THE NATIONAL CENTER ON SCALING UP EFFECTIVE SCHOOLS

With the Design in Mind:

High School Reform Model Features that Matter in Implementation

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Abstract

This paper proposes a framework for analyzing program design features that seem to matter in implementation. The framework is based on findings from a study conducted by the Consortium for Policy Research in Education (CPRE) between 2004 and 2007 that explored how reform ideas and practices created by five external provider organizations were enacted in a national sample of high schools. Four interrelated design factors are examined: emphasis, level of complexity, approaches to teacher and administrator engagement, and availability of implementation supports. This framework offers a guide for local educators, provider organizations, and researchers to generate questions and collaborate to strengthen implementation and realize program goals.

Introduction

Implementing deep and long lasting change in schools is hard. Too often, changes envisioned do not fully reach hoped for outcomes. Adaptations may reflect only the surface attributes of an innovation, lacking the deeper intent upon which the reform is based. We know from practice and decades of research on implementation that even the most thoroughly studied and elegantly crafted program is likely to be altered as it is brought to life in a particular classroom, school, or district. While some alterations strengthen the viability of a program in a specific setting, others may seriously undermine a program's ability to facilitate desired change. The challenge is to be able to recognize and anticipate both.

We need a framework to help program providers and local education leaders identify key components of designs that matter in implementation. Such a framework can help providers and education leaders make decisions about the appropriateness of the design for a particular school setting and predict potential trouble spots in the implementation. Once the decision to implement the design has been made, a framework can help educators and providers make predictions about where the design is likely to encounter challenges and plan accordingly.

Increasingly districts are partnering with external organizations to assist in improving core facets of schooling—instruction, learning, and school community. In 2004, Millot

estimated that school improvement purchases were climbing rapidly, from $50 million in 1996 to $1.4 billion in 2001. Since then, that figure has dramatically increased as government accountability requirements have placed greater pressure on school systems to improve academic outcomes for all students and offered financial incentives to turn to outside organizations to provide support.

Given the significant investment, much attention has been directed toward improving the implementation and scale-up of externally created educational reforms. Coburn (2003) identified four dimensions of scaling-up educational reforms: depth, spread, sustainability, and ownership. Attention to these four dimensions is also useful for understanding implementation within a particular school or school system. *Depth* of use involves moving "beyond the surface structures or procedures to alter teachers' beliefs, norms of social interactions, and pedagogical principles as enacted in the curriculum" (p. 2). *Spread* involves both the number of people or schools in contact with the reform. There is an important interaction between these first two. Program developers want the reform ideas and activities that are spread across a faculty to have depth rather than be mere superficial changes. *Sustainability* involves the nature of the reform's persistence over time. *Ownership* focuses on the extent to which "authority and knowledge of the reform" (p. 7) moves from the external provider to those individuals, schools and school systems using the design.

School improvement efforts developed by external provider organizations pose a unique set of implementation questions. Unlike a school system's homegrown improvement efforts, the basic program blueprints are designed by the provider and intended for implementation in multiple school locations. The creators of the program often have a strong sense of what needs to happen in order for the reform to meet the desired outcomes based on beliefs about the nature

of change needed and how to effect change. Those beliefs may reflect years of research and work in school systems. At the same time, local educators have a deep knowledge of their particular context, needs, and priorities. And it is there—in that district, school, or classroom—that educators and the provider negotiate how the blueprint will come to life. In the hallmark Rand Change Agent study, Berman and McLaughlin (1978) describe this push-pull between an externally-developed initiatives and the setting as a process of mutual adaptation in which both the program and those who are engaged in the implementation are changed. Datnow, Hubbard, and Mehan (2002) argue that we have vastly "underestimated the co-constructed nature of implementation" (p. 10). This has significant implications for understanding why an externally created blueprint that depicts the program's implementation as a logical set of components and sequential steps can look quite different in subtle and substantial ways when it is enacted in a particular school.

Program providers have employed a variety of approaches to address this core tension between maintaining fidelity to a program design and adapting to meet the needs and priorities of the implementing school or district. These approaches reflect the designers' theories of how to effect change in schools. Some designs are accompanied by highly detailed guidance. Providers argue that specificity is necessary to remain faithful to the design's core principles in implementation and then achieve the desired ends (Ball & Cohen, 2003; Berends, Bodilly, & Kirby, 2002; Shiffman, Massell, Goldwasser, & Anderson, 2006). Detailed instructions of the program's components, materials, and processes leave little ambiguity for those tasked with enacting the program. Thus, educators implementing the program have concrete guidance as they begin putting the program into practice. The provider has greater confidence that the program will achieve desired results, that those results can be evaluated, and that the program

can be replicated. Other providers opt for a looser blueprint that fosters deep involvement from the educators implementing the design. These providers argue this co-construction is essential to garnering educator buy-in and making the program viable in that setting (Datnow, et. al., 2002; McLaughlin & Mitra, 2002). Without educator buy-in—particularly when a design calls for difficult behavioral changes—commitment to the reform in the face of competing priorities is likely to be weak and educators will not have a sense of ownership of the reform ideas and practices. To address these competing pressures, Thompson and Wiliam (2007)—among others—argue for a 'tight-but-loose' approach to implementation that favors "obsessive adherence to central design principles" (p. 2) as well as space for addressing the needs, resources, and conditions of a particular school as long as these do not conflict with the 'tight part.'

An additional complication lies in recognizing that the providers' designs are never static (Berends, et. al., 2002; Datnow, et. al., 2002; Shiffman, Riggan, Massell, Goldwasser, & Anderson, 2008). Providers continually revise and refine designs with deepening knowledge of implementation in schools and changes facing an organization from the policy environment and the market. Thus, a program as designed in 2006 is likely to look different in subtle or substantial ways in 2015.

At the outset, both education leaders and program developers need tools to assess whether a program is a good fit. Hatch (2002) observes that to make an informed selection, education leaders need a deep understanding of the array of externally created programs and what might be required of a school or district in terms of time, resources, and amenability to change. He argues that too often education leaders do not have the time and resources to fully vet programs. A poor fit or underestimated implementation drains scarce resources, educator

time and energy, and ultimately does not serve students well. Once implementation begins, local education leaders need to be able to anticipate where and when alterations are likely, predict the impact of those alterations on the program's ability to facilitate the desired outcomes, and plan accordingly.

This paper offers one framework for analyzing program design features that seem to matter in implementation—a design's emphasis, complexity, engagement, and support. The framework is based on findings from a study conducted by the Consortium for Policy Research in Education (CPRE) between 2004 and 2007 that explored how reform ideas and practices created by five very different external providers were enacted in a national sample of high schools. Following a brief summary of the study and the program designs, this paper will discuss the framework and each of the four design features that influenced implementation in the study high schools.

The Study

For two academic years a team of CPRE researchers explored the ways in which five instructional improvement programs created by external provider organizations were enacted in 15 high schools across the United States. The study was funded by the U.S. Department of Education's Institute for Education Sciences (IES).[1] Two primary research questions guided the study:

- How do the reform ideas and practices of external change agents interact with school environments and teacher attributes to change instructional and organizational practices in high schools?

[1] Funding for this study was provided by the U.S. Department of Education's Institute of Education Sciences (Grant #R308A960003).

- What factors both within and outside high schools explain differing levels of understanding and enactment of programs?

(Supovitz & Weinbaum, 2008, p. 10)

Not only did these five programs have different foci, each took different approaches to implementation. Some programs provided highly specified instructions for rolling out the program; other designs emphasized co-construction of the reform from the beginning.

Description of Programs Included in the Study

The programs included in the study represented three common types of instructional improvement programs found in high schools at the time: whole school reforms, targeted literacy initiatives, and data use strategies (Gross & Goertz, 2005). Whole school or comprehensive school reform programs (represented in this study by First Things First and High Schools That Work) focus on making school-wide changes rather than concentrating on one area of a school or school population. These programs typically focus on improving instruction, school organization, and relationships in a coherent and comprehensive manner (Vernez, Karam, Mariano, & Di Martini, 2006). These models have grown in prevalence with federal and private funding incentives over the past couple of decades. The Education Commission of the States (2015) estimates that over 8,000 schools are using comprehensive school reform models. Targeted literacy initiatives (represented in this study by Ramp-Up to Advanced Literacy and the Penn Literacy Network) address a widespread and enduring concern that adolescent students do not have the literacy skills needed to complete grade-level coursework (Biancarosa & Snow, 2004). In 2013, 64 percent of eighth grade students scored at basic or below basic on the National Assessment of Educational Progress (U.S. Department of Education, 2014). In contrast to a whole school reform, targeted designs such as those examined in this study focus on the

needs of a specific subset of students and teachers needing additional support. Data use strategies (represented in this study by SchoolNet) focus on the use of data to improve instruction and student performance. The standards movement, accompanying accountability requirements, and significant technological innovation prompted the current emphasis on collecting, reporting, and using student performance data. Yet collecting, managing, analyzing, and using data to inform decisions remains a complex process that requires extensive cooperation and preparation (Lachat & Smith, 2005; Massell, 2001; Supovitz & Klein, 2003; Shiffman, et. al., 2006; Wayman, Stringfield, & Yakimowski, 2004). Table 1 provides a brief summary of the five designs included in the CPRE study. Note that these designs are not static. Table 1 presents key characteristics of the designs as they existed at the time of the study.

Table 1. Programs Included in CPRE Study[2]

Whole School Reforms
First Things First Created by the nonprofit Institute for Research and Reform in Education (IRRE) in 1989, this program seeks to strengthen relationships among students, teachers, and families; improve instruction that prepares students for college and careers; and reallocate resources to support these goals. At the time of the study, the design called for reorganizing students and faculty into theme-based small learning communities, instituting a family engagement system, and providing teacher professional development. The implementation plan was detailed and occurred over multiple years. Leader and staff positions were designated to guide the reform. Teacher buy-in for the reform was expected to come in completing program activities.
High Schools That Work Created by the Southern Regional Education Board (SREW), this program seeks to improve student achievement by fostering a school culture of high expectations and ongoing improvement. To do that, the design emphasizes enhancing instructional capacity and collegial discussion, and moving staff through a strategic planning process. At the time of the study, the design called for the school community to vote to accept the reform in the school and then participated in a strategic planning process focused on increasing achievement for all students. The design materials included a set of key practices that constituted an effective, high quality school as defined by the provider. These practices addressed what students should learn,

[2] These program descriptions reflect the designs as they existed during the study period.

conditions for optimal learning, and responsibilities of teachers. A technical assistance visit helped staff and other stakeholders evaluate their strategic plan. Each school was assigned an SREB representative to make technical assistance visits and provide ongoing, tailored support. HSTW schools also had access to the organizations network of high schools across the country.

Targeted Literacy Initiatives

Ramp-Up to Literacy

Created by the National Center for Education and the Economy (NCEE), this design is an unbundled component of NCEE's whole school reform—America's Choice. The Ramp-Up program seeks to bring middle and high school students performing one to two years below grade level up to grade level within two years. To do that, the program employs a workshop model of instruction that scaffolds learning and is organized around specified routines and rituals.

At the time of the study, the program provided a highly detailed comprehensive curriculum for two English courses. Supervisors and teachers assigned to Ramp-Up followed the design's detailed curriculum, pacing calendar, classroom arrangement, and student evaluation plan. The design called for structural changes for the two courses including block schedules, class size limits, and looping—in which the teacher moves with the students to the second year of instruction. The school was required to purchase a classroom library as well. The design also called for cross-age tutoring in which Ramp-Up students read to younger children to foster student motivation. Some professional development from NCEE was included as part of the basic package.

Penn Literacy Network

Created by professors affiliated with the University of Pennsylvania, the basic design follows a professional development model for individual teachers. The program goals include offering teachers and school leaders a framework for improving literacy instruction, learning, and assessment; providing opportunities for reflection and professional community; and working to build a research-based curriculum.

At the time of the study, the design engaged teachers and schools through voluntary participation in workshops and courses. The design did not specify instructions regarding how to put program ideas into place. The design focused on facilitating teacher change through reflective practice and enhanced instructional literacy skills. This design did not call for changes to the school structure; rather change was concentrated in individual teacher practice in a classroom.

Data Use Strategy

SchoolNet

This design was developed by the SchoolNet company in 1998 to assist districts with collecting, managing, and making data accessible to teachers, administrators, and the school community. Through tracking instruction and student performance, analysis, and reporting results, the design assumes teachers and administrators will adjust curriculum and instruction. Student academic achievement is expected to improve with greater attention to individual students' learning needs. The design also envisions an online professional community to share lesson plans, instructional strategies with colleagues.

At the time of the study, SchoolNet offered multiple internet-based products and technical assistance for purchase. SchoolNet worked with school districts to select products and then develop an individualized district data system and supports. As a district-led effort, the design did not follow a particular approach to student learning or implementation plan. The basic design relied on a train-the-trainer model although additional technical assistance from the company was available for purchase.

Data Collection and Analysis

To identify the 15 study high schools, CPRE researchers asked leaders from each of the five provider organizations to identify three high schools that showed promise implementing the program. The focus of the study was on early implementation years. Thus, each provider organization identified two high schools that were in the early stages of implementing the reform. The provider representatives were also asked to identify a third high school designated as the "mature" site. The mature site was selected as an example of where the program had been in place for at least three years and was considered to be operating well. CPRE researchers conducted multiple site visits to early implementation high schools over the two-year data collection period and conducted one site visit to each of the 'mature' high school sites. The 15 study high schools were diverse by region, school and district size, and student demographics. At all 15 high schools, the researchers interviewed teachers and school leaders and administered a survey of teacher attitudes about the program. Over 500 interviews were conducted at the school and district level. In addition, 25 interviews were conducted with senior staff at the five provider organizations.

Interestingly, the variability found in the study schools was not necessarily attributable to the length of the time the reform had been in a particular school. In some cases, early implementing schools were operating the program more consistently with the blueprint than the mature sites. To explain the implementation experiences in the 15 schools and the variability across schools, CPRE researchers focused on four key areas: program design, school social networks, school leadership, and school district role.[3]

[3] A full account of the research study is available in Supovitz, J.A. & Weinbaum, E. H. (Eds.) (2008). *The Implementation Gap: Understanding Reform in High Schools.* New York: Teachers College Press.

The framework discussed in this paper focuses on program design. Data that informs this paper are drawn from interviews with provider staff, teachers, and school and district administrators; and materials produced by or about the five instructional improvement programs. We first analyzed the designs as they were presented by the provider. Next, we examined the designs as they were implemented from the perspective of the provider, school, and district staff. We reviewed interview transcripts that described modifications to design ideas and strategies. Finally, we analyzed the data across the schools and designs to identify patterns in the implementation in these 15 high schools.

Design Factors Framework

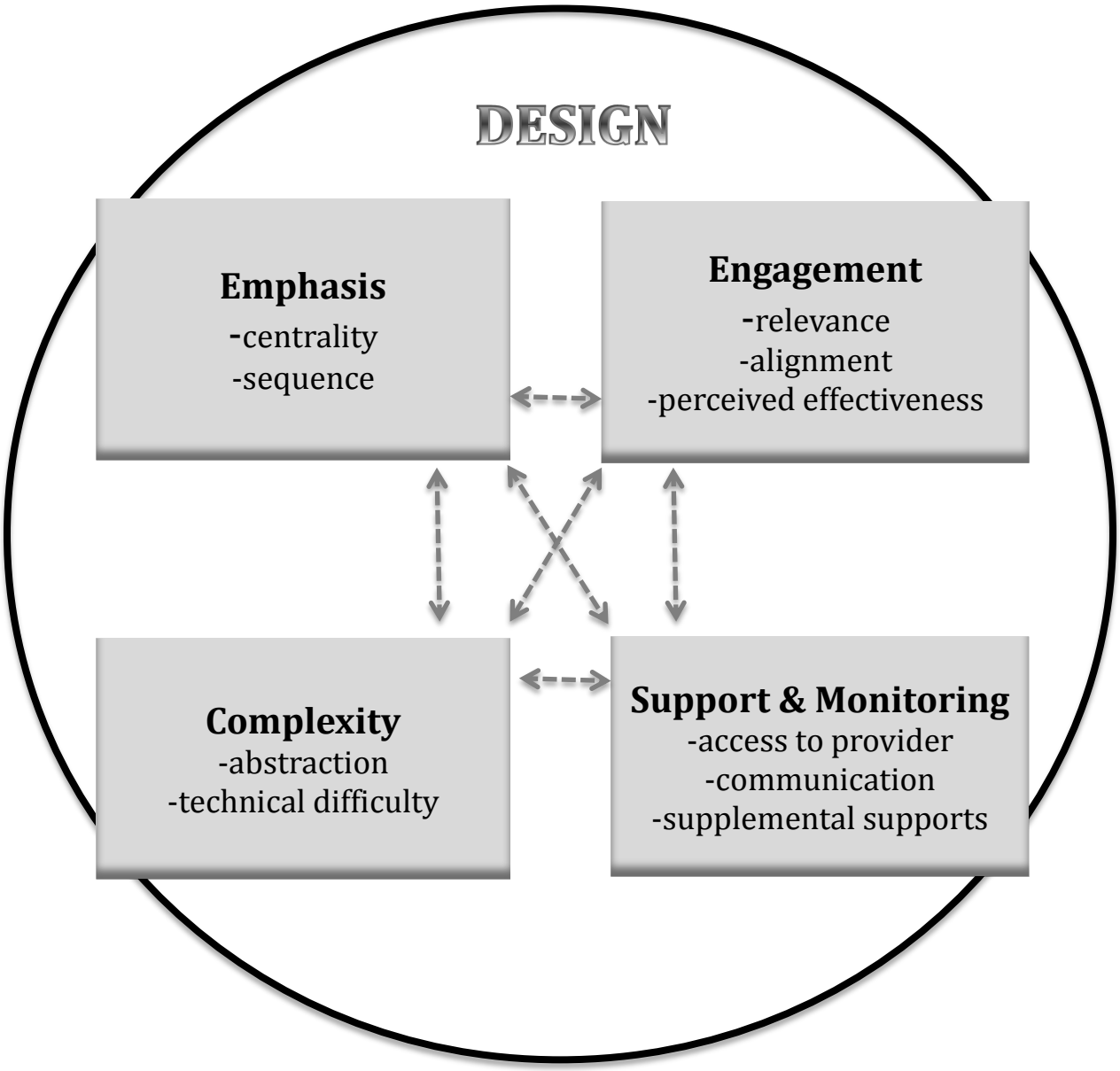
A framework can direct the attention of providers and education leaders to dimensions of the design that are likely to be more or less susceptible to modification. This can be of particular benefit to schools and districts with limited time and resources, aiding selection of an appropriate design to meet desired goals (Hatch, 2002). This framework can also assist providers and local educators to plan implementation together.

This framework conceptualizes the process of implementing a particular design as a sequence of interactions between the provider staff and the implementing school or district staff. The resulting 'enacted' program in a particular school or district, thus, is a product of that ongoing dialogue and negotiation. In the CPRE study, the nature of those provider-school conversations evolved over time. In particular, the provider organizations were more apt to negotiate design components once implementation was underway, rather than prior to implementation (Shiffman, et. al., 2006).

The design factors framework directs our attention to four key design factors and two crosscutting themes that help to explain the implementation variation found. The four design

factors include emphasis, complexity, engagement, and support. The crosscutting themes center on the level of detail provided to enact the design and the interactions among design components that matter in implementation. Figure 1 provides a graphic illustration of the framework. The four design factors are depicted. The broken arrows represent the interrelatedness of the factors.

Figure 1. Design Factors Framework



Design Emphasis

Designers have to make choices about what to emphasize and when (Barnes, Khorsheed, de Los Rios, & Correnti, 2006; Berends, et. al., 2002; Desimone, 2002; Kronley & Handley, 2003). Inevitably there is a hierarchy among design components and that prioritization is critical to implementation (Bodilly, Keltner, Purnell, Reichardt, & Schuyler, 1998). During implementation, prioritized design components are more likely to receive greater attention from a provider, be accompanied by more instructions and support, and more fully enacted than design components receiving less emphasis. The hierarchy among design components may be implicit and only fully apparent when challenged.

Analyzing a design's theory of action—essentially how a program is supposed to be rolled out and achieve program goals—provides key information about components emphasized by developers during implementation. Two themes embedded in the theory of action help to illuminate design emphasis. The first theme centers on a designer's belief about where the bulk of the program's development should occur, i.e., at the provider organization or in the local school or district (Desimone, 2002; Glennan, Bodilly, Galegher, & Kerr, 2004; Kronley & Handley, 2003). As discussed earlier in the paper, decisions in this area reflect philosophical beliefs about ownership of the reform and importance of the local context. These decisions also reflect providers' strategies for generating buy-in among educators tasked with implementation. A second theme embedded in a design's theory of action centers on the role of organizational conditions in achieving program goals. Does the design rely on particular structural arrangements such as scheduling, grouping students and faculty, and distributing authority? These choices reflect providers' beliefs about how individual practice is related to a school's organizational conditions; how to most efficiently put the program in operation; and how to

demonstrate impact in a local school environment in which attention to this program competes with many other priorities.

Two key dimensions of design emphasis are: 1) centrality of the component to the overall program goals, and 2) the implementation sequence in which components are introduced.

Centrality

Design components that are central to a program and its underlying philosophy tend to be the components most likely to be accompanied by greater resources, specificity in instructions, and pressure from the provider to implement. In their study of comprehensive school reforms, Vernez and his colleagues (2004) identified two types of design components—those components that are central to a design's identity, and those that take a supporting role in realizing central components. In the CPRE study, we found a similar pattern. For example, the Ramp Up design had a highly detailed plan for classroom instruction but left the supporting cross-age tutoring component to the schools to figure out. This component was either not implemented or weakly implemented by the study schools. Consistent with the 'tight-but-loose' approach discussed by Thompson and Wiliam (2007), we found that providers in the CPRE study held tight to components that were central to the program's identity and were less willing to negotiate adaptations in these areas. When a First Things First school proposed organizing students in small learning communities based on student ability, the provider strongly objected and responded by intensifying support including providing additional resources and staff to implement the theme-based, equitable small learning communities.

Central components of a design can conflict during implementation. Often, ensuing provider-school system negotiations may reveal an implicit hierarchy among design principles. A particular location of conflict lies in a designer's beliefs about program goals and commitment

to co-constructing a program with local educators. Of course, whenever educators are consulted for their knowledge and expertise, a designer raises the risk that these educators may reject or devalue a particular component (Shiffman, 2012). Implementing the High Schools That Work design in the CPRE study schools provides an illustration. Specifically, this model seeks to foster high expectations for all students. Reaching this goal is achieved through a plan developed by the school community. When provider staff perceived these two were in conflict, we observed that the provider staff prioritized high expectations for students at the expense of faculty co-construction.

Given that prioritization is inevitable, it is valuable for both provider staff and education leaders to take a close look at the proximity of individual program components to central ideas and goals of the design. Such an examination can bring clarity regarding what the provider believes is important in the design and implementation process. This can assist providers and local education leaders to identify components more or less likely to be accompanied by the provider's elaboration and support. With less provider attention, a local school or district may need to step in to fully enact the component. The relative centrality of a component also has implications for the nature of provider-implementer negotiations around program modifications. School or district efforts to alter central design components are likely to meet with greater resistance from provider staff.

Sequence

A second dimension of design emphasis concerns the order in which design components are introduced during implementation. There is evidence from multiple studies that components introduced during the early implementation years are those components most likely to take hold and be fully enacted (Barnes, et. al., 2006; Vernez, et. al., 2006; Shiffman, et. al., 2008).

Instructional improvement programs are enacted in dynamic local school environments where educators are contending with multiple priorities, funding streams, changing student needs, and policy mandates. There are windows of opportunity in which the leadership, resources, and attention are present. Those school and district leaders who selected and approved the design are typically still present and most invested in the design achieving the desired results. With time, schools and districts will move on to other pressing needs, priorities, and opportunities for change. Leader and educator turnover can also dilute both understanding and commitment to a reform.

In the CPRE study, those design elements introduced early in implementation tended to be more fully realized than components introduced later. At the beginning, the provider and local education leaders and staff devoted the most attention and resources to the program. These early components also tended to be accompanied by the most detailed instructions for implementation. For example, the Ramp Up to Literacy design prioritizes specific instructional approaches supported with detailed guidelines. These were the program components that were readily apparent in the study schools during the first year. The High Schools That Work provider staff and schools invested heavily in defining the problem and reaching consensus on plans to address the problem. A school's strategic plan was thus in place before moving on to the next design activities in the study schools.

When a design calls for structural changes as a central feature of the design—those components are more likely to be introduced early. Structural arrangements may need to be in place before subsequent activities and processes can occur. However, having structures in place does not ensure subsequent changes will automatically follow—particularly when those changes are also complex. In the CPRE study, the First Things First and school staffs invested significant

attention, time, and resources to create small learning communities intended to foster supportive conditions for improved instruction. However, the difficult instructional changes that flow from the small learning community arrangement require additional and sustained support at a point when implementers' attention and energy can wane. Across the provider-identified 'mature' sites, we found schools and districts shifting priorities and attention to new problems and new funding priorities. Thus what was in place remained, while later components were abandoned or more loosely followed.

It is important to evaluate designs in terms of what elements will be put in place early. Those early components may be the only ones that take hold before local educators turn to other priorities—or move on to other jobs. This dimension of emphasis prompts questions for providers and local leaders: Are the components we most desire to see in place? Will those components get us far enough along towards our goals—and satisfy the very reasons the design was selected in the first place?

Complexity

The second set of design factors fall under the umbrella of complexity. Here complexity refers to the level of difficulty associated with bringing the reform ideas into practice (Fullan, 2007; Mazmanian & Sabatier, 1989; Rogers, 2003). Rogers (2003) describes the complexity of an innovation in terms of the ability to understand and use, arguing that there is a negative relationship between the perceived complexity of an innovation and the rate of adoption. Fullan (2007) elaborates further that the degree of complexity depends on the difficulty, skill required, amount of adjustments in beliefs, instructional approaches, and curricular materials needed. The framework includes two dimensions of complexity. The first concerns the level of abstraction

that accompanies the concepts and practices teachers, leaders, and staff are called upon to implement. The second concerns the level of technical difficulty.

Abstraction Level

At a superficial level, it is relatively easy to reach consensus around oft-touted goals of school improvement initiatives. Who is not an advocate of more student engagement, high academic expectations, and a supportive school community? However, as individual educators, leaders, and providers begin to drill down to determine what high expectations look like in practice—and the steps to get there—consensus breaks down.

Providers embed abstract program goals into their designs with varying degrees of elaboration and instructions regarding how to bring them to reality. The design must define and operationalize concepts that often defy easy operationalization. As noted previously, some designs structure defining those concepts and what they mean for practice as a process of co-construction between the provider and the local educators (McLaughlin & Mitra, 2002). Such co-construction takes time and variation is assured. Other designs attempt to encode those concepts into specific practices and organizational conditions that are believed to facilitate bringing an abstract concept to life. For example, restructuring a school into small learning communities is intended to engender engagement and professional community. The challenge becomes whether a structural change does in fact facilitate the intended goal or remains simply a scaffold without substantive changes in relationships.

Abstract concepts that can be particularly difficult to translate into practice include 'high expectations,' 'professional community,' and 'student engagement.' These concepts can be embedded into more concrete design components such as changes to school structure, policies, or activities. But, these concepts also involve unique beliefs and behaviors of individual teachers

and leaders. For example, there is substantial room for individual interpretation regarding what 'high expectations' should look like in a classroom. A design might embed high expectations in concrete, measurable changes such as encouraging students to take higher-level coursework. While more students may take high-level classes, those courses can be watered down based on teachers' beliefs about student readiness for this work in their classrooms. In the same vein, professional community may be facilitated by structural conditions such as common planning time—though the extent to which that professional community is fully realized and supports the larger program goals may depend on the group of individuals participating in the community. Likewise, student engagement may be strengthened through the use of specific instructional practices or student groupings—though without teachers' and leaders' concerted efforts to foster engagement in their routine interactions, these efforts may remain but procedural artifacts.

Fullan (2007) posits that while the level of complexity can pose challenges to implementing schools and districts, greater change can be possible when more is attempted. The lesson here is to pay particular attention to the level of abstraction accompanying a particular design concept, the ways in which the concept is operationalized, and the additional work that may be needed to fully realize the concept in a particular school or district. As Mazmanian and Sabatier (1983) argue, even difficult problems can be addressed with adequate understanding of the challenges posed and supports needed.

Technical Difficulty

A second type of complexity concerns the technical capacity required of individual teachers, leaders, schools, and school systems. Even when design components are fully articulated and accompanied by detailed instructions, appropriate local education resources and conditions may not be present. A school or school system will face technical difficulties if it

does not possess the existing infrastructure or staff knowledge and skills to implement design components with fidelity.

The basic structures and operations of school are often stubbornly resistant to long lasting change (Murphy & Adams, 1998; Tyack & Cuban, 1995). A design's structural changes that require coordinating schedules can be particularly challenging to implement and sustain. For example, scheduling and sustaining a block schedule for selected classes but not the entire school can pose an administrative challenge that reappears over time as new initiatives arrive. Thus, a central structural component of design is intermittently at risk of erosion.

The volume of data—and technology to access that data—have exploded over the last quarter century. If harnessed, student performance data can provide a powerful tool for assessing and monitoring student progress, informing subsequent instruction, and communicating with stakeholders about student and school performance. However, introducing new technology often poses enormous challenges for a school system's infrastructure and the skills of data managers and users. In order for teachers to access current data, the data needs to be up to date and available; and teachers must to know how to navigate such a system. Subsequently using that data to inform instructional calls on another set of skills that often require additional support. For these reasons, the districts implementing SchoolNet in the CPRE study faced significant challenges building a district-wide data system and utilizing the full capacity of that system.

For local education leaders selecting a design, it is important to evaluate the level of technical difficulty posed to a school or school system. Those designs that pose a high level of technical difficulty will require significant investments of local time and resources to be fully implemented. High levels of provider and educator leader attention are often devoted to the initial investment of resources, yet most design components require ongoing maintenance. For

those design components that pose technical difficulties, education leaders and providers need to ask whether a school or district will be able to devote the needed staff, funds, and commitment to sustain a design into the future in the face of competing priorities.

Engagement: Teachers and Administrators

Garnering staff commitment to a program that involves complex changes in instruction, learning, and school community is critical for deep implementation and sustained use. A core preoccupation in the organizational change and leadership literatures concerns fostering staff commitment. Leader and staff commitment can be understood as the ideal outcome of a process that begins with awareness and engagement.

School improvement designs approach school-level educator engagement in a variety of ways. Some designs call for voluntary participation. This approach presumes that those teachers and administrators choosing to participate bring with them an interest and willingness to engage in the program. However, this approach can be slow and have limited reach into a school's faculty. Teachers and administrators opting not to participate may never fully understand what the design—its components and processes—mean for practice. For other school improvement designs involvement is not optional. Teachers and administrators are required to undertake the implementation work. In doing so, the argument goes, that staff will deepen understanding of and participation in the initiative. Ideally, staff commitment to the reform will follow (Connell, 2002).

Three common dynamics helps to explain the level of engagement observed in the CPRE study. The first dynamic centers on teacher and administrator perceptions about the relevance of the design to their work. The second dynamic centers on the extent to which teachers and administrators perceive the design addresses a problem they consider important. Finally, teacher

and administrator engagement is enhanced when they see a positive impact on a recognized problem.

Relevance to Educator Work

Teachers and leaders pay attention when a program impacts their daily work. That initial awareness and participation can either support the program or work against it. For example, whole school reforms require changes that can impact virtually every aspect of a teacher's professional life. Whether resisting or embracing the changes, they are aware and involved—even if the level of engagement is superficial. In contrast, a design that targets a subset of teachers and students is less likely to receive much attention from those who are not directly impacted.

Proximity to a program's core work tends to deepen educator understanding of a program and investment in its successful implementation. In particular, individuals involved in constructing a design from the beginning may receive more training directly from the provider and be actively engaged in the adaptive work needed to implement the design in their school, classroom, or district. In the CPRE study, these individuals articulated the greatest understanding of the design and program goals, and expressed deeper commitment. The implementation experiences of the SchoolNet districts illustrate this. As a design initiated by district leaders that involves extensive collaboration and technical work between the provider and the district office to create and operate a data system, the central office staff developed a deeper understanding and commitment to the initiative. Teachers, particularly when using the SchoolNet system was optional, described little to no use of the system and limited awareness of what the system could do.

Engaging formal leaders is critical to implementation. When school and district leaders play key implementation roles, they are more apt to secure and protect needed supports and participate in aligning a design to school goals. In the CPRE study, we observed variation in instructional leadership around the reforms. When a design called for formal leaders to play an instructional role, these leaders expressed a deeper understanding and investment in the design.

This dynamic directs provider and local education leader attention to ways in which a program will or will not impact teachers' work within a school or school system. The teachers and leaders most directly impacted will be those who are most likely to pay attention to, reflect on, and engage with program ideas. They may be instrumental in co-constructing a program and spreading ideas to colleagues. They are likely to be those who can most effectively advocate for and protect the program. As such, both providers and education leaders need to think strategically about which individuals are likely to be selected to implement a program and what they are likely to need to succeed.

Alignment

The second dynamic concerns alignment between provider and educator perceptions of problems facing a school and the range of viable solutions. When teachers and administrators believe the design addresses a problem they consider to be important, they are more likely to take interest in the design. Conversely, when a design addresses a problem that is misaligned with teacher or leader priorities, additional work is likely needed to foster engagement. Low student engagement provides an illustration. Teachers face this fundamental problem in their daily classroom work with students. As such, teachers in the CPRE study often expressed strong interest in those design components that targeted strengthening student engagement. There was less need for discussion between provider staff and teachers about the value of addressing this

problem. Given the widespread teacher interest in improving student engagement, some designs deliberately introduce student engagement strategies early in the implementation to encourage teacher support for the program (Connell, 2002). By contrast, when teachers do not consider the problem addressed by the program to be a problem they will likely be less interested in the program and its efforts to address the problem. For example, while a literacy initiative may seek to improve student literacy throughout a school, teachers in subject areas other than language arts may not view literacy needs as their problem. In this scenario, more work will be needed to align teacher and provider conceptions of a problem as a means of deepening educator engagement.

How a problem is defined and framed also shapes perceptions about the range of possible solutions. Thus, it is important to consider whether teachers and leaders recognize an issue as a problem to be addressed, and then agree with the design's framing of the problem and solutions. In cases where there is misalignment, providers and local leaders overseeing implementation may need to plan additional work to reach a shared understanding of problems and potential solutions.

Perceived Effectiveness

The third dynamic concerns teacher and administrator opportunities to witness a program's positive impacts. Observable evidence of success is likely to deepen engagement and further interest in a program. These opportunities are critical for motivating educators in the midst of uncertainty about what the program does and their capacity to carry it out in the context of competing obligations and demands. Some designs strategically introduce and structure design components to show evidence of success fairly quickly (Connell, 2002). The First Things First design calls for initiating simple strategies to foster student engagement in classes early in

implementation. In the CPRE study, teachers were able to quickly see the design's positive impact on an issue they cared about—student engagement. Similarly, by following the Ramp Up plan for instruction, the teachers and education leaders were able to witness increased interest in reading among their students fairly quickly. They viewed this as a positive indicator of the program's impact.

This dynamic directs provider and education leader attention to look strategically at the nature of evidence available about a program's impact for those who are engaged in putting its ideas into practice. What aspects of a program are likely to show positive impact? Will that impact be recognized? By whom? And, when is a positive impact likely to be evident? For those contending with the hard work and uncertainty of putting new ideas and practices into operation, experiencing a few positive impacts during implementation boosts morale. Long term, the ability to observe positive impacts has implications for deepening educator commitment to a program's ideas, practices, and continued implementation.

Support and Monitoring

The fourth design factor that contributes to variation in implementation involves the availability and nature of supports and monitoring. Implementation is a dynamic and context-specific process. Access to timely and appropriate supports and monitoring can make or break a program's implementation. Promising structural and content dimensions of implementation supports include those that provide frequent opportunities for ongoing and shared learning grounded in classroom practice and those that allow for ownership of reform by school actors (Berends, et. al., 2002; Bodilly, 2001; Cohen, Peurach, Glazer, Gates, & Goldin, 2014; Garet, Porter, Desimone, Birman, & Yoon, 2001; McLaughlin & Mitra, 2002; Slavin, 2004). Yet, many of these supports are likely to incur high costs (Barnes, et. al., 2006; Vernez, et. al., 2006).

Furthermore, it is often difficult to anticipate the total cost of fully implementing a design at the outset. Both the providers and local education leaders feel pressure to contain costs.

This design factor highlights three characteristics of implementation supports associated with program understanding and use on the part of local educators—access to provider staff and materials; communication between the provider organization and those who are putting the design into practice; and availability of supplemental supports when needed.

Access to Provider Staff and Materials

To make the kinds of substantive changes to teaching, learning, and school culture outlined in program designs often requires some form of professional development for those responsible for putting the changes into practice. While evidence of what makes professional development effective remains somewhat suggestive, approaches that include sustained engagement, the use of active teacher and provider learning, and collective participation show promise (Cohen, et. al., 2014; Garet, et. al., 2001; Wayne, 2008). Professional development can be extraordinarily costly. Program designers and local educators have to make difficult choices about the ways in which implementation supports are provided to contain costs, while also optimizing possibilities for implementing the kinds of deep, widespread, and sustained changes that are owned by school and district staff (Coburn, 2003).

Professional development in support of program implementation can take multiple forms that range in both cost and intensity. One form is direct training and advising from the provider organization staff. Another is a train-the-trainer approach in which selected local staff receives more intensive training from the provider and then return to teach their colleagues. A third method is to provide educators with detailed prepared guidelines to review while implementing design components. Often, a design will employ a combination of these approaches. Given the

significant pressure on the part of the school systems and the provider to contain their own costs as it relates to professional development, providers often offer more intensive trainings but do so as an additional cost to the school system. School systems will attempt to minimize costs where possible, and professional development—given the potential expense and uncertain scope—is a likely candidate.

Direct access to technical assistance from a provider has implications for deep understanding and use of the program ideas. The CPRE study found that individuals with more direct access to provider staff for technical assistance articulated a better understanding of the design and its components. In contrast, we found greater confusion among those individuals receiving training indirectly from their colleagues about the design components, and later more difficulty incorporating reform ideas and practices into their work.

Timing is another factor. Teachers and leaders introduced to a design in the early stages may acquire a deeper understanding of a program and its goals. In the early stages of implementation, school, district, and provider resources and attention tend to be most concentrated. Thus, those receiving training in the early stages have access to more resources to learn about and collectively work through how to incorporate the reform into their work in the school and make it their own. Of course turnover is inevitable. As new teachers are introduced to program ideas later in the implementation, their training is more likely to be further removed from that initial intense implementation work.

Provider guidance is also critical to prepare school and district leaders for their role in implementation. When leaders have a clear understanding of their role in a design, they are more likely to be committed to implementing the design and aligning resources. In the CPRE study, some of the designs offered fairly explicit instructions and training for leaders related to roles

and responsibilities as pertained to the program. Other designs offered little to no guidance for formal leaders about their role.

Providers and education leaders face a difficult task in determining the nature of implementation supports. They seek a balance between containing costs and prospects for deep understanding and use of program ideas over time. This decision involves determining the level of access to provider staff and resources needed. Questions to guide this process include: What do teachers and leaders need in terms of knowledge and skills to successfully understand and realize the goals of the program—i.e., how complex are the ideas and practices being implemented? Will provider staff and implementing teachers and leaders have a shared understanding of these ideas and practices? If the answer is no, what level of access to provider supports will ensure that an idea or practice is implemented and sustained in a manner that supports program goals?

Communication

As stated previously, implementation is a dynamic process that is impossible to completely predict. As such, ongoing communication between a provider's staff and those implementing the program is critical for clarifying a design, addressing challenges to implementation, and deepening understanding and use of the program in practice to meet the goals of both the school and provider. Provider staff brings deep knowledge about a program, how design components and the implementation plan support program goals, common stumbling blocks during implementation, and availability and uses of resources and strategies to support implementation. However, provider staff is likely to have varying degrees of familiarity with the specific implementation circumstances in a particular school. Provider staff may never directly communicate with those individuals who are implementing and using the program. When

communication between provider and school staffs is limited, there is more room for modifications that reflect the understandings and solutions of the school staff. Without deep knowledge and experience with design, school leaders and staff may not be able to distinguish between superficial and substantive adoption of program ideas. In the CPRE study, some designs included minimal opportunities for provider staff to visit the schools to observe the design in practice and offer technical assistance. As such, provider staffs had limited awareness about what was actually happening in the study schools.

When provider staff has limited contact with those individuals involved in implementing designs, an important communication pathway is curtailed. The provider staff—those who are most familiar with the design, implementation experiences, and range of supports and challenges—cannot respond to the specific questions arising in a school or district as they emerge. A teacher's question may be altered as the question travels through layers of translation or never even reach the provider. As a result, provider staff may never be able to identify micro-level misunderstandings and design modifications that ultimately undermine program goals.

Supplemental Supports

It is very difficult to anticipate the full range of supports needed to deeply embed an external design into classroom practice and school culture. Coupled with the cost pressures of provider-led training and other activities, school systems face constant pressure to minimize costs. However, providing additional supports—at the time they are most needed—is often critical to deep implementation of design components. Supplemental supports can involve professional development tailored to address specific problems, technical assistance visits, mentoring, and call-in support. As a principle, supports that require provider staff time tend to be expensive. Berends and his colleagues (2002) have argued that this is a significant challenge

for provider organizations. Providers must successfully market the need for supplemental supports to districts that are often reluctant to devote scarce resources further. In the CPRE study, provider and local education leaders readily agreed that additional supports were key to substantively implementing the design in ways likely to achieve program goals. Yet they all faced pressure to make cost-saving choices. When supplemental supports and monitoring were not available, teachers and leaders were left to make do, drawing on whatever school and district resources were made available. Where local support and monitoring were insufficient, prospects for deep and sustained used of program ideas were vulnerable.

Crosscutting Themes

Two themes cut across the four design factors. The first concerns the level of specificity that accompanies a design or design component. The second concerns the interactions among design factors. Both are important to consider in evaluating a design and prospects for implementation.

Influences of Design Specificity on Local Interpretation

Providers and implementing schools systems struggle to find an optimal balance between implementing the design with fidelity and allowing schools and districts the flexibility to adapt a program so it remains viable. As a whole, the five designs in the CPRE study took quite different approaches to providing detailed instructions for implementation. This same pattern was true when looking at individual components of each design. Essentially, some program components were accompanied by more detailed instructions than others, even among those designs with an overall greater degree of specificity. Program components with less guidance called for greater interpretation on the part of the school or district staff to put the component into place. As implemented in the 15 schools, these less specified components ran the gamut—

from virtual nonexistence, to a superficial piece of the program, to a deeply understood and rooted component that supported a program's ability to achieve desired goals in that particular school or district.

As a simple guideline when assessing the possibilities for implementing a design in a particular setting, providers and implementing school systems can examine the amount of detail that accompanies design components. Those components with less specific instructions are likely to require more interpretation on the part of individual educators and leaders in the school and district. Whenever more school and district interpretation is called for, there is likely to be greater variability and potentially less certainty of expected outcomes. Paying attention to the level of specificity that accompanies individual program components can help education leaders plan for the time, capacity, and resources needed to do this interpretative work.

Interaction Among Design Components

Most—if not all—designs seeking substantive changes in instruction, learning, and school culture comprise multiple components. It is the combination of components that are intended to help the school or district reach desired goals. The relationship between components is important to recognize and understand. Glennan and his colleagues (2004) argued that a change to one design component can impact the range of "decisions and responses available" (p. 31) to implement other design components. In the CPRE study, this interaction occurred most often between key emphases of the design and efforts to engage teachers and administrators who were tasked with implementing the program. Desimone (2002) noted this tension, observing that even when providers strongly valued co-construction of the reform, implementing teachers called for specific instructions regarding how to put the design into practice.

Conclusion

Selecting an externally created design that targets core aspects of schooling such as instruction, learning, and relationships is a significant investment for a school system and the provider. Too often providers, schools, and researchers are disappointed when a program does not reach its goals. Characteristics of the designs play an important role in channeling the interaction among the design, the provider staff, and those charged with enacting the design in a particular school or district.

The framework outlined in this paper identifies four key design factors that can influence dialogue and provider-school/district negotiations as a design moves from blueprint to a living set of beliefs and practices. These four factors—a design's emphasis, level of complexity, approaches to teacher and administrator engagement, and availability of implementation supports—function in concert with one another. Therefore, a modification in one area may alter the range of options and responses in another area. Similarly, the level of specificity that accompanies a design component carries implications for the amount of interpretation required of implementing educators, and variability in program enactment.

This paper offers a potential framework for providers and local education leaders to more effectively and efficiently assess the appropriateness of a design for a particular school or district prior to making a selection. Once a program is selected, this framework can offer providers and busy local educators important clues about where implementation challenges and program modifications are likely to occur and thus make plans to provide critical supports. A framework focused on the program's design, such as the one proposed here can generate targeted questions in these two areas. In the preceding pages, several questions have been offered to guide provider

and educator planning. This is by no means an exhaustive list, but rather a starting point for providers, researchers, and educators to explore how to work together to realize often elusive goals for students, and those who serve them.

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