizing the value of additional support from people outside the systems to create better conditions for change within the systems.

Consequently, they did not only engage school, district, and state stakeholders but also people who were only tangentially related to their targeted education systems, aiming to create a culture of support for educational change that went beyond the systems' boundaries.

Gain the Public's Support

Knowledge brokers communicated through diverse channels to reach a broad audience to garner understanding and support for new pedagogies and teaching practices. The university institute, for example, educated parents to understand and support the newly implemented teaching approaches. They did "a lot of parent nights for districts" and wrote news articles and op-eds accessible to a broader audience. The intermediary organization, too, pitched op-eds to news outlets with national reach. Additionally, they leveraged relationships between school districts they worked with and local publications to pitch stories about their "work there to ... local outlet[s]." However, not all organizations sought out outlets that deliver "content for general audiences." Instead, the teacher education and professional development organization targeted groups and individuals responsible for professional learning when publishing content. Still, several knowledge brokers tried to foster the public's support for changes in teaching practices, thus facilitating a culture of support for educators' continuous learning.

Engage with Higher Education Institutions

Additionally, knowledge brokers recognized that higher education institutions had to be convinced to shift admission and course requirements in order to support the curriculum and teaching changes at the K-12 level. One participant acknowledged that many high school

teachers believed students needed to attend the traditional courses and curriculum to be “competitive when they’re going into colleges.” This knowledge broker realized they “need[ed] to get the colleges on board with this” change. As a result, they worked with colleges to think with them about what to do with students who did follow the new courses “and not cut them out of majors.”

Address the Complexity of Whole Systems

Further, knowledge brokers recognized that all levels of the education system, from local to district, state, and national policies and practices, were intertwined. Consequently, the university institute engaged in state policy initiatives to facilitate change in K-12 teaching practices. Also, the policy institute was aware of “these multiple layers of complexity” in terms of “developing capacity at the state level, and then from there to the local level.”

In sum, these knowledge brokers aimed at creating a culture supporting changes in teaching practices. Towards this goal, they addressed the public, engaged with higher education systems, and tried to adjust policies to facilitate improvement.

Discussion

This study provides insights into how knowledge brokers support not only knowledge entering “into the ongoing stream of decision-making” (Coburn et al., 2020, p. 42) and how it is mobilized, but also capacity building with the goal of sustainable change. They built capacity (i.e., “the power to engage in and sustain continuous learning” (Stoll, 2009, pp. 116)) by (a) engaging various roles within systems (i.e., targeting different roles with tailored resources, engaging roles that potentially constrain change, bringing people together for joint learning, and fostering shared responsibility), (b) fostering communities and partnerships, (c) supporting educators’ and policymakers’ agency and efficacy, and (d) creating a wider culture of support

(i.e., gaining the public's support, engaging higher education institutions, and addressing the entire education system's complexity). As such, they worked in all three areas relevant to building capacity: (a) facilitating learning and skill-oriented experiences and opportunities, (b) ensuring interrelationships and synergy between all the components, and (c) creating and maintaining the necessary conditions, culture, and structures (Stoll & Bolan, 2005). Instead of only bridging the contexts in which knowledge is produced and the ones in which knowledge is used (Levin, 2011), the participants in this study contributed to the kinds of cultures and structures that support systems' capability "to engage in and sustain continuous learning" (Stoll, 2009, p. 116), hence contributing to the systems' capacity.

Our findings provide further evidence that knowledge brokers external to education systems do more than disseminate knowledge (Cooper, 2014; Farley-Ripple, 2020; Malik, 2020). While research on knowledge brokers has shown that their activities include capacity building in the context in which evidence is used (Cooper, 2014; Farley-Ripple, 2020; Malik, 2020), this study expands upon this literature by demonstrating four distinct and nuanced ways of building capacity in complex contexts.

There are some limitations of the study. The list of possible capacity-building strategies is not conclusive but mirrors only the strategies of our participants. Also, we did not evaluate the effectiveness of these strategies on how knowledge is accessed, understood, and implemented in systems, and whether this learning results in change and improvement. While our participants—all leaders in their fields—perceived their capacity-building strategies to be successful, future studies should shed light on the effectiveness of the presented strategies.

Despite these limitations, we believe that this research is relevant as leaders and educators experience frequent barriers to mobilizing knowledge, including lack of time,

competing priorities, lack of support, and lack of authority and autonomy to initiate evidence-based policy and practice changes (Nutley et al., 2007). There are several well-known approaches to capacity building, such as workshops, training, online tutorials, written FAQs, and glossaries (Cooper, 2014). However, the knowledge brokers in our study employed context-specific strategies targeting whole systems instead of individuals to ensure that the organization and individuals within had the capability and conditions to engage with and adapt the brokered knowledge and resources. As such, brokering organizations supported policymakers, system leaders, and educators in creating change-enabling conditions. For example, by empowering individuals, knowledge brokers supported systems in gaining the “power to engage in and sustain continuous learning” (Stoll, 2009, p. 125), even in complex contexts. In doing so, they also countered the often-reported lack of authority and autonomy to initiate policy and practice changes (Nutley et al., 2007). Also, in addition to being a source of social capital for educators and policymakers, the knowledge brokers facilitated the building of additional social capital by fostering partnerships and communities among their audiences that supported continuous learning. We argue that the broker organizations’ capacity building went beyond the uptake of evidence and resources. Instead, we argue that these capacity-building strategies enabled organizations to engage in the kinds of activities that can support lasting transformative change.

This study also has practical implications. We argue that engaging with knowledge brokers can be seen as a strategy to build capacity that goes beyond professional learning and development. As such, these engagements can be on par with content area or data coaches (Datnow et al., 2021), distributed leadership (Harris, 2004), and professional learning communities (Stoll & Bolam, 2005). While professional development and providing resources are often the entry points for broker organizations, their work can be more nuanced and holistic,

sometimes resulting in collaborations and partnerships, and can provide systems with more than just inputs for new ideas.

We would argue that knowledge brokers also foster professional capital (Hargreaves & Fullan, 2015). Particularly, knowledge brokers worked toward systematically developing (a) human capital across the systems by engaging with and training various roles, (b) social capital by fostering communities and partnerships, and (c) decisional capital by supporting educators' and policymakers' agency and efficacy. Since knowledge brokers do much more than disseminate resources, educators and leaders who consider engaging professional knowledge brokers should not only query the resources and content they will provide but also their capacity-building strategies that go beyond professional learning and development. However, the tension in this approach is that "top-down capacity building strategies rarely build the internal commitment and agency necessary to sustain improvement" (Stoll, 2009, p. 123). Therefore, including educators closest to the daily challenges and ultimately implementing change in the decisions of what knowledge broker to engage might strengthen the knowledge broker efforts' effectiveness. Inclusion in decision-making might further contribute to educators' commitment and agency for lasting change.

Further, other knowledge brokers might benefit from the strategies presented in this paper. In addition to building capacity, these strategies can bolster efforts to strengthen relationships between organizations that create evidence-informed resources and systems that adapt them. Further, these findings support the importance of mindset shifts accompanying changes in teaching practices (Lockton et al., 2022). Knowledge brokers achieved these by facilitating learning among actors. This learning could be facilitated by, for example, creating opportunities for cognitive dissonance between what is and what we want it to be. The research

community should continue to explore and document knowledge mobilization activities, as many knowledge brokers have infrastructures in place that effectively create enabling conditions for improvement.

Finally, organizations that fund the work of knowledge brokers should consider the multifaceted nature of their work. Funding the production of knowledge and resources continues to be important, but attention should also be paid to the relational aspects involved in the brokering of these items to decision-makers and practitioners (Tseng et al, 2022). Similar to knowledge mobilization, relational evidence-use approaches involve bidirectional communication, collaboration, and policy informing research and vice versa, as well as consider knowledge as “valuable when it meets the needs and contexts of its would-be users” (Tseng et al., 2022, p. 2). This study documents the role of capacity building in knowledge mobilization and, therefore, also in the relational use of evidence - a role that should be explicitly outlined and supported by funding institutions.

The ways knowledge brokers support capacity building within educational systems are at times highly visible, but also sometimes more nuanced and hidden. The ability of systems to successfully adapt knowledge and resources to their contexts often leans heavily on their capability to engage in continuous learning. Identifying and acknowledging visible and hidden capacity-building activities of brokering organizations can support them in developing this difficult aspect of their work and ultimately result in more equitable education systems.

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Table 1
Participant Overview

Organization	Examples of Knowledge Mobilization Activities	Examples of Mobilized Knowledge	Interviewee(s)
Policy institute partnering with policymakers and education leaders with the aim of increasing equity for students	community of practice/ research-practice partnership with policymakers and state leaders; research and policy briefs	research-based leadership and policy guidance	1. co-founder and director, researcher 2. co-founder and director, researcher
University institute developing research-based STEM teaching practices	resources for educators freely available on their website; in-person and online workshops/ trainings/ presentations for educators, leaders, parents, students; social media campaigns; videos; op-eds and articles in broadly accessible magazines; books; policy and curriculum advocacy	research-based teaching practices, materials, and ideas; curriculum; lessons learned; research	1. co-founder of institute, researcher 2. co-founder, executive director
Informal STEM learning space involving a team of researchers and practitioners	research briefs, social media campaigns, blogs, commentaries in practitioner-oriented journals,	lessons learned, research	1. research director 2. researcher 3. researcher 4. researcher 5. manager youth community
Intermediary organization working with administrators and practitioners to translate research into practice	research summaries and white papers; webinars; virtual network; partnerships with people leading school change; sharing of resources on their websites/ blogs/ local newspapers	school improvement models and tools; lessons learned	1. manager fundraising, marketing, communications 2. manager community programming
Teacher education and professional development organization of practitioners	podcasts, videos, resources for educators freely available on their website, in-house journal, workshops/ trainings, Coursera courses, conferences	teaching practices, materials and ideas, protocols	1. creator of resources and professional development

Table 2
Codebook of Codes Relevant for this Article

Code	Definition	Example Excerpts
Engage a Variety of Roles within Systems	Statements about how participants provide particular learning opportunities to individuals based on and tailored to their roles within education and their system.	“We've kind of thought about, like, who's the key person? So if we make a podcast ... one of the things we're thinking about is like, there's somebody who's running a [improvement] network ... And we want ... that person to know that we made something and we want them to assign our homework to their convening. ... there's these specific people, and we're trying to make stuff that they'll want to spread.”
Foster Community and Partnerships With and Among Practitioners and Policymakers	Statements about how participants foster a community and/or build trusting partnerships with their audiences.	“...you know, this, someone recently said, like, <i>this is the space where I can let my hair down</i> , or <i>these are people that get it</i> . So kind of a sense of belonging. Something's working.”
Support Practitioners' and Policymakers' Agency and Efficacy	Statements about the importance of individuals' agency to change their own practices or encourage wider organizational change. This code also includes statements about empowering audiences to be active participants vs. compliant with policies.	“It's up to them [teachers] whether they want to use any of the resources, but it would just be nice if we knew they knew they were there. And then choose not to or choose to or not.”
Create a Wider Culture of Support beyond the Systems' Boundaries	Statements about how participants engage people who are only tangentially related to their audience, but can create a supportive environment to establish their work better.	“...So we also realize parents need to be educated about this, so that they're not saying no, no, my child has to be in... And then we discovered that college school counselors are the real blocking point. ... they're not educators, they're much less knowledgeable than high school teachers. And they tell kids, you have to take So we have to think about how do we get to all these different audiences?”

Notes. These codes are child codes of the code *capacity building*, which in turn is a child code of the code *organizational goals*.