What's Happening

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Establishing and sustaining networked improvement communities: Lessons from Michigan and Minnesota

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Summary

A networked improvement community is a collaborative research partnership that uses the principles of improvement science within a group of organizations to learn from promising practices developed in each context and how they may be adapted to other contexts. Regional Educational Laboratory Midwest worked with educators in Michigan and Minnesota to establish two networked improvement communities during the 2015/16 school year. The collaborations revealed that the following tasks are important in establishing successful networked improvement communities:

- Building a cohesive team with participants representing different types of expertise.
- Reducing uncertainty by clarifying what participation entails.
- Building engagement by aligning work with ongoing efforts.
- Using tools and resources from improvement science to identify a problem that is important and specific enough to be able to act on.
- Embedding capacity building to develop additional expertise for using continuous improvement research to address problems of practice.

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Summary

There is growing interest in the ability of improvement science—the systematic study of improvement strategies to identify promising practices for addressing issues in complex systems (Improvement Science Research Network, 2016)—to spur innovation and address complex problems. In education this methodology is often implemented through collaborative research partnerships in which researchers and practitioners work together to systematically test and refine theories of change in real-world settings. A networked improvement community is a collaborative research partnership that uses the principles of improvement science within networks of organizations to learn from varied implementation of new ideas across contexts. While the central work of a networked improvement community is to identify a specific and actionable problem and collectively address it through an iterative process of designing, implementing, testing, and redesigning promising new practices, the learning from these iterative cycles can be brought back and applied to the local contexts of the networked improvement community participants (such as classrooms, districts, and states), potentially affecting education practices more widely.

Although there is practical guidance for how networked improvement communities should structure this work, few published accounts describe the process of forming a networked improvement community. This report describes the process of forming networked improvement communities in Michigan and Minnesota after state education agency leaders requested assistance from Regional Educational Laboratory (REL) Midwest to support state-led efforts to use improvement science to raise student achievement and narrow achievement gaps in schools with the widest achievement gaps (focus schools). The resulting collaborations led to the establishment of two networked improvement communities during the 2015/16 school year, one in Michigan and one in Minnesota, focused on improvement in schools identified as needing support under their accountability systems. The REL Midwest project team used guidance from the literature and other improvement science efforts (for example, Bryk, Gomez, Grunow, & LeMahieu, 2015) to direct its activities.

Each networked improvement community has a slightly different history and emphasis. The Michigan Focus Networked Improvement Community works across five focus schools —schools with the largest achievement gaps—in two districts to address disparities in student achievement within schools. The two districts are each part of an intermediate school district, a regional education service agency that provides consolidated support services to districts in an assigned service area and thereby plays an important role in providing professional development and supporting pilot programs in districts. Participants in the Michigan Focus Networked Improvement Community include state education agency representatives, intermediate school district administrators, district representatives, and focus school principals.

The Minnesota Statewide System of Support Networked Improvement Community seeks to improve state supports to six Regional Centers of Excellence that serve focus schools. In Minnesota, the Cross-agency Implementation Team oversees the implementation of the statewide system of support. Its members include leadership and content specialists from both the Minnesota Department of Education and the Regional Centers of Excellence; they also serve as participants in the networked improvement community.

The goal of establishing both networked improvement communities was twofold: to expose the state education agencies to a process that could be used to scale initiatives and to engage agencies at a level that would leave them able to use the process with other initiatives. Networked improvement community participants are now focusing on sustainability, using what they learned in the first year as the foundation for maintaining key processes and functions. This report aims to guide other researchers, state education agency leaders, and district leaders as they establish networked improvement communities in different contexts.

Throughout the process of establishing networked improvement communities in Michigan and Minnesota, the REL Midwest project team met regularly with colleagues with expertise in continuous improvement research to discuss the progress of each project and any challenges encountered. These conversations, in addition to feedback provided by networked improvement community participants during project debrief conversations, revealed that the following tasks are important in establishing successful networked improvement communities:

- Building a cohesive team with participants representing different types of expertise.
- Reducing uncertainty by clarifying what participation entails.
- Building engagement by aligning work with ongoing efforts.
- Using tools and resources from improvement science to identify a problem that is important and specific enough to be able to act on.
- Embedding capacity building to develop additional expertise for using continuous improvement research to address problems of practice.

Contents

Why this project?

There is growing interest in the ability of improvement science to spur innovation and address complex problems of practice. Improvement science can be traced to efforts to improve industrial manufacturing practice, but the process of improving practice through systematic inquiry has garnered interest in other disciplines as well, including education (Bryk et al., 2015; Lewis, 2015; Sparks, 2013). Educators have long engaged in strategies to improve practice, but because of their singular focus on their own practice, their findings are seldom shared beyond their school, district, or state (Zeichner, 2001). As a result, promising practices often are not implemented in new contexts or are implemented on a large scale without the necessary capacity to do so and without careful attention to the challenges of implementation (Bryk et al., 2015; Coburn & Stein, 2010). For example, a study of the failure of a large-scale initiative funded by the Gates Foundation to convert large high schools into smaller, more personalized learning settings recommends "learning by doing" on a small scale before moving to large-scale implementation (Bryk et al., 2015).

Although there is practical guidance for how networked improvement communities should structure their work, few published accounts describe the process of forming a networked improvement community

In education, improvement science is often implemented through collaborative research partnerships in which researchers and practitioners work together to systematically test and refine theories of change in real-world settings. Networked improvement communities are one such partnership.

Although there is practical guidance for how networked improvement communities should structure this work, few published accounts describe the process of forming a networked improvement community. The Carnegie Foundation for the Advancement of Teaching provides guidance for researchers and educators who intend to form networked improvement communities. Examples used in the guidance include forming networked improvement communities around increasing community college graduation rates and improving support for novice teachers (Bryk et al., 2015). However, the guidance focuses on conducting continuous improvement research within the networked improvement community after it has been established rather than on establishing a networked improvement community (Russell et al., in press). The literature addressing the social aspects of establishing a networked improvement community is also limited, including exploring the dynamics of the participants and how they negotiate their roles and responsibilities (Patton, 2010). Although connections can be made to how other collaborative partnerships, such as communities of practice or professional learning communities, are established, there is a lack of information about the process of leading, organizing, and operating networked improvement communities.

This report addresses these gaps by describing the process of forming networked improvement communities in Michigan and Minnesota and the lessons learned by Regional Educational Laboratory (REL) Midwest in the process. It aims to guide other researchers, state education agency leaders, and district leaders as they establish networked improvement communities in different contexts.

What is a networked improvement community?

In a networked improvement community educators working in different contexts use iterative cycles to simultaneously design, implement, test, and redesign promising practices on a small scale (Bryk et al., 2015). By starting small, educators gain a deep understanding of a problem and the complex education system in which it operates. They are able to design

solutions that address the problem, while taking into account the local context and the challenges it presents; as a result, the solution is more likely to be successful (Bryk et al., 2015). As the networked improvement community experiences success, participants can gradually move from implementing small changes in practice in one or two sites to larger changes in practice across several sites.

Networked improvement communities are a relatively new type of collaborative research partnership between researchers and educators, popularized in education settings by the Carnegie Foundation for the Advancement of Teaching (Coburn, Penuel, & Geil, 2013). A networked improvement community is similar to other quality improvement approaches (such as design-based implementation research and rapid-cycle evaluation) that focus on learning from efforts to improve the design of programs in local contexts so that they can be implemented in different contexts.

Networked improvement communities are characterized by four features: focused on a common aim, guided by a shared working theory of the education system, use improvement science methods and measures to spur improvement in testable iterations, and organized to integrate the practices and processes that they develop in other contexts

A general scientific research process includes eight stages: research aims (identifying the research questions), literature review, research design, instrumentation, pilot testing, data collection, data analysis, and a research report (Postlethwaite, 2005). In networked improvement communities and similar quality improvement approaches, participants use a collaborative process to identify and select the research question and implement the research process in an iterative manner. With facilitation from researchers, educators identify problems of practice, the factors that drive those problems, and promising solutions to those problems. They then engage in continuous improvement research, which involves iterative cycles of designing, implementing, testing, and redesigning solutions, while learning from variation across the settings that form the networked improvement community (Langley et al., 2009).

Networked improvement community participants can include educators working in a range of capacities and at different levels of the education system (such as the school, district, or state level). One example is the Building a Teacher Effectiveness Network (Bryk et al., 2015), which is facilitated by the Carnegie Foundation for the Advancement of Teaching, the Institute for Healthcare Improvement, and the American Federation of Teachers. Participants include principals and teachers from the Austin Independent School District, Baltimore City Schools, and the charter network New Visions for Public Schools. Another example is the Mathematics Teacher Education Partnership (Martin & Gobstein, 2015), which is facilitated by the Association of Public and Land-Grant Universities and an unnamed member university. Participants include leaders from more than 90 member universities and more than 100 K–12 school districts.

Networked improvement communities are characterized by four features (Bryk et al., 2015): they are focused on a well-specified, common aim; they are guided by a shared working theory of the education system in which they operate and how it can be improved; they use improvement science methods and measures to spur improvement in testable iterations, such as rapid plan-do-study-act cycles (see box 1 for an explanation of these cycles and other key terms); and they are organized to share and integrate the practices and processes that they develop in other contexts.

Box 1. Key terms

Collaborative research partnership. A long-term collaboration between practitioners and researchers that investigates problems (Coburn et al., 2013). Types of collaborative research partnerships include research alliances, design research partnerships, and networked improvement communities. Collaborative research partnerships are also referred to as research–practice partnerships.

Continuous improvement research. An approach to research that is based on improvement science principles and involves implementing, monitoring, and testing practices in iterative cycles (Langley et al., 2009). Continuous improvement research is also referred to as a model for improvement.

Fishbone diagram. A visual representation of a problem and its root causes. At the "head" of the fish is a problem statement. Each major "bone" represents hypothesized root causes of the specified problem. Through discussion, networked improvement community participants flesh out the "bones" by listing the factors that contribute to the root causes (Bryk et al., 2015).

Focus school. A school that has one of the largest achievement gaps in a state.

Implementation science. The study of the factors that influence the effective use of evidence-based interventions in practice (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005).

Improvement science. The systematic study of improvement strategies to identify promising practices for addressing issues in complex systems (Improvement Science Research Network, 2016).

Intermediate school district. A government agency that assists local school districts in providing programs and services in Michigan. It often operates at the county level but can include multiple counties. Intermediate school districts are sometimes referred to as regional education service agencies or education service agencies.

Networked improvement community. A collaborative research partnership that combines the principles of improvement science within networks of organizations to learn from varied implementation of new ideas across contexts. Participants in a networked improvement community identify a problem that is common across contexts and engage in rapid cycles of design, implementation, testing, and redesign to develop solutions (Coburn et al., 2013). The term was introduced in in 1992 by Douglas Engelbart, an engineer who saw the promise of using collective action to improve the functioning of systems (Engelbart, 1992).

Plan-do-study-act cycle. An iterative process through which an innovation is designed, implemented, tested, and redesigned (Deming, 1993). In recent years it has been applied to healthcare and education as a method for continuous improvement by testing and refining changes on a small scale (Bryk et al., 2015).

Priority school. One of the most persistently low-performing schools in a state.

Professional learning community. A group of educators working together to improve practice through the examination of student data (Hord, 2009).

Regional Centers of Excellence. Six centers established by the Minnesota Department of Education as part of its request to receive an Elementary and Secondary Education Act waiver.

(continued)

Box 1. Key terms *(continued)*

The centers implement Minnesota's statewide system of support, which offers differentiated recognition, accountability, and support for priority schools and focus schools.

Root-cause analysis. A process through which participants in a networked improvement community define the problem that will be the focus of their efforts. Root-cause analysis moves participants from a broad problem to one that is specific enough to be able to act on. Root-cause analysis is also referred to as causal systems analysis.

Statewide system of support. A framework for providing differentiated supports to low-performing schools. Each state that received an Elementary and Secondary Education Act waiver was required to implement a statewide system of support that focused on priority schools and focus schools. The U.S. Department of Education granted wavier requests to the Michigan Department of Education in 2011 and the Minnesota Department of Education in 2012.

Systems. "Organization(s) characterized by a set of interactions among the people who work there, the tools and materials they have at their disposal, and the processes through which these people and resources join together to accomplish its work" (Carnegie Foundation for the Advancement of Teaching, 2015). Examples include a classroom, school, district, state, or network of two-year or four-year colleges.

Theories of practice improvement. A description of the link between inputs and outputs when a change is introduced into a system. Theories of practice improvement often are depicted visually in a logic model (a graphical representation of causal links between the resources, activities, outputs, and outcomes that can be used to guide implementation, evaluation, and improvement efforts).

What does a networked improvement community do?

The first task of a networked improvement community is to conduct a root-cause analysis, formulate an aim statement, and generate hypotheses about the changes in practice that will drive improvement to meet the aim

The work of a networked improvement community is defined by three primary tasks: develop a theory of practice improvement; use continuous improvement research methods (such as plan-do-study-act cycles) to implement, test, and redesign an intervention in an iterative manner; and build a measurement and analytics infrastructure (Russell et al., in press).

Develop a theory of practice improvement. The first task involves conducting a root-cause analysis, formulating an aim statement, and generating hypotheses about the changes in practice that will drive improvement to meet the aim.

The root-cause analysis by the Michigan Focus Networked Improvement Community, which was facilitated by REL Midwest, focused on math achievement gaps in focus schools. Participants saw math achievement gaps as a driver of focus school identification and an important subject on which to concentrate efforts. In answer to the question "What are the root causes of math achievement gaps in Michigan Focus Networked Improvement Community schools?" participants developed a list of potential causes, including lack of math fluency skills. Participants voted to focus on this cause as the primary driver of achievement gaps in math in Michigan Focus Networked Improvement Community schools. A fishbone diagram—a tool adapted from the business sector—can be used to guide participants in visually representing the problem, its root causes, and the factors that contribute to each root cause (Berwick, 2008; Bryk et al., 2015; see appendix A for a fishbone diagram template). Participants in the Michigan Focus Networked Improvement

Community identified five major "bones" of the fishbone diagram that contribute to the problem of low math fluency skills:

- Time: reteaching math concepts leaves limited time for additional practice.
- Priority: teachers use breaks in instruction to focus on literacy practice rather than math practice.
- Skill: teachers lack the skills needed to monitor student progress and target instruction.
- Commitment: teacher professional development is most often centered on literacy instruction rather than math instruction.
- Ownership: teachers do not embed math fluency into daily teaching.

After the root causes are identified, the networked improvement community selects one or two root causes on which to focus and develops an aim statement that aligns with the root causes selected. The Michigan Focus Networked Improvement Community's aim statement was: "Students in the bottom 30 percent of math achievement will achieve mastery on grade-level benchmarks in math fluency by the end of the school year." This goal was aspirational but helped organize efforts to achieve it.

The second task of a networked improvement community is to use continuous improvement research methods, such as plan-do-study-act cycles, to implement a change in practice based on the theory of practice improvement

Once the aim is established, the networked improvement community then hypothesizes what changes in practice would drive the improvement needed to achieve its aim. Participants in the Michigan Focus Networked Improvement Community mapped out perceived factors that would influence students' ability to achieve mastery on grade-level benchmarks in math fluency. Participants felt that time, data use for continuous improvement, teachers' skills for differentiating instruction, lack of coherence in curriculum and support structures, and family and student engagement were all factors that accounted for achievement gaps in math, particularly math fluency.

After the Michigan Focus Networked Improvement Community participants developed a theory of practice improvement and hypothesized about factors that could affect the outcomes specified in the aim statement, they came to a consensus about which factor to focus on: time. The group developed an intervention in which students would practice their math fluency skills for at least 15 minutes per day. The REL Midwest project team developed measurement tools to track these efforts, including teacher logs and principal observation protocols to monitor how students and teachers spent those 15 minutes.

Use continuous improvement research methods. The second task of a networked improvement community is to use continuous improvement research methods, such as plan-do-study-act cycles, to implement a change in practice based on the theory of practice improvement (Bryk et al., 2015). All participants in a networked improvement community may plan to implement the same change or may choose to implement variations of the change identified in their respective contexts. Next, the participants implement the change and observe the process, collecting formative evidence of its success. In the analysis stage, participants examine the evidence and determine what tweaks need to be made for the change in practice to be more successful. Finally, they implement the modified practice and test it again, often at additional sites to learn from variation across these sites. The scale of the change is small initially—for example, changing the way in which teachers respond to student questions in a particular subject—but then grows in scale as the networked improvement community continues its work. Cycles may be as short as two weeks or as long as three months.

Build a measurement and analytics infrastructure. The final task of a networked improvement community is to build a measurement and analytics infrastructure to determine whether the change in practice led to improvement. At first, measurement may be informal, based on the observations of participants, and focused on process-oriented measures (measures related to how well the change has been implemented). But as the change in practice is scaled to additional sites, the need arises for a common measurement system that involves the collection of data across sites, with the goal of being able to examine whether the change in practice led to a change in the primary driver and the ultimate aim (Bryk et al., 2015). Bryk et al. (2015) emphasize the importance of practical measurement (measures that are directly related to the problem identified by the networked improvement community rather than more traditional accountability measures). Measurement should occur often and be embedded within regular organizational routines. As participants engage in this process, they develop an understanding of the networked improvement community process and how it can be used to scale other initiatives in their respective work sites.

The final task of a networked improvement community is to build a measurement and analytics infrastructure to determine whether the change in practice led to improvement

Although educators are the primary participants in the process, a network hub—often composed of researchers—facilitates the process (Bryk et al., 2015). The network hub provides expertise on continuous improvement research, guiding the participants through each step of the process. The network hub also monitors the process of continuous improvement research across sites and provides feedback to participants about what is working well and where there may be challenges. Finally, the network hub plays the practical role of convening participants. As Bryk et al. (2015, p. 159) conclude, "tending to the needs of the community is foundational for everything else." The REL Midwest project team served the role of network hub for the networked improvement communities in Michigan and Minnesota.

How Regional Educational Laboratory Midwest facilitated networked improvement communities in Michigan and Minnesota

The U.S. Department of Education granted flexibility from elements of the Elementary and Secondary Education Act to Michigan in 2011 and to Minnesota in 2012. Both states subsequently revised their statewide systems of support to promote school improvement for priority schools and focus schools. In 2015 state education agency leaders from Michigan and Minnesota participating in the REL Midwest School Turnaround Research Alliance[1] requested assistance with establishing and sustaining networked improvement communities to advance their efforts to raise student achievement and narrow achievement gaps in priority and focus schools. The REL Midwest project team relied on written guidance from the Carnegie Foundation for the Advancement of Teaching to help fulfill this request (Bryk, Gomez, & Grunow, 2011; Bryk et al., 2015).

The project team's assistance addressed both short-term and longer-term needs. In the short term the project team would play a strong facilitative role to assist each state in establishing networked improvement communities and in building the knowledge and skills of participants to engage in and lead this type of collaborative research partnership. The development of tools and resources would address longer-term needs by supporting participants as they took over facilitative responsibilities after REL Midwest's participation in the project ended.

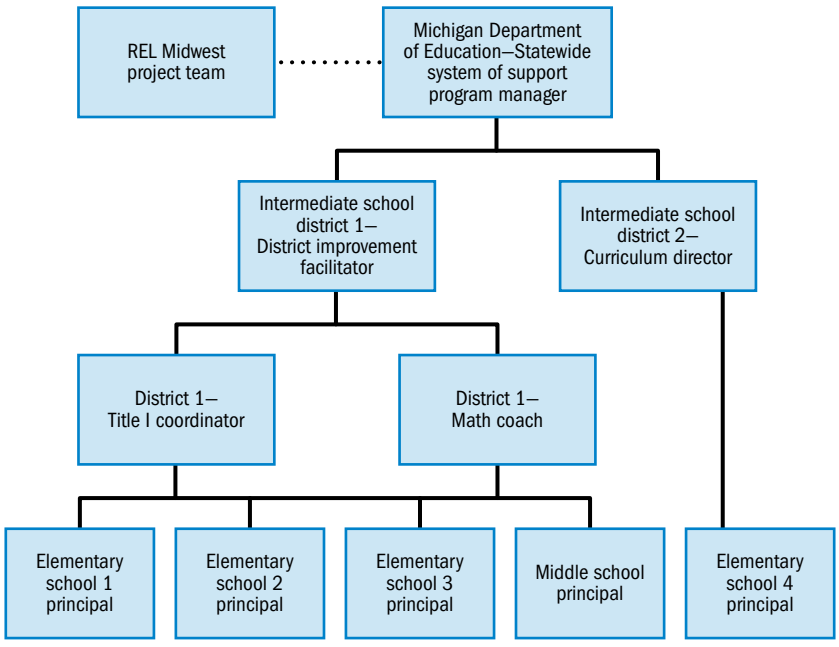
Michigan Focus Networked Improvement Community

At the request of the Michigan Department of Education, the project team established the Michigan Focus Networked Improvement Community to support school improvement in select focus schools. The Michigan Department of Education had an evidence-based system of supports in place for priority schools founded on turnaround models from prior years. However, focus schools had only recently been identified through the state accountability system, and as a consequence, the system of support needed was less clear. Forming a networked improvement community offered the Michigan Department of Education an opportunity to test improvement strategies in local settings in ways that were relevant and useful to practitioners in those schools. The goal of the Michigan Focus Networked Improvement Community is to address disparities in student achievement within schools by engaging personnel at the school, district, intermediate school district, and state levels in iterative plan-do-study-act cycles. Participants include state education agency representatives, intermediate school district administrators, district representatives, and focus school principals (figure 1). The Michigan Focus Networked Improvement Community works across five focus schools in two districts. The two districts are each part of an intermediate school district.

The goal of the Michigan Focus Networked Improvement Community is to address disparities in student achievement within schools by engaging personnel at the school, district, intermediate school district, and state levels in iterative plan-do-study-act cycles

Through monthly meetings, participants in the Michigan Focus Networked Improvement Community identified inequality in math achievement as their primary concern and hypothesized that math fluency skills were a primary driver of this inequality. They developed an intervention to address math fluency skills for students in the bottom 30 percent

Figure 1. Organization of the Michigan Focus Networked Improvement Community



Note: The Regional Educational Laboratory Midwest project team supported the Michigan Focus Networked Improvement Community but operates outside the governance structure of Michigan public schools. The project team worked primarily with the Michigan Department of Education to establish the networked improvement community and therefore is placed next to Michigan Department of Education staff as a joint partner but not connected to the network under a formal arrangement.

Source: Authors.

of math achievement and determined which formative and summative indicators would be used to measure changes in math fluency.

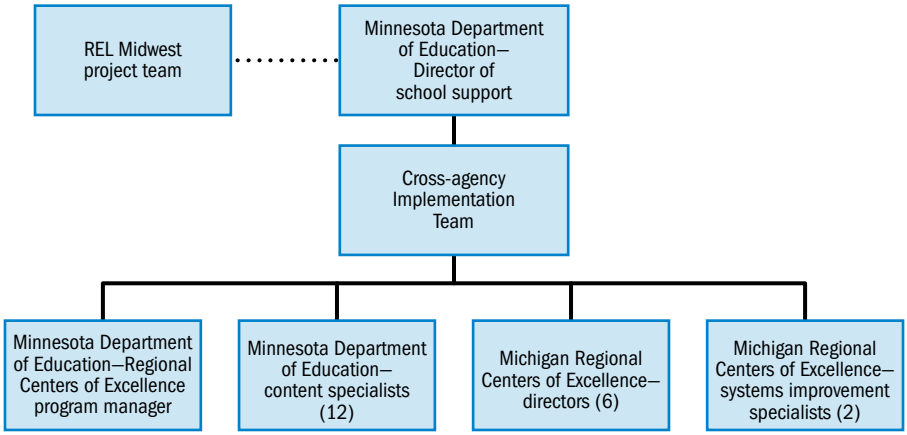
Minnesota Statewide System of Support Networked Improvement Community

The Minnesota Department of Education approached REL Midwest for assistance with improving the supports (such as professional development and coaching) that it provides to its six Regional Centers of Excellence, which provide direct support for school improvement to priority and focus schools across the state. The REL Midwest project team, in conjunction with the director of school support at the Minnesota Department of Education, decided that forming the Minnesota Statewide System of Support Networked Improvement Community would be a promising approach to studying and improving the supports that the Minnesota Department of Education provides to the regional centers. The directors of the regional centers and their staff draw on improvement science methods by engaging school leadership teams in needs assessments and continuous data review to define priorities and implement evidence-based practices that address these priorities, but they had not used improvement science methods in a networked improvement community. The networked improvement community builds on staff members' existing expertise in improvement science and allows for learning across the six regional centers. REL Midwest facilitates the networked improvement community in partnership with the Minnesota Department of Education's director of school support, who oversees the Cross-agency Implementation Team, which oversees implementation of Minnesota's statewide system of support.

The Minnesota Statewide System of Support Networked Improvement Community builds on staff members' existing expertise in improvement science and allows for learning across the six regional centers

The Minnesota Department of Education decided that the members of the Cross-agency Implementation Team—which include department staff (the director of school support, the program manager of the Regional Centers of Excellence, and content-area specialists) and the directors of the regional centers—would participate in the Minnesota Statewide System of Support Networked Improvement Community (figure 2). Through an iterative

Figure 2. Organization of the Minnesota Statewide System of Support Networked Improvement Community



Note: The Regional Educational Laboratory Midwest project team supported the Minnesota Statewide System of Support Networked Improvement Community but operates outside the governance structure of the Minnesota Cross-agency Implementation Team. The project team worked primarily with the Minnesota Department of Education to establish the networked improvement community and therefore is placed next to Minnesota Department of Education staff as a joint partner but not connected to the network under a formal arrangement.

Source: Authors.

process, the networked improvement community identified challenges that the Minnesota Department of Education faces in supporting the regional centers, including clearly communicating expectations for closing achievement gaps. Through a root-cause analysis, participants identified several factors that contribute to the problem, including lack of knowledge about evidence-based practices related to closing achievement gaps; lack of professional development opportunities focused on closing achievement gaps; and insufficient communication among the Minnesota Department of Education, the regional centers, and the staff who work in focus schools to close achievement gaps.

What the project found

This section reports on five key lessons learned during implementation of networked improvement communities in Michigan and Minnesota. In doing so, this report aims to contribute to a nascent literature on considerations that emerge in the process of establishing and sustaining networked improvement communities. The lessons learned were distilled from a series of conversations and brainstorming sessions held by the REL Midwest project team for each networked improvement community. Over a period of several months, the REL Midwest project team met regularly with colleagues with expertise in continuous improvement research to discuss the progress of each project and any challenges encountered. These conversations were informed by feedback from networked improvement community participants provided during project debrief conversations with the REL Midwest project team at critical junctures in the project, such as after networked improvement community meetings. These conversations provided opportunities throughout the project to identify common challenges and lessons learned across each networked improvement community.

Networked improvement communities require distinct types of expertise—including content, context, and research expertise—to ensure accuracy and build legitimacy for their work

Build a cohesive team with members representing different types of expertise

While REL Midwest served as the facilitator for each networked improvement community, it was critical to do so in partnership with a champion at the state education agency. Champions are usually decisionmakers in the organization and have the power to commit institutional resources to the project. Champions help recruit participants, contextualize the work for participants, and advocate for the process both within the state education agency and across the stakeholder groups represented in each networked improvement community. Champions are most effective when they are viewed as knowledgeable and valuable by other stakeholders.

Networked improvement communities also require distinct types of expertise—including content, context, and research expertise—to ensure accuracy and build legitimacy for their work. Content experts specialize in the content or disciplinary areas that the statewide system of support addresses. Context experts deeply understand the organization of their state's education system, the responsibilities of stakeholders in the system, how those stakeholders interact with each other, and how those stakeholders are both supported and challenged. They are knowledgeable about the political and personal landscape of the local context. And they connect the networked improvement community to resources, anticipate and propose solutions to barriers to implementation of an intervention, and provide guidance on how to structure the networked improvement community for sustainability. Finally, research expertise supports the data collection and analysis work of networked improvement communities and contributes thinking to the development and assessment of outcome measures.

Because the Michigan Focus Networked Improvement Community is trying to address students' mastery of benchmarks for math fluency, the REL Midwest project team considered it important to have a math content expert who could speak knowledgeably about key considerations for student proficiency at various grade levels, the availability of assessments, and proposed curricula for the intervention. In addition, the multilayered system of support in Michigan required at least one representative from each governance level as context experts to provide insight into the problem and to help address barriers to developing the intervention, such as those related to how participating schools and districts make decisions about math curricula and teaching practices. Finally, data specialists at the district level were included to provide research expertise. This expertise was supplemented by the project team, which supported the data collection and analysis work of the networked improvement community and contributed to the development and assessment of outcome measures.

Recruitment for the Minnesota Statewide System of Support Networked Improvement Community was straightforward. The participants were already members of the Cross-agency Implementation Team, led by the Minnesota Department of Education (the champion). The participants include the directors of the six Regional Centers of Excellence, who serve as content experts. The directors previously held positions as teachers and school leaders and therefore understand how schools work and the challenges faced by schools. They also are intimately familiar with the context of schooling and the broader needs of their particular regions. The Minnesota Department of Education's director of school support and its manager of the Regional Centers of Excellence understand the state-level context, including the goals of the statewide system of support and the details of how it functions across the state. Finally, the Cross-agency Implementation Team includes specialists from the Minnesota Department of Education who are experts in program implementation and data collection and analysis. In sum, participants in the networked improvement community understand the challenges of the problem, have the capacity to implement the changes designed from the process, and can collect outcome data to measure success. The REL Midwest project team worked in collaboration with the Minnesota Department of Education data specialists to provide research expertise.

In both states some participants came to the process with preconceptions about what a networked improvement community is and does based on their past participation in communities of practice and professional learning communities

Reduce uncertainty by clarifying what participation entails

After potential participants were identified, the REL Midwest project team met with them to explain the networked improvement community's goals and intended outcomes. In Michigan these early conversations illuminated a need to provide information about what a networked improvement community is and how it differed from but built on continuous improvement work that participants already were undertaking, about what participation in a networked improvement community involves, and about expectations for participating. In both states some participants came to the process with preconceptions about what a networked improvement community is and does based on their past participation in communities of practice and professional learning communities. Communities of practice are groups of people who share a common purpose and learn together to improve practice (Wenger-Trayner & Wenger-Trayner, 2015). Although networked improvement communities are similar to communities of practice in that members share a common purpose and learn collaboratively, they differ in that networked improvement communities use a structured process to identify a problem to address, decide on and implement an intervention, and measure the outcome of the intervention. Similarly, networked improvement

communities share some features of professional learning communities—specifically, collaborative learning to develop a shared understanding of a common topic (Hord, 2009)—but focus on the impact of a common intervention introduced across sites rather than on improving individual practice. Clarifying the differences between a networked improvement community and other collaborative processes provided a common understanding of participants' responsibilities and how each participant's expertise would be used to support the goals of the networked improvement community.

The REL Midwest project team intentionally structured recruitment activities to build commitment among participants and clarify participant responsibilities, roles, and expectations. In Michigan the Michigan Department of Education partner made initial contact with intermediate school districts. The project team then traveled to the Michigan Department of Education to meet with the recruited intermediate school districts at a state-led meeting for focus school support providers. At this meeting, the idea of a networked improvement community was introduced and details were given on how it would be carried out. The project team then worked with intermediate school district officials to identify schools and districts that could also participate. This multistep process of recruitment at each governance level—first state, then intermediate school district, then districts, then schools—was crucial to building relationships with partners across the state, intermediate school district, district, and school levels, as well as ensuring that the right stakeholders would be involved in the process.

In both states the multiphase recruitment process was important for building trust among participants

In Minnesota the project team held an initial meeting with the Minnesota Department of Education to determine who would participate in the networked improvement community. At the meeting it was agreed that members of the Cross-agency Implementation Team would participate. During a second meeting the project team and the Minnesota Department of Education determined the specifics of the project plan and set the agenda for the project kickoff meeting with the Cross-agency Implementation Team. The project team vetted the materials that would be provided to participants at that meeting with the Minnesota Department of Education. Prior to, during, and after the kickoff of the networked improvement community, the project team described the networked improvement community process and answered questions about participation. During initial meetings of both networked improvement communities, the project team provided participants with a brief handout that described the proposed networked improvement community and the responsibilities of each participant (see box 2 and appendix B for an example from Minnesota).

In both states the multiphase recruitment process was important for building trust among participants. Engaging in the work of a networked improvement community requires participants to take a close look at their practices, be willing to admit that some practices are not working well, and make changes accordingly. This may be challenging for some because the process requires them to accept critical feedback on work that they were deeply invested in. To facilitate this process the project team had to build trust with the participants as well as among the participants themselves. The multiphase recruitment process helped do so by providing numerous opportunities for the project team to interact with participants prior to the networked improvement community's work. Although this takes time, it is important to build the foundation for the networked improvement community's success. Time demands on participants can be minimized by aligning recruitment meetings with existing meetings. In Minnesota all recruitment meetings occurred in conjunction with standing Cross-agency Implementation Team meetings.

Box 2. Responsibilities as a networked improvement community participant

The Regional Educational Laboratory Midwest project team developed a list of frequently asked questions for each networked improvement community to clarify the responsibilities of participants. What follows is an excerpt from the document used in Minnesota (see appendix B for the complete document).

As a participant in this NIC, you will be asked to:

- Participate in regular meetings to identify specific problems.
- Assist in developing a solution to each problem.
- Provide information about how the change has been implemented.
- Participate in discussions to refine the change as it is implemented.

Build engagement by aligning work with ongoing efforts

Networked improvement communities focus on problems that are important and actionable

In Michigan, participants wanted to know how the networked improvement community's work differed from the continuous improvement work that they were already engaged in, which included annual needs assessments. The REL Midwest project team explained the value of the networked improvement community approach, which involves rapid, iterative cycles that use formative, rather than summative, data. The project team further explained the value of leveraging a network of schools and districts for learning how change varies by context. The project team worked with state education agency staff in Michigan to use terminology and align networked improvement community work to the state's blueprint for its statewide system of support. In presentations the project team explicitly demonstrated how improvement science methods could be used to achieve the aims of the statewide system of support. For example, Michigan's school turnaround plans suggest that districts create a protocol for reviewing multiple sources of data; the project team discussed how the networked improvement community model could be used as one such protocol for data review.

In Minnesota the project team mapped the networked improvement community's work to the comprehensive statewide system of support evaluation plan to illustrate how the networked improvement community's activities would address components of the plan. The kickoff meeting for participants was led by the state education agency partner, who explained how the project originated within the state education agency and complemented existing efforts to evaluate and improve the supports provided to Regional Centers of Excellence staff using continuous improvement methods. By addressing participants' concerns about duplication of effort and by describing the value of the networked improvement community, the project team was able to establish trust and engage participants in the networked improvement community's work.

Use tools and resources from improvement science to identify a problem that is important and specific enough to be able to act on

Networked improvement communities focus on problems that are important and actionable, such as failure rates in developmental math in community college or teachers' abilities to implement a specific pedagogical practice (Bryk et al., 2015). Identifying important problems can enable initial and sustained institutional support, buy-in and ownership of participants, and diffusion of practices and processes that are produced through the

networked improvement community's work. However, problems also need to be within the participants' control if they are to enact changes in practice through rapid plan-do-study-act cycles and learn from those changes. In initiating the Michigan and Minnesota networked improvement communities the REL Midwest project team worked with participants to identify problems that were both important and actionable. In both states the focus of the networked improvement community is the implementation of the statewide system of support. However, to make progress on improving supports to schools served by the statewide system of support, it was necessary for each networked improvement community to engage in an iterative process to further narrow the problem on which it would focus. This process involved multiple conversations with key stakeholders.

One strategy for narrowing the scope of work to a specific problem is to conduct a root-cause analysis (Bryk et al., 2015). The project team adapted this suggestion from the literature by developing two activities (see box 3 and appendix A). Activity 1, creating a focused problem statement, enabled participants to move from specific problems encountered in their daily practice during the previous day, week, month, and year to a focused problem statement that would guide the networked improvement community's work. Using participants' daily experiences rooted the problem in practice and helped narrow the scope to a problem that was specific and actionable. This also helped participants connect the networked improvement community's work to their current responsibilities, increasing buy-in. The project team then led participants through an exercise using a fishbone diagram to identify the root causes of the problem statement. During the course of three months, using this set of structured activities, Michigan Focus Networked Improvement Community participants narrowed their focus to the specific problem of the lack of time for students to practice their math fluency skills on a daily basis.

Problems need to be within the participants' control if they are to enact changes in practice through rapid plan-do-study-act cycles and learn from those changes

Box 3. Root-cause analysis: Overview of activities 1 and 2

Each root-cause analysis activity requires approximately 1.5 hours. Activity 1 helps individuals create a focused problem statement based on problems they have encountered in their daily practice. Activity 2 uses a fishbone diagram to identify root causes. The primary problem statement becomes the "head" of the fishbone diagram. The focused problem statement comprises the key factors that make up each major "bone" (Berwick, 2008; Bryk et al., 2015). See appendix A for more detailed instructions about sample activities for the root-cause analysis.

Activity 1. Participants are encouraged to brainstorm problems that they have encountered in the past day, week, month, and year. Participants document these problems on sticky notes, which are collected by facilitators and placed on a large poster board. Participants take turns sharing the problems with the group and then work together to categorize them into broad buckets, such as "leadership" or "alignment." Participants draft a problem statement for each bucket and consolidate the problem statements into one focused problem statement to guide the networked improvement community's work.

Activity 2. Participants work in small groups to identify root causes of each problem identified in activity 1. Using a fishbone diagram, participants visually represent the problem and the contributing factors to each (Berwick, 2008; Bryk et al., 2015). They ask "Why?" until they have identified several contributing factors—or root causes—of each problem. After the group decides on a final depiction of the problems and root causes on the fishbone diagram, the facilitator leads a whole-group discussion to build consensus on which of the root causes the group will focus.

Embed capacity building to develop additional expertise for using continuous improvement research to address problems of practice

Each participant brings important knowledge and skills to the networked improvement community; however, participants may not have experience in designing and engaging in continuous improvement research within a networked improvement community. In both states there was a desire to build capacity for continuous improvement using the networked improvement community model. An important goal of these projects—beyond addressing the identified problems of practice—was to develop shared expertise to support lasting uses of continuous improvement research, including building participants' skills to be able to purposefully plan and measure changes in practice. To meet this goal, the REL Midwest project team intentionally structured these projects so that the networked improvement communities would engage in one or two plan-do-study-act cycles with project team facilitation and then continue to engage in additional plan-do-study-act cycles on their own as needed.

An important goal—beyond addressing the identified problems of practice—was to develop shared expertise to support lasting uses of continuous improvement research

Conclusion

Although there is practical guidance for how networked improvement communities should structure continuous improvement work, few published accounts describe the process of forming a networked improvement community. This report shares five lessons learned by REL Midwest while forming networked improvement communities in Michigan and Minnesota. As researchers and state education agency and school district leaders set out to form networked improvement communities, they can draw on these lessons to guide their efforts.

These lessons highlight the importance of relationships during the process of establishing and facilitating networked improvement communities. Continuous improvement research relies on the ability of networked improvement community participants to work together. Facilitators cannot foresee and account for all barriers that may arise. For example, in Minnesota the networked improvement community's work required the Minnesota Department of Education and Regional Centers of Excellence staff to look closely at their practices—a task that was challenging because it required them to accept critical feedback on work that they were deeply invested in. Participants engaged in many difficult but important conversations. As a result, they had to reset their expectations about the timeline for the project. The REL Midwest project team has shared these lessons so others may anticipate potential challenges as they set out to establish networked improvement communities.

This report has three limitations. First, this report examines only two instances of initiating and sustaining a networked improvement community. Other networked improvement communities might experience other types of barriers that are not described in this report, such as a major change in senior leadership over the course of the project. Second, the REL Midwest project team set out not to systematically study networked improvement communities and their impact, but to report on experiences during the process of implementing guidance found in the literature. It is unknown whether the investment in these networked improvement communities will have an impact on the outcomes of interest. Finally, the project team's work in Michigan and Minnesota focused on building each state's capacity to engage in continuous improvement research—including additional plan-do-study-act cycles—after REL Midwest was no longer involved. It is not yet known whether the states will be able to sustain these efforts without REL Midwest's support or to generalize what they learned to other content areas.

Appendix A. Sample activities to define the problem and identify root causes

This appendix provides a set of sample activities that a facilitator can use to bring a group to consensus about the definition of a problem and its root causes. Activity 1 helps individuals create a focused problem statement and categorizes potential causes. Activity 2 uses the fishbone diagram to identify root causes. The primary problem statement becomes the "head" of the fishbone diagram. The focused problem statement comprises the key factors that make up each major "bone."

Together, the activities should take approximately 2 hours and 15 minutes, depending on the size of the group.

Activity 1: Create a focused problem statement

Goal: Bring the group to a consensus on the specific problem statement.

Strategy: Start with small, specific problems, and then combine issues to form a general statement.

Materials: Chart paper, markers, sticky notes, pens/pencils.

Step 1: Brainstorm problems (20 minutes)

Encourage participants to think of a problem that they have experienced in the past day related to the topic at hand (such as providing supports to low-performing schools). An example might be, "Earlier, I tried to conduct a site visit, but the school schedule had changed and I could not meet with the assistant principal as planned." Have them write the problems down on individual sticky notes. Only give them a few minutes to do so.

Next, encourage participants to think of one to three problems that they have experienced in the past week related to the topic at hand. Do the same for the past month and year. Each problem should be written on a sticky note, with an indication of whether the problem arose in the past day, week, month, or year.

Step 2: Share and group problems (15 minutes)

Solicit a few volunteers to read their problems aloud.

Have participants get together in small groups and group all the problems written on the sticky notes together into general categories (such as "scheduling" or "lack of knowledge of best strategies").

If participants note that a problem could relate to more than one general category, encourage them to attach each problem to its dominant category—the one that characterizes it most centrally.

Step 3: Write a problem statement (15 minutes)

Assign a few participants to each general category of problems. Have the participants work together to draft a focused problem statement for each category. Encourage the participants to be as specific as possible.

Step 4: Build consensus (25 minutes)

Read the drafted problem statements aloud and ask if there are any revisions. Ask participants whether the drafted statements are specific enough. Make revisions as a group and finalize the statements.

Use the individual problem statements to draft one large, focused problem statement as a group.

Activity 2: Root-cause analysis

Goal: Determine the root causes of the problems defined in activity 1. A root cause is the reason why the problem occurs, unearthed in this exercise after several iterations of asking why a particular phenomenon exists.

Strategy: Assign groups of participants to each individual problem, now a subproblem under the general problem statement, developed in activity 1 and have them work through the fishbone diagram (figure A1).

Materials: Projector, sticky notes, pens/pencils, dot stickers.

Step 1: Work in small groups on subproblems (20 minutes)

Project the fishbone diagram, if possible, and write out the general problem statement developed during activity 1 at the head. Each "bone" should be one of the subproblems identified in activity 1. Each subproblem should have multiple root causes (these are the sticky notes from step 1 of activity 1).

Ask participants whether other subproblems should be listed. There should be only four or five. These subproblems now should be thought of as causes. If a subproblem does not make sense as a cause of the problem statement, keep that sticky note in a "parking lot"; perhaps it is actually a root cause or perhaps it just illustrates a root cause.

Divide participants into groups. Each group should have one subproblem, depending on the size of the group. Each group should get a copy of the fishbone diagram.

Encourage participants to use the sticky notes they grouped in activity 1 to think about the subproblem. Each group should ask, "Why does this happen?" for the subproblem, and fill out the fishbone diagram with answers until they get to a root cause. A good rule of thumb is five "why" questions, but that is not a hard-and-fast rule. Each group should focus only on the causes of their particular subproblem.

Remind participants to focus on causes and not solutions.

Step 2: Present the root causes (25 minutes)

Have each group present its root causes to the larger group. Ask the larger group if it has anything to add. Make revisions as needed.

As participants read out their fishbone diagram, add to the larger fishbone diagram that is projected on the wall so participants can see how they are building the whole diagram together. Another option is to have groups that finish early do this while they are waiting for others.

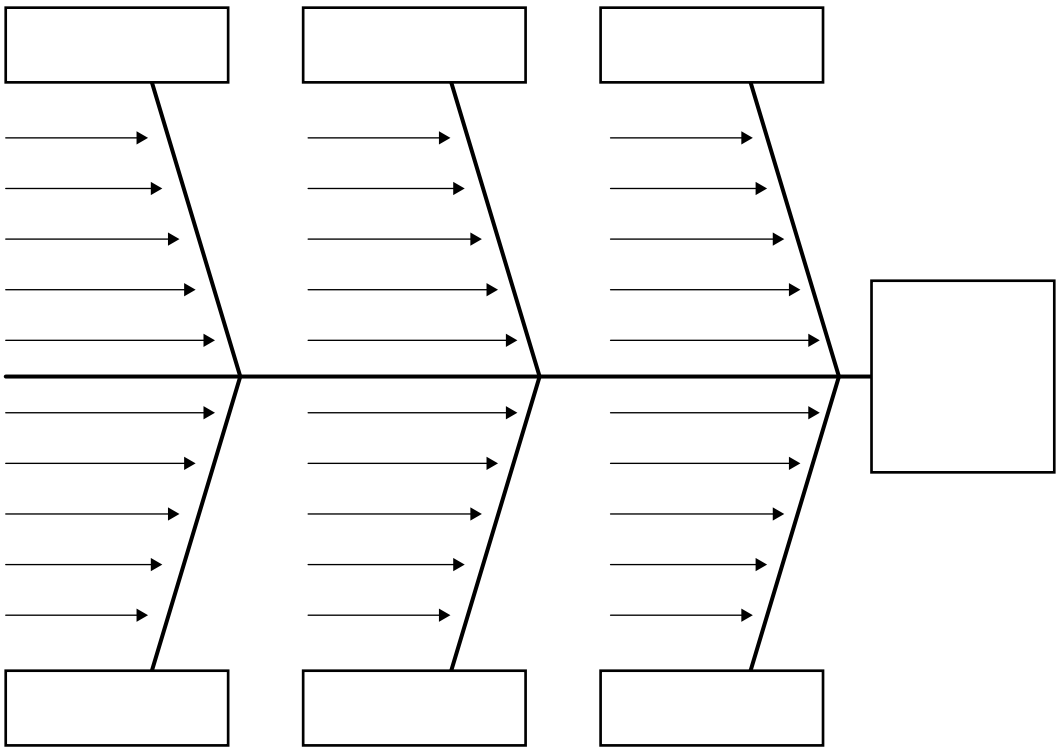
Step 3: Engage participants in a discussion of the root causes (15 minutes)

Did the process yield the results they expected? What was surprising? What was not surprising?

After participants have shared their reflections on the results of the root-cause analysis, ask them to think about which of the root causes they want to address first.

Provide each participant with three dot stickers. Ask each participant to vote on which root cause they want to address by placing their dots next to the root cause they want to address first. Participants can distribute the dots in any way. The cause identified as the highest priority will be addressed first by the networked improvement community.

Figure A1. Fishbone diagram



Appendix B. Frequently asked questions about networked improvement communities

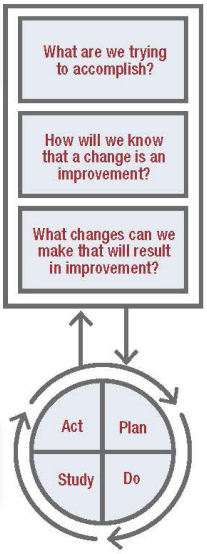
This appendix contains the frequently asked questions handout created by the Regional Educational Laboratory Midwest project team for the Minnesota Statewide System of Support Networked Improvement Community. This handout was used to support the recruitment of networked improvement community participants.

REL MIDWEST
Regional Educational Laboratory at American Institutes for Research

Developing a Networked Improvement Community to Support Regional Centers of Excellence
Frequently Asked Questions

What is a networked improvement community (NIC)?

A networked improvement community (NIC) is a group of individuals who come together across diverse contexts to work on a problem of practice. It is a scientific learning community in which quick, actionable research is used to make changes to practice in complex organizations. These changes are continually measured and refined to address a specific problem of practice. NICs are different from communities of practice because the goal is to not only share across contexts but also work together to invent and continually refine solutions to problems of practice.



Why develop a networked improvement community to support Regional Centers of Excellence?

The Regional Centers of Excellence are relatively new in Minnesota, and the Minnesota Department of Education (MDE) would like to better understand how well it is supporting these Regional Centers of Excellence as they implement the statewide system of support. Through an iterative process, the NIC will leverage the expertise of staff from MDE, the Regional Centers of Excellence, and Regional Educational Laboratory (REL) Midwest to

- Identify specific areas of need (**Plan**).
- Intervene to improve supports to address those needs (**Do**).
- Measure any changes that occur (**Study**).
- Refine the intervention (**Act**).

Why have I been chosen to participate in this continuous improvement process?

You have been chosen to participate in this process because you work with MDE or the Regional Centers of Excellence. Participation is voluntary and should not be in addition to work that you are doing; it should be complementary.

The Plan/Do/Study/Act graphic is from Langley, G. L., Moen, R., Nolan, K. M., Nolan, T. W., Norman, C. L., & Provost, L. P. (2009). *The improvement guide: A practical approach to enhancing organizational performance* (2nd ed.). San Francisco, CA: Jossey-Bass.

What are my responsibilities as a participant in the NIC?

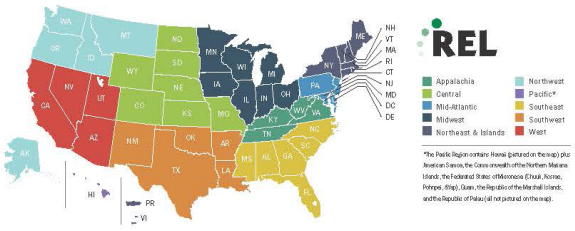
As a participant in this NIC, you will be asked to

- Participate in regular meetings to identify specific problems.
- Assist in developing a solution to each problem.
- Provide information about how the change has been implemented.
- Participate in discussions to refine the change as it is implemented.

During fall 2015, you may be asked to complete an interview or survey about your experiences with the statewide system of support rollout. Your responses will provide data that will help in the planning of the continuous improvement process.

What is REL Midwest and what is its role in the continuous improvement process?

REL Midwest is part of a network of 10 regional educational laboratories funded by the U.S. Department of Education's Institute of Education Sciences. Each REL serves a designated region of the United States and focuses on the national priority of helping states and districts use data and analysis to address important policy and practice issues, with the goal of improving student outcomes.



REL Midwest will support the NIC by providing tools to identify a problem of practice that is directly related to the statewide system of support. REL research staff also will develop indicators and instruments to specify how changes to practice that aim to improve this problem will be measured.

Contact Information

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Note

1. The REL Midwest School Turnaround Research Alliance is a partnership between researchers at REL Midwest and educators in REL Midwest Region states. The alliance builds capacity among members to identify and address school turnaround challenges related to policy and practice through regional research, technical assistance, and dissemination projects.

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Summaries of research findings for specific audiences

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Research methods for educational settings

Tools
Help for planning, gathering, analyzing, or reporting data or research