Principals’ Leadership Moves to Implement a Discipline-Specific Instructional Improvement Policy

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ABSTRACT

Discipline-specific instructional improvement policies require teachers to implement new teaching and collaborative practices. What kinds of leadership moves do principals make to support enactment of new practices? Drawing on leadership theories to examine principals’ leadership actions, data come from a qualitative study of three elementary school principals leading implementation of an ambitious mathematics teaching policy. We found that principals used instructional, facilitative, and positional moves across school settings to support teachers’ enactment. These findings add depth to current conceptions of discipline-specific instructional leadership and raise questions about how principals might make strategic moves based on available expertise and resources.

The recent adoption of the Common Core State Standards (CCSS) and other similar state-based standards has ushered in a host of new local discipline-specific policies aimed to align instruction to the CCSS, from the implementation of new curriculum to discipline-specific professional learning models. Implementing these policies presents a formidable challenge for principals: they are expected to be the main instructional leader in their schools, tasked with supporting their teachers to provide high-quality instruction to each and every child (e.g., Louis, Leithwood, Wahlstrom, & Anderson, 2010), and must work across disciplines.

While researchers have observed the challenge of leading for high-quality instruction across multiple disciplines for several decades (Stein & Nelson, 2003), implementation efforts around the CCSS have highlighted the gap between teachers’ current practices and those required by the new standards. In order to teach to these rigorous standards, teachers must often fundamentally reorganize their instructional practice, a task that requires significant learning (Kazemi, Franke, & Lampert, 2009). Current research shows that principals are not typically disciplinary experts who can directly lead the complex learning teachers need to reorganize their practice (Lochmiller & Acker-Hoevar, 2016; Lowenhaupt & McNeill, 2018; McNeill, Lowenhaupt, & Katsh-Singer, 2018; Rigby, Larbi-Cherif, et al., 2017; Stein & Nelson, 2003). This is especially true in elementary schools where principals (and teachers) are required to be generalists, highly knowledgeable and skilled in all of the content they teach (Lowenhaupt & McNeill, 2018).

As designers of school schedules and professional development sessions, classroom observers, allocators of resources, shapers of school culture, and evaluators, principals are uniquely positioned to support the implementation of rigorous instructional standards in their schools. Often, instructional standards are presented at the school level as policies, either from the state or district. Research on policy implementation in schools shows that principals’ actions help determine when and under what conditions policies are taken up by teachers across the organization, and more specifically how instructional policies are taken up in classrooms (Robinson, Lloyd, & Rowe, 2008). Principals frame policies in specific ways that either open or constrain learning opportunities for individuals enacting the policy (Coburn, 2001; Horn, Kane, & Wilson, 2015; Woulfin, Donaldson, & Gonzales, 2015). They shape the culture of a school, thus influencing
teachers’ willingness to take risks, a key feature in taking up a new teaching practice as directed by a policy (DuFour & Mattos, 2013; Louis, 2007). Principals also determine formal structures and allocate resources that provide opportunities for teachers to engage in collective meaning making of a new policy, such as daily or weekly teacher workgroup meetings, professional learning opportunities, and the availability of instructional coaches for support (Louis, Leithwood, et al., 2010).

Principals, then, must utilize distinct actions that span multiple leadership domains, including pursuing a vision of high-quality instruction, facilitating teachers’ collaboration and learning, and managing school logistics. We know little about how principals lead across these domains toward the implementation of discipline-specific standards. This study addresses this gap by examining the leadership actions of principals who implemented a district-based professional learning initiative in elementary mathematics that was a local instantiation of implementing CCSS–Mathematics. We asked, What types of leadership actions do elementary school principals take to implement an ambitious discipline-specific initiative?

In a qualitative case study, we observed three elementary school principals over a year and a half in one district in the Pacific Northwest as they implemented an embedded, ongoing professional learning initiative aligned with the CCSS–Mathematics. Drawing on leadership theories, we argue that principals use a range of instructional, facilitative, and positional leadership actions to influence teachers’ uptake of new, rigorous mathematics standards. We define and describe these leadership actions and raise questions about how principals might purposefully utilize these varied actions across school settings to effectively support implementation of rigorous, discipline-specific standards.

The case of elementary school mathematics

We view mathematics as a particularly rich context to see the leadership challenge of implementing rigorous, discipline-specific standards for two reasons. First, the mathematics education research community has established a consistent and strong vision of high-quality mathematics teaching and learning, focusing on providing students with opportunities to develop a conceptual understanding of key mathematical ideas, establishing procedural fluency, and communicating mathematical reasoning effectively through multiple representations, as called for in CCSS–M (National Council of Teachers of Mathematics, 2014). Second, improving mathematics instruction is both timely and high-stakes. Despite a decades-long push toward this type of instruction, studies of US mathematics instruction show that teachers typically select tasks and materials that ask students to reproduce mathematical procedures presented by the teacher (Hiebert, 2003). Even in districts where teachers are expected to use curricula with cognitively demanding tasks, implementation is often not aligned with the curriculum (Cobb, Jackson, Henrick, & Smith, 2018; Remillard, 1999; Rigby, Larbi-Cherif, et al., 2017; Stein, Grover, & Henningsen, 1996). Teachers require significant school-level supports to learn and reorganize their instructional practices to align with the CCSS–M, such as selecting high-quality tasks, allowing students to engage with mathematical concepts rather than simply providing procedures, and focusing on students’ explanations of their mathematical reasoning rather than a single correct answer. A focus on mathematics, then, allows us to explore how principals’ leadership actions support an established goal of ambitious instruction through the implementation of rigorous standards.

In this study, we investigate principal leadership specifically in the context of the implementation of an instructional improvement initiative known as Math Labs. Math Labs are a structure to help facilitate the implementation of the CCSS–M. The professional learning goals of Math Labs are aligned with the instructional approaches embedded in the CCSS–M (Kazemi et al., 2018). Math Labs are full- or half-day, job-embedded experiences in which a group of educators comes together multiple times throughout the school year to learn and reflect. Typically, the experience is facilitated by a school-based mathematics coach, and the principal is an active participant. The central activities of a Math Lab are classroom visits in which teachers experiment with new teaching practices and learn together about students’ mathematical thinking. Participants plan and teach together, maintaining norms that allow teachers to regularly and publically confer with one another during instruction as they interpret students’ responses to the lesson. After the classroom visits, teachers
consider how their instructional decisions influenced student learning and reflect on what they observed about student thinking related to the content. Teachers also decide on common instructional activities or practices they will try in their own classrooms before the next lab. While Math Labs are often facilitated by an instructional coach, successful implementation of the professional learning model requires principals to arrange for Math Labs to take place, to align the work with other school structures and initiatives, and to establish a trusting and improvement-focused school culture (Rigby, Lenges, et al., 2017). Principals are the “chief worrier” of instruction-focused school, they facilitate how and if leadership is distributed, and are ultimately responsible for outcomes. While instructional coaches play a key leadership role in Math Labs, this analysis focuses on the role of the principal in the process as we are interested in implications specifically for the principalship in implementation of discipline-specific standards. See Gibbons, Kazemi, and Lewis (2017) for a study on a coaches’ leadership role in Math Labs.

**Relevant literature**

Existing literature describes principal leadership actions in support of various components of implementing instructional reforms broadly defined, such as facilitating teacher collaboration, setting an instructional vision, or allocating resources. However, current studies have yet to explain how principals use these leadership actions to support ambitious discipline-specific instructional practices across the domains of their work. What leadership moves and practices do principals use to support these changes? How do they manage the range of demands? In the following section, we review existing literature about principals’ leadership actions within the separate domains of instructional leadership, teacher collaboration, and school management to illustrate the foundations for this study and the gap that it fills.

**Principals as instructional leaders**

Broadly speaking, current literature suggests that principals act as instructional leaders through actions such as one-to-one teacher support (Horng, Klasik, & Loeb, 2010; May & Supovitz, 2011; Rigby, Larbi-Cherif, et al., 2017; Supovitz, Sirinides, & May, 2010), organizing opportunities for teachers’ learning such as professional development and teacher workgroup meetings (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Louis, Leithwood, et al., 2010; Sebastian & Allensworth, 2012), and cultivating an instructional vision that guides the culture of the school (Wallace Foundation, 2010). Each of these leadership tasks requires multiple forms of instructional expertise. For instance, principals typically use classroom observation and feedback routines, a form of one-to-one teacher support. With recent changes that couple teacher evaluation policies with teacher development, principals must both evaluate and support (Neumerski et al., 2018; Woulfin & Rigby, 2017). A principal is unlikely to have the time to both evaluate and support all of their teachers (Neumerski et al., 2018) or have the content expertise across all disciplines to support needed discipline-specific teacher development (Lowenhaupt & McNeill, 2018; McNeill et al., 2018; Rigby, Larbi-Cherif, et al., 2017; Steele, Johnson, Otten, Herbel-Eisenmann, & Carver, 2015). Principals may need to rely on more collective approaches to instructional leadership, such as distributing leadership functions to instructional coaches (Woulfin & Rigby, 2017), and facilitating opportunities for teacher collaboration. Rather than focusing only on one type of instructional leadership, such as teacher evaluation or classroom observation and feedback, this study seeks to capture the ways in which principals may integrate their leadership across multiple domains.

**Principals as facilitators of teacher collaboration**

In addition to supporting teachers one-to-one, facilitating learning opportunities for teachers is a key way that principals can support collective teacher instructional improvement (Bryk et al., 2010; Louis, Dretzke, & Wahlstrom, 2010). There is extensive research on the elements of high-quality professional learning opportunities for teachers. First, professional learning opportunities should be ongoing, long-term, and responsive to participants’ specific needs and priorities (Borko, Koellner, & Jacobs, 2014). Second, teachers
are more likely to incorporate new learning into their instructional practices if the learning opportunities are situated in their classroom instruction, focus on improving their specialized content knowledge, and student thinking is placed at the center. Third, Borko et al. (2014) argue that high-quality teacher learning opportunities take place in a community that fosters active participation, has a focus on a common learning goal, and encourages risk-taking. A community that promotes risk-taking and trust lays the foundation for teachers’ ability to engage in challenging learning with one another and deprivatize their practice (Bryk et al., 2010). Further, engaging in open discussions with colleagues helps teachers to develop shared understandings of the purpose and structure behind new instructional practices, and build shared language that enables collegiality and experimentation (Horn & Little, 2010; Little, 1982).

How prepared are principals to lead this type of complex, high-quality professional learning? The current literature presents mixed findings. Huggins, Scheurich, and Morgan (2011) state that productive school leadership in teacher workgroups may help teachers change their pedagogical practices to support all students’ learning needs. In contrast, two other studies show that principals’ participation in middle school mathematics’ teachers’ workgroups disrupted the teachers’ focus on student thinking and instruction and instead directed teachers’ attention toward standardized tests (Rigby, Andrews-Larson, & Chen, in press) and other types of instructional management activities (Horn & Kane, 2015). However, if principals lack the content expertise to lead high-quality professional learning sessions themselves, studies suggest that they can create structures and opportunities for teacher learning (Fleming, 2004; Huffman, Hipp, Pankake, & Moller, 2001), provide resources such as substitutes, instructional materials, and experts (Huffman et al., 2001; Youngs & King, 2002), and monitor the groups’ work (Murphy, 2015). This study elaborates on current findings on principals’ leadership actions in teacher workgroups and situates these actions in the broader context of the principals’ work across the school.

**Principals as managers**

Principals can push for a strong vision of instruction and foster teacher learning, but ambitious instructional improvement also requires school conditions conducive to student and teacher learning. In elementary schools, principals’ non-instructional duties might include completing paperwork for the central office; managing logistics like student pick-up and drop-off, breakfasts and lunches, recess supervision, the school schedule, and substitute coverage; resolving discipline issues; managing the human resources in the building by supervising employees, including hiring and firing; analyzing and sharing school-based data in ways that make sense to multiple stakeholders; and establishing supportive relationships with families and community (Goldring, Huff, May, & Camburn, 2008). This type of managerial work is necessary and often crosses over into efforts to improve learning (Hallinger & Murphy, 2013; Terosky, 2014). Further, not only do non-instructional decisions and actions impact classrooms, but principals can also use their positional power to communicate expectations across school settings for students, teachers, and community members. For example, a principal’s presence at a meeting implicitly signals the value of the meeting. While leadership scholars and practitioners conceptualize the principal’s role as leading learning and instructional improvement, several recent studies indicate that managing the school building still takes up nearly 90% of principals’ working hours (e.g., Horng et al., 2010). This literature suggests that effective management sets the conditions for teachers to approach the implementation of rigorous standards but doesn’t guarantee improvement will happen. This study examines the connection between managerial leadership actions and the implementation of rigorous standards through an instructional improvement initiative.

In sum, while extant literature examines particular aspects of a principal’s role and points to principals’ importance in supporting teachers’ enactment of discipline-specific instructional policies, there aren’t studies that examine and characterize principals’ leadership actions across and between the multiple domains of their daily work. Given the current context and expectations of principals to do just that, this study addresses a key gap in the literature. The following research question guides our analysis: What types of leadership actions do elementary school principals take to implement rigorous, discipline-
specific standards through an instructional improvement initiative? While future research may assess the efficacy of these distinct leadership actions, this paper strives to describe and categorize them.

Conceptual framework
In this study, we examine principals’ policy-leadership actions, specifically in the context of a discipline-specific instructional improvement initiative, Math Labs. Math Labs are a structure meant to facilitate the implementation of high-quality learning opportunities as described in the CCSS–M. In order to do so, Math Labs require teachers to develop new ways of understanding and teaching mathematics content and new routines for collaborating with colleagues. Thus, the principal’s role is to ensure that teachers develop deep understandings of these new demands to avoid surface-level policy implementation. First, we conceptualize principals’ leadership actions as leadership moves, or distinct units of practice. Based in the professional learning literature that examines the decomposition of practice into discrete moves within a broader practice (Grossman et al., 2009; Hatch & Grossman, 2009; Lampert, 2010), the idea of looking at leadership moves allows us to unfurl the broad and often all-encompassing notion of school and instructional leadership. We conceptualize principals’ actions in three distinct domains: instructional, facilitative, and positional.

Instructional Leadership Moves: Principals make instructional leadership moves to support teachers to learn and implement new instructional routines and practices. Instructional leadership moves include sharing ideas about structuring a lesson, explaining content, or providing feedback on classroom instruction (Rigby, 2014). In the context of a content-specific policy, principals may make discipline-specific instructional leadership actions that address mathematics content and pedagogy. For example, mathematics-specific leadership moves might include advocating for particular tasks that promote reasoning and problem solving (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010), or modeling mathematical discourse moves or discussion strategies aimed at eliciting and building on student thinking (Kazemi & Hintz, 2014).

Facilitative Leadership Moves: To support teachers’ collaborative engagement in a new instructional initiative, principals use facilitative leadership moves such as demonstrating new protocols for sharing student work or leading a discussion of a professional text. These moves might include leading or arranging for professional development sessions or conducting professional learning community meetings (Youngs & King, 2002). To implement a mathematics instructional initiative, facilitative leadership moves might aim to provide content-specific opportunities and structures for teacher learning, particularly through questioning, collaborative planning, and coaching (Burch & Spillane, 2003; Graczewski, Knudson, & Holtzman, 2009).

Positional Leadership Moves: Principals use positional leadership moves to design school structures, set expectations, and utilize accountability to support policy implementation (Goldring et al., 2008). These moves rely on principals’ formal decision-making power, ability to allocate resources, and presence. In the context of implementing rigorous, discipline-specific standards, some examples of positional leadership moves might include aligning teacher evaluation processes with the standards or allocating time and funding for teacher collaboration to collectively learn about the standards and rehearse the instructional moves needed to enact the standards (Horn, 2010).

Methods
To understand how principals used different kinds of leadership moves to support the implementation of rigorous, discipline-specific standards through an instructional improvement initiative, we drew on data collected over fifteen months spanning the 2014–2015 and 2015–2016 school years as part of a larger qualitative study documenting leadership in the instructional improvement initiative, Math Labs, in a single district. This analysis presents a qualitative case study of principals’ leadership moves at three schools. As we attempted to capture and characterize the variety of leadership moves, the unit of analysis is each leadership move rather than the principals making the moves.
Sample

Cedar Ridge\textsuperscript{1} is a mid-sized school district located in the Puget Sound region of Washington State. The district leadership partnered with a local university and a philanthropic foundation to implement Math Labs in an effort to improve elementary mathematics instruction toward the aims outlined in the CCSS–M, making it an ideal site for research on implementation. The district serves a racially and linguistically diverse population of approximately 22,000 students. Approximately 34\% of the student population identifies as White, making up the largest group, followed by Latinx at 25\%, 12\% Asian, 12\% Two or More Races, 11\% Black/African American, 4\% Native Hawaiian/Pacific Islander, and 1\% American Indian/Alaskan Native. Sixty percent of all students in the district qualify for Free or Reduced Price meals. Additionally, around 15\% are classified as English Language Learners. In the year prior to our data collection period, not a single student group in grades K-8 met the Annual Yearly Progress (AYP) for math proficiency based on state standardized assessments.

During the 2014–2015 and 2015–2016 school years, twelve elementary schools in the Cedar Ridge School District volunteered to pilot Math Labs as a part of district-wide efforts to improve mathematics instruction through teacher professional learning. At each school, the same core group of approximately 4–8 elementary teachers, the school-based instructional coach (generalists, not mathematics-specific), and the principal participated in Math Labs. For this study, we purposefully selected the principals at three of these twelve schools with the hope of seeing a broad variety of leadership moves. To increase the potential that we would observe a multitude of leadership actions, we selected schools based on principals’ consistent and engaged participation in labs and other instructional improvement efforts. The fact that these principals volunteered to be a part of the district’s Math Labs initiative and were eager participants and partners suggests that these principals’ leadership moves are likely unique compared to other principals in the district. Accordingly, the goal of this analysis is to describe the variety of leadership moves, not to generalize to all leaders or to evaluate the efficacy of their practices.

Participants

Donna is a long-time principal who began her career as a special education teacher. She spent a number of years as a central office administrator before returning to the role of principal at Dogwood Elementary in 2010. Donna relied on her school’s instructional coach, Marianne, to plan and facilitate Math Labs, although they met before each lab to discuss the agenda. Donna worked to support and reinforce Marianne’s coaching efforts through one-on-one interactions with teachers in the year-long evaluation process.

Kyle is a former high school English teacher and school-based instructional coach. Kyle took over as principal at Windward Elementary, his first administrative position, midway through the school year in 2013. Kyle drew strict boundaries between his evaluation-related work with teachers and the learning-focused support provided by his school’s instructional coach, Mara. When the two met to discuss Mara’s work, Kyle expected Mara to describe her work generally and to keep details about particular teachers’ challenges confidential. Kyle charged Mara with leading Math Labs and reinforcing the learning between labs through coaching support. They did not meet before the labs to go over the agendas.

Kathy was an experienced elementary school teacher before moving into a teacher leadership role as a math coach for a state-sponsored instructional improvement initiative. She worked as the school-based instructional coach at Mountain View Elementary before transitioning into the role of principal at the school in 2011. Kathy partnered with her school’s instructional coach, Tom, to share planning and facilitation duties during labs. In between lab sessions, she and Tom participated equally in classroom coaching to support teachers’ uptake of the new practices learned in labs.

All three principals (and the instructional coaches) participated in a two-day Math Lab “launch” facilitated by a mathematics educator from the local university. The launch included learning
opportunities focused on both ambitious mathematics instructional practices and leadership moves to help teachers learn and engage in these practices.

**Data collection**

For this analysis, we drew primarily on data collected between May 2015 and June 2016. Our primary data sources were interviews with and shadows of principals, and observations of Math Labs. In an effort to document changes in principals’ thinking and leadership practice, we conducted semi-structured interviews with each principal in Spring 2015, then again in Fall 2015 and Spring 2016. In the interviews, we prompted principals to describe their leadership activities in support of teachers’ mathematics instructional improvement. For example, we asked: “In what ways would you describe your role as supporting teachers’ learning in the labs?” and “What does your follow-up work look like between labs?” Interviews were recorded and professionally transcribed.

Through observations, we collected data on principals’ participation in the Math Labs, providing direct evidence of their leadership actions related to mathematics instruction. We observed a total of 13 full-day math labs at the three focus schools over the fifteen months of the study for a total of around 90 hours of observations. During observations, members of the research team audio recorded the planning and reflection phases of the lab and collected field notes during each phase. To maintain consistency across all observations, we used a common form with sections for the planning, classroom visits, and reflection phases of the Math Lab (see Appendix A). Typically, between two and four researchers collected data in each Math Lab, and two collected data during each interview and shadow. We merged field notes taken by each researcher to capture the most detail, and we transcribed audio segments any time the principal participated to supplement field notes (Miles, Huberman, & Saldana, 2014). We gathered both observational and interview data during full or half-day long shadows of each principal, taking detailed field notes, supplemented with transcriptions of audio recordings when the principal participated. We arranged to shadow the principals during typical daily routines, including classroom observations, and we asked principals to describe their instructional expectations before entering each classroom (Patton, 2015). After exiting the classroom, we prompted principals to describe what they saw and reflect on the leadership moves they planned to use regarding the instruction they observed. Additional data came from observations of other related events during the same time period, such as a district-wide event launching Math Labs. To ensure the validity of our data, we had two member-check meetings with both the principals and the coaches of the three schools. During these audio-recorded meetings we presented our findings, asked the participants to affirm the accuracy of this portrayal, and solicited additional information (Miles et al., 2014). We took field notes and audio recordings at these events, which we transcribed when the principals participated. Both meetings led to clarification and elaboration of our findings as well as additional data. Finally, we sent the principals a copy of the near-final manuscript to ensure that their leadership was accurately portrayed. They felt that it is and did not offer any edits or changes.

**Data analysis**

We initially categorized our data using broad descriptive codes to indicate the nature of the activity and participation using Dedoose software (Dedoose Version 8.0.23, 2018). For example, our categories marked when principals and coaches participated, when the conversation was specifically about mathematics, and when tools were used. For this analysis, we drew upon the data initially categorized as principal participation. In the second analytical phase, we used deductive codes that addressed principals’ leadership moves in support of school improvement (e.g., Peterson & Deal, 1998; Youngs & King, 2002). Among others, these codes included: developing or utilizing formal and informal school structures, creating coherence across various people and initiatives, and building and leveraging relationships. We also attended to each principal’s vision of high-quality math instruction.
(Munter, 2014) and ideas about teacher learning (Borko et al., 2014). Additionally, we added inductive codes that arose from our data, including the distinctions between the different types of leadership moves (instructional, facilitative, and positional). The combination of both types of codes led to a final codebook that reflected both the current research and literature as well as the context and viewpoints of our participants. In the third phase, we further differentiated and defined the three types leadership actions. For example, we realized that within the data coded as “instructional leadership moves” there were those that related to instruction generally, those that related to mathematics content, and those that related to the process of teaching mathematics. We similarly re-coded the facilitative leadership moves into three distinct types of facilitation. Our unitization was “leadership moves,” or the decomposition of leadership practice into discrete actions within a broader practice (Grossman et al., 2009). We coded segments of text where there was evidence of a principal’s leadership around a particular idea or task. Modeled after Horn’s (2010) “episodes of pedagogical reasoning”, a move was sometimes a single turn of talk, while other times the move was a conversation including multiple people and turns of talks. Moves were sometimes coded with multiple codes.

For all phases of coding, the team of three to five researchers first calibrated our coding using the same data sets with the first author as the anchor coder. Once we reliably reached consensus on the theme (Armstrong, Gosling, Weinman, & Marteau, 1997), all data were coded and compared through discussion by at least two researchers. When further clarification or revisions to the codebook were necessary, all coders were notified and reviewed their coding to ensure that the data were all coded alike. After all data were coded, all discrepancies settled, and all flagged items decided upon by the anchor coder, we created a series of memos focusing on the different leadership moves, then a summary matrix that allowed us to display and compare our findings across distinct settings (Miles et al., 2014).

**Limitations**

Our study defines and describes the leadership moves used by principals to support the implementation of rigorous mathematics standards. We collected data for fifteen months in three settings: Math Labs, classroom observations, and in one-on-one interviews. In addition to the arenas we observed, the principals engaged in leadership in any number of other settings, including full staff meetings, grade-level teacher workgroups, walking in the hallways, etc. The three settings in which we collected data capture opportunities for distinct approaches to leadership. However, it is likely that principals enacted a different proportion of leadership moves in other settings and while doing different job activities. For example, Math Labs afforded principals ample opportunities for instructional leadership moves because there were numerous instruction-focused discussions. However, full staff meetings might yield fewer opportunities for this type of leadership move and would likely feature a greater proportion of positional leadership actions. Thus, our findings are not generalizable to these principals’ overall practices. Rather, we describe the variety and nature of these principals’ leadership moves in the context of the implementation of a content-specific initiative.

Our aim with this study is to describe the types of leadership moves principals made and to distinguish between different kinds of moves. As discussed earlier, this analysis does not make claims about which combination of leadership moves is more effective. Future analyses may include these kinds of distinctions and efficacy claims.

**Findings**

To answer our research question, *What types of leadership actions do elementary school principals take to implement rigorous, discipline-specific standards through an instructional improvement initiative?* we depict the different types of moves we observed and provide illustrative examples. We found that each principal used instructional, facilitative, and positional leadership moves while working to implement the mathematics initiative. Across the data, our principals used slightly more instructional leadership
moves (40%) than facilitative (36%) or positional (24%) (see Table 1). We found that most of the leadership moves were aimed at improving instructional practice generally, not necessarily specific to the policy to improve mathematics instruction. While we briefly describe and provide an example for how principals made positional moves, this approach is written about more frequently in prior literature (e.g., Giles, 2007; Hallinger, 2005; Peterson & Deal, 1998), thus our focus in this manuscript is on unpacking the principals’ instructional and facilitative moves.

In addition to observing a variety of leadership moves, we found that principals supported implementation by using moves across different settings. For instance, we captured principals’ reflections on specific instructional leadership moves during classroom visits (in response to the researcher’s question, “What will you do next? Why that?”). We also observed principals using instructional leadership moves during Math Lab discussions to focus teachers’ attention on the relationship between instructional moves and student work. Similarly, we saw principals use facilitative moves both to direct teacher learning during the Math Lab sessions and to set the agenda for other learning experiences, such as coaching meetings, professional learning community (PLC) sessions, and staff meetings. In the Discussion section, we consider the purpose of different moves across settings and raise questions for further research.

**Instructional leadership moves**

The main purpose of the ambitious instructional improvement initiative in this case was to improve teachers’ mathematics teaching practices. Therefore, we set out to observe and understand how principals used instructional leadership moves to support the implementation of Math Labs. During data collection activities, we most often observed principals making instructional moves. Table 2 illustrates the number of times the three principals engaged in specific types of instructional leadership moves. We found that the vast majority (72%) of principals’ instructional leadership moves were focused on practices that were generalizable to all disciplines. Across the data, we observed a very small number of math-content specific moves (n = 9). We noted 14 distinct math practice-focused instructional leadership moves, making up 17% of the total instructional leadership moves.

**General instruction leadership moves**

These types of leadership moves are instructional leadership actions that focus on instruction in general, including actions, ideas, explanations, and/or feedback on instruction that would be beneficial for any discipline (Rigby, Larbi-Cherif, et al., 2017). For example, one principal, Kathy, described feedback she gave to a second grade teacher after a classroom observation: “[I suggested that she] give a sentence frame before a Turn and Talk, and unpack the academic language and the sentence frame.” Given that many of the students in this school are English Learners, this is an important element of feedback for the teacher: a focus on academic language and supporting the use of complete sentences as part of meaningful student discourse. Similarly, Kyle suggested to a teacher that they include a turn-and-talk in their lesson because “it allows kids to have a second to process

| Table 1. Distribution of principals’ leadership moves. |
|--------------------------------------------------------|
| **Percentage of Total Leadership Moves**               |
| Instructional                                      40% (113) |
| Facilitative                                        36% (100) |
| Positional                                          24% (67)  |

| Table 2. Instructional moves by type.            |
|--------------------------------------------------|
| **General Instruction Moves**                    |
| **Math-content Specific Moves**                  |
| **Math Practice Standards Moves**                |
| Percentage of Total Instructional Moves         |
| 72% (58)                                         |
| 11% (9)                                          |
| 17% (14)                                         |
what they have heard … I know it’s scary to just give someone a pen [to go up to the board].” This type of instructional feedback is useful across disciplines. The vast majority (72%) of the principals’ instructional leadership moves were focused on practices that were generalizable to all disciplines.

**Mathematics-content specific leadership moves**

Mathematics-content specific instructional moves are particular to the mathematical ideas of a specific lesson, either in the context of a Math Lab or an individual teacher’s classroom (Rigby, Larbi-Cherif, et al., 2017). In these cases, the principal recognized the mathematical goal of the lesson, connected how the instructional decisions around the mathematics led to the goal, and made instructional leadership moves based on those factors. Eleven percent of the instructional leadership moves were mathematics-content specific. The following example of a mathematics-content specific instructional leadership move is from shadowing Kathy as she conducted a classroom observation. A second-year teacher was leading a lesson with her third graders focused on fluency, explaining their thinking, and understanding the meaning of the equal sign. When we walked in, mid-lesson, students were seated on the carpet, facing the board, and discussing the problem $4 \times 6 = 24 \div 6$ written on the board, underneath the statement “True or False” (see Figure 1). Note that the problem $7 + 28 = 28 + 7$ was written above but was not discussed when we were in the classroom.

Below is a transcript of the lesson from field notes from two researcher observers:

**Teacher:** [Speaking to students] I think this is true because … or I think this is false because … Or I think I am in the middle, and someone needs to convince me. Show me [gestures] what you think. Who can defend their thinking?

**Student A:** $4 \times 6$ is 24.

*Teacher writes 24 under $4 \times 6$.*

**Student B:** it’s true because it’s just flipped around.

**Teacher:** Then $24 \div 6 = 4$ … Thoughts on this?

**Student C:** Basically, they are just flipped.

![Figure 1. Classroom white board: true or false.](image-url)
Teacher: [Student C] is confirming that what [Student B] said is true. [Student D], what would you like to add? Who would like to defend their stand that the statement is false?

Student D: I would like to add that the equal sign means the same, and 24 and 4 aren’t the same.

Teacher writes that 24 is not equal to 4 (using the ‘not equal’ sign).

Teacher: With your think partners, talk about whether this is a true fact or a false fact. [Provides sentence stems:] I think this is true because … I think this is false because …

The conversation continues with students explaining their thinking, many students still believe that the statement is true.

Teacher: Show me if you agree or disagree. [Student E], you need to show me your talk move [thumbs up or down]. (The teacher pauses to look at students’ thumbs.) Let me tell you something … 24 is not equal to 4. So when I go back to 4 × 6 = 24 ÷ 6, who now thinks they are the same?

Student B: On the division equation, it’s flipped around still.

Teacher: I am going to do the equation 4 × 6 first. I can use my facts over here (points at column of equations already written to the left of the board). If I solved the equations separately, who thinks they’re still equal? Remember, multiplication leads to a larger product, while division leads to a smaller quotient. This statement here is false.

The teacher ended the lesson after this last statement. The principal and two researcher observers left the classroom and discussed what the principal saw, and what her next steps were. The principal described what she saw:

“She gave three opportunities for turn-and-talk but at the end she still gave [the answer] to them when the boy still had the misconception. I was wondering in terms of ownership, how she could have left that to possibly a turn-and-talk. It’s kind of what I saw with her lesson on division. There were still a few kids with misconceptions. I just wondered if simpler numbers would have helped them get the meaning of the equal sign. Because they were seeing the ‘flipped around’ piece …”

In this reflection, the principal addresses the numbers the teacher used in the problem with the students, and wonders if simpler numbers would have helped the students understand the concept more easily. She went on to discuss if the equation 7 + 28 = 28 + 7 was intentionally placed above the problem addressed in the lesson, “I wonder if she did that purposefully to see if that would throw them, to see if they really understood the meaning. I wondered if it was intentional. But I wasn’t sure.” When asked about her next steps, the principal said she’d ask the following questions:

“Why do you think students have that misconception [it’s just flipped]? What problems might you choose tomorrow for the true and false? At the end I would ask, what decision did you make to tell students at the end that it was false, and how are you checking for student understanding?”

In the classroom observation and conversation after, Kathy recognized the goal of the lesson, understood how the teacher’s instructional moves were and were not leading to the goal, and had suggestions and question probes for the teacher that were based on improving the instruction of specific mathematical concepts.

Donna used a mathematics-content specific instructional leadership move during the classroom lesson portion of a Math Lab. The teacher leading the lesson asked a student to share how she found the answer to the problem at hand with the class (her work was projected on the board):

Student: I did a tape diagram for Hannah and Mario. How I got 6/10s was 3/5s times 2/2 = 6/10.

Teacher: Can you point to where you did that [in your student work]?

Donna: [Student], what does 2 over 2 mean? Why’d you do that?
Student: So I can get even fractions.
Donna: Even?
Student: I did 3, each kid will get 3/10 bag.

In this instance, Donna modeled asking a question that supported students to develop a conceptual understanding of equivalent fractions by asking about the meaning of a particular fraction (“2 over 2”). This move built on the teacher’s question which asked the student to identify a particular part of their work. Later in the interaction, Donna makes a second mathematics-content specific move by asking the student what they mean by “even.” Because “even” can have multiple meanings, Donna is offering the student an opportunity to clarify what is meant by that word in this particular case. We infrequently observed or heard this type of leadership move, noting only nine instances over the data collection period. When principals made mathematics-focused leadership moves, they more frequently made those related to the practice standards (14 instances) rather than to content (9 instances).

Mathematics practice standards-focused leadership moves
One of the core elements of the Common Core State Standards–Mathematics are the eight Mathematics Practice Standards (http://www.corestandards.org/Math/Practice/). These standards describe how, or the process through which, students do mathematics. For example, the first standard is “Make sense of problems and persevere in solving them.” This way of engaging with problems is applicable in kindergarten as well as high school calculus. From a principal’s perspective, identifying instructional practices and student engagement from a lens of a mathematics practice standard is more specific than general instruction as it is connected to targeted ways of engaging with mathematical content. We coded principals’ instructional leadership moves as mathematics practice standards-focused when the principal attended to elements of how students did mathematics rather than the mathematics content itself, such as the level of difficulty of the problem described above.

The following example is taken from two researchers’ field notes during a shadow of Donna. We observed an inclusion preschool classroom with a total of 12 students, six typically developing and six who received special education services. The teacher was in her first year of teaching and was a member of the Math Lab team. At one table, two students were working on a mathematics problem with an instructional aide:

Annena [has] 6 carrots. Emma has 5 carrots. How many carrots all together?

Figure 2 shows the two students’ work after completing the problem. After the observation, one researcher asked what Donna saw in the classroom, what she expected to see, and what her next leadership moves would be.

Donna: I expected to see stations, it’s a preschool. A lot of the learning is going to happen through language and different activities. I would have expected to see activities with support and facilitation by adults. One is math. Also, manipulatives. Drawing.

I would suggest that [the teacher] use manipulatives to do the adding, you know the drawing gets in the way. So, giving them a tangible way to group the six, the five, and then combining. And then maybe moving to paper-pencil.

Donna’s suggestion was likely drawing on Mathematics Practice Standard #5: Use appropriate tools strategically. Donna recognized that the students were not able to track the carrots they drew on the page when counting. One student in particular tried to count her carrots several times and lost count each time. Following Donna’s suggestion about using manipulatives before drawing would give the students concrete tools to do the adding, allowing them to then move on to creating representations of the mathematics on paper. This reflects the distinction between the focus on how students do mathematics (using manipulatives) rather than the mathematics content (such as suggesting a problem with smaller numbers for the students).

In another example of a mathematics practice standards-focused leadership, Kathy oriented Math Lab teachers toward Mathematics Practice Standard #3: Construct viable arguments and critique the
reasoning of others. In the conversation quoted below, Kathy guides the teachers to a lesson goal focused on second grade students sharing their problem-solving strategies, listening to one another, and paraphrasing each others’ strategies.

**Teacher 1:** We need to come up with our goal.

**Kathy:** It probably would be how you come to agreement – any grade-level, especially at this age, it is about “me and my strategy.” So it is about that collaboration skill. Especially at that age. Even listening to their partner, paraphrasing what their partner said, accountability, A talks first, B tells back what they heard. And each child has to share their strategy. That might be an idea we put in the norms: A talks first and the B says it back and then switch roles.

**Teacher 1:** What is our target like for the share out, are we focused on the strategies they used?

**Teacher 2:** With the success criteria, something about explain and listen to my partner’s strategy.

**Teacher 1:** Right now our target is focusing on the strategy.

**Teacher 2:** I say we stay with this. I think that is something that needs to be taught. I think we want them to share what their strategy is to their group.

**Kathy:** I still think they’re sharing their strategy first. And then there can be a question the teacher asks: How did you agree on that strategy?

Kathy identifies a developmental stage of student’s discussions (“it is about ‘me and my strategy’”) and then presents an instructional strategy to support the students to engage in Math Practice Standard #3: *Construct viable arguments and critique the reasoning of others*. She provides explicit instructional moves for teachers by stating a norm and providing a question for the teacher to ask.
Across the data, we observed 14 distinct math practice-focused instructional leadership moves, making up 17% of the total instructional leadership moves.

**Facilitative leadership moves**

In the implementation of Math Labs, we observed that principals enacted a range of leadership actions aimed at supporting teachers’ learning of mathematics, instructional practice, and ways of collaborating with colleagues. We found that our sampled principals used teacher-learning focused facilitative moves only slightly less often than instructional moves. We identified three distinct types of facilitative leadership actions, each used to support teacher learning: logistical, structural, and content-driven. Our observations of Math Labs and principals’ classroom visits provided evidence of these types of leadership moves in practice (see Table 3).

**Logistical facilitative leadership moves**

Principals used facilitative leadership actions to address logistical considerations of Math Labs. These logistical leadership moves took place during the day-long Math Lab sessions and consisted of actions that moved the activities of the lab forward or ensured that the group followed the planned sequence of events. During the course of data collection, we observed 49 instances of logistical facilitative leadership moves during Math Labs, making up 43% of the total number of facilitative moves. The following example took place in a Math Lab in which Kathy led the teachers in a discussion about how to phrase directions for students before an instructional activity called a Counting Collection. A Counting Collection provides children with opportunities to organize and

| Percentage of Total Instructional Moves | Logistical Moves (49) | Structural Moves (24) | Content-driven Moves (41) |
|----------------------------------------|-----------------------|-----------------------|--------------------------|

*Figure 3. Students executing a counting collection.*
count a group of objects and record how they counted (see Figure 3 for an example of two first
graders working on systematically counting and recording heart-shaped papers). Depending on the
grade level, teachers give their students bags of items such as q-tips, small fuzzy balls, bottle caps, etc.
(less than 20 items for kindergartners, more than 100 for third graders).

Kathy: Are we going to give them bags [of the items to count]? … So the first step [for the
students is to] discuss and talk about a plan [to count the items] with a partner, right?

Teacher 1: Writing the directions on a poster for the students. If I write a 1, would that be more
helpful? What are you going to do first?

Teacher 2: I would do a bullet …
Kathy: Maybe “Make a plan with your partner to count your collection.” Do we want to then
say, “ask partner clarifying questions” and “work together to count your collection”?

Teacher 1: That’s number 1 [on the poster]?
Kathy: Mmmhmm.
Teacher 1: Work together to … Writing it as second bullet point.
Teacher 3: Count collections. I guess we’re not using the word “record” anymore, right?
Kathy: Maybe that’s the third piece. Record how you counted your collections?

In this excerpt, Kathy led the process of planning language for teachers to use with students in the
classroom. Her purpose was to facilitate the sequence of events and tasks that make up the structure
of the lab. While these details are mainly about ensuring teachers follow a process, Kathy’s prompt-
ing both signals the level of detail teachers should attend to (how do we direct students to work
together instead of in parallel? How do we write the directions so that they are clear?) as well as
encouraging teacher collaboration around these decisions.

The principals also used logistical facilitative moves with quick responses and redirects. For
example, during the classroom lesson portion of the lab, after setting up the lesson the teacher
leading the lesson asked the other adults in the room, “Did I forget anything?” and Kyle responded,
“Do you want to show the success criteria [the ways students will know if they successfully under-
stand the lesson goal]?” With this short response, Kyle helped to ensure that the group followed the
lesson plan they collaboratively designed earlier in the day.

Structural facilitative leadership moves
While logistical leadership actions took place during the Math Labs, structural leadership moves
created spaces and conditions to support teacher learning across the range of structures that existed
in schools. We observed principals leveraging structural facilitative leadership moves to align the
work done during grade-level PLCs with Math Lab learning, to set up meetings with teachers and
coaches between labs to support Math Lab activities in classrooms, and to share Math Lab learning
publically at full staff meetings. We documented 24 instances of structural moves which represent
24% of the total number of facilitative leadership moves. In the following excerpt from an interview,
Kyle describes his use of structural leadership moves to support teacher learning in Math Labs:

“… [teachers] understanding that it’s not a standalone process that we’re using, that it’s really nested in our
building goals, and our school wide goals, our grade level goals, our classroom goals. It’s there to enhance their
professional development around mathematics, which is what their SMART goals are based on. I think they just
understand how it is system-wide, trickling down to their work, creates an atmosphere of trust … “

Kyle’s efforts to align a range of school structures (school-wide, grade-level, and classroom goals)
with the discipline-specific policy reinforced the learning that teachers experienced in Math Labs. By
ensuring that these goals worked together, Kyle buffered teachers from competing initiatives,
focusing their attention and work to provide multiple opportunities to discuss, deepen knowledge,
and apply to practice.
Donna provided a specific example of how she aligned different structures in her school to facilitate broader and deeper learning of the pedagogical approach to teaching mathematics learned in Math Labs. She paired the learning in Math Labs with PLCs “in order to provide staff that were not part of the Math Labs with some background knowledge and opportunity to learn some of the strategies so they could practice them in their classrooms.” By taking this approach in the first year of implementing Math Labs, Donna “sowed the seed” of ambitious mathematics instruction across her school. As a result, many teachers saw a benefit of participating in the labs and volunteered to participate in the second year of implementation. Further, Donna led toward a shift in the normative approach toward mathematics instruction across the entire school building from a traditional “drill and kill” toward a focus on conceptual understanding and problem-solving skills alongside procedural fluency.

**Content-driven facilitative leadership moves**

Lastly, principals used content-driven facilitative leadership moves to engage teachers in discussion or coaching, directly leading learning experiences for teachers. These are different from instructional leadership moves in that they focus on the learning of adults rather than the understandings of children. We captured 41 instances of content-driven leadership moves, making up 36% of the total number of facilitative leadership moves. For instance, principals used content-driven facilitative moves during Math Labs when asking pointed questions during analysis of student work or when trying new mathematics activities. In the following example, Donna called the teachers together in a “teacher time out” during the classroom visit portion of the Math Lab. A teacher time out is called by a Math Lab team member to engage in collective reasoning and decision-making in the moment as the lesson unfolds. It allows the Math Lab team to pause the lesson to discuss an emerging question or idea (see Gibbons, Hintz, Kazemi, & Hartmann, 2017 for an elaboration of this practice). In this case, Donna called the teacher time out to prompt the teachers to consider what students’ work revealed about their mathematical understandings.

**Donna:** You’ve moved from the script [we planned together], and I’m kinda wondering if we should go back. They jumped into multiplication but they may not have seen the proportion of three-fifths as two point threes (0.3). I’m just wondering what you all saw.

**Jenna:** I thought we were going to ask, “what is the difficulty of combining these two, which would lead into [the difficulty of combining fractions and decimals]?”

**Donna:** Yes, once that was solved right? Cus we’re trying to flesh that out [what the students know about adding unlike terms] … I’m not sure we’re solid on that. What do you guys see?

**Karen:** I think it depends on what we see them doing.

**Colleen:** Yeah, I want to look at their papers and see what they’re doing.

In this excerpt, Donna coached the teachers, pointing their attention toward student work and refocusing them on assessing students’ understanding. These moves engaged teachers in the work of learning about how students make sense of the mathematics so that the teachers could reflect on their instructional practice.

Another example of a content-driven facilitative leadership move comes from a Math Lab in Kathy’s school. After collectively planning the lesson, Kathy asked the teachers, “Do you guys want to look at the eight mathematical practices? We haven’t gone in and done [the lesson] yet. Once we do the lesson, we’ll be able to see, what’s the one practice we can hone in on. But as you’re looking at the eight, are there any that jump out at you that you think we might anticipate or notice today that might get in [the students] way [of understanding]?” Kathy facilitated a learning experience that brought the mathematics practice standards into the teachers’ work not only for this lesson, but for other lessons they planned outside of the lab context. In this way, Kathy’s facilitative leadership move pressed for ambitious mathematics practices without requiring explicit mathematics expertise.
**Positional leadership moves**

Positional leadership moves require principals to make decisions and act on budgets, hiring, scheduling and class assignments, school safety policies, and other issues of school governance that are not directly related to classroom teaching and learning. These moves also include setting expectations and holding staff members accountable (Katterfeld, 2013). Positional moves that relied on authority from a principal’s formal role were the least common in our data. We rarely encountered these types of moves during our direct observations (25 separate instances), most often the principals described them in interviews (42 separate instances). In the context of Math Labs, we observed principals taking management-related actions to support implementation by supplying resources and bolstering the status of labs. For example, in the following interview excerpt, Kyle describes how his position allows him to act as a “sponsor” supporting the implementation of labs by affirming their importance. He notes,

“I feel like being a sponsor is just your presence. As a principal, there are certain things that just come with it. Anytime I walk into a room, things are different. People, they act differently. Their conversations are different. They know what my expectations are for them and so they want to live up to those expectations. When I’m not there and I’m not sponsoring the work, I send the message that it’s not important to me.”

In this example, Kyle describes how his participation in labs confers importance by communicating his approval. His participation lends weight to the labs because they become associated with his formal role as evaluator and decision-maker.

Other positional moves revolved around the distribution of resources to support the labs. For example, the district had a substitute shortage which made ensuring each teacher had a substitute for their class during the lab challenging. Kathy used support staff at her school as substitutes if the district could not provide them. Finally, all three principals talked about drawing a connection between the labs and the teacher evaluation process. Donna said that several of the teachers who participated in the labs asked her to conduct one of their formal evaluation observations when they planned to use an instructional strategy that they had learned in the lab. She said, “… because they embraced the structure so much, it gives me a way to [do an evaluation] that is agreed upon practice that they have used and support.”

**Discussion**

This analysis investigates principals’ leadership actions around Math Labs as a case of supporting the implementation of a discipline-specific instructional improvement effort. Understanding principals’ leadership moves in this context is pressing given the predominance of discipline-specific policies both at the broad institutional level, such as the CCSS and similar standards, as well as a multitude of district-level discipline-specific policies that schools are expected to implement, such as textbook adoptions, reading programs, and science kits. Principals are expected to lead these efforts, yet little is known about how they do so.

By examining principals’ leadership moves in depth, we developed differentiated categories to describe both instructional and facilitative leadership moves, both of which were more complex than we initially conceptualized. While we hypothesized that principals would make instructional leadership moves that were either generalizable to all instruction or more focused on mathematics, we also found a distinction in their mathematics-focused moves between those targeting content or the processes of learning mathematics. There is utility in all three types of instructional moves, and considering how each may lead to teachers’ learning and instructional improvement allows for a more complex approach to “instructional leadership.” Similarly, principals’ facilitative leadership moves were focused on one of three ways to support teachers’ learning: logistics, structures, and content-driven. These moves rarely relied on a principal’s content expertise, yet they focused the teachers’ attention toward ambitious mathematical instructional practices.
Our findings corroborate previous research conclusions about the discipline-neutral nature of principals’ instructional leadership (Rigby, Larbi-Cherif, et al., 2017). However, rather than a simple call for “more content expertise,” these findings illustrate that principals used a variety of leadership moves to support discipline-specific policy implementation. Beyond instructional knowledge, principals relied on their knowledge of adult learning to facilitate spaces for teachers to engage in and make sense of new practices. Further, they used their positional roles to design a system of supports in their school that promoted and integrated the new practices into many facets of the daily working lives of teachers. For example, one principal with less mathematics content knowledge enabled his instructional coach, who had higher levels of mathematics content knowledge, to engage with and support teachers. An effective principal may be able to take stock of their expertise and available resources, and distribute leadership functions to promote ambitious instruction. With a strong instructional coach, this may mean a principal makes more facilitative or positional leadership moves. A more complex understanding of different types of leadership moves may enable principals and those that support them to be more intentional about their leadership.

In addition to a variety of types of moves, we found that principals used these moves across different settings. Research on the limited impact of single-session professional development “workshops” (Garet, Porter, Desimone, Birman, & Yoon, 2001) suggests that the cross-setting nature of these principals’ actions may lead to a more robust implementation. It is quite possible for Math Labs to be implemented as stand-alone, day-long professional development sessions that are distinct from the rest of teachers’ work. Teachers could spend a day in Math Labs and return to their previous approach to mathematics instruction in their classrooms until the next Math Lab six weeks later. Especially given the distance between current practice and the kind of instruction expected from the CCSS and other similar standards (Hiebert & Stigler, 2000), improvement is likely to happen only with this strong set of messages and supports, and the school leader’s role in framing policy messages is essential to support this challenging cognitive work (Coburn, 2001). In this case, teachers learned a new approach to mathematics instruction in Math Labs supported by their principal, were encouraged by their principals to take on and “try out” these new approaches one-on-one in classroom observations, and were supported by many formal structures throughout their work day, such as time with an instructional coach and opportunities to meet in grade level groups in between Math Lab sessions.

This set of findings indicate that the principals in this study worked to develop a coherent professional learning system at their schools, utilizing a variety of leadership approaches across settings to encourage teachers’ learning about new (and challenging) instructional practices. This study adds to a body of district and school-level instructional improvement research that examines how leaders coordinate supports to create coherent learning experiences for teachers. Since the early 1990’s educational policy scholars have argued that teachers need congruence across curriculum, assessment, and professional development policies to change their practice (Cohen & Hill, 2000; Fuhrman, 1993; Smith & O’Day, 1991; Spillane & Jennings, 1997). Many of the messages teachers receive, however, come from outside of the school site (Coburn, 2005). Principals, then, have the responsibility to take into account messages from multiple spaces, and rather than simply put a policy in place, they must actively engage teachers to learn about a new policy and what it looks like in practice. The findings from this study explicate what this practice looked like, detailing the complexity of leadership across three schools in one district.

**Implications for implementation of a discipline-specific policy**

These findings have several implications for both researchers and practitioners interested in the implementation of discipline-specific policies. While this study was focused on improving elementary school mathematics, it is likely that the findings about leadership actions are applicable to other subject areas that also have a gap between current teacher practice and new, ambitious standards (such as the Next Generation Science Standards for science instruction). Most of the research on principals’ facilitation of teachers’ learning is focused on either brokering opportunities for teachers to learn by ensuring the professional development is coherent and sustained (Sebastian &
Allensworth, 2012; Youngs & King, 2002), or by ensuring that teachers have time to collaborate (Bryk et al., 2010; Coburn, 2005; Louis, Leithwood, et al., 2010; for a comprehensive review, see: Larbi-Cherif, 2016). In other words, the research is focused on principals’ organizing actions, not on individual leadership moves aimed at facilitating teachers’ learning. Both are necessary, but we know little about the latter. The leadership field needs greater specification in how we support school leaders’ learning. This analysis provides a model for conceptualizing the landscape of leadership actions, thereby providing more context for the kinds of learning supports school leaders need.

Rather than unilaterally calling for principals to be “instructional leaders,” this analysis makes the components of this leadership practice visible for practicing leaders, those that support them, and leadership preparation programs. Most expectations and supports for principals as instructional leaders are content neutral (e.g., National Policy Board for Educational Administration, 2015), and yet the support that teachers need to improve their instruction is discipline-specific. The distinctions we make between instructional leadership moves for general instruction, for mathematics content, and for instructional practices for mathematics provide nuance to the sweeping calls for instructional leadership. In order for teachers to implement complex discipline-specific policies or instructional initiatives, they need directed and specific support around subject-matter content and practices; the examples from this study begin to illustrate what this kind of leadership looks like. However, the principals in this study overwhelmingly used content-neutral, general instruction leadership moves. The conceptualizations of leadership practice we developed can both serve as a scaffolding for principals to improve their practice and as an indicator of the need for outside expertise (a content-specific coach, district-level support, etc).

These findings also have implications for how we currently evaluate principals. Rather than focusing on the role of principal simply as instructional leader, our findings suggest that the broader set of expertise and tasks as outlined in the 2015 Professional Standards for Educational Leaders (National Policy Board for Educational Administration, 2015) may be more aligned with leadership moves that promote an integrated instructional approach across the organization and aspects of teachers’ daily work. Additional research should consider the outcomes of these varied leadership moves. What are the results of the distinct moves in terms of changes to teachers’ instructional practices? Is one type of move more effective than others at improving teachers’ collaborative and teaching practices? Findings from this type of further research could have implications for the field’s definition of what counts as an “effective instructional leader.”

While this study documents principals’ use of varied leadership moves, questions remain about how principals develop their capacity to deploy these different moves. For example, we observed differences between the three principals in our study. Notably, one principal used far more instructional moves than the other two. While we can speculate that principals’ level of expertise in instruction and teacher learning relates to how often and how well they use instructional and facilitative moves, our data collection did not set out to measure principals’ knowledge of mathematics, instruction, or adult learning. While it is quite possible that principals’ instructional capacity is developed through their participation in discipline-specific instructional initiatives like Math Labs, this is a topic for a future project. Further studies might also attempt to determine the relationship between a principal’s expertise and their ability to use these moves. Another potentially productive line of research is to examine how preparation programs and support systems for in-practice principals provide opportunities for leaders to both reflect on their current practices and develop new leadership moves.

A variety of principals’ leadership moves were useful for teachers’ opportunities to learn and improve their instructional practices in the schools in this study. The explication of these moves around a discipline-specific instructional reform is useful to help both practitioners and researchers further understand the breadth of principals’ work and the associated learning that is needed for principals to be successful in their work as instructional leaders.

Notes

1. Note that all names are pseudonyms.
2. Note that this statement is mathematically incorrect. The principal did not take this up.
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# Math Lab Summary Form

## Background

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| School        | Date          | Grade Level   | Principal     |
|               |               |               | Coach         |
| Teachers in attendance | Others in attendance | (Researchers, district staff, etc.) | Main Facilitator |
| Seating Arrangement | Contextual Notes (e.g., recent events; staffing changes, etc.) |               |               |

### Phase 1: Introduce

| Start time | Content | What does the principal do? | What questions does the principal ask? What statements does the principal make? | What does the coach do? | What does the coach ask? What statements does the coach make? | References to [teacher evaluation rubric] | Resources and their Use | Notable teacher participation | End time |
|------------|---------|----------------------------|--------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------|--------------------------------|-------------------------|-----------------------------|----------|
|            | (Did the team do math together? did they read an article? Reflect on what they've done? What did they do in this time?) | | | | | (When? How?) | (When? How?) | | |

### Phase 2: Prepare

| Start time | Content | What does the principal do? | What questions does the principal ask? What statements does the principal make? | What does the coach do? | What does the coach ask? What statements does the coach make? | References to [teacher evaluation rubric] | Resources and their Use | Notable teacher participation | End time |
|------------|---------|----------------------------|--------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------|--------------------------------|-------------------------|-----------------------------|----------|
|            | (Task they planned for, etc.) | | | | | (When? How?) | (When? How?) | | |
Phase 3a: Enact

Start time
Whose classroom?
How do coaches, principals, and teachers arrange themselves?
Who takes the lead?
(How was this decided?)
What does the principals do?
What does the coach do?
What is the level of student opportunity to learn?
Describe the teacher time outs.
(Why were they called? By whom? What happened?)
End time

Phase 4a: Debrief and Reflect

Start time
How was reflection structured?
Did they examine student work?
(If so, how?)
What does the principal do?
What questions does the principals ask? What statements does the principal make?
What does the coach do?
What does the coach ask? What statements does the coach make?
What are the changes from one lesson to the next?
(What is the rationale for the changes?)
References to [teacher evaluation rubric]
(When? How?)
Resources and their Use
(When? How?)
Notable teacher participation
End time

Phase 3b: Enact

Start time
Whose classroom?
How do coaches, principals, and teachers arrange themselves?
Who takes the lead?
(How was this decided?)
What does the principals do?
What does the coach do?
What is the level of student opportunity to learn?
Describe the teacher time outs.
(Why were they called? By whom? What happened?)
End time
Phase 4b: Debrief and Reflect

Start time
How was reflection structured?
Did they examine student work?
(If so, how?)
What does the principal do?
What questions does the principals ask? What statements does the principal make?
What does the coach do?
What does the coach ask? What statements does the coach make?
References to [teacher evaluation rubric]
(When? How?)
Resources and their Use
(When? How?)
What do teachers want to try in their own classrooms?
(What commitments do they make?)
How will the coach/principal be involved with the follow-up from the lab as teachers try things in their classrooms?
Notable teacher participation
End time

Final Reflection

Reflect on what you observed.
Include thoughts about:

- Teacher learning goals
- Technical or adaptive nature of the implementation of the lab (and why)
- Notable difference between today’s lab and previous labs
- Lingering questions