Building an improvement network

Jennifer Lin Russell, Jennifer Zoltners Sherer, and Jennifer Iriti Iriti
Partners for Network Improvement, Learning Research Development Center, University of Pittsburgh

This feature article illustrates the work of improvement science networks. Through the work of such networks, there is alignment to the Principles of Learning. Clear Expectations are evidenced by developing common understanding and specific goals, hypothesizing intermediate steps, and analyzing and reflecting on your work and the work of others. Self-Management of Learning and Recognition of Accomplishment, which tie closely to Clear Expectations, are hallmarks of the work of improvement-science networks. Networks use practical measures to monitor and adjust their ongoing work. The same measures allow networks to recognize their progress incrementally and in meaningful ways.

Networks that engage educators in continuous improvement have the potential to harness the power of collaborative work to accelerate learning and solve complex problems. District leaders have the opportunity to build improvement networks within their organizations, but they vary in some distinct ways from networks typically seen in K-12 education.

We believe three indicators drive the potential of improvement networks and differentiate them from other networks, such as sharing networks.

**Improvement networks are grounded in shared goals, norms, theories of improvement/action, and practices.** Members of improvement networks have a clear, common understanding of their objectives and a shared hypothesis about how to achieve them. Members also have a collective commitment to their work and a sense of shared responsibility. Beyond improving their own work practices, members of improvement networks believe they are collectively solving a broader, systemic problem, and they can articulate a clear theory of improvement that will move them toward accomplishing their shared goal.

**Improvement networks engage in disciplined inquiry to learn how to solve their focal problem of practice.** Members use systematic methods of inquiry to test their theory about what strategies will be most effective for achieving their goals. They typically use systematic methods and routines such as Plan, Do, Study, Act (PDSA) cycles that are integrated into their daily work. Improvement networks measure outcomes, but members of improvement networks also use practical measures to assess the processes that contribute to improvement.

**Improvement networks coordinate and accelerate learning and improvement through strategic knowledge management.** Network leaders monitor the changes that educators are making, review evidence that supports judgments that changes are leading to improvement, and...
Using student-centered classroom routines to improve comprehension of complex texts

Allison Escher  
*IFL, English language arts fellow*

The Networks for School Improvement (NSI) work taking place among Dallas ISD (DISD), the Institute for Learning, the University of Pittsburgh School of Education Center for Urban Education, and the Learning Research and Development Center, funded by the Bill & Melinda Gates Foundation, has largely focused efforts on improving instructional rigor, providing better supports for English language learners, and improving cultural relevance.

One particular change idea that teachers have been testing in order to improve instructional rigor is the use of student-centered routines. When we ask students to engage in cognitively challenging work, we recommend doing so through a set of routines: individual writing on a question or task, sharing of ideas in pairs and trios, and whole group discussion. These rituals and routines, derived from research on cognitive apprenticeship, are designed to engage all students as learners in collaborative problem solving, writing to learn, making thinking visible, establishing text-based norms for discussions and writings, ongoing assessment and revision, and metacognitive reflection and articulation as regular patterns in learning. Additionally, these routines support the Principles of Learning, specifically Self-Management of Learning and Clear Expectations.

Using a complex and meaningful text, DISD teachers collaboratively planned a comprehension task to use with students. The task included a high-level question that asks students to make sense of the big ideas in the text, opportunities for students to write about the text informally through quick writes, and opportunities to metacognitively reflect on how their thinking about the text changed through talking and writing.

Additionally, teachers created student-centered task sheets to help students

- understand the purpose for the work that they will be doing, which sets up clear expectations for students as well as a rationale for why they are engaging in this particular task.
- understand the steps in the task as well as gain some insight into how to complete new activities or skills, such as providing tips for completing a quick write if that is new for students. These scaffolded steps present an opportunity for students to self-manage their learning by working towards the goal in incremental steps, allowing space for questions, connections, and metacognition.
  - reflect on how their thinking has changed about the big ideas in the text and how they learned from working with classmates, which again promotes self-management of learning through metacognition and gives students opportunities to manage their own learning by evaluating the feedback they get from others.

This test of change will be adopted as teachers overall are seeing an increase in students’ repertoire of academic skills. This is evidenced by the number of students who complete quick writes, who share text-based thinking during conversation, and who state accurate or mostly accurate understandings of big ideas. We look forward to continuing to understand how engaging in the work carried by a task sheet can provide opportunities for students to engage in high-quality and rigorous work.
The Guilford Public Schools’ vision is that of a professional learning community where instruction invites effort and supports academic rigor for all students and educators. To that end, our daily work in classrooms is rooted in and supported by the Principles of Learning (POLs). These nine principles have been foundational to our work over the past 10+ years.

The importance of the POLs in Guilford is evidenced by just how prominently they factor into ongoing district work. Prior to the start of the school year, Guilford administrators participated in a retreat focused on equity. A portion of the retreat was a retrospective on the Principles of Learning during which each POL was defined and mapped to both the high-leverage practices and the TRU Framework. Administrators watched several classroom scenarios and considered the application of the Principles of Learning as a way to frame instructional conversations with their faculties. Principals and administrators brought this work back to their buildings to support a deeper understanding of each principle as well as to clearly represent each principle’s impact on classroom instruction. A deep and growing understanding of the Principles of Learning has been established through our long-standing partnership with the Institute for Learning and is reflected daily in our schools’ cultures and in the way our students engage with content and process.

In our classrooms, we see evidence of the Principles of Learning in action every day. For example, our content-focused coaches have supported teachers as they continue to grow their conferring practice. Effective conferring helps teachers and students develop clear expectations for growth and encourages self-management and self-assessment of learning. Teachers keep notes of conference teaching points and use these notes to track the trajectory of learning, to plan, and to individualize instruction to meet the needs of each student. Conferring also facilitates the identification of strengths on which to build and the creation of goals for improvement by the students themselves.

Let’s step into a classroom to see the impact of several of the Principles of Learning, specifically Clear Expectations and Self-Management of Learning. Students in Ms. Pierce’s 4th-grade classroom at Melissa Jones Elementary School have been working on clearly communicating their mathematical thinking. This work has included using visual representations as well as written and oral explanations to clarify and make visible mathematical reasoning. After engaging in this work on several occasions, students were given the opportunity to individually reflect on their areas of strength as well as the concepts they find challenging. Following this self-reflection process, the class worked as a whole to brainstorm elements of a quality mathematical explanation. This, in turn, led to a class-generated criteria chart indicating the qualities of effective communication of mathematical reasoning upon which all students agreed. Each student used this checklist to self-assess one of their previously recorded mathematical explanations and then identified one area to set as their goal for better meeting the criteria for quality explanations.

A copy of the chart was posted in the front of each student’s math journal and is being used independently by students as a guide when reviewing mathematical explanations and monitoring progress towards an identified goal. Teachers are able to reference this student-generated tool when conferring with students in order to better ask advancing and assessing questions that push students’ thinking around mathematical reasoning.

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**Clear Expectations:** Student-generated criteria chart clarifies expectations about quality mathematical explanations.

**Self-Management of Learning:** This student identified “Use precise math vocabulary” as a goal and is keeping notes on a sticky note to support her progress.
Engagement vs. compliance: Looking closely at criteria charts

Kristin Klingensmith  
IFL mathematics fellow

A quick search on the Internet surfaces hundreds of suggestions for getting students engaged in mathematics classrooms. In this article, we are going to take a closer look at one of the ideas, the use of criteria charts.

Criteria charts are not new to mathematics classrooms. We have seen criteria charts for student work, for rules/procedures for problem solving, and for ways of working or talking during a mathematics lesson. Regardless of the focus, the chart serves as a physical embodiment and public naming of expectations.

At first glance, it seems as if criteria charts would align with three of the Principles of Learning: Clear Expectations, Self-Management of Learning, and Recognition of Accomplishments. And though criteria charts have been leveraged by students to manage their learning and by teachers as guides to help decide what to recognize as an academic accomplishment, it is not that simple. It is not that simple because central to the Principles of Learning is the active pursuit and use of knowledge on behalf of the learner. Inherent to this is the idea of active engagement, where the learner actively uses their existing knowledge to construct and refine their understanding of a concept. (Be sure to look for future articles related to Academic Rigor in a Thinking Curriculum, another of one of the Principles of Learning.)

Criteria charts that spur students to engage with the content matter actively are more likely to align with the Principles of Learning, so analyzing the criteria is critical. We have to consider if the combination of expectations results in active engagement with mathematical ideas that leads to deep understanding or simple compliance of learned procedures and rules.

Take a moment to review the two quality work criteria charts and consider the differences in their potential impact on student engagement with the mathematics they are studying.

<table>
<thead>
<tr>
<th>Quality Work Chart A</th>
<th>Quality Work Chart B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Name is at the top.</td>
<td>1. Have I responded to all parts of the problem?</td>
</tr>
<tr>
<td>2. All parts of the question are</td>
<td>2. Does my response include at least two different representations (words, equations, diagrams, graphs, tables) that can help people understand the work?</td>
</tr>
<tr>
<td>answered.</td>
<td>3. Are the diagrams, tables, and/or numbers in the equations labeled so others know what is being represented?</td>
</tr>
<tr>
<td>3. Number model is included</td>
<td>4. Have I made connections between representations?</td>
</tr>
<tr>
<td>(expression, equation, inequality).</td>
<td>5. Does my written explanation contain my mathematical reasoning?</td>
</tr>
<tr>
<td>Other representations are optional.</td>
<td>6. Does my written explanation refer to the story problem, equations, graph, tables, and/or charts?</td>
</tr>
<tr>
<td>4. Description of how you arrived at the answer.</td>
<td>7. Have I referred to other similar problem or mathematical ideas?</td>
</tr>
<tr>
<td>5. Evidence that the answer has been checked is included.</td>
<td></td>
</tr>
</tbody>
</table>

As you likely noticed, the criteria in Chart A is about compliance. Chart A criteria focus on rote application and completion. Students can meet all of the criteria on this chart without having to think critically about the mathematics they are studying.

In contrast, the criteria of Chart B sets the expectation for students to be actively making sense of and exploring mathematical ideas. These criteria, framed through a series of yes/no questions, have students analyze their work. The criteria target specific practices that students who are working as mathematicians should employ, such as creating and connecting mathematical representations.

When students connect mathematical ideas, they have to “translate” the mathematical idea in different ways. There is an explicit expectation that students refer to their representations in their explanations and include mathematical reasoning. The criteria also signal to students that they have to extend their thinking beyond the problem to look for similarities to other problems and criteria of Chart B are clear. When such criteria are publicly posted and regularly discussed, students have a means of judging their work and the work of others. The criteria also establish for students the practices they should use when engaging with mathematical explorations.

Self-Management of Learning: By using the criteria of Chart B, students can actively monitor and revise their thinking. We have to keep in mind that hanging a well-designed criteria chart on the wall does not automatically mean that students will use it to manage their learning. Teachers need to refer to the criteria regularly, using it as a tool to support students as they work. In this way, the criteria provide scaffolding for students, which they use less and less as they internalize the practices and expectations.

Recognition of Accomplishment: The criteria provide teachers an outline of what to look for in mathematics classrooms. Because the criteria cover a range of practices,
Clear Expectations and Self-Management of Learning: Moving the Principles of Learning from Theory to Practice

Danielle Mastrogiovanni, EdS.
Supervisor of Humanities, grades 1-6, New Brunswick Public Schools

In thinking about the work we have been moving throughout our district, we are extremely proud of the way our teachers have been incorporating Clear Expectations and Self-Management of Learning, two of the Principles of Learning that are inextricably connected. At the onset of our work in New Brunswick Public Schools, we noticed that there was a problem of practice during small group instruction period that was impacting both our teacher-facilitated guided reading, as well as student-led literacy centers during this time. In brief, we recognized that teachers needed support in order to provide explicit instruction of developmentally appropriate reading strategies and guidance on how to create cognitively demanding center tasks that would encourage opportunities for rigorous, independent student learning.

We first focused on refining the use of generalized reading strategies for all students, at all levels. We created a guided reading planner that asked teachers to not only identify the specific skill or strategy that they were planning to teach, but also to think through the explicit instructional moves that they were going to use in order to do so. This sets up clear expectations not only for the students but also for the teachers. The article “Principles of Learning for Effort-Based Education” (Resnick and Hall, 2000) states that in order for “teaching and learning environments to create intelligence, they must communicate clear expectations about what students will learn, how they will learn it, and what qualifies as good work.” Providing both teachers and students with clear expectations of what “good” teaching and learning during guided reading should look like, in addition to a bank of resources that enabled them to select and plan appropriate lessons, truly helped everyone to develop a common understanding of both the rationales and the pedagogy required to increase reading proficiency across the district.

We also felt it paramount to address what the rest of the class would be doing independently while the teacher was busy working with the students in guided reading. For the most part, we observed students engaging with tasks that required low levels of cognitive demand—unclear about what they were being asked to do, the purpose of the work, or what the expected outcomes were. The center tasks lacked both clarity of expectations and discouraged self-management of learning. In response, we created a checklist that identified and described the necessary components of small group instruction: planning, organization, relevance, rigor, choice, differentiation, accountability, and feedback. We then collected center tasks that were currently in use in order to analyze them through this lens. After identifying the places where the tasks fell short, teachers worked together to improve the existing tasks which we used to create a bank of “before and after” task cards that exemplified the necessary shifts in instruction. Exemplar tasks, which included visual, step-by-step instructions of what to do at each center from start to finish, were created and shared so that teachers across the district could refer to, reproduce, and modify the tasks as needed to meet the needs of their students. These tasks not only provided clarity, but also encouraged students to “take responsibility for their own engagement with learning… work productively and without distraction in a variety of settings—individually, with a partner, or in small groups—without the need for constant adult supervision,” (Hall and Resnick, 2000) which were critical components of successful Self-Management of Learning.

I firmly believe that the root of our success has been grounded in our ability to move teachers from theory to practice. In closing, if we as leaders want teachers to begin to shift their thinking and move from basic to best practice, it is critical that we provide teachers with both the theory behind the Principles of Learning as well as tangible supports that allow them to identify and replicate what they look like in action.

Reference:

IFL offers robust instructional materials in ELA and math!

The IFL offers high-quality instructional materials in mathematics and English language arts that can be flexibly integrated into existing curricula. Designed around core concepts in each discipline, our materials apprentice students to read, write, talk, inquire, and reason as mathematicians, readers, and writers. Visit our website to learn more about IFL’s instructional materials. Contact Peter Compitello with any questions.
The Institute for Learning 2020 Leaders Retreat
Using the Improvement Journey to Bring Equity to Every Student

The IFL Leaders Retreat seeks to convene change-makers in education for the purpose of exploring and finding solutions to educational wicked problems of teaching and learning. This retreat will provide time and space for leaders to reflect and learn together. Join us and look forward to the following:

**A Deep Focus on Equity**
Discussions led by educators who are doing deep work in schools help us see biased practices that exist in schools and the impact these have on students and teachers.

**Research-Based Writing Practices**
A clear set of research-based writing practices in content areas to motivate, effectively engage, and support every student—including African American, emergent bilinguals, students in special education programs, and low-income students—for success in college and careers.

**Improvement Science for Schools**
How do we know what works and does not work in our classrooms? Practical measures that support you with data that helps kids learn in real time.

**Ideas, Ways of Working, and Results of Using Culturally Relevant Practices**
School leaders discuss and share what they changed, how they teach, how they talk, and what they offer students who have traditionally not had access to these opportunities.

**Leadership Moves Required to Move A District Toward Equity**
Discussions and workshops led by experienced educators who are doing critical work in schools. Understand the challenges they face and learn about their successes.


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Content-Focused Coaching® Mathematics

The Institute for Learning (IFL) is pleased to announce a new online workshop to support instructional coaches who are responsible for supporting math teachers. Drawing on IFL’s extensive experience with coaching, this workshop focuses on specific practices and routines that coaches can use during the coach-teacher discussion cycle to improve classroom instruction. We will explore the Content-Focused Coaching (CFC) cycle in mathematics, specific coach moves used during the CFC cycle, and these key research-based coaching practices:

- Maintain an inquiry stance toward teaching and learning.
- Co-construct mathematical and pedagogical goals.
- Maintain a content-focused discussion.
- Engage in evidence-based reflection.

Together, we will learn to differentiate between mathematics goals and performance goals and explore pedagogical goals. We’ll study a set of coach moves and the benefit of the coach moves for focusing and supporting teacher discussion of mathematical and content pedagogy. Finally, we’ll plan for a coaching discussion with a teacher, learn how to prepare for the post-lesson discussion with that teacher, and discuss how to provide evidence-based feedback.

Workshop participants will engage in impactful, research-based learning routines. You will see models, get to apply new learning in your own classroom, and receive feedback from peers and your IFL facilitator. After participating in the workshop, you can expect to see and experience observable changes in instruction and student participation.

Contact Courtney Francis, IFL director of online learning, to enroll in this 8-week coaching workshop.® Content-Focused Coaching is a registered trademark of the University of Pittsburgh.
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work to spread and scale the most promising changes. This accelerates the learning within the improvement network.

District leaders can take the following five strategic actions to build improvement networks within their district.

1. Focus attention on shared goals pursued through common theories of action. Tools of improvement science can support this work (root cause analysis, building a shared theory of improvement represented in some way—e.g., driver diagram).

2. Embed improvement cycles and routines into existing collaborative structures. Examples of ways to do that include the following:
   - Structure the work of existing PLCs to support inquiry for improvement.
   - Principals and/or assistant principals work together on issues such as chronic absenteeism and inequitable discipline practices.
   - Teachers work in PLCs to support a shift toward more ambitious forms of pedagogy, anchored in inquiry cycles.
   - Use coaches to support continuous improvement.
   - Leverage research-based best practices to accelerate improvement (e.g., partner with experts to identify evidence-based solutions to pressing problems).
   - Create cross-school learning opportunities to optimize collective learning and opportunities to spread what is being learned

3. Leverage a practical measurement system to guide continuous improvement. Improvement work involves data of multiple types, including short cycle data that informs action and summative data to assess the impact of an initiative. Districts can support school engagement in continuous improvement by identifying outcome and process measures, and by building tools and routines to collect, analyze, and act on data. To promote equity and learning, leaders must be intentional about what data is brought for discussion and how it is represented. In addition, leaders must build the capacity to analyze data and lead these sensemaking routines.

4. Prioritize strategic knowledge management. When leaders engage in strategic knowledge management, they harvest and manage the learning of others in the organization and make this learning visible. They identify which changes lead to improvement and then facilitate the spread of the most promising ideas that emerge from the collective learning of the organization.

5. Build district capacity to operate as an improvement network through partnerships. While educators are reflective by nature and collaborative by design, operating as an improvement network requires new ways of working. Educators are both changing their practice while also learning to engage in improvement cycles. The data collection varies from traditional data uses and has new rhythms (especially those tied to inquiry cycles). Engaging external experts, often supported through partnerships, can support this complex work. District leaders can identify and convene partners with expertise in content knowledge relevant to the problem of practice, improvement science, change management, and analytics and practical measurement to build and operate the learning network. Improvement networks can serve as a mechanism for building capacity within school districts to tackle complex systems’ problems such as chronic absenteeism, gaps in student achievement, inadequate supports for students with special needs, and teaching for conceptual understanding.

Growing in popularity, these networks can serve as an alternative to rolling out district-wide initiatives that fail to recognize and respond to expected implementation challenges. Educators in improvement networks who engage in more intentional and coherent within-school and cross-school collaboration can build and spread promising interventions to solve specific problems. They can integrate necessary knowledge of implementation challenges to ensure that the changes they implement will contribute to improvement in varying contexts.

Key to this work is the use of data to assess and adapt implementation through the course of an initiative. Partnerships can provide capacities necessary to design and implement improvement (research-based, high-leverage strategies; measurement and analytics; change management). Pushing beyond traditional sharing networks, improvement networks bring stakeholders with diverse forms of expertise together to support educators as they engage in inquiry cycles that can accelerate learning and drive toward improvement.

We have to keep in mind that a hanging a well-designed criteria chart on the wall does not automatically mean that students will use it to manage their learning. Teachers need to refer to the criteria regularly, using it as a tool to support students as they work. In this way, the criteria provide scaffolding for students, which they use less and less as they internalize the practices and expectations.
PRINCIPLES OF LEARNING

Powerful Supports to Education

Clear Expectations
If we expect all students to achieve at high levels, then we need to define explicitly what we expect students to learn. These expectations need to be communicated clearly in ways that get them “into the heads” of school professionals, parents, the community and, above all, students themselves. Descriptive criteria and models of work that meet standards should be publicly displayed, and students should refer to these displays to help them analyze and discuss their work. With visible accomplishment targets to aim toward at each stage of learning, students can participate in evaluating their own work and setting goals for their own effort.

Recognition of Accomplishment
If we expect students to put forth and sustain high levels of effort, we need to motivate them by regularly recognizing their accomplishments. Clear recognition of authentic accomplishment is a hallmark of an effort-based school. This recognition can take the form of celebrations of work that meets standards or intermediate progress benchmarks en route to the standards. Progress points should be articulated so that regardless of entering performance level, every student can meet real accomplishment criteria often enough to be recognized frequently. Recognition of accomplishment can be tied to opportunity to participate in events that matter to students and their families. Student accomplishment is also recognized when student performance on standards-based assessments is related to opportunities in higher education.

Self-Management of Learning
If students are going to be responsible for the quality of their thinking and learning, they need to develop — and regularly use — an array of self-monitoring and self-management strategies. These metacognitive skills include noticing when one doesn’t understand something and taking steps to remedy the situation, as well as formulating questions and inquiries that let one explore deep levels of meaning. Students also manage their own learning by evaluating the feedback they get from others, bringing their background knowledge to bear on new learning, anticipating learning difficulties and apportioning their time accordingly, and judging their progress toward a learning goal. These are strategies that good learners use spontaneously, and all students can learn through appropriate instruction and socialization. Learning environments should be designed to model and encourage the regular use of self-management strategies.