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Where's the Playbook? Curriculum, Infrastructure, and High School Turnaround

The passage of No Child Left Behind in the early 2000s ushered in the current era of school turnaround, with its emphasis on standardized test scores, proficiency in core subjects at each grade level, and the rapid improvement of schools deemed as "failing." As schools, districts, and states rushed to meet ambitious proficiency targets, models for school turnaround began to emerge, some of which grew out of existing educational improvement agencies and others that created new pathways to improvement, such as state takeover or charter conversion. No matter the context, improving schools that had failed annual yearly progress or fell in the bottom five percent in a state revealed several core challenges: meeting rigorous standards for student learning requires instructional transformation that conflicts with historical norms of teaching (Hassel, Hassel, Arkin, Kowal, & Steiner, 2010; Hassel, Hassel, & Rhim, 2007; Herman et al., 2008); teachers and school leaders typically do not have the knowledge, time, or resources to improve practice on their own (Duke, n.d.; Whiteside, 2006); and the concentration of schools in need of turnaround demands that school systems organize around instructional improvement that, in turn, requires a new set of resources, incentives, support teams, and processes for learning how to improve.

These core dilemmas are more pronounced in high schools. By high school, gaps between student knowledge and college-and-career ready standards have widened (Neild & Balfanz, 2006), and students are more likely to perform at vastly different levels, creating even greater challenges in meeting all students' needs. At the same time, high schools have smaller hiring pools and fewer teachers teaching in their trained subject areas, especially in math, such that teachers likely have limited support or exemplars to guide their practice (Ingersoll, 1999). Additionally, the challenge of shifting teachers' habits and ways of working to a collaborative, team-based approach is all the more formidable at the high school level due, in part, to their size and departmental structure (McLaughlin & Talbert, 2001; Peck & Reitzug, 2014; Thompson, Brown, Townsend, Henry, & Fortner, 2011). It is of little surprise, then, that some researchers argue that high school improvement is a long-term endeavor in which obtaining results can take up to seven years (Peck & Reitzug, 2014; Thompson, Brown, Townsend, Henry, & Fortner, 2011).

These and other dilemmas of school turnaround contributed to a multi-billion-dollar school improvement industry that, along with the expansion of charter schools and other school choice options, disrupted the "one best system" that characterized public education in America for half a century (Cohen, Spillane, & Peurach, 2017; Tyack, 1974). New educational models provided new possibilities for improving education, particularly for low-income students and children of color. Organizations like Success for All and KIPP built robust systems of instruction, leadership, and professional learning which served as illustrative proof-points for other reform efforts (Borman et al., 2007; Peurach, 2011; Tuttle et al., 2015;

Woodworth, David, Guha, Wang, & Lopez-Torkos, 2008). Yet, these reform models -- and the handful of others with some evidence of success -- reach only a small fraction of the thousands of schools deemed failing under state accountability systems.[1] There are even fewer proven models for high school turnaround, where the problems of instructional improvement are, as noted above, all the more difficult.

So, while the traditional school district may no longer represent the one best system for public education, and while many of the best known turnaround programs come from outside formal educational institutions, the road to systemic, widespread educational improvement and turnaround runs through traditional public school districts. Finding ways to enhance their effectiveness remains a paramount priority. This raises an obvious but fundamental question: Can the same districts on whose watch failure occurred be the agents of their own improvement? And, if so, how do districts reorganize to initiate and sustain success?

District-Led Turnaround

Systematically improving teaching and learning in high schools is simultaneously necessary and enormously difficult, with few examples of sustained success. Meaningful changes in practice require shifting away from the traditions of teacher autonomy and local control to a system characterized by shared materials and practices, collaboration, and robust guidance for improvement. This, in turn, requires recalibrating norms of behavior, control, and incentive structures (Elmore, 1996); systems to generate and use instructional knowledge (Glazer & Peurach, 2015), as well as processes for learning about and acting upon local adaptation and variation (Redding, Cannata, & Miller, 2018). While these are necessary for turnaround of any type, they present unique challenges to districts with a tradition of bureaucratic management , mistrust between teachers and administrators, and political and financial constraints that limit innovation and shared responsibility for collective improvement (Crowson & Morris, 1985; Cuban, 1988; Louis, 2007).

Yet district-led turnaround is not without advantages. First, districts are embedded in the local environment, making them potentially more responsive to school needs and constraints. Second, locating improvement efforts at the district level creates the opportunity to build "infrastructure" for improving instruction for all the schools in the district, including those not classified as under-performing (Supovitz, 2006). Third, it avoids politically and fiscally costly confrontation with local communities, and has the potential to recruit a broad coalition of supporters (Glazer & Egan, 2018). Leaving local school

[1] In the 2009-10 school year, the U.S. Department of Education reported that nearly 15,000 schools were identified as "in need of improvement" under No Child Left Behind rules. Under NCLB waivers, states were required to identify the bottom 5% of schools as "priority," which would equate to about 5,000 schools nationwide.

governance in place also maintains student enrollment and per pupil funding necessary for the long-term sustainability of local school systems. District-led turnaround may not be easy, but it is not without some advantages.

Instructional Improvement

The increasing diversity of organizations operating schools over the last several decades has led to a commensurate growth of research into various systems of teaching, learning, and improvement (Furgeson et al., 2012). This literature has highlighted the dimensions of an educational infrastructure that can support system-wide learning and improvement (Aladjem & Borman, 2006; Camburn, Rowan, & Taylor, 2003; Cobb et al., 2018; Cohen & Ball, 2007; Mehta & Fine, 2015; Peurach, Glazer, & Lenhoff, 2016; Rowan, Correnti, Miller, & Camburn, 2009). Examples include: a clear and articulated vision for instruction (Mehta & Fine, 2015); shared instructional tools with support systems dedicated to their effective use (Rowan, Correnti, Miller, & Camburn, 2009); and a continuous improvement framework that informs adaptation and learning over time (Peurach, 2016; Peurach, Glazer, & Lenhoff, 2016). Together, these design principles have the potential to inform models for improvement that can be developed, adapted, and scaled to more schools in varying contexts.

Among these components, a common curriculum provides the foundational tools and materials needed for common improvements in classroom instruction. A common curriculum establishes the potential for shared lesson plans, shared pedagogy, an agenda for professional learning, and a common language for instruction (Remillard, 2000). Yet, curriculum represents only one element of a full educational infrastructure. A common curriculum can guide teachers in what to teach, but it does not ensure that teachers will translate curricular materials to successful instructional practices, and by itself it does not develop the deep knowledge of content, pedagogy, and student thinking that underlies successful use of curricular resources (Stein, Grover, & Henningsen, 1996). A few teachers may marshal this knowledge and skill on their own, but, for many, effective curriculum use will require a robust system of guidance and professional learning. Without support in developing the required skills and knowledge, improvement programs run the risk that teachers and school leaders will adopt the routines of school turnaround (i.e., frequent assessment of student learning, data-driven instruction, and monitoring and evaluation) without the substantive shifts in teaching and learning required to transform instruction. For instance, many studies have documented increases in time spent on student assessment and on students whose performance is likely to most impact school accountability ratings absent corresponding meaningful changes to instructional practice (Booher-Jennings, 2005; Honig & Hatch, 2004; Spillane, Parise, & Sherer, 2011). Therefore, while curriculum is one critical dimension of infrastructure, norms, guidance,

routines, materials, and coaching that continuously support the cognitive and technical process of instructional change are also critical dimensions.

In this chapter, we present interim results from an ongoing study investigating the effort of an urban district to improve 23 underperforming schools (including 7 high schools) characterized by high concentrations of poverty and a long history of academic failure. While our overall sample included elementary and high schools, we focus here on the efforts of two high schools to cope with a new curriculum, the classroom challenges of implementation, and the implications of those challenges for school and district leaders. We argue that high school turnaround is best understood as a long-term process of infrastructure building at the classroom, school, and district level.

iZone Context

In 2012-2013, Shelby County Schools in Memphis, TN, established the iZone, a special enclave within the larger district dedicated to the improvement of low performing schools designated by the state as "priority schools." Though formally part of Shelby County Schools (SCS), iZone schools were given additional autonomy, funding, and an extra hour in the school day. Initial improvement strategies focused on recruiting school leaders and teachers with a track record of success and providing them with autonomy over most school-level decisions, such as curriculum, instruction, assessment, and staffing. Strong results and a growing reputation led to increased demand, and by 2017 the iZone had grown from an initial 6 to 23 schools (Zimmer, Henry, & Kho, 2017).

Despite a reputation as a rare turnaround success story, a combination of increasing scale and Tennessee's transition to Common Core-aligned standards rendered the "autonomous principal" strategy unsustainable. iZone leaders determined that there was an insufficient number of leaders and teachers with the capabilities to drive improvement in an environment characterized by rigorous standards, high concentrations of poverty, and stringent accountability. By the 2016-2017 school year, a new strategy emerged that focused on a shared system of teaching and learning, heavy investment in capacity building, and a tighter system of central management. Integral to the strategy was the adoption of a shared math curriculum -- Eureka Math -- that defined both content and pedagogical principles for all iZone schools.[2]

At the central office level, the iZone established its own organizational structures, distinct from the larger district, to monitor and support schools. This included Instructional Leadership Directors (ILDs), who

[2] Eureka was adopted as the math curriculum for all district schools, but a separate system of support was provided to iZone schools, as well as the provision of an additional hour.

supported and evaluated school principals, and an Instructional Support Team (IST), comprised of a director, content managers, and content-based coaches who provide instructional coaching to teachers.

iZone leaders established a common organizational blueprint that defined routines, structures, and roles intended to coordinate practice, generate consistent information on teaching and learning, build professional capacity, and solve emergent problems of practice at the school level. Key roles included a school administrator who oversaw the math department, a math teacher content lead who supervised the math department in each school, and a coach responsible for the implementation of professional learning communities. The blueprint also called for each school to establish a math professional learning community (PLC) and an instructional leadership team (ILT), both of which were expected to meet regularly and contribute to the improvement process. iZone leaders also provided a common lens for analyzing instruction through observation and coaching tools (e.g., Instructional Practice Guide (IPG)).

In the 2017-2018 school year, the iZone implemented the Eureka Math curriculum, marking the first time that there was a standard curriculum throughout the iZone and district. Eureka lessons are intended to scaffold students' conceptual development through a series of connected problems that link prerequisite skills to the current lesson, escalating from procedural fluency to conceptually demanding tasks that students undertake independently. In choosing the new curriculum, iZone leaders noted Eureka's alignment to Tennessee State Standards and its emphasis on concept development. Further, iZone leaders saw the curriculum as complementing their pedagogical focus on productive struggle and rich classroom discourse.

Although Eureka curricular materials are designed to offer support to teachers, effective enactment demands considerable preparation and pedagogical content knowledge. Consider for example the lesson "scripts" that accompany the curriculum. On the one hand, they specify teacher questions, ideal student responses, sequence of tasks,[3] pacing within the lesson, closing, and exit tickets. On the other hand, the curriculum designers implicitly rely on teachers to *select and enact* tasks based on an analysis of student learning. Specifically, for each Eureka lesson script, teachers are expected to solve the lesson's recommended math tasks ahead of time, and then determine which tasks are best aligned with students' knowledge and needs. In Eureka parlance, teachers select "must dos" for all students to complete, and "could dos" for students with greater procedural fluency and conceptual understanding. Furthermore, teachers are expected to select among several conceptually-based tasks which in turn afford students

[3] For simplicity, we will define "task" as a classwide, group, or individual activity that involves students doing mathematics.

opportunities to demonstrate connections between multiple mathematical representations rather than mechanically apply procedures without understanding their underlying meaning or applicability (Stigler & Hiebert, 2009).

While customizing lessons to anticipate student thinking makes good pedagogical sense, it is a complex process that challenges entrenched norms of direct instruction and procedural fluency. Consider, for instance, a Eureka lesson on the distributive property that presses students to use algebraic and geometric representations to explain why $(a+b)^2 \neq a^2 + b^2$. While the task reflects the conceptual orientation of the curriculum, it also surfaces several challenges for both teachers and students. Students who lack experience representing algebraic quantities with geometric representations, or correctly interpreting mathematical inscriptions, are likely to struggle to complete the task. This, in turn, demands that teachers develop students' computational skills and make connections between different representations, while keeping up with the district's swift pacing guide.

Additional examples abound. For instance, teachers are expected to introduce tasks to students in ways that facilitate conceptual understanding without already mastering a rote procedure; they are expected to broaden student participation and allow for multiple strategies to arise and be collectively evaluated; they must monitor student work to select and sequence student solutions that reveal different aspects of key mathematical concepts, as well as common student misconceptions. Finally, teachers are expected to orchestrate classroom discussions in which students explain and justify solutions to mathematical problems, while other students ask additional questions or make connections to different solution strategies.

These examples illustrate the demands that curriculum implementation places on teacher knowledge, skill, and beliefs. In order to successfully enact the curriculum, most teachers must strengthen their own mathematical knowledge, develop new instructional practices to foster student conceptual understanding, and recalibrate their expectations about what students are capable of learning in math. Moreover, these demands challenge many teachers' conceptions of good teaching that are often rooted in a long history of direct instruction and teaching to the test. This phenomenon is not limited to the iZone. Research has found that most teachers need extensive, coherent support over multiple years to effectively select and introduce tasks in math classrooms, maintain the cognitive demand of tasks, and facilitate classroom discourse around math tasks (Jackson, et al., 2012; Kazemi & Franke, 2004; Stein et al., 1996).

But if conceptually and pedagogically rigorous instruction demands extensive teacher learning for most teachers, where will the knowledge and skill come from? What changes to the organization of schools, district central offices, and the design of learning opportunities will enable this capacity to emerge? One reason these questions matter is that just as a new curriculum can pose steep demands on teachers, the work of redesigning school organizations to improve instruction can exceed the experience and skill of many principals, which in turn can place pressure on central offices. This, then, is a central dilemma of district-led turnaround: how can the same practitioners, operating in the same "failed" system, identify and use new knowledge in ways that far surpass past performance?

In the remainder of this chapter, we analyze evidence from our study of the first year of iZone scale-up, with a focus on iZone high schools. The larger iZone study, which began in spring 2017, has included 20 interviews with iZone and district staff, 18 interviews with school administrators, 24 interviews with teachers, and 10 focus group interviews with teacher workgroups, for a total of 72 interviews. We also conducted 19 observations of iZone principal and teacher coaches, to further understand the infrastructure and support in place for district-led school turnaround. Finally, we surveyed 128 teachers in 30 district schools using a validated survey instrument on math teaching; and we surveyed 81 school leaders in the same set of schools on their priorities, perceptions and use of support and guidance, and school organizational characteristics. Response rates were at 80% for both of the surveys (Stein, Correnti, Moore, Russell, & Kelly, 2017).

Although we drew on data from across the study, our primary data sources for this chapter were approximately 25 interviews and 6 observations of high school teachers, school leaders, and iZone leaders. Analysis for this chapter unfolded primarily through the generation of memos that followed each data collection event. For each interview, the interviewer wrote an interview summary form within one week of conducting the interview to capture main themes related to our research questions. After each observation, we wrote an analytic memo that captured the themes of the observation, and their relationship to our research questions and other data. Most observations were followed by a subsequent interview. We further generated a set of analytic memos that summarized trends within schools, across schools, and within iZone leader role groups. While conducting the analysis for this chapter, we regularly referred back to the original interview transcripts to check that memos accurately captured participants' responses.

Results

In the sections below, we document the significant professional hurdles that the Eureka Math curriculum posed to teachers, school leaders, and district support staff. To illustrate these points, we focus on a particular challenge that has rippled through multiple layers of the iZone: selecting and enacting mathematical tasks for high school students. While this is just one of many problems of practice in the iZone, it serves as a useful example by which to illustrate the systemic, multi-layered nature of curriculum reform and its enactment in a high school turnaround environment. Overall, our results show that implementation of a common curriculum demands new ways of thinking and acting for teachers, new organizational structures and routines at the school level, and new systems of support at the district level. We further demonstrate how these changes conflict with deeply entrenched norms and practices, and the extent to which developing infrastructure to support these changes is a long-term process that runs counter to popular conceptions of turnaround.

Classroom Level: Selecting and Enacting Tasks

The process of selecting and enacting tasks in Eureka challenged iZone teachers' norms and beliefs about mathematics instruction, highlighted gaps in their mathematical content knowledge, and exposed their unfamiliarity with pedagogies designed to cultivate a conceptual understanding of mathematics. Interviews with district leaders revealed that, for many high school math teachers, old habits of direct instruction, low-level classroom discourse, and teaching to the test conflicted with the pedagogies embedded in the new curriculum. This, in turn, undermined a lesson planning process that was intended to focus on conceptually-oriented mathematics and student opportunity to struggle. Instead, many teachers relied on traditional practices (e.g. modeling procedures, repetitive procedural practice) to deliver the new curriculum. A second year Algebra 1 teacher described his and a colleague's stance towards direct instruction:

> [The other math teacher] and I are like heavy, drill sergeant type teachers, so we struggle with the gradual release of letting kids go out there and swim on their own. We're both very old school.

The demands of curriculum implementation further revealed how gaps in teachers' content knowledge influenced their ability to select tasks, understand the connections between tasks in a lesson, anticipate student misconceptions, and subsequently enact lesson plans. For example, a math content manager noted that many teachers implemented the lesson plan without careful consideration of how to surface student thinking to maximize learning opportunities over the course of the lesson:

> … So how are you going to have the students talk about their thought process when working this problem? We'll [need to] ask some questions like that even though it's not written in the script … In some [teachers'] minds that they have to follow the script. We're trying to get them to just ask students questions to provide different opportunities for the students.

This same iZone leader remarked that many teachers lacked the content knowledge and pedagogical skill needed to support student discourse in the classroom, and that historically-embedded norms of direct instruction and procedural math stymied the development of new pedagogical skills. Indeed, several iZone leaders commented that, despite the lesson scripts and other forms of guidance, the majority of teachers still had significant gaps in understanding which tasks to select, why those tasks were important, how to ameliorate significant achievement gaps, and how to anticipate student misconceptions prior to the lesson. One instructional coach noted that the rigor of both the content and pedagogy implicitly embedded in the curriculum challenged many teachers:

> I would say [the main problem is] just really understanding the content itself. I heard so many [teachers] saying, 'I really had to sit down and I had to watch videos and I had to make sure to do that.' So just being able to convey it to the scholars and not trying to teach it the traditional way (is a challenge)… And then we have some scholars that do have difficulty anyway, lower performing scholars.

One way that iZone leaders attempted to support curriculum implementation was through deploying a team of instructional coaches to plan lessons with teachers. They reasoned that since lesson planning was a critical first step in delivering high quality instruction, they would focus initial efforts there. A math content manager who supervised one team of math coaches remarked that while coaching had a positive impact on lesson planning, it also revealed the extensive support that many teachers needed:

> The lessons that we're planning with them are more sound lessons, but the problem is ...that the lessons that we don't plan with them are not as good ... So our problem is trying to figure out how do we let this work carry over when we're not there.

On one level the strategy made sense. High-quality instructional coaching can be an effective way to build teacher capacity (Kraft, Blazar, & Hogan, 2018). However, a combination of scale, financial constraints on the size of the coaching team, the depth of student needs, ambitions for pedagogical rigor, and the ever-present threat of accountability limited the potential for individual coaching to build capacity and improve instruction in the first year of scale-up.

A primary consequence of these factors was that a substantial part of the capacity-building agenda needed to be shouldered by schools. That is, while coaching, professional development, and other forms of district-provided guidance could help, much of the support and problem solving would need to take place in schools. Yet supporting teacher learning demanded far-reaching changes in school organization and culture. Schools had to develop collegial structures, roles, and routines that provided teachers with access to in-house expertise, opportunities to learn from colleagues, and regular feedback on practice. Moreover, these new organizational processes and routines would need to be managed by many of the same teachers whose professional capacity was in question. Additionally, school leaders would need to establish structures and routines that defied historical leadership and cultural norms as deeply embedded as direct instruction was for teachers. Was such a plan even feasible? In the next section, we demonstrate how principals and other school leaders began to manage the instructional problems that arose from the implementation of Eureka.

School Level: Redesigning School Organizations to Build Capacity

The iZone organizational blueprint represented a set of resources that school leaders could use to focus their organizations on developing professional capacity and improving teaching and learning. Yet, as we elaborate below, just as many teachers lacked the knowledge and skills to use curricular resources in ways that aligned with the iZone vision for improving *student* learning, so too did school leaders lack the capacity to use the organizational structures and processes in ways that would advance *teacher* learning. Moreover, school leaders' implementation of this blueprint occurred within a context that presented several challenges. One was that the policy environment rewarded schools and school leaders for rapid improvements in test scores, more than it did for developing teachers' instructional expertise. A second was the legacy of teacher autonomy prevalent in many iZone high schools. For example, high school teachers and administrators often demonstrated a lack of commitment to collegial learning that undermined the productive use of the PLC structure designed by the iZone. At one high school, the principal did not require that math teachers participate in regular PLC meetings, reasoning that they had little time due to other initiatives, and that they could access other sources of guidance. Explaining this decision he stated: "This year I just did not push the PLC. I received feedback from my teachers that they're really stressed and kind of burnt out. So I tried to pull back some."

The implication was that the PLC structure was not valued in the school as a potential source of support for teachers, with limited ability to enhance the lesson planning process associated with the new curriculum. Moreover, to the extent that PLCs did occur, teachers reported that they focused primarily on the exchange of information, some standardization of language, and various tips and tricks that did not

address core instructional issues critical to implementation of the curriculum. In another iZone high school, for example, math teachers described coming to consensus on language for concepts that cut across high school math courses (e.g., agreeing to refer to slope as "rate of change") without actually discussing how they might make these concepts more accessible to students. Math teachers also noted that they did not discuss how to annotate Eureka lesson scripts, identify and cope with challenges they encountered in those lessons, or other issues at the heart of curriculum implementation. One iZone high school math teacher described his co-planning process with another math teacher:

> So he'll be like, "Okay, what did you do this week? Does this match the pacing guide? If it doesn't match it enough, how could we twist it to make it match?" And then we'll just go through it ... So it's not a lot of "how do we teach this," it's more of like "how much of it are we going to use?"

The end result was that despite the establishment of school-level structures to promote collegial learning, there were limited collective opportunities to develop practices compatible with the iZone's vision for instruction, and teachers were left largely on their own to cope with the challenges of a new curriculum and new pedagogical expectations that significantly departed from their past experience.

Enactment of the organizational blueprint for schools was also undermined by a lack of content knowledge and capacity to enact routines focused on problems of practice among school leaders. Thus, when school leaders established collegial learning processes, their capacity to guide professional learning was limited. One high school leader lamented the inability of the school's leadership team to lead the math PLC despite a clear need for improvement:

> No one on the admin team has a math background...and math is again our weakest tested area. So the PLC of math looked a lot different from the PLC of English where my vice principal is a former English teacher [and] really takes the lead.

Indeed, strong professional knowledge among some portion of the math teachers could have mitigated the weak knowledge among school leaders, and infused collegial structures with a strong vision of practice and an agenda for continuous improvement. But low teacher retention (common in many high poverty schools) resulted in a relatively inexperienced cadre of math teachers charged with overcoming the extraordinary demands of curricular rigor, high stakes accountability, and a student body with formidable academic and non-academic needs. For example, in the same iZone high school referred to in the previous

quote, three of the four math teachers had less than 3 years of experience, and the more senior teacher admitted struggling to shift from a more traditional pedagogical approach.

The lack of content and pedagogical knowledge among school leaders also weakened efforts to generate effective feedback loops aimed at improving instruction, which is a common challenge for school leaders who oversee math teachers (Rigby, Larbi-Cherif, Rosenquist, Sharpe, Cobb & Smith, 2017). The iZone expected principals to review lesson plans in preparation for weekly observations and feedback to teachers. While both high schools principals in our sample complied with the directive to review lesson plans, the process was enacted ritualistically and in ways that had little bearing on classroom instruction. Math teachers in both schools claimed that the process had virtually no impact on their practice. One second year teacher stated that the absence of feedback left him with little guidance around a core instructional dilemma:

> Yesterday, as we were talking about the pacing and what we can do to combine [the lessons], one of my questions was, okay, I've been submitting my lesson plans. I'm not quite sure if this is what is being asked of me […] I know the administration does routinely give feedback on those, I just haven't gotten that yet.

In sum, the demands that curriculum enactment placed on teachers posed a parallel set of demands on school leaders that had far-reaching consequences for the school organization. Yet the exigencies of collegial learning, instructional leadership, and collective problem solving did as much to expose a lack of organizational capacity at the school level as it did to improve classroom practice. Perhaps this should be of little surprise; the iZone blueprint for school organization and leadership represented a significant departure from the historical template of teacher privacy and loose coupling that has informed school leadership and organization for over a century (Meyer & Rowan, 1977; Meyer & Scott, 1983). Moreover, prior research has documented the challenges that new instructional leadership practices pose to school leaders unaccustomed to this model of leadership in conjunction with teaching demands for teaching (Larbi-Cherif, 2017; Nelson & Sassi, 2005). The leadership and collegial structures that iZone leaders established had the potential to reverse these historical trends, but leaders and teachers needed guidance on how to use them.

For iZone leaders, then, meeting the demands of high school turnaround hinged in no small part on their own capacity to assess the needs of teachers and leaders, to understand how the resources they provided were interpreted and used, and to build the capacity of school-level professionals to make significant changes in teaching and leadership practice. The demands on teachers and leaders were too significant

and too far a departure from past practice to expect that they could marshal the necessary resources and capacities on their own. This, in turn, meant that iZone leaders would need to make changes to their own practices no less substantial than those required of teachers and leaders. We turn to this dilemma of district-led turnaround next.

District Level: Coordinating the Development of Teachers and School Leaders

The iZone's long term success depended, in large part, on the development and implementation of robust systems of support to guide leaders and teachers in making significant changes to practice, and to support the transformation of schools into collegial, problem-solving organizations. iZone leaders responded by establishing a two-pronged system of guidance. The Instructional Support Team (IST) was charged with developing teachers' pedagogical and content knowledge, and the Instructional Leadership Development Team (ILDT) focused on building principals' leadership capacity and the overall redesign of iZone schools.

Two central questions confronted the work of the IST and the ILDT: could they develop the capacity to provide consistent and robust professional support, and could they coordinate their efforts so they adhered to a common vision of instruction and a shared strategy of improvement? Both of these challenges confronted the political and social forces that have traditionally shaped the structure and function of urban districts. Past research has described districts as siloed, fractured, and uncoordinated, as well as bureaucratic and compliance oriented (Honig, 2012; Spillane, 1998). To be successful, the iZone would need to overcome these barriers. One advantage was that the two teams shared a common set of instructional goals. Moreover, both teams supported standards-based teaching and a conceptually-oriented approach to mathematics instruction, and they organized their work to reinforce and support these ideas about instruction.

At the same time, inconsistent and confusing messages from the iZone support teams often provided conflicting guidance to teachers and leaders. For example, members of the ILDT and IST disagreed over how to address the learning needs of students who are far behind, while still maintaining grade-level instruction. ILDs promoted the use of a curriculum supplement, whereas coaches maintained that the focus needed to be on the effective use of Eureka to meet the needs of all students. Similarly, ILDs and coaches were, at times, split on whether they should meet struggling students "where they are" (even if that was several grade levels behind) or maintain grade-level content that focused on students understanding the underlying concepts. Such disagreement is not uncommon in districts and even schools

(Coburn & Talbert, 2006; Spillane, 1998), but for the iZone to realize its goal of developing a coherent instructional system, such differences had to be reconciled.

More important than these specific disagreements were the divergent approaches to improvement. While ILDs and coaches were both focused on improving instruction towards the same goals, they relied on different change levers and operated under different incentives. ILDs primarily worked with principals to look for patterns of instructional problems across the school, and as such represented a school-level model in which the principal is chiefly responsible for ensuring improvement and results. By contrast, coaches worked directly with teachers on specific problems of practice in their classrooms. Additionally, coaches' position in the system was relatively shielded from the intensity of accountability pressures. This allowed coaches to focus on individual teachers' instructional growth, and maintain a steady eye on developing the high quality practices called for by Eureka. Indeed, one coach noted that she was not personally accountable for student performance in the classrooms of teachers she coached. Alternatively, ILDs and principals reported that they were personally expected to increase student scores on state standardized tests. Thus, while the IST and ILDT shared common instructional goals, they enacted different strategies on instructional improvement based on their proximity to accountability pressures. These differing incentives contributed to disparate priorities, which threatened the effort to build a coherent infrastructure for consistent and robust support to teachers and school leaders.

In addition, both groups struggled to support consistent and effective practices within their own teams, and often were forced to base decisions as much on personal judgment as on a shared system of coaching or leadership development. That is not to say that coaches and ILDs entirely lacked common practices. In fact, both the ILDT and the IST established a set of tools and routines that included an observation rubric aligned to the Eureka curriculum, common formative assessments that gave both groups access to the same student performance data, and cycles of professional learning that guided their work with teachers and school leaders.

Yet, in both cases, a lack of codified practices forced ILDs and coaches to make important decisions based on little more than personal experience and intuition. These gaps reflected considerable uncertainty as to how the practice of coaching and leadership development contributed to actual changes in practice, and ultimately to better student learning outcomes. For example, while the IPG guided coaches' observations of instruction and drew attention to key practices, it offered no guidance on how to foster improvement, what incremental progress looks like, or what might be a trajectory of teacher development. Consequently, iZone math leaders commented on how many of the coaches needed more support in their

work with teachers, particularly in identifying high leverage goals for teachers after conducting an observation. Hence, a common observation tool helped guide the work of coaching, but absent a shared and refined theory of teacher development, coaches could use the common tool in ways that might not foster long-term instructional improvement at scale.

The ILDT relied even more extensively on individual judgment to advance the practice of school leaders. Unlike the coaches, for whom the IPG defined core domains of instructional practice, ILDs had no shared tools that identified the core domains of leadership practice. The assessment of leadership practice and the identification of areas of weakness and strength varied according to the individual expertise, preferences, and discretion of each ILD. Moreover, the work of ILDs was not rooted in a commonly understood trajectory for improving principal leadership. Consequently, it was largely at the discretion of individual ILDs to determine how to develop principals' capacities to observe and give feedback on instruction, organize PLCs focused on instruction, and foster a culture of professional growth. Not surprisingly, ILDs reported feeling isolated in their work and desiring a greater degree of collegial support.

In sum, the steps that the two iZone support teams took to build their capacity and coordinate their work were impressive, and by the historical standards of U.S. education quite rare. Rather than focus on bureaucratic compliance, these teams were driven by a professional commitment to improving practice in an extraordinarily challenging environment. Yet, the systems in which they worked were only partially formed and thus provided inconsistent guidance around some core practices. While their mission was to ensure that iZone principals and teachers benefited from a common set of tools, guidelines, and support, they themselves were forced to make critical decisions absent an equivalent infrastructure. The result was that the support provided to teachers and leaders was at times inconsistent and incoherent.

For both the IST and the ILDT, it is important to note that filling gaps in their systems of work is an ongoing process. The work of teacher and principal development is fraught with uncertainty and complexity even in the best of circumstances. Elaborating core practices that attempt to cope with this uncertainty and complexity provides the opportunity to test key hypotheses, measure progress, and make continuous refinements. The alternative -- that individual ILDs and coaches enact this process on their own -- resembles the individualized conception of practice that has historically defined the work of education professionals in the US. The iZone is attempting to go a different route.

Conclusion

As discussed throughout the chapter, curriculum implementation requires significant learning for educators and administrators at all levels of a school district, particularly those engaged in turning around high schools. Teachers must develop new ways of thinking about instruction and student learning, as well as new instructional practices. School leaders must learn to redesign the school organization so that its core structures, roles, and routines provide effective feedback loops and support practice and instructional problem solving, while simultaneously meeting accountability targets. The burden is no less formidable for district leaders who must find ways to organize their work such that they provide consistent, coherent, and robust support for teachers and leaders.

At each level, these new norms and practices conflict with beliefs and norms formed over decades of experience and carved into school systems' institutional memory. For example, if teachers are to develop pedagogies that embrace the discomfort and uncertainty of student struggle, they will have to overcome norms of direct instruction and the conception of learning implied by it. If school leaders are to foster a culture of collaboration and joint problem-solving, they will need to overcome a culture of teacher independence and autonomy. If district leaders are to establish shared systems of teacher and leader development, they will need to overcome traditional, political, and epistemic boundaries that typify district leadership and stymie a coherent approach to reform.

One way to summarize our findings is that high school turnaround is not best understood in terms of high schools or turnaround. Rather, it is a long-term process for building educational infrastructure at multiple levels of a system (Lenhoff, 2013). At the classroom, school, and district level, new capacities and ways of working must be developed such that the improvement of teaching and learning becomes a collective, system-wide enterprise. One implication of this analysis regards the imperative of continuous improvement. The uncertainty and complexity of the work coupled with variation across local contexts means that developing tools, adapting, and refining must be an ongoing process. Furthermore, this emphasizes the importance of designing turnaround systems that support school and district-level actors in gradually increasing their knowledge, adapting and improving ways of working, and codifying new insights into tools and routines.

A second implication is that improvement efforts cannot be judged solely by assessments of student learning. While student learning outcomes are an important goal, the long-term incremental nature of infrastructure building means that district and state leaders need ways to gauge incremental progress that will eventually lead to stronger outcomes. An exclusive reliance on impact evaluation runs the risk that

improvement initiatives will be deemed ineffective while still in the early stages of development (Peurach, 2016). This, in turn, means that urgency must be balanced with the patience that incremental, system-building work requires. Our loosely coupled system in which practitioners work in relative isolation dates back over a century, and the process of replacing it with a system defined by interdependence and shared work will take shape slowly.

We close with a few words about high schools. In our view, the principles of teaching and learning, leadership, and school improvement are no different for high schools than middle or elementary schools. In the iZone, productive struggle and a focus on mathematical concepts applies equally to elementary, middle, and high schools. Yet, the challenge of replacing old norms and practices with new ones, of redesigning the school organization, and of reimagining school leadership is more daunting at the high-school level. As noted above, the departmental structure, the complexity of content, and the large gaps between high- and low-performing students further complicate already difficult work. But to the extent that improving high schools presents a particularly vexing challenge, then the imperative of building system-wide infrastructure to support the work is all the more critical. In other words, the greater the challenge, the more we must rely on systems in which problem solving, practice, and capacity building are shared within and across schools and at different levels of the system. Absent commitment to and investment in this approach, high school turnaround will remain an elusive goal.

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