

A Framework for the Initiation of Networked Improvement Communities

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FRAMEWORK FOR NETWORKED IMPROVEMENT COMMUNITIES

Executive Summary

Educators around the country are working individually and collectively to improve teaching and learning. Despite marked progress in some places driven by these improvement efforts, overall progress in the education field has been slow and outcomes remain highly variable. This is partly because the field is not organized to learn systematically, accumulate, and disseminate the practical knowledge needed for the improvement of teaching and learning.

This paper explores the initiation of a social structure to organize collaborative improvement work: the networked improvement community (or NIC). NICs are highly structured, intentionally formed collaborations among education professionals, researchers, and designers that aim to address a high leverage practical problem. We focus on NIC initiation, because of the challenges associated with launching improvement networks.

Developing the NIC Initiation Framework

We drew on two strands of theory and research to develop the framework. Given our interest in a networked form of organizing collaborative improvement, we draw on literature from the public administration field that explores inter-organizational networks as a strategy for addressing complex problems. We integrate our discussion of inter-organizational networks with a specific focus on the NIC concept as a particular form of inter-organizational network. By integrating these two perspectives, we make a case for this networked organizational form and lay the groundwork for attention to the process of network initiation.

While building our network initiation framework, we developed four network case studies including two cases of NIC initiation, the Building a Teaching Effectiveness Network (BTEN) and the Community College Pathways (CCP) NICs, and two cases of the formation experiences of mature reform networks, National Writing Project and Success for All. The analysis of live cases of NIC initiation enabled us to examine the process in real time. The investigation of mature reform networks enabled us to see what features of network formation contributed to the establishment of sustainable organizational structures, given that these networks have achieved longevity and prominence in the field. The case studies were developed based on records generated by the network (e.g., white papers, meeting agendas, and presentations) as well as informal conversations and formal interviews with network participants.

NIC Initiation Framework

We organize our discussion of the framework around five domains of activity that we hypothesize are critical to initiating a viable NIC. By viable we mean a NIC that is well positioned to both sustain operations and achieve its core aim. The domains are organized into concentric spheres of action. At the center, three interrelated domains specify the work necessary to launch the technical core of a NIC: developing a theory of practice improvement, learning and using improvement research methods, and building a measurement and analytic infrastructure. These three domains center around a specific problem of practice that anchors all activity in the NIC. The fourth domain, leading, organizing, and operating the network, is depicted as a circle surrounding the NIC core in order to emphasize that the structure of the network is aligned with the three central domains of activity. Leadership and emergent organization are critical during initiation because they lay the foundation for a sustainable organizational structure. Finally, the

outer layer of the framework, fostering the emergence of culture, norms, and identity consistent with network aims, refers to the characteristics of a network that enable the sustained voluntary engagement and discretionary effort of participants. Included here is the narrative of participation that defines a distinctive membership. While culture, norms, and identity are emergent properties of a NIC, a network initiation team must take strategic action to foster their development. In positing the framework, we argue that the developmental activity described in the domains is essential to NIC initiation. In other words, we assert that if these activities are not addressed during initiation, a productive NIC is not likely to fully form and be sustained.

This paper is a first attempt to articulate a framework that pushes the field a bit further into the details of transforming a promising set of ideas, the NIC concept, into actual execution. In specifying the framework, we argue that a firm foundation for network initiation is laid through the strategic actions of a network initiation team. By attending to the five domains of activity specified in our framework, initiation teams can catalyze the development of an organizational structure that accelerates educator capacity to learn from practice and build a professional knowledge base that enables the field to tackle complex educational problems. By calling attention to the multiple key processes in NIC initiation, we acknowledge the challenges associated with network formation and provide a starting point for both practitioners and researchers seeking to deepen this work.

A Framework for the Initiation of Networked Improvement Communities

Background/Context: Educators around the country are working individually and collectively to improve teaching and learning. Despite marked progress in some places driven by these improvement efforts, overall progress in the education field has been slow and outcomes remain highly variable. This is partly because the field is not organized to learn systematically, accumulate, and disseminate the practical knowledge needed for the improvement of teaching and learning

Purpose/Objective: This paper explores the initiation of a social structure to organize collaborative improvement work: the networked improvement community (or NIC). NICs are highly structured, intentionally formed collaborations among education professionals, researchers, and designers that aim to address a high leverage practical problem. We focus on NIC initiation, because of the challenges associated with launching improvement networks.

Research Design: Drawing on analysis of case studies of network initiation and theory on network initiation and the NIC concept, we posit an organizing framework for describing the process of NIC initiation.

Findings/Results: The NIC initiation framework specifies five domains of activity that we hypothesize are critical to launching a NIC. These domains attend to: developing a theory of practice improvement; building a measurement and analytics infrastructure; learning and using improvement research methods; leading, organizing, and operating the network; and fostering the emergence of culture, norms, and identity consistent with network aims. We illustrate these five domains with examples from a set of case studies of network initiation that we utilized as a way to test and further elaborate the framework.

Conclusions/Recommendations: A firm foundation for network initiation is laid through the strategic actions of a network initiation team. By attending to the five domains of activity specified in our framework, initiation teams can catalyze the development of an organizational structure that allows educators to accelerate learning from practice and building a professional knowledge base that enables the field to tackle complex educational problems.

FRAMEWORK FOR NETWORKED IMPROVEMENT COMMUNITIES

A Framework for the Initiation of Networked Improvement Communities

Educators around the country are engaged in efforts to improve teaching and student learning. Some are working largely alone to reflect on their practice and to improve instructional activities, pedagogical practices, and their ability to foster student motivation and engagement in their classrooms. Increasingly, many are also working collectively to address pressing problems of practice, such as gaps in student achievement between students of different races and ethnicities. They are doing so with colleagues in their departments, professional learning communities or even whole schools. A growing body of research suggests that these efforts to learn and improve do matter. Teachers, who engage in systematic reflection, and robust professional learning activities, have better student outcomes than their less engaged peers (Desimone, Porter, Garet, Yoon & Birman, 2002; Neufeld & Roper, 2003). Teachers who participate in productive learning activities collectively with colleagues from the same school, department or grade level are more likely to improve their teaching practice and student learning (Borko, 2004; Coburn, Russell, Kaufman & Stein, 2012; Frykholm, 1998; Horn & Little, 2010; Johnson, Kraft & Papay, 2012; Kazemi & Franke, 2004; Kraft & Papay, 2014; McLaughlin & Talbert, 2001; Stein, Smith & Silver, 1998). Likewise, schools with a collective orientation toward improvement boast superior student achievement (Bryk, Sebring, Allensworth, Easton, & Luppescu, 2010).

Despite marked progress in some places, driven by these collaborative improvement efforts, overall progress in the education field has been slow and outcomes remain highly variable. This is partly because the field is not organized to learn systematically, accumulate, and disseminate the practical knowledge needed for the improvement of teaching and learning (Hiebert, Gallimore & Stigler, 2002; Snow, Wigdor, Donovan, 2003; Bryk & Gomez, 2008;

Bryk, Gomez & Grunow, 2011; Bryk, Gomez, Grunow & LeMahieu, 2015). Lacking an infrastructure that enables rigorous development, identification, and dissemination of practical knowledge, we end up with a highly inefficient and variable system that fails to adequately support educator capacity to improve and consequently, produces variable outcomes.

This weak infrastructure for supporting improvement is exacerbated by critical disconnects between educators and other institutions that might support improvement efforts. University-based researchers are generating knowledge that might inform educational improvement, but the incentive structures in academia do not always encourage intensive collaboration between researchers and practitioners to design, test, and refine practical innovations (Firestone & Fidler, 2002). The commercial sector offers an array of educational products, but encourages the rapid spread of products with limited knowledge as to how to make it work effectively across diverse contexts (Burch, 2009; Rowan, 2002). As a result, educators lack the external resources that might support their efforts to improve teaching and learning.

Responding to the uncoordinated infrastructure for broad-based learning to improve in education, this paper explores the initiation of a social structure to organize collaborative improvement work: the networked improvement community (or NIC). The NIC concept takes its name from path-breaking work by Doug Engelbart on technology-assisted social learning (Engelbart 1992; 2003). Tony Bryk, Louis Gomez, Alicia Grunow and colleagues at the Carnegie Foundation for the Advancement of Teaching have adapted Engelbart's original conceptualization to promote NICs as highly structured, intentionally formed collaborations among educational professionals, researchers, and designers, that aim to address a high leverage practical problem (Bryk, Gomez & Grunow, 2011; Dolle, Gomez, Russell & Bryk, 2013). NICs operate as scientific learning communities distinguished by four essential characteristics: (1) they

are **focused** on a well-specified common aim; (2) they are **guided** by a deep understanding of the problem, the system that produces it, and a shared working theory of how to improve it; (3) their work is **disciplined** by the rigor of improvement science, and (4) they are **coordinated** to accelerate the development, testing, and refinement of interventions, their rapid diffusion out into the field, and their effective integration into varied educational contexts (Bryk et al., 2015). In essence, NICs are intended to situate practice improvement efforts in a supportive social architecture to accelerate a field's capacity to learn to improve.

The NIC concept is beginning to demonstrate evidence of promise through the early successes of two prototypical NICs. The first of these is the Community College Pathways Improvement Communities: networks of faculty members, researchers, designers, students, and content experts united in an effort to create a new system to increase the success rates of community college students in developmental math. Since their launch in 2010, the Pathways have been generating strong evidence that participating students are learning college level mathematics content, and taking less time to achieve college level mathematics credit, than their peers in the traditional developmental math sequence (Yamada, 2014). The second NIC is the Building a Teaching Effectiveness Network, which was designed to enable leaders in education practice, teacher development, policy, and research to come together to address the growing problem of beginning teacher development and retention. Working with urban school districts, BTEN engaged in rapid, small-scale testing of an innovative process for coordinating feedback cycles for beginning teachers. This has resulted in emerging evidence of improved school-based supports for beginning teachers (Takahashi, Bryk & Grunow, 2015).

As a testament to the power of the NIC concept, a number of educational groups are now seeking to organize as NICs to address complex challenges. For example, the Mathematics

Teacher Education Partnership is seeking to remedy the undersupply of new secondary mathematics teachers who are well prepared to help their students attain the goals of the Common Core State Standards (Martin & Gobstein, 2015). Similarly, the Network to Transform Teaching has been launched to support the transformation of the teaching profession by capitalizing on the instructional expertise and leadership potential of Board-certified teachers (Doctor & Parkerson, 2015). Many of these organizations have sought guidance from Carnegie for the task of initiating such networks, and it has become increasingly evident that the initiation process for this organizational form can be formidable (Bryk et al., 2015).

The challenges associated with successfully launching this type of collaborative work include technical issues such as: specifying a compelling and measurable aim that will motivate collective action; developing a working theory of improvement that enables progress toward the aim; and organizing the distributed work of diverse stakeholders. Meeting these challenges often raises, in turn, critical sociocultural issues that must be addressed in order to promote a shared vision and facilitate joint work among stakeholders with differing traditions, motivations, and normative orientations (Coburn & Stein, 2010; Coburn, Bae & Turner, 2008).

By systematically analyzing early field experiences and theory on network initiation and the NIC concept, this paper articulates a framework for describing the process of NIC initiation. The framework specifies five domains of activity that we hypothesize are critical to launching a NIC. We illustrate these five domains with examples from a set of case studies of network initiation that we utilized as a way to test and further elaborate the framework.

Developing a Grounded Theoretical Framework

We situate our discussion of network initiation in two strands of theory and research. Given our interest in a networked form of organizing collaborative improvement, we draw on

literature from the public administration field that explores inter-organizational networks as a strategy for addressing complex problems (Provan, Fish & Sydow, 2007; Provan & Kenis, 2008; Paquin & Howard-Grenville, 2013; Popp, MacKean, Casebeer, Milward & Lindstorm, 2013).

We integrate our discussion of inter-organizational networks with a specific focus on the networked improvement community concept (Bryk, Gomez & Grunow, 2011; Dolle et al., 2013; Bryk et al., 2015) as a particular form of inter-organizational network. By integrating these two perspectives, we make a case for this networked organizational form and lay the groundwork for attention to the process of network initiation.

Why Networks?

In recent years, we have seen a rapidly growing interest in networks as a promising organizational form for solving problems that require the integration of knowledge distributed across organizations and the mobilization of diverse social actors to engage in collective action (Kapucu, Hu & Khosa, 2014; Powell, Koput & Smith-Doerr, 1996). Public administration scholars have identified the networked organizational form as a promising way to address complex societal issues, sometimes referred to as “wicked problems,” that no one organization could reasonably solve on its own and that may require activating multiple societal sectors in their solution (Popp et al., 2013; Provan & Kenis, 2008; Weber & Khademian, 2008). Networks have been formed to address wicked problems such as climate change, global terrorism, and urban renewal (Van Bueren, Lijn & Kopenjan, 2003; Weber & Khademian, 2008). Education reform has the characteristics of a wicked problem, given that its complex challenges often cut across societal sectors such as social welfare, health, housing, and community services, as well as schooling (Tate, 2012).

As an organizational strategy for addressing wicked problems, networks are seen as a

way to take advantage of a broad set of resources and increase innovation, learning, and capacity building for problem solving (Brass, Galaskiewicz, Greve & Tsai, 2004; Issett, Mergel, LeRooux, Mischen, & Rethemeyer, 2011; Kenis & Provan, 2009; Klijn, Edelenbos & Steijn, 2010; Weber & Khademian, 2008). Furthermore, networks are viewed as a way to spread and support the implementation of promising solutions (Greenhalgh, Macfarlane, Bate & Kyriakidou, 2004; Valente, 1995). It has also been noted that networked collaborations have the potential to overcome the fragmentation of resources and expertise that is embedded in public sector governance structures (Weber & Khademian, 2008). In education, this fragmentation is compounded by the absence of a robust knowledge base for addressing problems of practice (Hiebert, Gallimore & Stigler, 2002).

Our interest in networks as an organizational structure to support educational improvement is consistent with a broader societal recognition of the potential problem solving power of networks. For example, in his recent book *Reinventing Discovery: The Era of Networked Science*, Nielsen (2012) argues that networks are accelerating scientific advances because they provide a social structure for amplifying collective participation and intelligence. Large scientific networks engaging diverse participants, often including non-scientists, are now mapping the structure of the universe and solving complex mathematical problems. These networks allow scientists to increase the cognitive diversity of collaborators, reduce barriers to entry by encouraging small contributions, and modularize collaboration by splitting overall tasks into smaller subtasks that can be attacked independently. This allows for the development of rich and well-structured information commons so that people can build on each other's work.

Engineer and inventor, Douglas Engelbart (1992) introduced the term “networked improvement community” to refer to groups engaged in collective pursuits to improve the

capability of a system. Building on his earlier work developing computing technologies that can augment human intelligence, Engelbart theorized about how systems of technologies might be combined with human capabilities and organizational structures in order to enable more productive collective action. In so doing, he posited a schema for practical knowledge generation that occurs at three levels. See Figure 1. Level-A learning occurs when front-line workers acquire knowledge while engaging in efforts to improve their daily practice. Level-B learning occurs within organizations as individuals share and reflect on practice. Level-C learning occurs when many organizations, networked together, share, test, and elaborate ideas for improvement in multiple, diverse organizational contexts. Networked improvement communities provide a deliberate organizational structure for facilitating and accumulating learning across all three levels. Engelbart argued that when social systems are structured in this fashion, they learn how to learn faster. Put another way, by working together a NIC accelerates collective improvement.

The NIC Concept and Educational Improvement

Tony Bryk, Louis Gomez and colleagues at the Carnegie Foundation for Advancement of Teaching have adapted Engelbart's ideas and promoted NICs as a promising way to help solve complex educational problems (Bryk & Gomez, 2008; Bryk, Gomez & Grunow, 2011; Bryk et al., 2015). In their conceptualization, NICs enable practitioners, researchers, and designers to work together to specify an important problem of practice, develop, test, and refine innovative tools and practices to address the problem, spread and support the uptake of practical knowledge, and analyze data to monitor progress toward a network-wide improvement goal. NICs are intentionally designed to bring together actors with diverse expertise and focus their energy on a common goal or shared aim related to a specific problem of practice. In a NIC, *practitioners* (e.g., teachers, administrators) from multiple organizations are working to understand and

ameliorate the same problem of practice in diverse local contexts, which increases the potential for uncovering practical solutions. Innovation generation is further accelerated as practitioners come into contact with research-based ideas through the participation of *applied researchers*, who assist in developing workable interventions that are anchored in the research-base of their disciplines. Exposure to methodologies for generating innovations and “design thinking” promoted by participating *designers* further contributes to the capacity to generate innovations.

The NIC structure is designed to accelerate the community’s capacity to learn from the design and testing of innovative solutions generated by network members. A central, coordinating network hub facilitates the development of a shared, network-wide conceptualization of the problem and solution space. As members take on a common language about the problem and solution space, network members are better able to efficiently and effectively share innovations and test the innovations generated by others. Because they provide access to varied contexts in which testing can occur, networks allow for examination of innovation performance under different contextual conditions, which in turn contributes to innovation refinement for effectiveness at scale. Analytic support from the network hub facilitates learning about the efficacy of innovations through shared data, common measures, and network wide analytics. This enables detection of patterns that might be difficult for any individual practitioner to see.

In addition, by orchestrating the collaboration amongst participating members, a NIC facilitates the development of social capital. Social connections are a well-documented mechanism whereby innovations spread (Rogers, 1983). As network leaders engage in deliberate efforts to nurture the development of relationships and trust, network members are more likely to sustain participation in collective action. Social capital also proves very helpful in accelerating

the testing of promising ideas generated in the network, as network members say to one another, “it worked for me, won’t you try it?” Interventions grounded in research and practice can be rapidly deployed and tested in diverse contexts because people who know and trust each other have established a common bond around a problem they jointly seek to solve.

The Challenge of Network Initiation

When examining networks as a way to organize cross-sector collaboration, public administration scholars have increasingly focused attention on the process of successful network initiation due to the complexity of operating this organizational form (Popp et al., 2013). Simply bringing together a set of partners is not sufficient to ensure that a network meets its goals. In fact, a large proportion of networked organizations do not perform the function that they were designed to achieve (Kogut, 1988; Podolny & Page, 1998). Known challenges to working in inter-organizational networks include: achieving consensus and commitment to shared goals (Bryson, Crosby & Stone, 2006; Provan & Lemaire, 2012); cultural clashes and competing institutional logics (Bryson, Crosby & Stone, 2006; Huerta, Casebeer & VanderPlaat, 2006; McPherson, Popp & Lindstrom, 2006); and coordination fatigue (Huerta, Casebeer & VanderPlaat, 2006; Provan & Lemaire, 2012). In their comprehensive review of the literature on inter-organizational networks, Popp and colleagues (2013) conclude that networks are an optimal organizational strategy only when there is real potential for competitive advantage, given that their operation is a “seriously resource consuming activity” (p. 24).

A critical feature of network initiation that is noted in the public administration literature is the importance of a lead entity that coordinates the process of initiation. These entities are variously referred to as network entrepreneurs (Burt, 2000), hubs (Dhanaraj & Parkhe, 2006), lead organizations (Provan & Kenis, 2008), or network administrative organizations (Human &

Provan, 2000), just to name a few. The lead entity role can be fulfilled by an organization within the network or by the creation of a new coordinating body (Provan & Kenis, 2008). Empirical evidence suggests that the presence of a coordinating lead entity is associated with superior network performance. For example, Provan and Milward (1995) found that health and human services networks were more effective if integrated by a central coordinating agency. Additionally, the literature on inter-organizational networks identifies a number of functions that an initiating team may engage in. These include defining common goals, spurring actor engagement, defining norms of action, attracting and managing network participants, fostering connections among participants, and facilitating learning from network member activity (Paquin & Howard-Grenville, 2013).

In their book *Learning to Improve*, Bryk and colleagues (2015) emphasize the role of a **network initiation team** in articulating the problem to be solved, analyzing the system that produces undesirable outcomes, and developing an aim statement, an initial working theory of practice improvement and associated measures that guide the collective work among diverse, and often widely distributed, participants. The network initiation team also plays a role in securing necessary resources, recruiting initial members, and engaging expertise relevant to the problem. These leaders craft a narrative of participation that helps to transform individual interests into productive collective action by specifying what network participants do, and do not do. The network initiation team establishes the processes and norms governing how individuals and groups work together and the evidentiary standards for warranting claims about the efficacy of improvements. This team also supports the open communication mechanisms necessary to accelerate learning network-wide. Over time, the initiation team leads the development of a central network **hub** that plays a key role in the distributed work of a NIC by providing ongoing

coordination, knowledge management, and analytic support (Bryk et al., 2015; Goldsmith & Eggers, 2005).

In sum, our review of public administration theory and research on inter-organizational network initiation, coupled with an emerging theory about the utility of the networked improvement community concept, serve to justify our focus on the networked organizational form and our attention to the process of network formation. The broad structure of a NIC has been outlined and a few exemplars exist (Bryk, Gomez, & Grunow, 2011; Bryk et al., 2015; Dolle et al., 2014), but much less attention has been given to the critical first steps in initiating the development and emergence of this novel and complex organizational form. This paper offers a framework, grounded both in the theory reviewed above and in a number of experiences to date, about key elements and steps in the process of NIC formation.

Anchoring the Framework in Cases of Network Initiation

While building our network initiation framework, we developed four network case studies including **two cases of NIC initiation**, the Building a Teaching Effectiveness Network (BTEN) and the Community College Pathways (CCP) NICs, and **two cases of the formation experiences of mature reform networks**, National Writing Project and Success for All. The analysis of live cases of NIC initiation enabled us to examine the process in real time. The investigation of mature reform networks enabled us to see what features of network formation contributed to the establishment of sustainable organizational structures, given that these networks have achieved longevity and prominence in the field. While these mature reform networks are not NICs *per se*, their formation experiences provide insight into processes and challenges that will likely be faced during NIC initiation, given their networked structure.¹

Our work to develop the framework was the product of a collaborative effort. Russell, Dolle and Gomez served as developmental evaluators for the two NIC initiation cases: BTEN and CCP. In their role as developmental evaluators, they chronicled the initiation process for the BTEN and CCP NICs. This effort to document the networks' initiation included gathering and analyzing various records generated by the network, such as white papers, funding proposals, meeting agendas, and powerpoints, and capturing participants' formation experiences through informal conversations, formal interviews, and surveys. Additionally, Russell, Dolle and Gomez facilitated structured conversations with Carnegie leaders, particularly Bryk, LeMahieu and Grunow, who had been deeply involved in the development of the two NICs. This ongoing interaction among the foundation's management team and the developmental evaluation team resulted in the identification of an initial version of the framework, which was later tested and refined by comparing it to the formation experiences of two mature networks, National Writing Project and Success for All.

The case studies of the mature networks were developed based on interviews that Russell and Gomez conducted with founding members of the networks and their review of various documents produced by or about the networks, such as white papers and other publications or websites. We used these network cases to elaborate the specific components of the initiation process that emerged from our conceptual work, described in the previous section, related to launching the technical side of networked improvement work and organizing, leading, and managing a networked organization.

Throughout the process of developing the framework, we tested its utility and practicality with three additional groups that were in the process of forming NICs. This happened through a series of convenings held as part of the Genesis of Improvement Networks project, funded by the

William T. Grant Foundation. The convenings were designed to provide a forum for the exploration of network formation issues. We invited three groups that had sought assistance in supporting NIC initiation: the Mathematics Teacher Education Partnership launched by the Association of Public Land Grant Universities; the Silicon Valley Research Alliance; and the Network to Transform Teaching (NT3) launched by the National Board for Professional Teaching Standards. These groups used the framework as a way to think about their initiation activities and, in turn, provided feedback on its form, language, and substance. While this was a component of our process for developing the framework, we will not describe it in detail because it is beyond the scope of this paper.

Networked Improvement Community Cases

Here we briefly introduce the four primary network cases in order to provide context for the examples provided throughout the discussion of the framework that follows.

Building a Teaching Effectiveness Network. The Building a Teaching Effectiveness Network (BTEN) brought together leaders in education practice, policy, and research to “improve teaching by focusing on the support, development, and evaluation of early career teachers.” BTEN was launched in 2011 with supports from the Gates Foundation as a partnership among the American Federation of Teachers (AFT), the Aspen Institute, and the Carnegie Foundation for the Advancement of Teaching, working in collaboration with three district partners. District partners committed to collaborate in a rapid prototyping process, through which innovations were developed, tested, analyzed, and refined in iterative cycles. Over time, the work of the network focused on testing and improving processes for providing beginning teachers with regular feedback and support. Iterative refinement of feedback processes in two districts produced promising evidence of improved supports for beginning teachers including more

consistent support from school leadership, the development of a shared vision across district participants regarding the importance of quality feedback, improved protocols for accomplishing quality feedback reliably, and teacher perceptions that schools were now making a more deliberate effort to support new teachers (Takahashi, Bryk & Grunow, 2015).

Community College Pathways. The Community College Pathways (CCP) network was launched in response to low student success rates in community colleges, particularly among students assigned to developmental mathematics courses. Nearly 60 percent of all students entering community colleges in the United States are required to complete one or more developmental mathematics courses and nearly 80 percent of these students never achieve college credits. This blocks their way to a higher education credential and to entry into many specialized career-technical certification programs (Bailey, Jeong & Cho, 2010). Recognizing the grave consequences for students' educational futures, Carnegie engaged networks of faculty members, researchers, designers, students, and content experts in the creation of two new pathways, one in statistics, Statway™, and the other in quantitative reasoning, Quantway™. These NICs aimed to develop and test new models for getting students to and through college level math by creating new courses with supporting instruction that is engaging, meaningful, relevant, and useful. Initially, 30 colleges from across the United States participated in the CCP NIC. In its first three years, over 50 percent of students enrolled in Carnegie's Pathways achieved college math credit within a year; a much higher success rate as compared to carefully matched comparisons, college-by-college (Yamada, 2014).

Mature Reform Networks

In order to supplement our knowledge of NIC initiation derived from our own engagement in establishing them, we also examined the formation experiences of two inter-organizational networks with educational improvement goals.

The *National Writing Project* (NWP) is a national network of 186 geographically dispersed sites working to improve writing in schools. It has been in existence for over 40 years. The regional sites are anchored at colleges and universities, co-led by an academic scholar and a practitioner, and serve teachers across disciplines and at all levels, from early childhood through university. NWP engages in a range of activities aimed at improving the teaching of writing and learning in schools and communities, including recruitment and development of teacher leaders, provision of professional development opportunities in schools, development of resources to promote and support writing improvement, and the generation of research on the teaching of writing. NWP was a particularly useful case for helping us to explore issues of culture formation, which we argue is a core domain of NIC initiation.

The *Success for All Foundation* (SFAF) is a nonprofit organization dedicated to the development, evaluation, and dissemination of a comprehensive school reform model that aims to ensure that all students develop literacy skills at grade level. SFAF leverages network connections with tens of states, hundreds of districts, and thousands of schools in order to facilitate coordinated improvement in professional practice, professional learning, and student achievement (Peurach, 2011). Key to this mission is the facilitation of simultaneous, distributed learning processes that enable the continuous improvement of SFAF's literacy development model. Currently over 1000 schools implement one of SFAF's five literacy programs. These diverse school-based sites provide an opportunity for SFAF to evaluate the implementation of the model under diverse conditions and engage in its ongoing refinement. SFAF is thus a useful

case for exploring leadership and operation, given the complexity of the network and its ambitious improvement-oriented reform agenda.

NIC Initiation Framework

We organize our discussion of the framework around five domains of activity that we hypothesize are critical to initiating a viable Networked Improvement Community. By viable we mean a NIC that is well positioned to both sustain operations and achieve its core aim. Figure 2 depicts the conceptual relationship between these five domains. The domains are organized into concentric spheres of action. At the center, three interrelated domains specify the work necessary to launch the technical core of a NIC: developing a theory of practice improvement, learning and using improvement research methods, and building a measurement and analytic infrastructure. These three domains center around a specific problem of practice that anchors all activity in the NIC. The fourth domain, leading, organizing, and operating the network, is depicted as a circle surrounding the NIC core in order to emphasize that the structure of the network is aligned with the three central domains of activity. Leadership and emergent organization are critical during initiation because they lay the foundation for a sustainable organizational structure. Finally, the outer layer of the framework, fostering the emergence of culture, norms, and identity consistent with network aims, refers to the characteristics of a network that enable the sustained voluntary engagement and discretionary effort of participants. Included here is the narrative of participation that defines a distinctive membership. While culture, norms, and identity are emergent properties of a NIC, a network initiation team must take strategic action to foster their development. In positing the framework, we argue that the developmental activity described in the domains is essential to NIC initiation. In other words, we assert that if these activities are not addressed during initiation, a productive NIC is not likely to fully form and be sustained.

Insert Figure 2 Here

The NIC Core Technology

An important task for the network initiation team involves launching the core technology of a NIC . This requires attending to three interdependent domains of activity depicted at the center of Figure 2. We discuss each core component and its constitutive elements in turn, providing illustrative examples from our cases of NIC initiation.

Developing a theory of practice improvement. It is essential that NIC initiation teams develop a theory of practice improvement. This theory grounds the collaborative work of the NIC by specifying the problem and aim that the NIC is pursuing and unpacking the systemic context that produces the problem. The specification of this theory begins as the network initiation team analyzes the specific problem of practice that the NIC intends to address. By engaging in a causal analysis of the system producing the problem, the NIC initiation team identifies system components thought to be major contributors to the current level of problematic performance. These problems then become specific areas for focused improvement work (Bryk, Gomez & Grunow, 2011).² Additionally, the process of identifying a NIC's aim and theory of practice improvement will contribute to the construction of common narratives that build member will to engage in collective action. We use the Community College Pathways case to illustrate the specific activities involved in problem specification and causal systems analysis, as well as the general process for developing a theory of practice improvement and its role in NIC initiation.

During the launch of the Community College Pathways (CCP) NIC, the initiation team identified the NIC's focal problem, low success rates in developmental math courses, by

beginning with a larger concern: that of low graduation rates in community colleges. In analyzing these low rates of graduation, low success rates in developmental mathematics emerged as a high leverage problem to solve. The vast majority of community college students tracked into developmental math courses fail to acquire college-level math credits, even after as many as three years of enrollment (Bailey, 2009; Bailey, Jeong & Cho, 2010). This prevents students from transferring to four-year institutions and entering many occupational preparation programs. Because the majority of community college students enter developmental math programs, the effect on graduation rates is significant.

The CCP initiation team's work illustrates a number of practical strategies for understanding a problem of practice. First, the initiation team took a user-centered approach to systems analysis, following students as they entered the community college and examining their subsequent experiences.³ Systems analysis included engaging diverse stakeholders such as students, faculty, institutional leaders, and researchers in conversations about why community colleges were getting these results. Part of the responsibility of the initiation team was to ensure that along the way, research-based knowledge was infused into the process. Between stakeholder convenings, the initiation team synthesized feedback representing it in a prototype working theory of the problem to be addressed. This enabled additional rounds of feedback and refinement. This process continued for multiple cycles until no major new observations emerged.

Second, the initiation team used the user-centered analysis to develop concrete representations of the system that produced the problem of practice. In the case of CCP, analysis of the problem resulted in the identification of multiple systems that influence student success in developmental math. These systems included the instructional system of what takes place in the classroom; the human resource system of selecting, training, allocating, and managing faculty

resources; the student support system of advising and guidance; the information infrastructure, including data on student engagement and learning; and institutional governance, or incentives and resources for student success. This systems analysis was represented in a Systems Improvement Map, a visual product of the causal systems analysis that can help the network build a shared understanding of the problem and solution space.⁴

A critical next step in the development of a theory of practice improvement is the identification of an improvement aim and a set of high leverage improvement “drivers.” The aim specifies the measurable outcome target that the network is created to achieve and a defined time frame within which the network intends to accomplish the aim. In the CCP case, the NIC initiation team established a target of increasing the proportion of students achieving college math credit in one year of continuous enrollment from five to fifty percent. The team drew on its Systems Improvement Map to specify a set of primary drivers that seemed essential to achieving this aim including: (1) the organization of instruction as a year-long pathway around college level mathematics content with embedded supports for the development of core math skills; (2) explicit attention to factors affecting students’ persistence in the pathway; (3) attention to language and literacy barriers to mathematics learning; and (4) professional development efforts to advance quality teaching.⁵ The aim and initial set of drivers serve as a framework for evaluating potential courses of action that might be taken by the network. It also guides the measurement activity necessary to inform a NIC’s efforts at advancing improvement. This phase of initiation is an analytical and empirical exercise where potential courses of action are interrogated, when possible, against extant empirical evidence including basic psychological research, program evaluation results, and case studies.

Over time, the aim and drivers are documented in a driver diagram. The driver diagram is further elaborated to include secondary drivers that elaborate more specific domains of action implied by the primary drivers. In this way, large complex problems are parsed into a discrete set of smaller, albeit still interacting, parts that are thought to fit together. Secondary drivers guide identification of discrete “change ideas” in work practice around which individual NIC members can innovate. For example, groups of faculty worked with a motivation researcher to develop and test change ideas aimed at encouraging students’ persistence in the pathway, the second primary driver. In this way, the network reduces the threshold to entry by enabling individuals to work on small parts of the problem, while still seeing how their part connects into a larger integrative whole.

Taken together, identification and analysis of the focal problem and the system that produces the problem, followed by specification of a measurable aim and detailing the high leverage drivers for achieving the aim, are the critical NIC initiation activities that form the backbone of a NIC’s *theory of practice improvement*. It is important to note that this working theory will be provisional and subject to evolution as the actual work of improvement begins and evidence from tests of change emerge. In this sense it is truly a “working theory”.

Learning and using improvement research methods. The process of launching a NIC also requires that the initiation team develop the network’s capabilities to use improvement research methods. Improvement science provides a disciplined approach to learning from practice, by deploying rapid tests of change to guide the development, revision and continued fine-tuning of new tools, work processes, roles and norms (Berwick, 1989; Kenney, 2008; Langley et al, 2009; Rother, 2009). Network initiation teams must develop improvement

research capacity, including sufficient people with the right mix of expertise to execute the work, and network routines to foster member's collaborative engagement in improvement projects.

A central method of inquiry used in improvement research is the Plan-Do-Study-Act (PDSA) cycle. The PDSA provides a structured routine for testing a change idea, such as the introduction of a new practice or tool, or a change to an existing work process. Each PDSA is, in essence, a mini-experiment involving the introduction of some change, a prediction of what the outcome will be, and the collection of evidence to examine whether the change appears to be an improvement. The cycle concludes with analysis and reflection in the context of the working theory of improvement, which leads to identification of the next step. A network can build a knowledge base about how to address the problem of practice as these cycles of change are tested over and over by different people and in different contexts. While this method seems relatively simple with a compelling logic of inquiry, it is a deceptively difficult practice to engage in. Consequently, another key process for the initiation team is creating opportunities for NIC members to actually experience the work of iterative PDSA development. In short, there is a significant professional development component embedded in NIC initiation.⁶

Our experience suggests that in the early stages of NIC formation, the initiation team will need to build their internal capacity to engage in improvement research methods while simultaneously seeking to support its development among network participants. In order to do so, the initiation team may need to draw on external sources of improvement research expertise. For example, when Carnegie began its work four years ago on BTEN, it engaged improvement advisors who had worked in healthcare quality improvement to offer both technical assistance and critical reactions from another field. When quality improvement efforts first moved into healthcare some two and half decades ago, they in turn drew on expertise from industry to

support their learning to improve (Kenney, 2008).⁷ These experiences suggest that practitioner members of a NIC will likely need significant support to develop the capability to engage in disciplined inquiry consistent with the practices and norms of improvement science.

In order to illustrate how a NIC initiation team learned and used improvement research methods, we turn to the BTEN case. During the initiation phase, the BTEN team prioritized the development of improvement science expertise within the team and among participants in the network. This expertise was brought to the network through the engagement of experienced improvement advisors who had led improvement projects in a number of sectors. In addition, during the early stages of BTEN's development, initiation team members engaged in intensive training with the Institute for Healthcare Improvement in order to build their own capabilities.

As they were deepening their own expertise, the initiation team simultaneously sought to build the capabilities of network members. Summer institutes were used to train district facilitators and school based teams in the improvement science orientation and methods. Participants engaged in simulations and other activities that provided opportunities to practice components of the method, such as PDSA cycles and the importance of measurement. Subsequent quarterly network meetings followed a common routine. The network initiation team shared school-level data with teams, as discussed below, and had them compare their data with network-wide trends in order to identify areas for further improvement. School-based teams then generated change ideas for the next action period and planned and executed their next PDSA cycles.

The initiation team also invested heavily in developing the improvement research capability of district-level improvement facilitators, intending for district facilitators to gradually take the lead in providing individualized support to school-based improvement teams between

network meetings. Improvement advisors from the initiation team had weekly meetings with the district facilitators and coached them on how to work with school-based teams. District facilitators then had weekly meetings with school-based improvement teams in order to coach them through their PDSA cycles. For example, when BTEN's improvement work focused in on testing and refining a process for providing feedback to beginning teachers, district facilitators worked with teams to develop and test changes that would support the enactment of feedback cycles with reliability and quality in their particular school context. In sum, the BTEN case illustrates the type of strategic actions an initiation team must take to build the network's improvement research capacity. Targeted training, ongoing coaching, and routines that scaffold participation are the types of practical strategies that can be employed in this process. In addition to coordinating training and scaffolding participation, the network initiation team promotes messages about why network members are now working in this distinctive way, thereby contributing to an evolving narrative of participation. This is a topic we elaborate on further under the culture-building domain.

Building a measurement and analytic infrastructure. A NIC's improvement activity is anchored in a measurement and analytics infrastructure that enables the NIC to establish whether specific changes introduced into local systems are generating the immediate process results expected and whether these, in turn, link to key drivers and the ultimate outcomes that the NIC seeks. This measurement infrastructure is the empirical complement to the analytic system represented by the working theory of improvement. Consequently, establishing these sensing systems is another a critical task for the initiation team. In order to build this infrastructure, the NIC initiation team must engage a diverse group of participants including those with research-based knowledge relative to the specific problem, practitioners expert in the targeted educational

contexts, and analytic staff with statistical and psychometric skills. Together, this expanded group needs to design both a system of measures and practical routines for collecting data as network members go about their work. Building the analytic infrastructure also requires that the initiation team assure agreements for data collection and use. Since a NIC typically will involve participants from multiple different organizations (e.g., schools and districts), developing and securing agreement around use of common IRB is essential to facilitate network-wide learning.⁸ Likewise, the initiation team needs to begin assembling an analytics group capable of rapid analysis of network data, seeking to learn from variation in performance to inform continuous improvement priorities.

As BTEN's focus crystalized around two primary drivers, (1) the development and refinement of processes that coordinate the provision of school-based feedback and support to beginning teachers, and (2) assuring a supportive relationships between new teachers and their school principal. Subsequently, the initiation team then built a measurement system spanning from the ultimate outcomes identified by participating districts to specific changes that were being introduced. The team identified measureable targets for improvement in order to get the "big picture" of how well districts were developing and retaining new teachers. This specifically included teacher attrition rates and performance ratings. They then negotiated a routine with participating districts for receiving and analyzing these data annually. These measures are referred to as *lagging outcome indicators*, because they are only available well after an intervention takes place.

Because indicators such as teacher attrition rates are lagging, improvement teams need more immediate, dynamic data to inform change efforts. The initiation team scanned existing research on beginning teacher attrition and identified two *leading outcome indicators* that would

enable them to see, in a more dynamic fashion, whether new teachers were on track for developing as effective teachers and remaining in the district. Self-efficacy and sense of burnout were known to be good predictors of whether teachers were on track to remain in the profession (Takahashi et al., 2015). Indicators of self-efficacy and burnout were refined into a 3-minute survey, administered to early career teachers every four to six weeks. As improvement work actually began in schools, these data were disaggregated by school site and shared with school-based improvement teams in quarterly meetings.

Complementing the leading outcome measures and drilling down into the actual work processes targeted for change, a set of *process measures* were eventually developed to examine whether specific changes being attempted, such as a conversation protocol used by principals in feedback conversations with new teachers, were actually operating as intended (e.g. occurring on a regular basis, addressing key needs identified by new teachers, resulting in feedback that was manageable and coordinated across multiple providers) (Takahashi et al., 2015). They also examined whether immediate process outcomes were signaling improvement. For instance, whether new teachers felt supported, knew what changes in practice to target in the next cycle, and received relevant support to make these changes.

In sum, the BTEN case exemplifies the work a network initiation team does to establish the groundwork for a measurement and analytics system that is capable of informing the NIC's ongoing improvement work. Besides addressing this practical network function, the act of building such a system deepens and solidifies a shared conception of the network aim and further cultivates the empirical disposition at the heart of systematic learning to improve.

Leadership, Organization and Operation

The next layer of our framework points to the leadership, organization and operation activities essential to NIC initiation. NICs must rely largely on the voluntary effort of network members to ensure a vital improvement community. In the absence of formal authority over network members, the initiation team needs strategies to govern the work that are different from the hierarchical command and control structures used to lead and coordinate traditional organizations. Leadership in networks is rooted in the ability to foster commitment to a common vision and motivate others to engage with it, rather than in formal power to impose roles or mandate actions (Eglene, Dawes, & Schneider, 2007). The NIC initiation team must be a good steward as “an initiator of activity and an integrative force for the overall enterprise” (Bryk, Gomez, & Grunow, 2011, p. 156). An important part of NIC initiation then is the development of systems and processes for leadership, organization, and operation of the network.⁹ This component of the initiation process includes securing human, social, and material resources and establishing and coordinating core hub functions, such as a communication and knowledge management infrastructure. To illustrate this domain of our framework, we draw on the case of the Success for All Foundation (SFAF), and highlight key operational decisions that need to be addressed during NIC initiation.

Securing human, social and material resources necessary for NIC operation. Launching a NIC requires that the initiation team develop an intentional strategy for identifying and attracting partner organizations. Our review of the networks literature and cases of mature networks suggests that networks can draw on different types of convening power, often in combination, when trying to recruit partners. This might include the credibility or legitimacy of a prominent, widely respected individual, the reputation or standing of a lead organization, or a track record or evidence-base for producing desired outcomes. For example, in the early stages

of network initiation, Success for All was able to recruit partnering schools due to the compelling research-based credibility of its founders Bob Slavin and Nancy Madden, and their affiliation with Johns Hopkins University. Later on, they leveraged evidence that the network was producing improvements in student achievement in its first cohort of schools to continue to attract more schools to the network. Initiation teams then may consider partnering with individuals or organizations that are prominent in the field they are trying to influence.

In tandem with the activation of convening power, a NIC initiation team needs to develop a membership framework that specifies criteria for member recruitment and participation, which ensures that the network has the right mix of partners to make progress toward the aim. This includes recruiting members with the kinds of expertise needed to engage the specific problem and with the will and capacity to undertake improvement projects. The recruitment process requires that the initiation team craft a narrative about the importance of the network's work and how participation differs from a standard project. The narrative is not static, but must be actively tested and refined to support the growth and sustainability of the network.

In order to illustrate the type of intentional work an initiation team needs to do in order to manage the composition of the network, we turn to the SFAF case. SFAF started small, first working with one school and building to be a network of thirty elementary schools scattered across the country, all within four years. The initial schools were not typical in that they had higher enthusiasm for working with an external program, better internal capabilities and leadership, and less environmental turbulence than most low performing schools (Peurach, 2011). This was not accidental but rather an explicit, strategic decision made by network initiators because it enabled the initiation team to co-develop the model under reasonably supportive conditions with actively engaged partner schools.

SFAF designed a voluntary program adoption process as their vehicle for selecting and socializing school-level network members. The program adoption process included meetings with school staff and school and district leaders to build a common understanding and shared vision for program expectations. In order for a school to join the network, SFAF required free and informed choice, as evidenced by a minimum of eighty percent of school staff voting to join the network. In addition, districts entered into a formal contract with SFAF to ensure that schools had the flexibility from district mandates necessary for full implementation of the SFAF comprehensive school reform program. The SFAF adoption process sought to build participant understanding of their roles and of expectations for engaging in the network, which is an important component of initiating NICs.

Successful NIC operation is also dependent on the initiation team's ability to attract and develop appropriate human resources for the network hub, which performs analytic work, provides improvement science training and coaching, and performs coordination functions. For example, the SFAF network required complex capabilities including trainers that acted as "front line managers" and key "social conduit of the professional network," carrying knowledge about the program to schools and feeding information about the use of the program in schools to program developers, thereby engaging in continuous refinement of the model (Peurach, 2011, p. 85). Many of the initial practitioners from SFAF schools became operational leaders as SFAF scaled up. In this way, those that developed know-how early on became a key resource for subsequent scaling, garnering clinical practice expertise that was an ideal complement to the research expertise that founders Bob and Nancy Slavin brought to the work.

Initiating a NIC also requires attention to the development of the network connections that facilitate collective action. When they first launched, the SFAF initiation team sought to

develop an organizational structure in which, “schools would be linked into a coherent, professional network with the Success For All project team as the coordinating hub, partners in a widely distributed, knowledge-producing enterprise aimed at improving both the design and its use in schools” (Peurach, 2011, p. 32). In its early initiation and development phase, the SFAF hub was characterized as a small, tight-knit social network (Peurach, 2011). The hub consisted of program founders, primarily researchers and project managers working with program developers and trainers. Program managers were in close day-to-day contact with trainers, who were in turn in close day-to-day contact with schools, thereby providing a coordinated array of learning opportunities for teachers and leaders. In this way, the leadership team was leveraging social resources in order to facilitate coordination, including norms of collegiality, dense professional networks, and a shared mission and vision. Likewise, initiating a NIC also requires the development of roles and routines that facilitate intentional connection among participants with different kinds of expertise.

In addition to securing the human and social resources necessary to launch a NIC, an initiation team must also raise sufficient material resources to support the launch and execution of the first phase of network activity. A number of current public and private funding opportunities support research-practice partnerships that could be pursued to support NIC initiation (e.g., IES Partnerships and Collaborations Focused on Problems of Practice or Policy and the Spencer Foundation’s Research-Practice Partnership Grants). That said, teams seeking to launch and sustain a NIC will likely need to secure a combination of funding sources. SFAF used a mix of fee-for-services provided to schools and external grant funding. The development and rapid expansion of the SFAF network was supported by the reauthorization of the Elementary and Secondary Education Act in 1988 which allowed schools with seventy-five percent or more

students in poverty to use their Title I funds for comprehensive, school-wide reform. This made billions of dollars of federal funding available (Peurach, 2011).

Organizing and operating core hub functions. During the initiation phase, the network initiation team must establish its core hub functions, including communication routines, knowledge management, and the improvement science capabilities and analytics that were described in previous sections (Bryk et al., 2015). In its early years, SFAF's communication infrastructure relied on close, long-term relationships between SFAF trainers and schools. Trainers would communicate the program's ambitions for professional practice and learning while they monitored progress and tailored assistance for program implementation (Peurach, 2011). The communication infrastructure was also critical for information about implementation challenges to flow back to program developers and for the dissemination of program improvements to schools. Communication and coordination were facilitated by having an established program, akin to what we would call a working theory of improvement, with an increasing number of tools, processes, and other artifacts that made this practical theory visible in the day-to-day work of the network.

Developing processes and routines for learning and knowledge management is also a core concern for the team charged with nurturing a fledgling NIC. In the case of SFAF, initial learning occurred informally through dense networks and communities of practice that included the hub management team, developers, and trainers who spent time in schools. As the network grew larger and more complex, SFAF developed systems for monitoring and addressing implementation issues, such as a routine for periodic implementation visits, and reports that generated, connected, and retained practice-based information that was useful to developers and trainers. Similarly, as a NIC grows in size and inquiries move from innovation development in a

small number of places into engaging many more actors and places in testing innovations, more formal measurement systems are needed to continuously learn to improve in these larger scale contexts. What is learned through qualitative and/or informal means in early efforts makes it possible to invent meaningful and sensitive measures that allow a NIC to learn even more as the work spreads. The SFAF development process exemplified a set of continuous and interdependent learning activities, resulting in a comprehensive literacy program that co-evolved in interaction with schools. SFAF simultaneously worked to improve its comprehensive school reform design, supports for implementation of the design, and the functioning of the organization while expanding the scale of its operations.

These highlights from the SFAF case illustrate the attention needed to organizational structure, leadership, and operations during network initiation. The SFAF case is consistent with prior scholarship suggesting that network management tends to be different than what is typical in hierarchical organizations. It depends more heavily on the degree to which an initiation team is able to develop new social networks, and possibly appropriate existing ones, to facilitate collective action rather than formal authority. Lastly, it is important to emphasize that the development of formal organizational structures for a network is an emergent process shaped by learning as it does its work. It needs to be good enough to start the work of improvement, while acknowledging that it is a work in progress.

Culture, Norms and Identity

The final component of the framework describes the development of the culture, norms, and identity necessary to attract and maintain participant investment in NIC membership. To accomplish its learning and improvement goals, a NIC requires that professionals work in a very different way. In educational systems, the status quo encourages professional autonomy and uses

data primarily for accountability. In contrast, NICs are structured to encourage collaboration and transparency, to equip professionals with evidence-based practices, and to use data for the purposes of learning and improvement. Building a culture that specifies norms of participation and member identities that are consistent with a collaborative scientific learning community then becomes a critical component of NIC formation.

Our analysis suggests that a NIC initiation team lays the groundwork for culture formation by developing and fostering a shared narrative that becomes enacted through particular norms of participation. The shared narrative helps anchor and engage the network, reminding members of the value and importance of the work they are engaged in and of their relationship to it. Shared narratives also play an important role socializing new members into the network. When narratives are most powerful, NIC members see themselves in the narrative, both as an operational matter, solving some persistent problem of practice, and as a higher professional calling, such as taking on new roles that enrich professional identities to become producers of knowledge that leads to the improvement.

Developing the NIC narrative is multi-faceted. It should provide a common language for and shared understanding of the network's aim and initial theory of practice improvement. Reifications of the aim and theory, such as the driver diagram, serve as tools that help participants understand, identify with, and commit to this common language to describe the community's shared work. The NIC narrative should also specify *norms of participation*, such as engaging in common work, subjecting practice to disciplined inquiry, and documenting and sharing knowledge gained. Additionally, the NIC narrative should foster member commitment and responsibility for the well being of the NIC, including, for example, the welcoming and induction of new members. Some of these norms of participation run counter to the dominant

culture of educational practice in the United States. Consequently, the NIC initiation team must plan for the enculturation of network members into these new forms of participation through the development of recurrent activity structures that promote participants embracing the cultural norms of membership and developing collective responsibilities.

We turn to the National Writing Project case to enliven our discussion of culture formation in NICs. While the NWP is not a NIC per se, it provides a useful example for how culture, norms, and identity are developed in a networked organization with an educational improvement goal. In particular, the NWP case illustrates how a powerful narrative and recurrent activity structures serve to develop norms of participation and transform individual identities. An NWP leader characterized its early years as “an emerging affinity network of people who cared about writing.” Through the network, people found “soul mates,” or fellow educators who were passionate about writing, the teaching of writing, and the use of writing in their teaching. Over time, NWP became deliberate and skilled in crafting a narrative that helped members see themselves as part of a group with a shared mission and develop personal identities that connected them to this collective narrative (Bryk et al., 2015).

The NWP narrative can be characterized as having four key components (Bryk et al., 2015). The first component is a shared belief that writing matters: “members affirm the importance that writing plays in representing and conveying knowledge and in helping to comprehend and improve the human condition” (Bryk et al., 2015). Second, the narrative asserts that all members are writers and that good teachers of writing must be writers. Third, members commit to continue to improve their performance as teachers. Fourth and finally, NWP teachers take on responsibility to advance the profession, acting as “teachers teaching teachers.” Note that

these components assert a compelling argument for the value and necessity of engaging in the network and promote significant transformation of personal and professional identities.

In order to promote this narrative, NWP created recurrent activity structures, particularly the annual summer institute. Writing about the NWP, Lieberman and Wood (2002) argue that “the social practices adopted by the NWP convey norms and purposes, they create a sense of belonging, and they shape professional identities” and this professional identity is critically about being part of a professional community (p. 21). The five-week invitational summer institute is the initiating experience for new NWP teachers and has three critical features: forums for teachers to teach one another best practices; opportunities for teachers to write and share in responses to colleagues’ writing in response groups; and time for teachers to read and discuss relevant literature and research (Lieberman & Wood, 2002). Over time, the narrative has been strengthened by members writing and disseminating essays about what it means to be part of the writing project and to live as a writing project person in the classroom and in their schools. These essays exemplify what it means to take on the identity of a writing project member.

In sum, setting the foundation for a participation structure that supports the development of an identity aligned with the narrative is a critical step in NIC initiation. The narrative aims to promote a common mission for addressing a high leverage problem of practice, promotes the dispositions necessary to engage deeply in the activities that address that problem of practice, and supports member development of an identity as an active agent in disciplined practice improvement.

Conclusion

The networked improvement community concept offers a promising set of ideas that is now attracting considerable attention. This paper is a first attempt to articulate a framework that

pushes the field a bit further into the details of transforming a promising set of ideas into actual execution. In specifying the framework, we argue that a firm foundation for network initiation is laid through the strategic actions of a network initiation team. By attending to the five domains of activity specified in our framework, initiation teams can catalyze the development of an organizational structure that accelerates educator capacity to learn from practice and build a professional knowledge base that enables the field to tackle complex educational problems. By calling attention to the multiple key processes in NIC initiation, we acknowledge the challenges associated with network formation and provide a starting point for both practitioners and researchers seeking to deepen this work.

The paper has sought to provide guidance for two primary groups: practitioners seeking to launch a NIC and researchers aiming to study the emergence of this particular form of collective action. In the case of both purposes, we offer the framework in the same spirit that guides improvement work itself, “possibly wrong and definitely incomplete,” and encourage practitioners and researchers to take up the ideas, revise, and elaborate them through engagement with practice and disciplined inquiry.

First, we aimed to develop a practical framework that might assist others who are now seeking to embrace the NIC idea. In this sense, the framework might function as a guide, based on experiences to date, about the critical considerations in initiating such an organizational form. We have some emerging field evidence that the framework has been useful for other network initiation teams and we have received numerous requests to share our consolidated insights about the initiation process (Parkerson & Doctor, 2015; Martin & Gobstein, 2015). In future work, we will develop and test practical tools, such as protocols and guides, that support network initiation based on the framework described here.

Second, the paper begins to sketch out a research agenda for investigating the NIC concept in action. In this sense, the paper represents a set of hypotheses that merit more intense inquiry. While the literature on intentionally formed inter-organizational networks emphasizes the importance of the initiation phase (Popp et al., 2013) and the challenges associated with network initiation (Bryson, Crosby & Stone, 2006; Huerta et al., 2006; McPherson, Popp & Lindstrom, 2006; Provan & Lemaire, 2012), it provides little concrete guidance for the range of activities that network initiation teams must undertake. Our framework is intended to be holistic, positing a set of essential domains of activity for network initiation. In so doing, the framework lays the groundwork for future research that tracks initiating networks over time in order to test the essentiality of the domains specified in our framework, and specifies critical domains of activity for subsequent stages of development, such as sustainability.

The NIC concept has resonated with many organizations and diverse stakeholders that want to support educational improvement and are looking for new ways of collaborating in service of educational improvement. While some of these organizations have gone on to launch NICs, there are a number that explore the concept but decide that a NIC is not right for them. While this is a topic that could likely be its own paper, we share some thoughts about what we are learning from groups that decide not to pursue launching a NIC because it helps us to highlight how NICs are different from other forms of research-practice partnerships and modes of professional collaboration.

Some groups that consider launching a NIC do so because they have resources and interest in bringing together other organizations or stakeholders to explore solutions to a broadly framed problem of practice. However, some such groups decide not to initiate a NIC because they do not have the resources or interest necessary to execute the level of common work

necessary to be a NIC. By common work, we mean a commitment to common outcomes tracked through common measures and joint engagement in work to design and test promising solutions to the problem of practice. These groups tend to be more comfortable operating as communities of practice or other forms of learning community that enable knowledge exchange, but do not demand deep forms of joint work.

Other groups that have expressed interest in forming NICs are located in organizations that aim to support improvement through a particular solution or strategy, such as a commitment to project-based learning, but do not have deep partnerships with practitioners that enable specification of a shared network aim and joint accountability for practice-based outcomes. This departure from the NIC concept emerges, in part, because the work these reform organizations do is principally about promoting a particular solution, rather than gaining a deep understanding of the manifestation of a problem in particular sites of practice. While these types of organizations might make a contribution to a NIC, without deep engagement with practitioner partners their work cannot embody the NIC concept.

What this discussion suggests is that while NICs can be considered a form of research-practice partnership, they differ from many such partnerships in a number of important ways. First and foremost, the work of a NIC is driven by problems of practice rather than questions identified by researchers. Consequently, the knowledge generation goals of traditional research become secondary to the development of practical knowledge and innovative solutions that can drive practice improvement. Rather than pursuing specific research questions, the types of roles that applied researchers and evaluators can play in NICs include contributing to the development of a research-informed theory of improvement and promising change ideas, engaging in analytic

work to explore variation in outcomes among practice based partners, and evaluating the health and developmental progress of the network.

Second, the NIC concept emphasizes the development of an organizational structure that is principally aimed at pursuing measurable improvements at some scale in practice. This shared commitment to a common aim drives all of the work in the network. A NIC offers a different approach than typical research-practice partnerships where all members from school leaders to research affiliates to front-line practitioners are active agents of change. They learn together by regularly testing new innovations at a local level and using data to make adjustments to their performance. In this way, the network becomes laser-focused on achieving quantifiable aims and all of its attention and resources flow in that direction.

The complex challenges confronting our educational systems today are also not likely to be improved by educators working alone. Nor are they likely to be addressed at scale through the autonomous action of local professional communities. Our field lacks the capacity and systemic infrastructure requisite for transforming productive local efforts into collective improvement. The NIC concept provides a vision for a social structure that connects educators working under varying contextual conditions to systematically develop and test promising ideas to address high leverage problems of practice. It holds great potential to accelerate how our whole field learns to improve.

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Endnotes

¹ We do not consider NWP and SFAF NICs because they depart in significant ways from the core design features of a NIC. The NWP is organized around a shared goal – improving writing instruction – however, it does not require that participating sites commit to particular outcome targets and/or common measures that would track progress toward that outcome. SFAF departs most significantly in its orientation toward practice improvement: while a NIC supports testing promising innovations across a range of sites of practice, the focus is on learning what works, for whom, under what conditions. In contrast, SFAF focuses on promoting fidelity to a tightly prescribed practice improvement model as the key to its theory of improvement.

² By causal systems analysis we refers to a systematic process for mapping and describing the complexity of the systems that produce a problem. This includes elaborating various elements or sub-systems that form the system and the inter-relations among them. For a more detailed discussion see Bryk, Gomez & Grunow (2011).

³ The design community refers to the user-centered focus as human-centered design. A user-centered focus provides a way for an analyst to view a large and complex system from the perspectives of its clients to learn what we should pay attention to.

⁴ Systems Improvement Maps are an analytic tools used to visualize the interacting subsystems operating at multiple levels that represent essential organizational features that manifest as improvement work proceeds (see Bryk et al., 2015 for more information).

⁵ For an extended discussion of the development of the CCP driver diagram, see Dolle et al., 2013.

⁶ Moreover, learning to use improvement research methods entails more than building technical expertise, such as, how to scaffold a good PDSA. It also includes taking on the mindset

and orientation of improvement research. Two fundamental dispositions, not normative in everyday practice, are key here. The first is an analytic disposition: what changes might we introduce and why? Participants are encouraged to ground these change ideas in the working theory of improvement and give preference to possible changes that already have some established evidence base. The second disposition is empirical. Given that confirmation bias is a fundamental fact of human existence—we tend to see what we want to believe—it is critical to cultivate a rigorous disposition toward empirical evidence in order to bolster the warrant for claims that some change actually led to an improvement (Jones & Harris, 1967; Ross, 1977).). Both of these mindsets are central to the formation of an improvement culture, a topic we return to in the fifth dimension of our framework.

⁷ Personal communication with pioneers in quality improvement work in healthcare – Paul Bataldan, Don Berwick and Uma Katagal – further supported this claim.

⁸ Since most of the NIC analytic activity is in support of the member institutions efforts to improve (rather than discrete generalized knowledge production projects), the analytic hub is positioned to act as an agent of the participating institution affording streamlined IRB protocols.

⁹ In discussing leadership, we adopt the perspective that leadership is a distributed process stretched across multiple leaders, followers and situations (Spillane, Halverson & Diamond, 2001). While individual leaders may play an important role, we posit that successful NIC initiation requires that leaders establish particular organizational and operational functions, which is our focus in this framework.

Figures

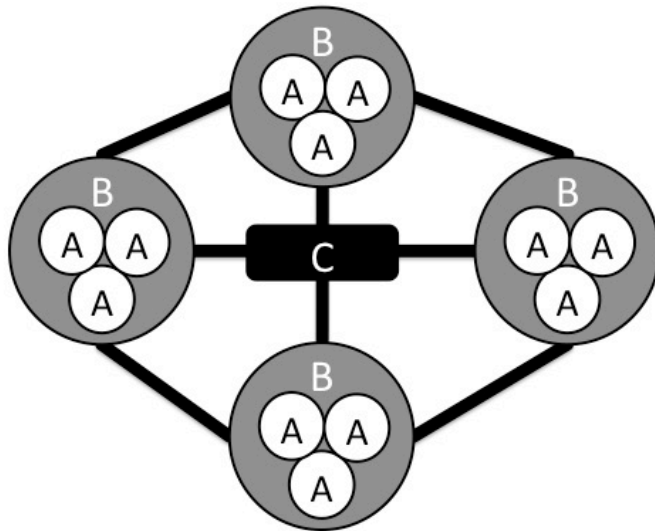


Figure 1. Schema for social learning adapted from Englebart (1992)



Figure 2. Framework for Initiating Networked Improvement Communities