The Middle Tier's Role in Education Improvement: Insights from Social Network and Bureaucratic Norms Research

Introduction

Foundational learning levels have stagnated since 2015, with nearly 70% of children in low-and middle-income countries (LMICs) unable to read a simple text with comprehension by age 10.[1] Global school disruptions and closures due to the COVID-19 pandemic, conflict, and climate-related events have exacerbated the urgency for education systems around the world to ensure that all children receive a quality education. To address this learning crisis, education scholars and practitioners have recently been paying increasing attention to the role played by the middle tier in effective policy implementation and instructional support for teachers.[2] The middle tier comprises subnational actors and structures in charge of education delivery situated between the school and the national ministry of education (e.g., regional, district, and cluster- or circuit-level staff). This literature review explores recent scholarship on this issue, pointing to how staff in the middle tier can play an effective policy mediation and feedback role between the school and the broader education system.

SYSTEM-STRENGTHENING FRAMEWORKS TO IMPROVE LEARNING OUTCOMES

There is significant interest within education development discourse on how governments, donors, and practitioners can best strengthen education systems for improved foundational learning outcomes for all. Most perspectives agree on the need to improve system prioritization, alignment, monitoring, and government engagement. But there are differences in how these perspectives understand these system features and how they should be improved.

One prominent understanding of system improvement draws on economics: principal-agent theory. It argues that to improve education system performance, the system should improve alignment and tighten formal accountability relationships. For example, in his study of successful education systems in Sobral (Brazil) and Puebla (Mexico), Crouch found that centralization and "tight management" result in more aligned, efficiently rolled out pedagogical training, instructional materials, monitoring, and coaching practices.[3] In a similar vein, the RISE 5x4 education systems framework (see Figure 1) outlines four key principal-agent relationships in education systems.[4] It advocates for improved alignment across five relationship dimensions: delegation, financial, information, support, and motivation. By diagnosing the misalignments in these relationship dimensions (or across relationships), the framework aims to help policy makers identify improved rules, incentives, training, and resources to address them.[5] This perspective also relates to what Honig calls "Route X" and Williams et al. call "Pathway A" (accountability and incentives).[6] With its focus on setting rules, targets, incentives, and rewards for performance, this perspective dominates reform efforts to improve public sector performance.[7] One common policy response that reflects this perspective is individual performance contracts—which outline quantitative performance targets aligned with national goals—that hold education system leaders at different levels accountable through rewards and sanctions for performance.[8] Other systems improvements include better routine data collection and use, streamlining roles

and reporting relationships, and ensuring that elements of a new policy (e.g., regulations, guidebooks, training, budgets, and monitoring) are mutually reinforcing and in alignment.

**Figure 1. The 5x4 RISE education systems framework**

Principal-agent relationships				
Five features of each relationship of accountability (Principal [P] to Agent [AI])	**Politics:** Citizens and the highest executive, legislative, and fiduciary authorities of the state	**Compact:** Highest executive, legislative, and fiduciary authorities of the state to education authority	**Management:** Education authorities and frontline providers (schools, school leaders, and teachers)	**Voice & choice:** Service recipients (parents/ children) and providers of service (schools, school leaders, teachers)
Delegation: What the principal wants the agent to do				
Finance: The resources the principal has allocated to the agent to achieve assigned task				
Information: How the principal assesses the agent's performance				
Support: Preparation and assistance that the principal provides to the agent to complete the task			e.g., Teacher training as part of new curriculum or pedagogical approach	
Motivation: How the principal motivates the agent, including the ways in which agent's welfare is contingent on their performance against objectives				
Performance of agent is the endogenous, or organic, outcome of the interactions between the actors in the system. The interaction between the actors in the system are characterized by the design elements of the relationships. Systems deliver learning when strong relationships of accountability align across design elements around learning objectives				

Source: J. Silberstein and M. Spivack, "Applying Systems Thinking to Education: Using the RISE Systems Framework to Diagnose Education Systems," RISE Insight Series (January 27, 2023) https://doi.org/10.35489/BSG-RISE-RI_2023/051.

Other systems improvement frameworks acknowledge the importance of alignment, role clarity, and appropriate resourcing, motivation, and support. However, they reflect a vision for system improvement that emphasizes a focus on educational outcomes from an organizational learning perspective. For example, the Learning at Scale system framework focuses on how education systems can achieve foundational learning at scale (see Figure 2). Based on an evaluation of eight foundational learning programs in South Asia and sub-Saharan Africa, it points to success factors for systems improvement in three nested levels: instructional practice (classroom), instructional support (middle tier), and system support (national). Focusing on the middle tier's role in improving instruction in LMIC education systems, Tournier et al. emphasize five components of district practice: providing support for school and teaching improvement; promoting professional collaboration within and across schools; brokering knowledge to promote the use of evidence; providing local instructional direction and system alignment; and testing innovations and scaling up promising practices.[9] These perspectives align with prominent education research on effective district practices in high-income countries (HICs),[10] as well as "Pathway B" (problem-solving and organizational learning) approaches in the study of service delivery.[11] Such perspectives include many of the same management components as the RISE framework, underscoring the importance of efficient organizational management for high-performing education systems. However, they delve deeper into the instructional and leadership practices and supports that the system, middle tier, and teachers can provide to improve the quality of education.

Figure 2. Learning at Scale system components for improving teaching and learning

Source: https://learningatscale.net/findings/
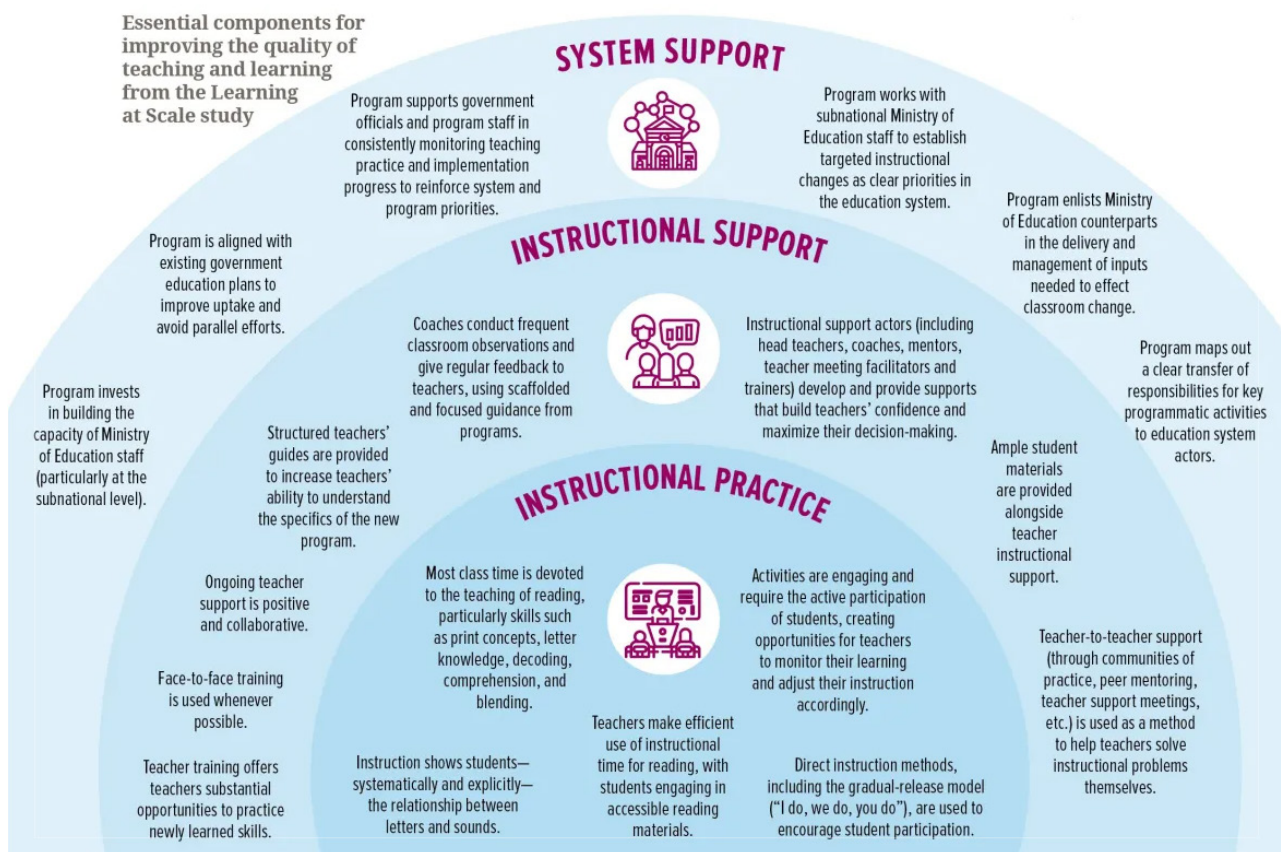
Building on these systems perspectives, this literature review presents insights from two research areas that can provide an enhanced understanding of how the education system's middle tier can support foundational learning improvement in LMICs. The first is **social capital and social network analysis**.[12] Although research using social network analysis in LMIC education contexts is still rare, evidence from social network studies of districts and school networks in HICs, combined with broader research on effective district practices in LMICs, indicates that a social network lens may be valuable for improving education policy implementation and supporting sustainable change in instructional practice. Second, the **bureaucratic norms** literature emphasizes the norms, roles, and pressures that shape the beliefs and actions of middle-tier and school staff as frontline professionals and public servants.[13] In seeing middle-tier and school staff as public officials, it focuses on how bureaucratic structures and informal rules of the game (norms) shape these actors' beliefs and behavior. It has insight on management and policy implementation strategies that may be more effective for complex tasks, such as improving instructional practices. Both areas of literature shed light on the process of policy implementation in schools. For example, they help explain why agents (such as school staff) do or do not make use of new information or financial and human resources or why they do or do not respond to incentives in the ways intended by the principal(s) in the relevant principal-agent relationships.

Bureaucratic norms research and social network analysis both emphasize the importance of *relationships* between actors in a network. They both also examine how bureaucratic structures shape relationships and how communication occurs through formal and informal channels alike. Taken together, these two research streams bring unique insights into how bureaucratic actors within the education system interact with one another and how resources—such as information, advice, and innovation—flow among people. As we will see, bringing these two bodies of literature together yields interesting perspectives on system improvement, policy implementation, and middle-tier capacity building. In general, these bodies of literature both see improving foundational learning

outcomes in LMICs as impossible to achieve with purely technical solutions (e.g., contracts, new pedagogies). As Childress et al. summarize in their review of middle-tier reforms:

> *reforms often fail because they pay too much attention to "technical" solutions, without building the wider human capacity which ensures that change embeds and endures—such as mindset shifts, culture change or political buy-in … —which in turn support the changes in practices and behaviours that lead to improved teaching and learning.*[14]

Indeed, social network analysis and bureaucratic norms research argue that sustainable change in practice likely requires deep and sustained engagement and problem-solving among stakeholders. These two bodies of literature have promise in providing insight into middle-tier leadership for foundational learning.

This literature review is organized as follows. After a brief discussion of the research questions and method, it presents a rapid assessment of the evidence from these two bodies of literature on middle-tier support for improving foundational learning in LMICs. Next, it presents thematic insights on three main areas: how information, knowledge, and advice flow through district and school networks; the role of school-facing district staff as knowledge brokers and boundary spanners; and pathways for improving problem-solving around vexing system challenges of implementing complex tasks (such as improving foundational learning) and fostering behavior change and organizational learning. The review concludes with a look at the gaps and limitations of social network analysis and bureaucratic norms research, as well as some reflections for future research and practice.

Research Questions and Scope

Taking as a starting point current understandings of system strengthening for improved foundational learning, this literature review focuses on the insights from social network analysis and bureaucratic norms regarding the role of the middle tier. It responds to two overarching research questions:

· How do **bureaucratic norms and structures** interact with social networks, social capital, and informal influence processes to inhibit or advance improvements in learning outcomes?

· What does the literature on **social capital and social networks** tell us about current and potential mechanisms in the middle tier to improve leadership for foundational learning?

The key concepts from these research questions are defined in Table 1.

Table 1. Definitions of key concepts from the research questions

Concept	Definition
Middle tier	"The subnational actors in charge of education delivery at the regional, provincial, state, district, municipality, city, or circuit and cluster levels within education systems in developing countries."[15]
Bureaucratic norms	"Conceived as the informal rules of the game, bureaucratic norms instruct public officials on how to interpret their policy mandates and the actions deemed appropriate in fulfilling them. Bureaucratic norms also influence how officials interact with individuals and groups in society, conditioning citizen expectations and collective action around public services."[16]
Bureaucratic structure	This is understood to include a bureaucratic hierarchy (levels of administration, reporting lines), institutions, bureaucrat roles, responsibilities, and resources. It emphasizes *formal* authority within the bureaucratic system (supervisors/formal leaders, mandates, official flows of information).[17]
Social capital	"The resources embedded in social relations and social structure which can be mobilized when an actor wishes to increase the likelihood of success in purposive action."[18]
Social network theory	"Social network theory is concerned with the pattern of social ties that exists between actors in a social network."[19] "Social network studies in education … primarily focus on how the constellation of relationships in networks may facilitate and constrain the flow of 'relational resources' (attitudes, beliefs, knowledge, materials, and so on), as well as providing insight into how individuals gain access to, are influenced by, and leverage these resources."[20]

Scope

Middle tier: While the middle tier encompasses a range of subnational administrative levels, the literature selected for this study focused on those levels closest to the classroom: the district, cluster, and circuit levels of the middle tier. It did not include research on the regional, provincial, or state levels.[21]

Learning outcomes: The review endeavored to include research on foundational learning (per the research question). However, such research is limited. Many of the studies and articles included in the review did not explicitly measure or focus on the impact on learning outcomes. For example, many quantitative studies in the literature on social networks measured intermediary outcomes related to organizational change and effective pedagogical practice, such as trust, teacher collective efficacy, and innovative climate. Qualitative studies tended to focus on effective district practices and school actor perceptions of support.

Review Method and Analysis

Forty academic and gray literature articles and books were reviewed in depth for this literature review. Initial literature selection was conducted by experts from the Science of Teaching middle-tier research team and expert reference group. More references were subsequently added to the initial bibliography based on review by academics specialized in district education offices in LMICs. It is important to note that the references reviewed in this paper do not represent an exhaustive list of all relevant studies on social network analysis and bureaucratic norms.

The initial literature analysis was conducted with a Microsoft Excel-based literature review matrix between March and May 2024 (see Appendix A). The matrix contained 20 topics or themes for each reference reviewed. These included both descriptive data (e.g., year, focus countries, research design) and narrative summaries of paper findings related to each research question. Visuals, such as conceptual frameworks and tables, were also collected from each study. Next, cross-cutting themes were identified by analyzing the findings narratives from the matrix across references. Lastly, a narrative outline with thematic findings was prepared for the Science of Teaching team and expert reference group, who gave further direction for the framing and findings.

EVIDENCE REVIEW

This review covered 40 references: a mix of academic articles, gray literature, and major donor program reports. Overall, there is little empirical research that directly answers the second research question (how social network analysis can help us understand the middle tier's role in leadership for foundational learning in LMICs). Few studies can articulate "current mechanisms" using social network analysis to improve middle-tier leadership for foundational learning. Nonetheless, there is a robust literature on social network analysis in education in HICs that can indicate *potential* mechanisms. Such studies include social network and bureaucratic norms research that looks at school-level actors (not the middle tier), which can be suggestive of how districts could improve leadership for foundational learning. Other research related to, but outside, these two bodies of literature can also be suggestive of potential mechanisms for district leadership for learning. This includes reviewed studies on effective districts in HICs and district case studies and interventions in LMICs.

Strength of evidence

A rapid assessment of the strength of evidence was undertaken. Using the literature review matrix, this assessment considered the robustness of the quantitative or qualitative research design, study scope and relevance of sampling and analysis to districts in LMICs, and other design limitations. Table 2 shows that few studies present strong, direct empirical evidence on social networks/social capital in the middle tier in LMICs. Indeed, most studies provide emerging, promising evidence on improving the middle tier's role in improving foundational learning outcomes in LMICs.

Table 2. Literature reviewed, by strength of evidence on middle-tier support for foundational learning in LMICs

Strength of evidence	Working definition	References reviewed (#)
Strong	Robust methods *and* undertaken in an LMIC context on districts; not always directly using social network analysis or bureaucratic norms, but highly relevant	9 references
Emerging	Some but not all of the following: robust methods (including social network analysis), undertaken in an LMIC context, focused on districts	20 references
Weak or emerging	Undertaken in an LMIC context, relevant to districts but methods less robust	1 reference
Non-empirical	Conceptual or theoretical literature	10 references

Overall, there are clear gaps in social network analysis regarding middle-tier roles in LMICs. While bureaucratic norms research is more common than social network analysis in LMIC contexts, many bureaucratic norms studies do not explicitly focus on the education system and the middle tier, given their public administration and political science underpinning.

Nonetheless, the review found that both bodies of research offer important insights for current understandings of effective education system improvement for foundational learning. As discussed below, these promising studies and potential mechanisms provide invaluable perspectives on policy implementation and organizational change.

Findings

SOCIAL NETWORK AND BUREAUCRATIC NORMS PERSPECTIVES ON EDUCATION SYSTEM IMPROVEMENT

This section begins by providing an overview of these two bodies of research and then highlights their unique contributions to current understandings of the middle tier's role in improving foundational learning.

Social network literature in education

Social network analysis focuses on the pattern of social ties (interactions) that exist between actors in a social network. It tells us how the "underlying social structure determines the type, access and flow of resources to actors across the network."[22] According to this understanding, resources are relational—they constitute specific information, knowledge, or attitudes shared between two actors. Social network analysis has been applied to many sectors outside education.[23] It provides a framework to understand how information flows between people in a district and its schools. It focuses on how fostering social ties can improve the flow of information and other relational resources in district and school networks, which is crucial for effective policy implementation and sustainable organizational change. Social network theory has a specialized vocabulary derived from network analysis and social capital theory. Table 3 presents working definitions of these concepts as a reference for the thematic analysis below.

Table 3. Key concepts in social network analysis

Key concept	Definition
Networks	Patterns of relationships (ties) between actors. Networks are defined by the type of resources that flow between actors (e.g., advice network). Social structures determine the type, access, and flow of resources to actors in the network.[24]
Interactions	Individual events in or facilitated by a social relationship.[25]
Ties	Interactions, social relations, or flows of resources among actors in a network. Ties can be strong or weak, and positive or toxic. Ties can also be one-way or reciprocal.[26]
Resources	The content that is exchanged between actors or that flows through social ties. The type of resources flowing between actors defines the type of network. Examples are information exchange, knowledge transfer, innovation, and advice networks.[27]
Position	An actor's location in the social structure, which affects access to resources and outcomes for the actor and the larger network. Position can enhance or constrain the actor's resources. An actor's position (central or peripheral) may or may not align with their formal role.[28]
Density	A measure of the number of ties within a network compared to the total possible number of ties. Dense networks have increased levels of communication for the exchange of information, leading to shared norms, trust, and greater stability over time.[29]
Centrality	The number of direct and indirect ties that an individual has—i.e., indirect links with people who are connected with each other, or "friends of friends." High centrality means that an actor has more resources and more influence, allowing them to guide, control, and broker the flow of resources within the group. They can have higher status, power, and influence but, on the other hand, be burdened with too many relationships to maintain.[30]
Betweenness	The ability to connect two otherwise disconnected actors. Related to boundary spanner. Actors with positions of high betweenness have important roles and power, as they have a coordinating position.[31]

Overall, this body of work offers several unique contributions to the study of middle-tier leadership for foundational learning:

- It emphasizes the *relational* and *social* dimensions of policy implementation and organizational change.

- It can shed light on the quantity, quality, and pattern of information/advice flows through district and school networks. It quantifies and visualizes complex networks of resource flows that are crucial to processes such as organizational learning. Its insights can help improve policy implementation and contribute to the design of better staffing policies, training, and professional collaboration.[32]

    » For example, the Learning at Scale report identifies numerous essential system components that relate to district-school relationships. Social network analysis insights can inform efforts to design effective teacher-to-teacher supports (e.g., communities of practice, peer mentoring, informal teacher information exchange). It also can identify how instructional support actors can play a more effective role in supporting teachers' classroom practices and decision-making.

- It provides a useful perspective on district and school leaders and how they influence policy implementation and teacher sense-making. For example, social network theory helps identify actors with formal and informal influence on important information flows (policy advice, etc.) related to change processes such as pedagogical reforms.[33] The relational position of these influential actors can then be leveraged to build a shared understanding of such processes.

- It helps us understand how district staff can have a supportive or constraining role on how schools receive, process, and make sense of new practices and policies. The district offices act as *boundary spanners* between the district and school: they buffer, broker, filter, and repackage information and other resources for schools.[34]

Bureaucratic norms literature in education

Bureaucratic norms are defined as "the informal rules of the game … [that] instruct public officials on how to interpret their policy mandates and the actions deemed appropriate in fulfilling them."[35] This literature focuses

on the unique roles, norms, and expectations of public servants in making and implementing policy. Some of its unique contributions to the study of district leadership for foundational learning are as follows:

- It shifts our understanding of middle-tier and school staff from "principals" and "agents" toward an appreciation of the unique identities, expectations, and motivations of these staff as public service professionals working at different proximities to the front line. The literature provides insights into suitable management approaches and policy implementation designs that would empower these staff to implement policy adapted to local contexts.

- It makes visible the informal norms guiding district and school actor work. To sustainably change practice, understanding the informal rules and ethos of these staff is essential. For example, a district may have a norm to discuss district plans informally with community leaders to improve buy-in.

- It views the competing expectations faced by district and school staff as inherent to their role. Instead of trying to eliminate misalignments or competing pressures, the literature studies ways that district and school staff can navigate, manage, and cope with these pressures to deliver quality services.

- It sheds light on the different roles within the middle tier. District studies in HICs often speak about the district in the aggregate[36] rather than distinguishing between different functional roles within these offices.[37] As a result, the daily practices, hierarchy, and roles within the district are often invisible, which "obscure[s] what central office administrators within such organizations may actually be doing daily to foster (or frustrate) high-quality teaching and learning."[38]

Taken together, these two bodies of literature offer important insights on the role that the middle tier can play in leadership for foundational learning. These insights are unpacked in the three themes below.

THEME 1: UNDERSTANDING HOW KNOWLEDGE, ADVICE, AND INFORMATION FLOW THROUGH DISTRICT AND SCHOOL NETWORKS

A. A social network perspective highlights the role of formal and informal communication, information flows, and distributed leadership in policy implementation and organizational change.

Functional-structural views of district and schools tend to focus on the formal roles and responsibilities of staff. For example, in typical policy implementation cascade trainings, supervisors at each level train their supervisees down the education delivery chain. However, a key insight of social network analysis is that information exchange and learning does not happen solely in structured training sessions, nor solely between supervisors and supervisees. Rather, knowledge, ideas, and attitudes often flow outside formal structured meetings, and influential network leaders may not always be those with formal roles. Social network theory argues that leadership influence is not just about formal authority or technical expertise but also about the "constellation of social relationships surrounding that leader."[39] Therefore, an advantage of social network analysis is that it measures the flow of information, advice, and other resources across both formal and informal relationships, allowing us to better understand how information is shared across district and school communities and to identify formal and informal influencers.

In HIC contexts, distributed leadership and social network analysis have pointed to the importance of looking beyond the formal hierarchy to understand organizational learning and policy implementation processes.[40] One study in the United States found that much of teacher learning on instructional support approaches occurs in informal settings and not along hierarchical lines. Indeed, few respondents reported interactions taking place during formal organizational routines (e.g., grade-level meetings, school improvement planning processes).[41] This finding was echoed in a social network analysis undertaken among 940 ward and school staff in Tanzania.[42] As Figure 3 details, most teachers reported exchanging information outside formal communities of learning, and about a third reported doing so off school grounds (e.g., during the commute or in the community, such as at the market). Moreover, three-quarters of all interactions were judged "very helpful" by respondents. In her study of effective districts in South Africa, Mthembu notes that successful districts tend to adopt both formal (e.g., circulars) and informal (e.g., WhatsApp groups) lines of communication to share information with schools.[43]

Figure 3. Contexts in which Tanzanian teachers exchange information about formative assessment
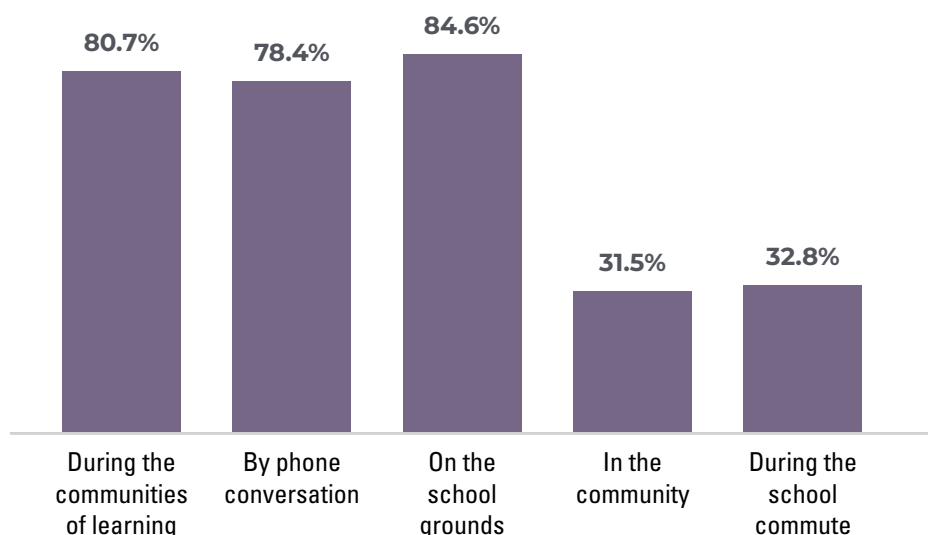
Note: Percentages are out of total respondent-contact links across all wards (n = 940).

Source: E. Randolph, S. J. King, T. Slade, et al., How Teacher Social Networks Might Be Leveraged to Enhance Diffusion and Implementation of New Pedagogies (Research Triangle Park: RTI International, 2023), p. 5.

Social network analysis finds that policy implementation focusing on formal roles may obscure the informal leaders who occupy influential positions in district and school networks. Daly et al. found wide variation in the extent to which superintendents, who have a formal knowledge-broker role in data-use reforms, actually occupy positions of high betweenness in their networks.[44] Of the top brokers in their analysis, only four out of nineteen were superintendents, with other top brokers being principals and district staff not formally responsible for advice on data use in the reform at hand. In another study of school networks, advice networks in Quebec also did not align along formal roles. When school staff were asked "With whom do you share a close relationship at work?," it was highly experienced teachers, rather than school leaders or designated subject teachers, who had the highest levels of centrality.[45] Informal leaders also emerged as influential in the social network analysis in Tanzania, which notes that head teachers and formally designated exemplary teachers are not always top network influencers: other teachers are often more central.[46]

Distributed leadership is often studied in social network analysis because it embodies the idea that staff outside the formal hierarchy can occupy leadership positions. According to one study of five districts in the United States, formal and informal leaders play a crucial role in co-constructing data-driven decision-making practices.[47] Distributed leadership is also key to making practices relevant to different staff, who are encouraged to utilize their skills and expertise in data use. Research in the United States and Canada has found a positive association between distributed leadership and teachers' sense of collective efficacy.[48] In Rwanda, distributed—rather than directive—leadership has also been found more effective for high-performing teacher communities of practice.[49]

These findings suggest that systems perspectives on policy implementation should consider the role of both formal and informal routines and processes for information and knowledge sharing by district and school staff. They also indicate that there are likely informal leaders who occupy strategic network positions who can be identified and supported to share policy information and feedback across the network.

B. **District and school leaders can shape the content and quality of ties, thereby building trust, support, and alignment for collaborative work between districts and schools.**

The social network literature finds that while the number and type of ties in a network are important for organizational change and improvement, it is also important to identify the content and nature of existing social ties, as well as their alignment with the intended reform. In other words, social network analysis is not just about mapping where information is shared between actors but also about determining what information is shared and how. For example, though information and advice on a new pedagogical practice may flow efficiently through district and

school networks, the information shared may be wrong, or the advice distrusting of the new policy.[50] The nature (positive or negative) and quality of social ties matter.

Most social network analysis research in education has focused on the role of prosocial or neutral resource flow between actors in a network. Few studies in the field have measured the flow of negative ties between actors. Negative resources can include difficult relationships, task conflicts, avoidance, gossip, harm, and dislike.[51] One of these studies—an exploratory study by Daly et. al—looked at the pattern of difficult relationship ties between actors in a low-performing US district.[52] It explored the association between difficult working relationships, trust, efficacy, innovative climate, and individual and dyadic demographics related to work level, experience, and gender. The authors found that leaders reporting low levels of trust are also more likely to perceive difficult relationships with other leaders. Other results were somewhat surprising, with many expected relationships not supported by the data. Overall, there is a need for more research in this area, as understanding the role that negative ties play in shaping actor openness to change, collaboration, and support is likely crucial to efforts to strengthen system contributions to improving foundational learning.[53]

Relational trust draws on social capital theory and is often included in social network analysis as a complementary measure. Relational trust "views the social exchanges of schooling as organized around a distinct set of role relationships" (e.g., teachers with the school principal).[54] Relational trust is therefore role specific, and it has four components: *respect, personal regard for others, competence,* and *integrity*. As Daly writes, trust may be crucial to sustained changes in district and school practice: "mutual trust may prove to be the glue needed to hold together the district and school practices that involve using data to improve instruction and achievement."[55]

Why does trust—particularly relational trust—matter for the implementation of complex reforms to improve foundational learning? Research in the US context has found that high levels of trust are associated with risk taking in education organizations—namely, raising challenges, seeking support and feedback, and trying new things.[56] Trust and related indicators, such as collective teacher efficacy, are positively associated with a range of behaviors and attitudes conducive to collaboration (risk-tolerant climates), organizational learning (problem-solving), and collective action (joint collaborative work).[57]

Social network analysts have measured actor trust and social networks, finding that perceptions of trusting relationships between district office staff and superintendents predict the number of *reciprocal ties* within a network.[58] Reciprocal ties are those interactions where resources flow both ways (i.e., advice is both given and received between two actors).

Network density—which refers to the number of ties compared to the total possible in a network—also matters for building shared values. According to one study, the more integrated school staff are within their network, the more likely they are to build shared norms and have faster, more thorough knowledge sharing and exchange within the school network.[59] In scholarship on effective districts, high-performing district-school relationships are similarly often characterized by two-way relationships and a sense of closeness:

> *Communication in high-performing districts is fostered by a perception of "flatness" in the district. Principals and teachers feel socially and organisationally close to those working in the central office, a perception that encourages fluid horizontal and vertical communication. Shared beliefs, values, and purpose are both stimulants for, and the result of, such communication.[60]*

Social network research on the flow of resources through networks has focused largely on positive ties (and therefore prosocial shared values and norms), while the relationship between network density and negative ties (e.g., resistance, avoidance) is less studied.[61]

The bureaucratic norms literature also highlights the importance of trust and shared norms in improving collaboration and policy implementation. Indeed, Mangla's study of primary education in Indian states points to the power of shared norms in shaping education officials' attitude toward school improvement: "bureaucratic norms bind officials to a common purpose. They provide a shared grammar to make sense of policy mandates and negotiate conflicts on the job, eliciting commitment to collective goals."[62] Furthermore, Honig argues that an incentives-heavy, compliance-oriented management approach to improving performance in complex reforms such as improving learning

outcomes may not always be effective.[63] How public officials are managed matters. Openness, trust, and shared vision are essential for empowering public officials to implement reforms (see Theme 3C):

> *changes in management practice like introducing greater managerial support and feedback, providing more autonomy, promoting a climate with greater trust and psychological safety, or simply encouraging a sense of mission can be useful in transforming education systems for the better.[64]*

Overall, the findings from social network analysis and the bureaucratic norms literature point to the critical role that district and school leaders can play in *shaping the content of social ties:* fostering a district and school climate that encourages collaboration, trust, and shared norms.[65] As described above, school-facing district staff tend to have both a control and support role, and the former may undermine the relationships that these staff build with teachers. In Tanzania, a social network analysis of schools found that when school leaders display more caring, supportive leadership styles, they have more ties and a higher degree of centrality (influence).[66] A study of effective instructional leadership practices in South Africa emphasized a strong social relationship with school staff, including sharing a district vision and goals (alignment), and role modeling and close supervision.[67] Mutual trust between district and school staff is crucial. The Learning at Scale evaluation of eight programs in South Asia and sub-Saharan Africa found that foundational literacy coaching for teachers is effective if implemented in a way that is more supportive, friendly, and focused on pedagogical improvement over compliance.[68] By contrast, as shown by a study in Ghana, a compliance-oriented management approach may undermine trust within district offices.[69]

Taken together, the literature reviewed in this section offers insight into how formal principal-agent relationships (information flow, management authority, and access to resources) are shaped by informal relationships and the broader normative environment, including social relationships of trust and shared norms. These findings also resonate with the Learning at Scale framework's emphasis on creating a positive and conducive environment for teachers to learn, collaborate, and try new things. The findings emphasize the need to build an environment conducive to mutual trust and openness between the district and school, in part through building reciprocal ties and improving network density. Importantly, these relate to the framework's system components of *ensuring positive and collaborative teacher support, classroom monitoring with regular feedback*, *instructional support, building teachers' confidence and decision-making,* and *supporting teacher-to-teacher communities of practice and mentoring*.

THEME 2: REALIZING THE POTENTIAL OF DISTRICT AND SCHOOL LEADERS AS KNOWLEDGE BROKERS AND BOUNDARY SPANNERS FOR TEACHERS

A. District staff and school principals can be "knowledge brokers" in social networks. They can introduce new ideas and translate policies for schools facing competing policies, regulations, and expectations. On the other hand, leaders holding this powerful position can also constrain innovation in schools.

District and school leaders, given their role in the system, can be knowledge brokers. In other words, they occupy a position in the network that gives them more access (ties) to different groups than others typically have. Social network theory posits that knowledge brokers have high levels of "betweenness": they can control the flow of knowledge and information across actors in a network or between networks (as boundary spanners).[70]

As knowledge brokers, district and school leaders can support school actors in numerous ways. First, these actors can shape, restrict, and curate the amount of information that teachers receive. District leaders can "translate" policy directives from the top to the school level.[71] In this way, they can facilitate coherence by protecting the instructional core from conflicting expectations or policies. Second, high betweenness means that these staff are in a unique position to connect teachers to knowledge from outside networks.[72] District staff can then facilitate the flow of novel information from other networks to schools.[73]

At the same time, however, high levels of betweenness by district and school leaders may overly constrain the flow of information and knowledge, hindering important processes related to organizational change. In a large study by Moolenaar et al. of 51 primary schools in one district in the Netherlands, teachers in schools where the school leader had a high level of betweenness were less likely to perceive their school as oriented toward innovation.[74] They argue

that school leaders in such network positions may disproportionately mediate and control new ideas and practice, constraining teachers' willingness to try new things, be creative, and undertake continuous improvement. Rather, innovative climate tends to be higher in schools where the leader exercises transformational leadership, which they define as "a leader's ability to increase organizational members' commitment, capacity, and engagement in meeting goals."[75] The authors found that principals' centrality matters for organizational change: "the more principals were sought for professional and personal advice, and the more closely connected they were to their teachers, the more willing teachers were to invest in change and the creation of new knowledge and practices."[76]

Therefore, social network analysis and the district literature have identified the paradoxical role of district staff as knowledge brokers. This powerful network position allows district leaders to facilitate alignment, translate policies to local contexts, and introduce novel ideas. However, it can also lead them to become gatekeepers, possibly restraining the flow of relational resources and innovative practices.

B. School-facing district staff (e.g., circuit managers) are boundary spanners with typically high levels of "betweenness." Their potential for knowledge brokering and leadership for foundational learning is constrained. They are generally under-resourced, unsupported, and overloaded with conflicting mandates.

Much of the literature on district education offices in LMICs focuses on the role of the school-facing district staff, variously called, among other things, circuit managers, ward offices, or school improvement support officers. These staff typically have multiple roles. This includes compliance monitoring of school and curriculum standards, dissemination of regulations and procedures to schools, curriculum and new policy training, classroom observation, administrative data collection, fielding ad hoc issues and requests from school staff, and supporting school routines such as school plans, capitation grants, and school management committees. Other important school-facing staff in the district office are instructional coaches (subject advisors) and other specialists who conduct school visits.

From a social network perspective, these school-facing staff (like school leaders, discussed above) are highly important as knowledge brokers and boundary spanners. As described in the previous section, boundary spanners are intermediaries who broker access to information and ties to the district and other schools. They have high levels of "betweenness" and can play an instrumental role in resource flows between otherwise disconnected actors in the district office or in other schools.

School-facing staff in LMICs: Limited budget and large, competing mandates

Research on school-facing staff in many district offices in LMICs indicates that this consequential network position is not fully benefiting schools and districts. Many circuit managers are under-resourced and unsupported, meaning that their betweenness becomes a *bottleneck* for the flow of information and advice between districts and schools. In South Africa, Bantwini et al. argue that the circuit manager is the "weakest link in the school district leadership chain," as they are responsible for an overly large number of schools but lack circuit office space, reliable vehicles, printers, and other basic operational necessities.[77] Fuel is a crucial bottleneck for school-facing staff because they face long travel times to schools and poor road conditions. In Ghana, school improvement support officers often pay out of pocket for the fuel needed to visit schools, and fuel constraints can lead to infrequent, short school visits.[78] In Tanzania, only half of ward education officers have a budget for vehicle maintenance and only a quarter have a fuel budget for travel to schools.[79] Less than one in ten ward education officers have access to a computer. Overall, district offices in LMICs are often understaffed, and school-facing staff are constrained in their ability to visit schools and work on quality improvements. The chronic under-resourcing of school-facing district staff roles in LMICs represents a *finance* misalignment in the relationship between national education authorities and frontline providers.[80]

In addition to funding shortages, school-facing staff in district offices tend to have unclear, overloaded mandates that undermine their relationships with school actors. In their review of the middle tier in LMICs, Childress et al. find that district roles are poorly designed, with unclear mandates and confused lines of accountability.[81] Moreover, district staff are often recruited because of their seniority level, not their leadership or instructional skills. Those who are hired typically do not receive training for their new role (e.g., a school leader hired to be a district pedagogical advisor), nor do existing district staff tend to receive regular in-service training. For example, circuit managers in South Africa have been shown to have unclear roles, which constrains their effectiveness.[82] In Ghana, there have

been notable efforts to realign the school-facing officer's role from supervision (as circuit supervisor) toward school and instructional support (school improvement support officer). However, school improvement support officers are expected to continue their previous administrative duties (facilities monitoring, logbook and attendance checks, administrative data collection), which limits the time and attention available for their new support functions.[83] In Tanzania, ward education officers largely consider it impossible to complete all the tasks assigned, given the different expectations they face from supervisors and stakeholders.[84] Tanzania's subnational education structure is complex: education is overseen by the Ministry of Local Government, but subnational staff from the Ministry of Education, Science and Technology also assert important technical roles.[85] This bureaucratic structure leads to bottlenecks in the flow of school inspection information through the ward and district education systems.[86] For example, as noted by one study, ward education officers prepare reports on school issues, but only 70% share them with district education officers, and only about half of ward officers believe that these reports are read and acted on.[87] Given these unclear, overstuffed mandates, the support activities of school-facing staff (e.g., classroom observations) may be pushed aside in favor of control-type activities, which are less complex and respond to demands from the bureaucratic hierarchy.[88] These are, in part, "coping mechanisms" that staff adopt to manage competing expectations with scarce resources (see the street-level bureaucrats discussion in subsection C).

From a social network perspective, such complex bureaucratic structures can result in coordination challenges between actors that inhibit flows of relational resources (knowledge, information, advice, attitudes). Indeed, an intervention to address information and coordination challenges faced by subnational education actors in Tanzania had positive results for student learning and teaching practice. In the experiment, a random subset of school inspection reports of 10–15 pages from ward education officers was summarized into a small set of actionable recommendations and sent by text message to supervisors to follow up with schools. Especially in regions where another donor program had improved the funding available for school monitoring, these summaries, combined with text message reminders, led to improved teacher practice and student learning outcomes. While the study showed that improving the flow of easily digestible information at the district level could improve effectiveness, the underlying reporting structure did not change, limiting the long-term viability of the intervention.

Realizing the potential of the school-facing district staff role

District literature in the United States also points to the crucial boundary-spanning role played by school-facing district staff. Meredith Honig, a prominent scholar of districts, argues that school-facing district staff must strike a balance between district and school relationships ("connecting without overconnecting").[89] In other words, circuit managers with close connections to the district office become fluent in the norms and language of the district and are thus able to better translate expectations to the school. However, if the circuit manager is too closely identified with the district, this may hinder their legitimacy in the eyes of schools and distance them from strong relations with school actors. Indeed, numerous studies on school-facing staff in LMICs describe an overly administrative, and sometimes adversarial, role between circuit managers and schools.[90]

Daly and Finnegan argue that district staff should create more opportunities for school administrators to build lateral ties across school networks.[91] This includes creating school clusters for knowledge sharing. Many new school principals can be isolated in the network, constraining their access (and by extension, the school's access) to new knowledge, advice, and information. Social network analysis research has found that hierarchical management does not accurately reflect or optimize the flow of information, knowledge, and advice resources in school networks.[92] Overall, the more that subgroups in a network have opportunities to share information and other relational resources, the more likely they are to develop beneficial new information for the whole network. In other words, lateral ties between different groups are crucial to innovation and may increase their *absorptive capacity*, which Daly defines as "a group's ability to assimilate and replicate new information from external sources."[93]

Myende et al.'s case study of district staff practice in deprived districts of South Africa also provides insight into how school-facing staff can leverage their boundary-spanning role to improve conditions for learning in schools.[94] They describe how circuit managers went beyond expectations to identify underlying community-level factors hindering children's regular attendance at school. In response, these managers built strong relationships with other sectors (e.g., police) and with community, political, and traditional leaders outside the system to change practices that had led to school absenteeism. The authors argue that such *relationship-driven leadership* is crucial, especially in contexts where students face multiple deprivations, as no one actor or sector can fully address the barriers to learning. However, they note that South Africa's bureaucratic system, with its administrative focus, does

not reward this intensive investment in external relationship building. This finding underscores the importance of greater discretion for school-facing district staff to be able to adapt their activities to best respond to local needs. It also highlights the importance of informal communication channels between the government and community to identify and solve policy implementation problems.[95]

In the context of Ghana, school improvement support officers also report feeling pulled between a strong control mandate (e.g., logbook and attendance recordkeeping, data collection) and a support mandate (e.g., classroom observations with feedback, teacher coaching).[96] Rafaeli et al. envision an expanded knowledge-broker role for school improvement support officers. They argue that these school-facing district staff should emphasize their support role, and they recommend knowledge-broker practices such as "translating the best international evidence on pedagogy for use in the local context, building the capacity of teachers as researchers, identifying local bright spots, and scaling up the best local innovations," as well as "facilitating professional collaboration between teachers (e.g. communities of practice), connecting innovative and high performing schools with similar schools that can learn from their practice (e.g. statistical neighbours) and providing tools and support (e.g. protocols, structures, guidance) for schools to share knowledge and practice, and solve local problems."[97]

It is important to consider whether school-facing staff have the skill sets to undertake these brokering activities effectively—and if not, how they can be supported in realizing this role. Without adequate levels of training and support, school-facing staff, given their overloaded mandates and competing pressures, may not fully embrace these brokering activities and may instead opt for more compliance-focused or control-type activities to satisfy upward reporting.

School-facing district staff occupy a strategic network position, with typically high levels of betweenness between schools, district staff, and other district stakeholders. This means that school-facing staff can be knowledge brokers or boundary spanners. However, the potential benefits of this role are constrained by chronic under-resourcing, overburdened caseloads, and conflicting control and support mandates.

C.   District staff must balance competing pressures and stakeholders as "street-level managers" of teachers as "street-level bureaucrats."

Within the bureaucratic norms literature, foundational theory by Lipsky argues that teachers are quintessential "street-level bureaucrats": professionals working at the front lines of public service who use discretion to deliver policy amid competing expectations and scarce resources.[98] School principals and school-facing district staff manage teachers and can be considered "street-level managers."

In line with the social network analysis of school-facing district staff as "boundary spanners," Lipsky argues that the work of street-level bureaucrats and managers is inherently multi-level and complex. Teachers—as public servants, as education professionals, and as community-facing staff—face competing expectations and multiple stakeholders. Meanwhile, school leaders and school-facing district staff also have to contend with multiple, competing stakeholders and expectations from the bureaucratic hierarchy, the community, and political actors.[99] This is inherent to public service policy implementation. As Mangla writes:

> *Public service bureaucracies exhibit what Dixit (2012) calls "multidimensional complexity," that is, they are responsible for multiple tasks, have multiple levels of hierarchy and are accountable to multiple principals, including supervisory officials, elected leaders and nongovernmental stakeholders.[100]*

What does this mean for the middle tier's role in leadership for foundational learning? The literature on street-level bureaucrats explains that district and school staff are agents of the state, responsible for delivering policy and services according to established rules, regulations, and policies. But many situations in the application of those rules in local contexts fall outside the rulebook or require discretion in the application of policy. Teachers, school leaders, and district staff (as their managers) must interpret policy. However, district staff and school leaders in LMIC education systems tend to have less formal authority and autonomy than their counterparts in HIC contexts.[101] Using PISA 2015 school questionnaires, Anand et al. found that school leaders in LMICs are less likely than those in HICs to have autonomy over decisions on selecting courses, hiring teachers, setting assessment policy, and deciding budget allocations.[102]

Furthermore, the difficult work of street-level bureaucrats (and managers) is made harder by the fact that they are typically given inadequate resources. As a result, Lipsky theorizes, they adopt coping mechanisms (e.g., shortcuts, simplifications) to fulfill their duties. The literature describes many of the coping mechanisms adopted by circuit managers, such as tickbox-type compliance monitoring and reduced (or nonexistent) classroom observations.[103]

The bureaucratic norms literature reminds us that the competing expectations faced by school-facing district staff, school leaders, and teachers are inherent to their work. While there may be scope to improve role clarity and the alignment of various dimensions of the relationship (e.g., finance, information, support), these staff (as public service professionals working on the front lines of education policy delivery) will always face multiple principals and competing logics guiding their work.[104] What can make the difference is leadership strategies: how district leaders navigate these competing expectations and support schools in managing them.[105] For example, district managers in Bangladesh face competing pressures from the bureaucratic hierarchy and donors to pursue a "development" agenda, against a "patronage" logic held by political and local stakeholders that favors a personalized governance where public resources benefit supporters.[106] Effective administrators tend to adopt a *selective bridging* approach, which uses patronage logic selectively to pursue broader development goals. For example, district staff leverage personal relationships with politicians to fast-track the construction of needed school infrastructure.

In sum, social network analysis and effective district research in LMICs and HICs point to the strategic network position of the middle tier and, in particular, school-facing district staff. Their high levels of betweenness allows them to buffer and protect the school technical core from conflicting expectations. They can play an important role in creating coherence in resource flows between the national system and the school, helping school staff more easily make sense of instructional policies and expectations. Their position also allows them to be knowledge brokers: linking school staff with other school networks, district staff, or external actors who can provide useful information or advice. However, studies of school-facing staff in many LMICs indicate that the potential of this role is constrained by an overcrowded mandate of both administrative control and instructional support responsibilities, a lack of training and support (in particular for their instructional role), and a severe lack of financial resources to conduct frequent, quality school visits. Returning to the RISE 5x4 framework, these issues represent misalignments across several dimensions in the relationship between school-facing officers (as agents) and the principal (district leader). Insights from the street-level bureaucrats and street-level managers literature suggest that the competing expectations and stakeholders faced by middle-tier—and particularly school-facing—staff are an inherent part of their work. This literature reminds us that while there is some scope to align mandates, training, and budgets, the work of the education middle tier and schools is inherently complex. These staff are simultaneously public servants, education professionals, and service delivery officials at the front line who interface with the public and community. They operate in a complex social and organizational normative environment with competing expectations and stakeholders.

These two research streams both point to the fact that school-facing staff in the middle tier are crucial for system improvement for foundational learning. Given the complexity of the environment in which the middle tier works, these studies help explain why typical interventions to build capacity in the middle tier (e.g., creating a new position or training program, introducing new performance contracts) may not have the desired effect. Indeed, district scholars have argued that system change will come not through "tinkering" but through whole-office/district "transformation": seeing how culture change and organizational learning in middle-tier offices can be instilled in operational, instructional, and stakeholder activities.[107]

THEME 3: SOLVING COMPLEX EDUCATIONAL PROBLEMS AND SUSTAINABLE ORGANIZATIONAL LEARNING AND CHANGE

A. Centralized networks are effective at diffusing non-complex knowledge and information, but centralization may impede complex tasks.

Social network analysis across sectors finds that highly centralized networks—in other words, those where ties are concentrated around a few actors—are effective at disbursing non-complex knowledge, such as schedules.[108] However, studies find that network centralization is not ideal for achieving complex tasks, such as high-level communication, improving learning outcomes, and systemic change. This is because complex tasks require greater information processing, the integration of different types of expertise and experiences, coordination, feedback, and adaptation to implement effectively.[109]

This finding runs against the arguments of some systems scholars who, drawing on principal-agent theory, have called for greater centralization and tighter accountability relationships to improve instructional practice.[110] Social network analysis sheds light on why such an approach may have unintended negative consequences for organizational change. Daly and Finnegan, for example, found that low-performing districts sanctioned under high accountability policies to improve learning outcomes have more centralized networks over time, which isolates actors and school networks.[111] School staff operate in "survival mode" as networks gradually become more internally focused. Ties across schools lessen, constraining the flow of new ideas and innovation. In all, accountability policies appear to limit districts' and schools' "absorptive capacity" for new ideas and, ultimately, organizational change.[112]

Echoing this negative association between network centrality and complex tasks, Moolenaar et al.'s study on Dutch schools found that teacher collaboration has a significant positive indirect relationship with grade 6 learning outcomes.[113] They found that more dense school social networks are positively related to a sense of collective efficacy in teachers (which is related to teacher collaboration), but networks with high levels of centrality are not. They suggest that collective efficacy stems more from a high number of interactions across actors rather than from frequent interactions with a central actor.

The findings suggest that to facilitate the implementation of complex district office activities—such as those in the Learning at Scale system framework[114] related to instructional support (conducting classroom observations, teacher training, coaching, and supporting teacher communities of practice)—policy makers and district leaders should aim to reduce the centralization of district and school networks and instead foster increased lateral ties within and across networks. Park and Datnow provide several examples of district efforts to build lateral ties in their study of the implementation of data-driven decision-making in four US districts.[115] They find that effective districts engage in knowledge brokering across schools. These districts allocate space for teachers to collaborate and discuss experiences within schools but also organize "action walks" for multi-school teams to conduct school site visits to see data-driven decision-making in practice within the district. Crucially, effective districts seek to create an environment of learning rather than blame, corroborating the findings described above and in the next section on the deleterious effects of a punitive environment on institutional knowledge and organizational change.[116]

B. High rates of turnover in bureaucracies can negatively impact school networks and the capacity for organizational learning.

Low-performing districts under accountability sanctions may also have high rates of leadership turnover, which has a relational cost to school networks. A four-year study on districts facing sanctions by Daly et al. found major shifts in the number and quality of relationships in social networks over time.[117] High rates of staff attrition in districts were detrimental to their social networks. Further, leaders with high centrality were more likely to leave than leaders more peripheral to the network, disrupting information flows within districts and between districts and schools. By the end of year four, there were few reciprocal relationships or emotional ties. The authors found that due to leadership turnover and the weakening of social networks, new school principals were more isolated than experienced ones, with little information exchange with the newcomers. This study underscores the "relational cost" of leadership turnover in a knowledge- and relationship-intensive sector such as education.

C. Bureaucracies that engage in dialogue, problem-solving, and discretion are a better fit for solving complex problems such as improving learning outcomes.

Bureaucratic norms research has argued that a deliberative, inclusive, problem-solving approach to policy implementation may yield better-quality services. In his study of primary education policy implementation in India, Mangla presents a complexity-based typology of education tasks, many of which are conducted in whole or in part by the middle tier.[118] As shown in Figure 4, non-complex tasks are more codifiable and tangible (e.g., provision of teaching and learning materials and infrastructure), while complex tasks are more relational and non-tangible (e.g., providing instructional support to teachers). To address these complex tasks, Mangla argues, bureaucrats (district and school staff) need time and space to "puzzle" with a wide range of stakeholders.

Figure 4. District activities like monitoring quality and instructional support are highly complex tasks

Complexity	Tasks		Administrative and political challenges
Low			
	• Student enrollment • Providing textbooks and materials • Building school infrastructure and facilities	*Codifiable tasks*	• Identifying out-of-school children • Bottlenecks in delivery of physical ("hard") inputs over a territory • Establishing common systems and procedures
	• School and academic planning • Posting teachers in difficult to reach schools • Providing teacher training	*Intensive tasks*	• Integrating less tangible ("soft") inputs • Coordination among local agencies and across geographic jurisdictions • Managing frontline worker (e.g., school-teacher) resistance
	• Monitoring the quality of classroom teaching • Providing academic support to teachers • Promoting community engagement in school governance	*Complex tasks*	• Repeated coordination between local agencies, schools and community members • Managing community demands • Adjudicating conflicts between teachers and parents
High			

Source: A. Mangla (ed.), "Making Bureaucracy Work," in Making Bureaucracy Work: Norms, Education and Public Service Delivery in Rural India (Cambridge: Cambridge University Press, 2022), p. 41.

This typology of tasks by complexity also echoes Honig's argument that different management strategies may be better suited to different types of public sector activities.[119] He argues that "Route Y" approaches (emphasizing coaching, support, and autonomy) are better suited for tasks that are difficult to monitor and require discretion and adaptation in implementation. "Route X" approaches (focusing on command, control, compliance, and monitoring) may be more applicable to measurable tasks such as school construction or textbook provision.

According to Mangla's research, improved learning outcomes can be achieved when bureaucrats adapt education policies to meet local needs by engaging in "thick" information exchange and coordination in deliberative spaces where public officials across the hierarchy enter into dialogue with school and community actors.[120] These spaces encourage more frequent, inclusive formal *and* informal discourse between stakeholders and the government, which improves policy contextualization and, ultimately, quality and effectiveness. These *deliberative bureaucratic norms* foster collective problem-solving. On the other hand, education policy implementation risks being uneven and of lower quality in spaces that reflect *legalistic bureaucratic norms*, which are focused on monitoring, rule compliance, and official, formal channels of communication between a more limited set of stakeholders. Manga's typology is presented in Table 4.

Table 4. Typology of legalistic and deliberative bureaucracy

Dimensions	Legalistic bureaucracy	Deliberative bureaucracy
Normative orientation	Rule based	Problem based
Organizational dynamics	Officials protect hierarchical boundaries and procedures	Officials participate across boundaries and modify procedures
Communication	Vertical lines of communication, primarily through formal channels	Vertical and horizontal lines of communication, through formal and informal channels
Information	Prioritize official knowledge, written documents and governmental data sources	Allow both official and colloquial knowledge, written and oral accounts and diverse data sources
Frontline agent discretion	Select among existing policy rules in response to particular cases	Modify policy rules or create unofficial rules in response to problems arising in particular cases

Source: A. Mangla (ed.), "Making Bureaucracy Work," in Making Bureaucracy Work: Norms, Education and Public Service Delivery in Rural India (Cambridge: Cambridge University Press, 2022), p. 53.

Regarding the completion of complex tasks, social network theory resonates with these arguments about how education actors can best solve complex tasks in education. Mangla's framing of bureaucratic norms above includes key components of social network analysis: communication (formality and direction) and information (type of knowledge or "relational resources"). As discussed in sections above, social network studies have repeatedly emphasized the importance of informal channels for resource flow, distributed leadership, network density, and reciprocal ties for trust, collective efficacy, and innovative culture.

Mangla's emphasis on deliberative bureaucracy also reflects findings on high-performing districts in the United States. As described by Meredith Honig, districts can become learning organizations partly by engaging in "joint work" in their assistance relationships with schools.[121] This can be achieved by creating structures for the meaningful, purposeful, and focused participation of district, school, and other stakeholders to identify and solve instructional challenges.

These findings suggest that middle-tier relationships with schools are nuanced. Many tasks undertaken by the middle tier are less complex and quantifiable (for example, the distribution of new textbooks, sharing new reporting regulations, staff contracting, and operations). Studies in LMICs show that some aspects of instructional practice are effective when somewhat centralized: the Learning at Scale evaluation and the Puebla and Sobral reforms, for example, found that some structured pedagogy (e.g., following a teacher's guide with a directed sequence of lessons) is effective in improving outcomes.[122] However, the findings argue for caution in the centralization of networks and rollout. They suggest that providing ample time and resources for collective problem-solving, raising issues, and gaining the buy-in of diverse stakeholders is likely to pay dividends in terms of the quality of complex policy implementation. Indeed, much of the instructional support activities found by the Learning at Scale study, in addition to Tournier et al.'s middle-tier instructional leadership framework, reflect these complex, relational activities that require time for staff to puzzle through and dialogue about.

D. Districts and schools can adopt a "closure-brokerage oscillation" approach to facilitate learning, implementation, and organizational change.

As this review has outlined, district staff, given their high levels of betweenness in networks, play both buffering and brokering roles in their relationships with schools. As a buffer, staff can narrow and shape the flow of policy information to schools. As a knowledge broker or boundary spanner, they can also connect schools with new information, knowledge, and actors. Social network literature suggests that for organizational learning, districts may be wisest to alternate between these buffering and brokering roles. Wang describes this process as the *closure-brokerage oscillation.*[123] When new information (e.g., an instructional policy) is introduced into a network, there is value in allowing network members to "huddle in" and dialogue internally to make sense of the new policy. This sense-making can take place in both formal structures (such as communities of practice, peer mentoring, and school meetings) and crucially also through informal exchanges (hallway discussions, etc.). This internalizing, sense-making step is crucial to behavior change.[124] However, after a period of "closure" of the school network around new information, social network theory suggests that it is helpful for the district to engage in brokerage to bring in fresh perspectives and solutions to challenges and questions emerging from the closure stage.[125] In the social network study in Tanzania, wards with denser networks also create opportunities for school staff to interact with others outside their network. Ward education officers play a brokerage role, facilitating experiences for teachers such as school visits and mentoring in other schools.[126] This oscillation between deep engagement and connecting across groups and networks may result in better organizational performance.

This insight could inform policy implementation design, where practices are bundled so that they alternate between intentional moments for closure of networks and for brokerage to wider networks of actors. Practices could include structuring teacher-to-teacher support with periodic, built-in district-supported external activities, school clusters, trainings, or broader deliberative forums. Instructional support actors, too, may integrate both closure and brokerage moments into their work with teachers, ensuring that there is time and space for formal and informal discussion and information flow.

Overall, the literature reviewed in this section has several important implications for our understanding of systems improvement in education for foundational learning. As underscored by social network analysis and the bureaucratic norms literature, because many activities core to system improvement for foundational learning are complex and relational in nature, it is important to ensure deliberation and informal and formal channels for meaning-making, engagement, and problem-solving. Social network analysis may help identify productive informal channels for resource and information flow that feed into formal routines. There may be ways to leverage these discussions into formal processes while still protecting critical informal spaces. For example, if teachers informally discuss new practices and problems of practice over lunch at school, the professional learning community meetings could encourage teachers to share reflections from lunchtime conversations, building pathways to feed these flows into formal routines. Moreover, the closure-brokerage oscillation reflects a promising program design for complex organizational change initiatives that are part of many policies to improve instructional practice. On the other hand, the use of accountability-heavy education policies in LMIC systems (such as district- and school-level performance contracts in Ghana[127] and Rwanda[128]) do not take this into account. Moreover, efforts to build subnational capacity in instructional practices may also be undermined by high turnover and may disrupt district and school networks through the isolation of school staff from resource flows and the exit of central leaders, which can weaken and impede the flow of resources (information, advice, innovation) across actors.

Limitations and Gaps

Despite the valuable insights offered by social network analysis and bureaucratic norms research, these two bodies of literature have some limitations and gaps. Addressing these gaps not only highlights the need for more nuanced methodologies but also paves the way for future research that can contribute to a deeper understanding of education system improvement for foundational learning. Overall, there is a research gap in social network analysis with regard to the middle tier and schools in LMICs.

Beyond this, social network research methodology has important limitations:

- Social network analysis adopts a largely quantitative understanding of relationships (composed of ties and specific resource flows). As a result, it is limited in revealing nuances in relationship dynamics and the quality of the resources accessed (e.g., the type and quality of the information on a new policy).[129] It is also limited by the quantitative measures used.[130] As a result, mixed-methods approaches may be complementary in unpacking the findings of social network analysis. In particular, follow-up qualitative research can help shed light on how resources flow and why and help unpack actor sense-making processes and organizational learning.[131]

- With respect to the quality of resources shared, social network analysis tends to measure "positive" resources (e.g., information on a desired practice or policy, personal advice, innovative ideas). However, information and advice can also be negative, or "toxic." More research on "toxic ties" is needed, as interactions between actors in a network are not always supportive of positive policy change.[132]

- Current research on social network analysis in education has not sufficiently focused on how gender, race, and other actor characteristics might shape ties and network position in high-income contexts.[133] Gender, ethnic group, age, language, and social status are likely to shape resource flows across actors in district and school networks in LMICs.

Bureaucratic norms research also has some important limitations and gaps:

- While research on street-level bureaucrats and managers in LMICs is growing, there is still a substantial gap in terms of understanding the unique contexts and expectations that district and school staff face as public sector professionals in different education systems.[134]

- Much of bureaucratic norms research takes place outside education (in broader public administration and political science fields) and does not focus explicitly on education (with notable exceptions[135]). While bureaucratic norms research sheds light on the broader identities and constraints faced by district and school staff as public servants, the literature pays less attention to the unique features and considerations of teachers' work, the substance of instructional support, and learning outcomes. Education is a unique public sector with a range of social, cultural, historical, and psychological dimensions. Moreover, service delivery in education requires specific expertise (e.g., adapting lessons to different types of learners, designing and conducting assessments) different from other classic street-level bureaucrat jobs (e.g., social workers, police, welfare officers). By extension, these particularities affect the role of street-level managers in education (middle tier and head teachers). There is scope for greater collaboration between the education and public administration fields to delve into the specificities of district and school staff work in LMICs.

- Bureaucratic norms research is limited by specific challenges regarding the study of public administration in LMICs.[136] There is limited existing high-quality subnational quantitative data to measure activities, skills, and beliefs.[137] In addition, more qualitative research is needed to understand context and formal and informal norms, such as that undertaken by Mangla.[138]

Conclusion

This review has aimed to provide an overview of how insights from social network analysis and bureaucratic norms research can shed light on our current understanding of systems improvement for foundational learning in LMICs. Taken together, these two bodies of literature provide useful theoretical, conceptual, and methodological toolkits that can be applied in future studies of middle-tier and school policy implementation and organizational change.

These perspectives suggest that low learning outcomes and policy implementation failures cannot be addressed by technical fixes alone. Rather, they view middle-tier and school staff more as public sector professionals working, sense-making, and relating together in an environment shaped by bureaucratic norms, local context, and formal and informal relationships within and across their networks. These approaches also deepen our understanding of the nature of middle-tier leadership: the nature and reciprocity of ties with schools, the competing expectations faced by staff and how they cope and navigate these, and their strategic roles as buffers, brokers, and boundary spanners. This literature review underscores the potential for social network analysis and bureaucratic norms research to help us understand the education middle tier and school networks in LMICs. Recent exploratory studies in Tanzania[139] and Rwanda[140] represent promising new areas of research to better understand the relational, normative environment of education staff working close to, and on, the front lines of education policy delivery and teaching. The Rwanda study includes both social network analysis and qualitative interviewing on relationships and practices, which responds to calls by the field for more complementary data collection.[141] Overall, the reviewed research on social network analysis and bureaucratic norms reveals promising insights on how the middle tier can significantly contribute to sustainable system transformations, enhancing foundational learning for all.

Endnotes

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