CONTINUOUS IMPROVEMENT IN EDUCATION

BY SANDRA PARK, STEPHANIE HIRONAKA,
PENNY CARVER, AND LEE NORDSTRUM

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EXECUTIVE SUMMARY

In recent years, 'continuous improvement' has become a popular catchphrase in the field of education. However, while continuous improvement has become commonplace and well-documented in other industries, such as healthcare and manufacturing, little is known about how this work has manifested itself in education. This white paper attempts to map the landscape of this terrain by identifying and describing organizations engaged in continuous improvement, and by highlighting commonalities and differences among them.

The findings classify three types of organizations engaged in continuous improvement: those focused on instructional improvement at the classroom level; those concentrating on system-wide improvement; and those addressing collective impact. Each type is described in turn and illustrated by an organizational case study. Through the analysis, six common themes that characterize all three types of organizations (e.g., leadership and strategy, communication and engagement, organizational infrastructure, methodology, data collection and analysis, and building capacity) are enumerated.

This white paper makes four concluding observations. First, the three case studies provide evidence of organizations conducting continuous improvement work in the field of education, albeit at different levels and in different ways. Second, entry points to continuous improvement work are not mutually exclusive, but are nested and, hence, mutually informative and comparative. Third, continuous improvement is not synonymous with improving all organizational processes simultaneously; rather, research and learning cycles are iterative and gradual in nature.[1] Fourth, despite being both iterative and gradual, it is imperative that improvement work is planned and undertaken in a rigorous, thoughtful, and transparent fashion.

WHAT IS CONTINUOUS (QUALITY) IMPROVEMENT?

It is worth pausing at the onset of this paper to explicate a working definition of continuous improvement, and to differentiate this explication from the related terms 'quality improvement' and 'improvement science'. Absent this, the subsequent presentation of several case examples of educational organizations engaged in continuous improvement will inherently serve to plasticize and obscure an organizational characteristic that is meant to be both precise and well-bounded. Beginning with the latter term, improvement

[1] The scope of the research cycles depends on the organization. Some organizations mainly employ small-scale tests while others undertake larger cycles.

science has been defined as: "a body of knowledge that describes how to improve safely and consistently. Improvement science is not the same as research. Research is designed to find out what is possible. Improvement science is not the same as audit. Audit is designed to find out what is actual. Improvement science describes how to reduce the gap between what is actual and what is possible" (Health Foundation, 2011: 6). Shojania and Grimshaw (2005) describe the goal of this research process as ensuring that quality improvement efforts made by organizations are based on a high warrant of evidence. In other words, strategies for the utilization and adaptation of evidence-based quality improvement methods should themselves be based on a foundation of evidence. In this sense, improvement science seeks to discern what works for addressing a particular problem, for whom, and under what set of specific conditions (Berwick, 2008; Bryk, Gomez & Grunow, 2010). It represents a field of study focused on the methods, theories, and approaches that facilitate or hinder efforts to improve quality in context-specific work processes, and centers inquiry on the day-to-day "problems of practice that have genuine consequences for people's lives" (Bryk, 2009: 598; Health Foundation, 2011).

So defining improvement science inexorably necessitates our delineating the second term, 'quality improvement'. Quality improvement is the disciplined use of evidence-based quantitative and qualitative methods to improve the effectiveness, efficiency, equity, timeliness or safety of service delivery processes and systems[2] (inclusive of the human resources within that system) toward the pursuit of better services or outcomes for 'users' or customers of the system (URC, 2012).[3] This definition comprises five interrelated aspects of quality improvement. First, quality improvement focuses on system outcomes for a defined population of beneficiaries, as well as the processes that lead to these results: it requires both a problem- and user-centered design. That is, the work should center on engaging relevant actors in co-developing testable hypotheses for the specific problem the organization is attempting to solve. Second, variation in system performance, inclusive of processes and outcomes, is essential to improvement work. Indeed, improvement cannot occur in the absence of standard practices since variation makes it difficult to determine what has been improved and what is due to random noise. Third, the ability to 'see the system' is paramount. There is the implicit recognition in quality improvement work that every system is perfectly designed to achieve the results it gets,[4] which means that results are the natural products of the current state of affairs. This also requires that quality improvement is context-embedded: it "entails an engineering orientation where the varied demands and details of local contexts are a direct object of study and design" (Bryk & Gomez: 10). Such 'sticky' information about user needs and the context of use are essential for innovation work in education (von Hippel, 2005; Bryk et al., 2010). A 'systems' perspective implies that, in order to achieve improved results, one must of necessity alter the system and the ways of working in it. Fourth, a prerequisite for quality improvement is the capacity to measure and track key processes and outcomes. The act of measurement should be embedded in day-to-day work and used to determine whether a change in fact constitutes an

[2] A system is defined here as those sub-elements of the overall educational system that the stakeholders exert control over. In education, this is oftentimes analogous to the school district, its people, processes, and outcomes.

[3] System 'users' in the field of education are students. While this term may appear somewhat dehumanizing, it merely refers to the individuals who are the recipients of services. Though education is a public good and 'neighborhood' benefits do certainly accrue to households and societies at large, the direct recipients of educational services are students.

[4] This phrase is attributed to Paul Batalden, Dartmouth pediatrician and former chair of the Institute for Healthcare Improvement.

improvement. Fifth, quality improvement entails the employment of a specific and coherent methodology to improve system services and processes. Many such formal methodologies exist (e.g., Lean, Six Sigma, the Model for Improvement) and these differ to a greater or lesser extent, but the germane point here is that quality improvement requires the application of an evidence-based methodology, with its inherent standards, protocols and guidelines.

From this platform, then, continuous (quality) improvement is the act of integrating quality improvement into the daily work of individuals in the system. It is a characteristic, or rather a set of three characteristics, of an organization that is both designed and managed to improve over time vis-à-vis desired outcomes in light of a specific system aim. 'Continuous', in this sense, is a qualifying adjective of quality improvement work which connotes three organizational characteristics: 1) the frequency of quality improvement work; 2) the depth and extent of its integration at different levels of the organization; and 3) the extent of contextualization within a system of work processes. First, for an organization to be characterized as engaging in continuous quality improvement, the work should be typified by regularity and constancy. As such, an organization would not qualify as a continuous improvement organization if it engaged in a one-off quality improvement project. So much is readily obvious, that 'continuous' requires regularity and high frequency. However, the frequency of improvement work is, in itself, insufficient to classify an organization as conducting continuous improvement work. It is easy to imagine, for example, an organization that carries out numerous unrelated, discontinuous, and non-sequential quality improvement projects with a high degree of fidelity (within that particular project). Such an organization would be frequently engaging in quality improvement work, but that work would not be continuous; rather it would start and stop as projects begin and end. Hence, 'continuous' improvement requires a second feature: that quality improvement work is fully infused in the day-to-day work of individuals. The only way for quality improvement work to be truly continuous is if it is woven into the fabric of the daily work that individuals are constantly doing. Continuous improvement, therefore, cannot be a separate intervention, implemented in parallel with others. Its focus on processes (all work is a process) necessitates that individuals do not simply do the same work differently, but rather that individuals conduct different work. The third feature of continuous improvement organizations is that they situate problems of practice as products and elements of a system (Bryk, 2009). Rather than view organizational success or failure as the product mainly of nonreplicable craft or artistry aggregated across individuals, results are viewed (and situated) as natural outflows of the current design of the system (Deming, 2000).

These three features of continuous improvement (i.e., frequency, depth, and system contextualization) draw in part from two distinct frameworks for organizational learning that are important to briefly highlight here. Douglas Englebart (1992, 2003) articulated a stratified model of organizational improvement comprised of three levels of activity. The 'A' level activity represents the organization's primary activity (e.g., teaching and learning). 'B' level activity is concerned with improving the capability within the organization to perform A-level functions through the use of quality improvement methodologies. Englebart realized, however, that as organizations improve at A-level activities through B-level work, rates of return will inherently fall off. In other words, there is only so far that an organization can go toward improving upon desired outcomes via the same methodologies; organizations need to improve their ability to improve. This C-level of activity is

"inter-institutional, representing the capacity for learning to occur across organizations. Here institutions engage in concurrent development, working on problems and proposed solutions that have a strong family resemblance. Concurrent activity across contexts puts relevant aspects of the context in sharp relief and can help each local setting see its efforts from new vantage points" (Bryk et al., 2010: 7). Englebart's model maps onto the above framework for continuous quality improvement through its recognition of how quality improvement necessarily impacts the day-to-day work of organizations and the individuals within them. It also adds a further element of organizational learning: inter-organizational improvement communities. But continuous quality improvement also requires that results and outcomes are situated within a system of work processes, and here Englebart's C-level activity – that organizations can learn from one another, test the validity of local knowledge and, if necessary, adjust their understanding of a problem – presupposes an ability to question the fundamental goals and design of one's own organization. Here it is helpful to draw on Argyris's (1976) theory of single- and double-loop learning. Single-loop learning is learning "that does not question the fundamental goals, design and activities of [the] organization" whereas in double-loop learning "participants would be able to ask questions about changing fundamental aspects of the organization" (p. 367). Put together, organizations and the people within them need to be able to engage in both single- and double-loop learning while conducting B- and C-level activities. While this will, at least in the short term, occasionally impede the day-to-day A-level activities, openness to adaptation and change according to local contexts and new knowledge "afford mechanisms for testing the validity of new knowledge, adjusting local understanding of the true nature of a problem, and advancing local support structures for improvement" (Bryk et al. 2010: 7). All of this activity is designed to support A-level work and to render it more efficacious.

The above framework for quality improvement and continuous improvement paints a portrait of a rigorous and exacting practice that is not at all common in educational organizations, and does not correlate highly with much of what currently passes as 'continuous improvement' in education. For example, yearly strategic plans which espouse organizational goals and targets, and which lay out a general vision of work would not meet the above definition, even when the plan is labeled a 'continuous improvement strategy'. Strategic plans fall short because they are nearly universally focused on measuring system outcomes, and spend little time identifying processes, devising means to measure them, or attempting to situate outcomes and processes within a system. Even when attention is paid to work processes, strategic plans tend to speak of them in vague notions (e.g., "We will roll out professional learning communities by subject area in every school"), and do not articulate how processes of work are impacted. Similarly, the use of data and analytics to focus or improve curriculum and instruction does not qualify as continuous improvement because this is almost ubiquitously conducted without a standard methodology to drive improvement efforts. Moreover, data on lagging outcomes (i.e., student achievement) is generally used to inform and leverage changes in teacher practice, but without actually measuring the practices in which teachers engage. A final example is that using video recordings of lessons to observe and critique teacher practice does not fully meet the definition of continuous improvement because there is often no standard protocol for watching videos and determining how teachers can learn from them.

BACKGROUND AND PURPOSE

Continuous improvement (e.g., Lean, Six Sigma, the Model for Improvement) is most often associated with industries such as manufacturing, business, and healthcare. Many organizations in these industries have adopted formal improvement methodologies, often with notable results. The field of education, however, has been slow to take up such approaches. This is partly due to the fact that schools and districts are not organized in ways that promote continuous learning: work is often done in silos, policy demands push for quick results, data isn't provided frequently or quickly enough for it to meaningfully inform and change practice, and poor outcomes are viewed as individual failures rather than a by-product of a misaligned system. 'Silver bullets' and high-stakes accountability remain, the prevailing levers for improving school, teacher, and, ultimately, student performance. As a result, continuous improvement is less prevalent in states, districts, and schools than is the case in other industries. Nevertheless, and given the press for improved student and teacher performance amidst severe budget cutbacks, schools and districts have begun to recognize the need to 'continuously improve' (i.e., work more efficiently and effectively) if they hope to achieve increasingly ambitious outcomes, though definitions of improvement vary widely.

A handful of educational organizations and school districts have begun to embed continuous improvement in their work. An increasingly common phenomenon is for districts or schools to contract third-party, for-profit consultant companies to develop individualized improvement plans, provide personalized professional development, or to lead them through a particular process of change.[5]

The purpose of this white paper is to learn, in a preliminary and exploratory way, how continuous improvement has been taken up in three educational organizations. While these brief case examples illustrate continuous improvement work at various organizational levels, this paper does not claim that all five of the aforementioned aspects of quality improvement and the three elements of 'continuous' quality improvement are embodied in these organizations. Rather, this research represents an initial attempt to describe the tools and methods that are used for continuous improvement in a selective sample of educational organizations, and to elucidate the structures necessary to support its use.

METHODOLOGY

The data gathered for this white paper was compiled through a 90-day scan, which was comprised of a combination of literature reviews and unstructured individual interviews with representatives from organizations variously engaged in continuous improvement. During this scan, organizations were sought that met one or more of the following criteria: they have adopted formal quality improvement processes (e.g.,

[5] Prominent examples of these in education are the American Productivity and Quality Center (APQC), Jim Shipley & Associates, and Partners in School Innovation, inter alia.

Lean, Six Sigma[6]); they have been formally recognized in the field for successful continuous improvement work; or they train schools and districts in continuous improvement methods.

A 'snowball' sampling approach to data collection, which started with a short list of referred organizations, was employed; other organizations were added to the research plan as they were referred to in interviews or readings. To the extent possible, efforts were made to obtain a diverse mix of types of organizations, including school districts, individual schools, improvement science consultants, technical assistance organizations, and community partnerships. This engendered an understanding of how continuous improvement is understood and applied in different contexts. The final list of organizations and interviewees is tabulated alphabetically in Table 1, below. This white paper centers on detailed case examples of two school districts and one community partnership organization: the School District of Menomonee Falls, Montgomery County School District, and Strive Cincinnati.

Table 1. List of organizations and interviewees

Organization	Organization type
American Productivity and Quality Center (APQC)	School improvement consulting
CESA #1 (Wisconsin)	Regional Ed. Services Agency
Jim Shipley & Associates	School improvement consulting
Kentucky Dept. of Education	State dept. of education
Kettle Moraine SD	School district
SD of Menomonee Falls	School district
Montgomery County SD	School district
Partners in School Innovation	Nonprofit
St. Benedict's Prep	College preparatory school
Strive Network	Community partnership
Strive Partnership Cincinnati/Northern Kentucky	Community partnership

Note: Organizations listed in alphabetical order.

[6] For an abridged list of formal improvement processes, see Appendix A.

RESULTS

Organizational Typologies

The organizations included in the scan fall into three broad categories: 1) classroom-level instructional improvement; 2) system-wide improvement; and 3) collective impact. These categorizations are based primarily on the level at which the work is initiated and targeted. Organizations focused on classroom-level instructional improvement obviously center work on micro-level classroom processes, system-wide organizations focus on the district level, and collective-impact organizations focus on the community level. From here, the work often spreads to or impacts other levels, but there is usually a clear point of entry. The rest of this section provides a brief description of each category followed by a set of case examples (i.e., School District of Menomonee Falls, Montgomery County Public Schools, and Strive Cincinnati) that highlight the work of three organizations, each of which can be classified respectively into one of the three categories above.

'Classroom-level Instructional Improvement' Organizations

These organizations focus on the use of student data to drive instructional improvement in the classroom; the inquiry process is thus largely built around analyzing student data. Given that the primary goal is to get teachers to use the data to improve instructional and classroom processes, this focus motivates infrastructural changes and changes in practice from the bottom-up (i.e., from the classroom to the school and sometimes district levels). Two such examples are the creation of grade-level or school data committees that look at data (on both processes and outcomes) or the assignment of instructional coaches who train teachers on how to analyze and use data regularly to inform instructional practices and processes. This category includes charter management organizations, as well as organizations that support schools and districts in using their own inquiry frameworks that promote data-informed decision-making at the classroom level.

'System-wide Improvement' Organizations

These organizations focus on process and performance management at the system or district level in the belief that these broader infrastructural improvements from the top will better support instruction and learning in the classroom. Within this approach, a process is a "set of causes and conditions that repeatedly come together in a series of steps to transfer inputs into outcomes," a sequence of events to accomplish work (Langley et al, 2009: 36). A system is defined as "an interdependent group of items, people, or processes with a common purpose" (Langley et al. 2009: 37). Educational organizations focusing continuous improvement at the system level attempt to improve the processes (or steps) that take inputs (e.g., monetary investments in teacher training) and produce outcomes (e.g., educating children) through tests of measurable change. Improvement in this sense means replacing wasteful activity with efficient and effective processes in a given system, which in turn requires enumerating educational processes and systematically measuring them. By elucidating the processes inherent in educational systems (e.g., a school district) and identifying measures for these, educational actors can, in principle, identify inefficiencies and bottlenecks within a system and propose contextually appropriate interventions to render processes more efficacious.

However, most educational measurement systems have centered on either inputs or outcomes, and have tended to regard processes as a something of a 'black box'. On the other hand, school districts that take this entry point[7] often use the Criteria for Performance Excellence developed by the Baldrige Program, a nationally and internationally accepted model for system performance management, as their guiding framework.[8]

Organizations Focused on 'Collective Impact'

In their 2011 article of the same name, Kania and Kramer define "collective impact" as "long-term commitments by a group of important actors from different sectors to a common agenda for solving a specific problem. Their actions are supported by a shared measurement system, mutually reinforcing activities, and ongoing communication, and are staffed by an independent backbone organization." This entry point focuses on cross-sector organizational alignment around a shared vision and system of accountability and a commitment to identifying strategies and practices that work and encouraging their spread and improvement across the network. One of the most well known examples of collective impact is the Strive Partnership in Cincinnati, Ohio. At this organizational level of work, improvement involves an outside-in approach where the Strive Partnership leverages the power of networks, and collaboration within a community strengthens supports for students and their schools.

Of these three entry levels for improvement, much has been written about data-driven instruction at the classroom level (Bambrick-Santoyo 2010; Boudett, City, and Murnane 2006). To highlight other entry points for continuous improvement which have led to positive outcomes, we offer three case studies at the classroom level, the system-wide, and collective-impact levels, respectively. The first case, The School District of Menomonee Falls (SDMF), provides a window into classroom-level instructional improvement and the infrastructural supports the district has created to make the initiative possible. Alternatively, the second case example, Montgomery County Public Schools (MCPS), prioritized setting a common vision, measures, and goals to motivate improvement at the system-level, which in turn impacts the classroom. MCPS is a much larger district than Menomonee Falls, which might contribute to the difference in their respective approaches. Regardless, both cases take aspects of their community and local context into account to develop system-wide strategies for improvement. Strive, the third case study, represents the collective impact model which, similar to MCPS, engages many entities within their system, but Strive in particular weaves these players into a network structure. Combined, these three cases illuminate the various components necessary to create the space for improvement work, and the possible forms and infrastructures that the work may take based on the community context.

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[7] Jim Shipley & Associates labels this entry point as a "systems approach to continuous improvement". This approach utilizes the application of the Baldrige criteria to integrate the application of three key strategies. The first is "clear direction" which is comprised of vision, mission, aligned goals, and corresponding measures at every level, the second is student and staff engagement which typically is in the form of professional learning communities, improvement teams, and students engaged in setting personal goals and monitoring their progress (i.e. student data folders). The third is the systematic utilization of the plan-do-study-act continuous improvement cycle to improve key district, school, and classroom-level processes. Emphasis is placed on developing district and school-level processes to support the classroom as a system with the emphasis on student engagement as a key strategy to improve classroom learning processes.

[8] See Appendix B for more information on the Baldridge Program.

Case 1: School District of Menomonee Falls, Wisconsin (Classroom-level Instructional Improvement)

Overview

The School District of Menomonee Falls (SDMF) serves 4,270 students with 550 full- and part-time staff in four elementary schools, one middle school, and one high school. The village of Menomonee Falls is located in the greater Milwaukee area and has a population of approximately 32,600. The district's mission is to provide the best personalized and comprehensive education so students will be prepared for, and positively contribute to, a profoundly different future.

In 2011, SDMF had a 100 percent graduation rate. Academic achievement across grade levels was also consistent, with typically 80–95 percent of students scoring proficient or advanced in each subject area of the Wisconsin Knowledge and Concepts Exam, a state assessment for grades 3–10. Concurrently, the proportion of students registering minimal or basic achievement scores decreased from 2007–2010, and decreased by half in fifth grade mathematics (i.e., from 16 to 8 percent). Moreover, SDMF's results have consistently been six or more percentage points higher than the Wisconsin state average. In 2010/11, 279 SDMF students took the ACT and averaged an overall composite score of 23.1, which falls in the 70th national percentile. During the same year, 151 students took 237 AP exams, with 67 percent recording a score of three or higher.[9]

Despite these impressive achievements, however, the district still strives to do better, particularly with reference to three demographics of concern: economically disadvantaged children, students with disabilities, and those of minority status. To achieve their mission, the district has begun to focus on one primary strategy: developing classroom learning systems guided by the Common Core State Standards where teachers and students work together to improve.

Bringing Continuous Improvement to the Classroom

In establishing this mission, Superintendent Patricia Greco set a clear vision that all 300 teachers in the district receive training and eventually use improvement tools to create classroom learning communities. She also worked closely with each leader in the system to ensure the improvement process penetrates both the instructional and operational functions of the district. In initiating district-wide continuous improvement, Greco first made sure that her goals were aligned with the school board's. With assistance from Jim Shipley & Associates, an education consulting group that uses the Baldrige criteria, they first created buy-in from the school board by educating them on the methods by which they could achieve the vision (i.e., continuous improvement). Greco believes that Menomonee Falls benefits from the approval of a board that values quality and a committed leadership team and staff.

When approaching staff and teachers with this change, the administration framed continuous improvement as a response to some of the persistent conversations on teacher evaluation and the focus on student

[9] A score of three on AP exams confers college credit to the test taker.

academic growth. The district aimed to shift the focus on evaluation to supporting all teachers in improving their practice and outcomes. With training, support, and the understanding that clear learning goals (i.e., Common Core State Standards) and improvement tools can help teachers improve their instruction regardless of the curriculum or program they are using, teachers have responded positively to this way of thinking. The Common Core State Standards were made meaningful to students in "I can" statements by grade level and course. The quality tools are supporting staff in engaging students in the process of their improvement. Overall, teachers have been impressed with the district's thoughtfulness with regard to training and implementation as well as the changes they have seen in their instruction, student ownership over their learning, and ultimately, student outcomes. This has been critical in strengthening their buy-in and the overall spread of the work.

Carrying out district-wide instructional improvement has also necessitated additional organizational-level support. The principals are not just committed to student learning; their work with staff members has changed as they have developed the skills to lead the quality process in their schools. At the district level, the head of the Curriculum and Instruction Division oversees the continuous improvement training for teachers and leaders. The head of Assessment and Technology oversees the system quality and metrics. As a team, these leaders ensure that instructionally and systemically the quality principles are becoming part of the way the system works. The district believes that improvement cannot operate as a stand-alone initiative within separate departments, so they aim to build continuity with common classroom assessments, clear performance targets for students, school and departmental dashboards, and staff training in the use of process measures and tools.

Cheryl Kmiecik, senior consultant at Jim Shipley & Associates and continuous improvement consultant to SDMF, has built a technical support team that is comprised of a layered coaching system to train teachers and build capacity. The first level of coaching contains eight steps, which often requires one-on-one discussions where teachers are asked to share their learning requirements, identify classroom learning goals, examine current data, and define the classroom mission statement. They are then ready to engage in plan-do-study-act (PDSA) cycles,[10] particularly around the Common Core State Standards (the last four steps). By the end of January during the school year, the district aims for every teacher to receive this classroom learning systems training. The second level of coaching focuses on the teacher–student partnership. Kmiecik has found that conducting the coaching sessions with groups of teachers working on similar goals allows them to share their experiences, leading to a richer discussion and greater learning.

Kmiecik first trains continuous improvement coaches by having them sit in on her coaching sessions with teachers. Gradually coaches increase their responsibilities, starting with a small cohort of teachers and supporting them in implementing improvement cycles in their classrooms. Meanwhile, coaches continue to learn by observing Kmiecik. Under this "train the trainer" structure, these coaches will eventually know how

[10] The PDSA cycle is shorthand for testing a change in a real work setting by planning it, trying it, observing the results, and acting on what is learned.

to lead the first and second levels of coaching. Thus this model builds both classroom learning systems and an internal capacity to ensure the improvement work grows sustainably.

When running PDSA cycles on the Common Core State Standards, teachers choose a standard on which to focus, break the standard down to its component parts, set an aim with their students about what they would like to achieve as it relates to the sub-standard (e.g., 100 percent of students will learn how to…) and then identify and test different instructional approaches to help students reach the aim.[11] Students are also asked to identify and test different learning strategies they think might be helpful. Each learning cycle runs approximately seven to ten days, during which time teachers collect student data to track their progress toward the aim as well as feedback from students about which instructional strategies were helpful, which need to be tweaked, or which need to be abandoned altogether. The data is posted in the classroom and motivates students to focus not only on their own learning but also to support that of their peers.

At the district level, a data warehouse system facilitates the analysis of rubrics and other formative assessment tools. To assist with data collection, the district is developing a scanning technology that will allow teachers to automatically enter data into a database, as well as an assessment system for quick data feedback, particularly in math. Menomonee Falls teachers are demonstrating their ability to track progress and inform instruction. For example, a data-based inquiry test within a single classroom could involve a kindergarten teacher aiming for 100 percent of students to distinguish between upper- and lower-case letters. If the class only reaches 60 percent proficiency after a pre-determined period of time, the teacher knows to make further adjustments until the aim is reached. These adjustments, however, also rely on students' feedback. The teacher works with students to identify what learning strategies work for them, which not only helps the class reach their proficiency goal, but also encourages students to be meta-cognitive of their own learning. Menomonee Falls utilizes an external assessment agency to administer common assessments in the district four times each year. The objective of these assessments is for teachers and schools to track data over time, understand what instructional processes are working and what resources are needed to change in the interim. The district is also trying to benchmark and track progress along a set of process indicators, such as engagement and attendance.

At the district level, the system administrators (finance, human resources, pupil services, food service, technology, communications, facilities, and the superintendent) are embedding continuous quality improvement into the way their work is done. Each division is developing their core mission of service aligned to the system mission, framing core metrics, creating dashboards to monitor progress, and setting division goals and PDSA cycles of improvement. The system leaders are also developing the 90-day cycle for the rapid prototyping and the refining of innovations for testing. The district administrators and school principals report progress to the school board on a quarterly basis. The district planning and budget processes have been aligned and there is a clear focus on learning, effectiveness, efficiency, and organizational success.

[11] For an example of an improvement artifact from SDMF, see Appendix C.

Clearly, this work has been intensive and there is no shortcut to deeply embedding the process of quality. Yet within a two-year period of time, the School District of Menomonee Falls can demonstrate both reasonable success in implementation as well as results in performance instructionally and operationally. The early progress is encouraging and the district team is focused on building a system that will sustain quality results for the children and community they serve.

Case 2: Montgomery County Public Schools, Maryland (System-wide Improvement)

Overview

Montgomery County Public Schools (MCPS) is the largest school district in Maryland and the seventeenth largest in the nation. Since the mid-1980s, the district has grown by almost one-third, its minority population close to doubling. The district now serves approximately 147,000 students; almost 34 percent of students are white, 26 percent Hispanic, 21 percent African-American, and 14 percent Asian; 32 percent receive free or reduced-price meals. The student population represents 164 countries speaking 184 languages. When recently retired superintendent Jerry Weast started his tenure at MCPS in 1999, he set an ambitious goal for the district: by 2014, 80 percent of all students would be prepared for college and career ready. By setting this expectation for all students, Weast also highlighted his desire to close the achievement gap between white and African-American and Hispanic students. During his twelve-year tenure, the district made dramatic progress toward these goals. For example, between 2001 and 2009:[12]

- The proportion of students successfully completing Algebra 1 or a higher-level mathematics course with a grade of C or higher increased 23 percentage points from 43 percent to 66 percent. For Hispanic students, the proportion rose 30 percentage points from 16 percent to 46 percent, and for African-American students, 26 percentage points from 21 percent to 47 percent.
- The number of AP exams taken by students more than tripled, and the number of AP exams that received a score of three or higher more than doubled. In addition, the district percentage of African-American graduates in 2009 who earned at least one AP exam score of three or higher was more than three and five times the state and national averages, respectively.

MCPS was able to achieve this by in part reallocating resources to schools needing extra support as well as by increasing spending overall on instruction due to some extent through administrative savings accrued from improvements in management efficiency. Indeed, between 2006 and 2011, MCPS lowered the percentage of the budget spent on total administrative functions, including central and school-based administration, from 8.4 to 8.1 percent, while at the same time increasing student growth. For these accomplishments, MCPS has earned numerous accolades and awards, including the 2010 Malcolm Baldrige National Quality Award. Only six school districts have received the honor and MCPS is the largest district to be so recognized.

[12] All statistics derived from MCPS' 2010 Baldrige Application.

Transformation Via Continuous Improvement

Much of MCPS's success is attributed to Jerry Weast, who served from 1999–2011. When Weast arrived, MCPS was considered a high-performing district; however, after conversations with stakeholders in the community, bus rides around the neighborhoods, and visits to a number of schools, Weast discovered a district comprised of "two systems": one that served middle- and upper-class families who lived on the outer edges of the county and produced high student performance outcomes (which he called the "Green Zone") and one that served poor, minority students, who were concentrated in the center of the district, whose outcomes were far below those of its counterpart (identified as the "Red Zone"). Instead of focusing on just the needs of the latter zone, Weast was adamant about bringing the zones together and looking at the system as a whole. If the district was to succeed, all students needed to meet the same expectations regardless of zone. Furthermore, accomplishing this would require all stakeholders (i.e., board, union, parents) to agree to this vision and develop a collective strategy for reform. Together, district leaders collected data to better understand the underlying causes of the problem, looked at the research to determine best practices, and held convenings around the district to engage in conversations with the community and maintain their buy-in. When they finished, district leadership articulated a vision and strategic plan for the district, titled "Our Call to Action: Raising the Bar and Closing the Gap." As the title suggests, the plan sought to close the achievement gap and help all students become career and college ready. Seven key strategies served as the plan's backbone:

- Organize and optimize resources for improved academic results.
- Align rigorous curriculum, delivery of instruction, and assessment for continuous improvement of student achievement.
- Develop, expand, and deliver literacy-based initiatives from pre-kindergarten through grade 12.
- Develop, pilot, and expand improvements in secondary content, instruction, and programs that support students' active engagement in learning.
- Use student, staff, school, and system performance data to monitor and improve student achievement.
- Foster and sustain systems that support and improve employee effectiveness, in partnership with MCPS employee associations.
- Strengthen family–school relationships, and continue to expand civic, business, and community partnerships that support improved student achievement.

It also identified key milestones, known as the Seven Keys to College and Career Readiness.[13] MCPS's progress toward these milestones is reported each year in the district's Results Book.

Getting parents, the union, and the community to buy into the vision and strategy in addition to the administration was no small feat, but it was a critical piece if the district was to move forward as a coherent system. In developing "Our Call to Action," Weast began building relationships with schools, parents, the

[13] Seven Keys to College and Career Readiness: 1) 1650 SAT, 24 ACT, 3 on AP Exam, 4 on IB exam; 2) Algebra 2 by Grade 11, "C" or higher; 3) Algebra 1 by Grade 8, "C" or higher; 4) Advanced math in Grade 5; 5) Advanced reading Montgomery School Assessment in Grades 3–8; 6) Advanced reading in Grades K-12.

board, the union, business leaders, and other community members by soliciting their input and feedback, and by engaging them in the decision-making process. What grew out of this was not just a collective vision and strategic plan for the district, but also a clear sense of shared accountability and investment in executing on the plan moving forward. Weast brought together a fractious board that agreed to a common vision and reached out to parents from immigrant and minority communities (who often felt disenfranchised from the process) as well as more affluent families from the Green Zone.[14] The leaders of all three unions in the district were invited to join other top leaders in MCPS on the executive leadership team. He also cultivated strategic relationships with the business community and drew on their expertise to build the capacity of his own team in the central office. Weast maintained these strong relationships with these stakeholders throughout his tenure, meeting regularly with key leaders and holding forums in the community to get their feedback on district policies and programs.

These efforts set the foundations for MCPS to engage in continuous improvement. MCPS applies a continuous improvement lens to all aspects of its work (i.e., operational, instructional support, and teaching and learning) and draws on a variety of improvement methodologies and frameworks. At the broad organizational level, the district uses the Baldrige Criteria; indeed, the main strategies articulated in Our Call to Action align closely with these tenets. MCPS organizes the entirety of its work from the district level to the classroom into five key processes: 1) developing rigorous curricula; 2) delivering effective instruction; 3) building staff capacity; 4) providing high-quality business services; and 5) monitoring results. Cross-functional teams were then formed around each of these processes to develop strategic plans, review and monitor progress, and to make recommendations for improvements during the school year.

At all levels of MCPS's work, including those described above, MCPS uses the PDSA cycle as a tool to articulate how the district operationalizes its core strategies. MCPS first starts with the Program Improvement System (PIS), which provides a high-level framework to organize its work, and then progresses to its Process Management and Improvement (PMI) model, which is used to track the creation and improvement of core organizational processes. Their annual Strategic Planning Process (SPP) is another core strategy; it is required of central office departments and schools in developing improvement plans, and is also important to teachers who use it to create individual staff development improvement plans and students' individual learning plans.[15] Thus, the PDSA serves as a tool that ensures that each part of the system is following a continuous improvement model.

With every PDSA developed from the PIS all the way down to the school level, data are collected to track the district's progress and to inform future action. The district tracks over 100 measures with regard to academic and operational performance as well as an even greater number of process-effectiveness measures. In addition, workforce engagement and satisfaction and community and stakeholder satisfaction data are collected and monitored.

[14] An example of this inclusive collaboration is that Weast convinced parents from the 'Green Zone' that adding budgetary funds for 'Red Zone' schools was not preferential treatment but would rather benefit all children.

[15] See Appendix D for further details.

Given the amount of data it collects, the district uses a number of data management systems to track and analyze the information. MCPS developed many of these systems itself, especially those used to track school performance and student data. The district also created a process to monitor and analyze the data. This "M-Stat" process helps the district and school leadership use the data to identify root causes to problems, focus on areas of need, and develop plans for improvement. They look at the data on a semi-monthly or monthly basis to track progress toward their goals and to make appropriate modifications to their processes.

In order to enact these strategies and ensure a disciplined use of data, Weast also heavily invested in training, recognizing district employees as key drivers in the district's success. This meant not only training in best practices around curriculum development, instruction, and business services, but also process management. All principals receive training in the Baldrige criteria and process management and teachers attend a Quality Academy that teaches them how to create a Baldrige-based classroom learning system.[16] In addition, district and school leaders participated in Harvard's Public Education Leadership Project, which similarly uses a systems approach to align district processes to improve student achievement. To accompany these training initiatives, MCPS has also developed handbooks and as part of its curricula redesign this year, they are embedding quality tools such as PDSA cycles and affinity diagrams into curricula, which will encourage instructional staff to incorporate improvement work into their daily work and lessons, and will provide them with concrete models for doing so.

Beyond the scope of the district, MCPS has also engaged in several national efforts to strengthen its knowledge and training endeavors. In 2000, MCPS joined the Baldrige Initiative in Education. In 2004, it applied for the Baldrige award, not necessarily with the expectation of winning, but rather using the application process as a way to evaluate their work. The district did not win that year, but used the detailed feedback on the application to identify areas in need of improvement and to justify the need for further capacity building around process improvement. Weast also brought in local business leaders with expertise in continuous improvement to further support training initiatives. This collaboration eventually evolved into a non-profit called the 114th Partnership, which seeks to bring business and district leaders together in communities across the nation. Additionally, MCPS became one of the founding members of the North Star Project, an initiative led by the American Productivity and Quality Center (APQC) that brings together districts nationwide to work on benchmarking key processes and process management. MCPS thus performs benchmarking against other districts in the state as well as districts that are part of APQC's North Star collaborative.

[16] To help build the district's capacity, Weast hired a consultant to oversee all the continuous improvement activities. MCPS also supported three Quality Academies with full-time staff. However, because of recent budget cutbacks, only one Quality Academy remains and the district no longer employs an overseer of the work. While CFO Larry Bowers believes that much of the work has become part of the fabric of the district, he did express concern about its sustainability.

Case 3: Strive Partnership Cincinnati/Northern Kentucky (Collective Impact)

Overview

The Strive Partnership, a cross-sector education partnership established in 2009 and based in Cincinnati, Ohio, and Northern Kentucky, targets continuous improvement at the broader network-level, particularly by building infrastructural supports around community-based school systems. Its mission is to unify community engagement around local education, so that students are supported by a network from "cradle to career." Five over-arching goals support this mission: 1) every child prepared for school; 2) every child supported inside and outside school; 3) every child succeeds academically; 4) every child enrolls in some form of postsecondary education; and 5) every child graduates and enters a career. Collective work around these goals is in turn defined by eight measurable outcomes: kindergarten readiness; 4th grade reading outcomes; 8th grade mathematics outcomes; high school graduation; ACT scores; postsecondary enrollment; postsecondary retention; and postsecondary completion. The Strive Framework has now expanded to over 80 communities across the country, 15 of which are receiving intensive support. These communities are supported by Strive Network, also based in Cincinnati.

A key objective of the Strive Framework[17] is to unify programs, which supports students with an inter-organizationally consistent vision and set of measures. In Strive's framework of collective impact, smaller sub-networks work together within the broader network toward certain indicators around particular issues or stages along the education continuum (e.g., kindergarten readiness, high school graduation, and college completion).

Traditionally, organizations have worked in isolation to address similar issues (referred to as isolated impact), yet often encounter pitfalls. With 'competition' to receive funding, typically each program must prove the effectiveness of their approach and strategy. Strive's approach, on the other hand, enacts a collective impact model wherein organizations collaborate and contribute to the larger network of educational resources. This infrastructure continuously supports students' progress from pre-K to high school graduation, college and, ultimately, a career. Strive has found that joining these traditionally isolated forces that work on similar education problems will strengthen the local system and make broader impacts.

Some notable results have been achieved since the Strive framework was developed. In particular, the Strive Partnership in Cincinnati/Northern Kentucky, Strive's first site,[18] has seen encouraging evolutions in student outcome measures. For example, kindergarten readiness[19] has increased by nine percentage points in the past four years (i.e., from 44 to 53 percent)[20] and schools have observed an increase of up to 40 percent

[17] See Appendix E for a depiction of the Strive Framework.

[18] The Strive Partnership Cincinnati/Northern Kentucky includes partners and school districts in three communities in the urban core of Greater Cincinnati. Those communities are Cincinnati, Ohio, Newport, Kentucky, and Covington, Kentucky.

[19] Kindergarten readiness is measured by the Kindergarten Readiness Assessment for Literacy (KRA-L), a test that measures elements of vocabulary and literacy development which are critical for later reading success. Exam scores range from zero to 29, and a mark of 19 or higher indicates that a child is 'kindergarten ready'. A score lower than 19 does not inherently mean that a child is not ready for kindergarten, but may indicate the child would require additional support.

[20] They are targeting that 85 percent of kindergarten-aged children will be 'kindergarten ready' in 2020.

in college enrollments. Many other cities within the Strive Network have observed improved student outcomes as well.

Collective Impact: Building Networks for Improvement

Strive grew out of an effort spawned by community leaders in the Cincinnati area in 2006. Recognizing the predominance of isolated impact in their community and the lack of coordination among organizations, they aimed to build a system consisting of local programs unified by similar goals. This first Strive Partnership brought together cross-sector organizations to work toward supporting education in their community. Within the Cincinnati Strive Partnership alone there are over 300 organizations from various fields, including philanthropies, colleges, public agencies, nonprofits, and private businesses.

In building a diverse network of local partners in a community, Strive's Four Pillars (i.e., a shared community vision; evidenced-based decision-making; collaborative action; and investment and sustainability) outline strategies to build and sustain improvement at the organizational level.[21] A shared community vision highlights the role of cross-sector stakeholder engagement in building a consistent approach for the cradle to career continuum. In the second pillar, Strive addresses evidence-based decision-making by utilizing a central data management system for its progress and outcome measures. Collaborative action entails identifying practices and key activities that demonstrate an impact on outcomes by prototyping and testing as well as benchmarking and identifying best practices. The fourth pillar, investment and sustainability, aims to sustain community-wide ownership of its goals to improve student outcomes. This last pillar involves collaboration between public and private funders to ensure that resources align with the strategies. Before a community can join the Strive Network, it undergoes a community assessment process where local groups and providers establish collective responsibility. Using the four pillars, collaborating groups define common goals, metrics, and performance targets. Identifying leadership within the community is also very important to advance the work of the partnerships and spread a common vision. When initiating a partnership with a community, Strive requires a high degree of buy-in, not only within the leadership, who serve as catalysts in recruiting and engaging other community organizations, but also within all participation levels.

For communities that join the Strive National Network and receive intensive support, Strive offers three main types of strategic assistance to build the local partnership. The first is comprehensive support where a Strive strategic assistance team provides tools and resources needed to launch a partnership. Support is offered in the form of site visits, on-site training, monthly conference calls, on-call support, access to an online portal of information, and access to national network activities. The second strand of assistance, provided for communities receiving intensive support, is the design institute which trains community members so that they can build capacity locally using the Strive framework. During the institute, a Strive strategic assistance team works with a community to create a three-day workshop for community stakeholders, during which they create a 180-day plan to launch the community partnership. Planning the institute is usually a three-month process, and the Strive team offers some on-call support following the workshop. The third form of engagement is collaborative action training where Strive consultant-trainers run workshops

[21] See Appendix E for more detail on Strive's Four Pillars.

on principles of continuous improvement. Participants learn to build capacity to carry forth continuous improvement by developing action plans around a focus area. These different layers of training guide communities in implementing their own continuous improvement work, as well as provide the fundamental infrastructure to sustain improvement.

Serving initially as a hub for community-based partnerships, Strive aims to consolidate the conversations with many community-based partner organizations to develop a shared understanding of the problem and collective solution. Efficient communication is particularly important, as they engage numerous groups at the local and national levels. Within the partnership, CEO-level leaders attend regular facilitated meetings in order to ensure everyone embraces a common vision as the work moves forward. Strive also utilizes web-based tools to facilitate communication among network members.

During a partnership's early stages, local organizations may loan staff or hire consultants to launch network activity. Strive also assists in identifying people and organizations in the community (e.g., businesses, university partners) that use methods of continuous improvement. Eventually, a committed leader in the community is hired to lead the local partnership.[22] In achieving the cradle to career civic infrastructure, the leadership must eventually recruit others for supporting roles, such as a data analyst and facilitator. A data committee, which may be comprised of representatives from different sectors, is also important to advance local partnerships because they ensure that data is made a priority by a community's key leaders. The committee also supports organizations and schools in collecting the appropriate data at the community, school, and student levels, and using that data to make evidence-based decisions. In general, a community that wishes to join the national network and receive Strive's strategic assistance services and infrastructural support must pay a fee. However, this fee is often subsidized by foundations.

To organize the work of a partnership, Strive has identified several areas along the education continuum from which they developed 15 Student Success Networks (SSN's) by type of activity (e.g., tutoring, early childhood education). Cincinnati has organized around the different SSNs, and Strive serves as a coordinating hub or 'backbone' for this infrastructure. Programs in Cincinnati also agreed to collect data on 54 indicators used to track progress along the aforementioned five goals that comprise the cradle to college continuum. While each service provider sets their own respective goals tied to these indicators, they collectively uphold the common vision of the partnership. To encourage further collaboration, Strive is also developing a cross-institutional data system so that organizations can share information.

'Anchor' entities within a Strive partnership also serve as leaders that help move the work forward. Strive has found that multiple organizations often want to think of themselves as the 'anchor' which suggests remnants of the isolated impact mindset. Strive's network-based infrastructure, however, represents their approach to shifting the culture from isolated to collective impact.

[22] See http://www.strivenetwork.org/sites/default/files/images/Strive%20Progress%20Assessment.pdf.

Nationally, Strive is developing and utilizing data tools to support the work toward shared goals. This includes a community impact report card to collect outcomes at the community-level, and a student success dashboard, which will aggregate the different data system providers that local school districts use. In terms of methodology, they draw upon Lean and General Electric's Six Sigma, which they have adapted for their work in the social sector. Although the Strive Partnership focuses on developing and establishing within a network a common vision, language, and measures to ensure shared understanding and collective engagement within a network, the organization also employs specific measures and data to engage in small tests of change at the local level.[23]

DISCUSSION

While the SDMF, MCSD, and Strive Cincinnati each provides an example of organizations oriented toward classroom-level, system-wide, and collective impact, respectively, each also conducts work at other organizational levels. In other words, there is evidence of overlap between organization types, and the entry points themselves are not mutually exclusive. As such, it is instructive to remember the above classification is not rigid, that the work of any given organization may be directed toward multiple levels. Table 3 below presents the work and goals of SDMF, MCSD, and Strive Cincinnati within a rubric of organizational categories.

The table highlights that while SDMF, MCSD, and Strive Cincinnati focus their efforts toward the classroom/school, district, and community levels, respectively, there is some overlap. Menomonee Falls, for example, devotes resources to professional development and support mechanisms such that teachers are trained and empowered to become researchers within their own specific context, testing interventions in collaboration with students in their classrooms. However, notwithstanding its primary focus on classroom practice, SDMF is also implementing district-wide action, including a multi-level coaching system, and is educating school board members on the benefits of continuous improvement methods.[24] Analogous patterns can be seen also in MCSD and Strive Cincinnati.

[23] An example of this is the Success by 6 Initiative of Hamilton County. Success by 6, a United Way initiative, collaborates with a number of early learning partners across Hamilton County to form the Strive Hamilton County Early Childhood Success Network. The network's goals, action plan, and timeline were established using a Strive Six Sigma process that will increase the number of children who are ready to succeed in kindergarten. For further detail, see: http://www.strivenetwork.org/sites/default/files/images/Successby6%20LearningCircles_0.pdf.

[24] It should be noted that the scan and interviews did not uncover any action at the collective impact level in SDMF. And while there were some elements of collective impact present in MCPS, the district cannot rightly be classified as an organization focused on collective impact either; most of its work centers on system-wide improvement.

Table 3. Multi-level rubric of case example organization improvement work

	Classroom-level instructional improvement	System-wide improvement	Collective impact
School District of Menomonee Falls	• All district teachers trained to use improvement tools in classrooms • Promote classroom learning communities • Teacher evaluation as a vehicle for improvement • Continuing support for teachers in implementing and analyzing classroom interventions • Teachers coached through PDSA cycles (7-10 days) by continuous improvement coaches • Engaging teachers in peer group work toward improvement • Students involved in small tests of change (e.g., learning strategies)	• District-wide multi-level coaching system (Jim Shipley & Associates) • Desire to benchmark, track progress along set of process indicators • Information campaign aimed at school board on benefits of continuous improvement • District departments set goals and apply PDSAs to key process in order to improve support to schools and classrooms • Emphasis on developing school-level leadership teams and school improvement teams to achieve school goals and implement continuous improvement with fidelity	
Montgomery County Public Schools	• Work organized into five key processes • Strategic Planning process: teachers create individual staff improvement plans and student learning plans • Data collection: academic measures • Bi-monthly data analysis by school leadership • Quality Academy trains teachers to create Baldrige-based classroom learning system • PDSAs, quality tools embedded in curricula	• Develop, expand, deliver literacy-based initiatives for pre-K to grade 12 • Use of student, staff, school, and system performance data to improve student achievement • Alignment of curriculum, instruction, and assessment for continuous improvement • Work organized into five key processes (Program Improvement System) • Process Management and Improvement model to track improvement of organizational processes • Data collection: process-effectiveness measures • Bi-monthly data analysis by district leadership • District, school leaders attend Harvard's Public Education Leadership Project • PDSAs, quality tools embedded in curricula • MCPS founding member of APQC North Star project	• Community convenings to articulate a shared vision • Data collection: community, stakeholder satisfaction measures • 114th Partnership: Local business leaders with expertise in continuous improvement to support training initiatives (PPPs)
Strive Cincinnati	• Promoting data-informed decision-making • Continuous improvement approach to improve practices over time (collaborative action training) • Student success dashboard	• Continuous improvement approach to improve practices over time (collaborative action training) • Student success dashboard	• Shared community vision of cross-sector engagement • Collaborative action networks • Investment and sustainability for community-wide ownership of goals • Community engagement • Community impact report card • Design institute of community training • Data management system to make community-level decisions • Cradle to Career Progress Assessment Tool

Common Elements and Cross-Cutting Themes

Numerous themes and common elements can be observed in all three cases, as well as other (non-case example) improvement organizations researched for this white paper, regardless of the level at which work is begun and targeted. These overarching themes include: leadership and strategy; communication and engagement; organizational infrastructure; methodology; data collection and analysis; and building capacity. Each is addressed as is appropriate to its approach and circumstance. Thus the following discussion of these elements and themes encapsulate the common behaviors, structures, approaches, and tools used by the above three case organizations.

Leadership and Strategy

Leaders of continuous improvement organizations bring a learning mindset to the work. They do not believe in silver bullets as a strategy for improvement, instead they focus on establishing disciplined processes for developing, testing, evaluating, and improving its core work streams and programs for building capacity to engage in this type of work. For both MCPS and SDMF, the vision and leadership came from superintendants who developed strategies to bring continuous improvement to their schools. For Strive's network-based model, leadership at multiple levels (e.g., the Strive National group and leadership within local partnerships to drive the community work) is necessary to spread and scale the work. Regardless of its source, these leaders set the agenda, provided the conditions in which it could be pursued, and monitored progress in adopting the continuous improvement perspective.

Communication and Engagement

Effective communication and strategies are critical in engaging all stakeholders in an organization's work. Many of the organizations studied apply a systems-thinking approach to their work; as a result, breaking down the silos and bringing together individuals from across the system is a natural part of how they do business. This allows them to understand the root causes of the problems they face, develop a collective vision for the entire organization, and to execute on strategies that recognize the interdependency of the organization's key processes. Most importantly, it builds a clear sense of shared accountability among all the workers and larger constituency. As seen with Strive, communications is particularly important, as their approach involves many autonomous community-based cross-sector organizations that must mobilize around a shared vision and coordinate their action. Their four pillars thus serve as a framework to engage all organizations and strengthen everyone's responsibility and accountability in the network.

Organizational Infrastructure

Again building on systems thinking, organizations engaged in continuous improvement tend to set up structures across core processes or around specific goals, both of which promote interactions across different parts of an organization. Many organizations also identify a central 'hub' or backbone organization that coordinates the work of other groups in the system and provides services that are not common capacities in the member organizations. School districts serve as the central coordinating body for schools. Strive National plays a similar role in the networked communities they lead. They ensure that all parts of the system

stay true to the common vision, collect data, track progress across the network, and facilitate communication throughout the system.

Methodology

As mentioned earlier, the definition of continuous improvement requires the use of a formal methodology. Quality improvement methodologies come in many shapes and sizes (e.g., Lean, Six Sigma, Model for Improvement, Results-Oriented-Cycles of Inquiry, and Data Wise).[25]

Which methodology an organization uses is often shaped by the factors described earlier: its purpose, the focus of the inquiry, and the level at which improvement is targeted. For example, some organizations that employ the inquiry process for strategic planning purposes, such as Montgomery County, tend to use Six Sigma and Lean. Others, such as Menomonee Falls, use the process to conduct 'small tests of change' to develop more granular improvements that are tested and modified in a handful of sites and eventually scaled across the organization. Still others have created an inquiry process built around using student data more effectively to inform and improve instruction. Some tools cut across these methodologies, such as the PDSA cycle, which is used both as a strategic planning tool and a way to test small changes.

Data Collection and Analysis

Using data to track an organization's progress toward its goals is a critical piece of improvement. Indeed, almost all of the organizations we studied use data to monitor their work. However, what organizations collect and the frequency with which they collect it varies. Most education agencies collect outcome data and all track annual student performance on state achievement tests. On the other hand, some (such as the above case examples) also collect data on monthly benchmark assessments and educational processes in an attempt to use the data to inform instruction during the course of the school year.

One challenge common to all organizations studied for this scan was data collection. Many did not have systems that were able to collect data more quickly and routinely in order to support more real-time decisions. To address this problem, some organizations were trying to build their own data systems even though it was very costly and required a substantial investment in training. This applies to the School District of Menomonee Falls, which is in the process of building their own assessment and data systems since none were previously well established; and at the systems level, Strive and MCPS are also working to develop shared data systems and tools.

Capacity Building

Again, as with any new approach, organizations must invest time and energy in training staff to embed this process into day-to-day work and to create an organizational structure that supports the approach. This is particularly true of continuous improvement, which often runs counter to how many education organizations have worked in the past.

[25] A brief description of each of these methodologies can be found in Appendix A.

As seen from the case examples, Strive has had to initiate a cultural shift from isolated to collective impact through strategically-planned collaboration, with the hopes that continuous improvement will eventually reach the classroom. MCPS also had to build infrastructure to spread their strategic planning initiatives to each school guided by Weast's overall vision. At Menomonee Falls, the district has created new roles and responsibilities within its administration to conduct teacher training. As a large component of the district's strategy, they had to invest resources, time, and careful organizational planning to work toward their goals.

Continuous improvement's emphasis on data and measurement also requires other system-based adjustments to ensure effective inquiry and progress. Strive and MCPS both have developed specialized data management systems to address their aims and measures. Menomonee Falls is in the process of creating systems so teachers can manage and 'own' their data. Developing a culture around data and data-driven inquiry in classrooms might entail the creation of these technological systems, but because this is a relatively new approach for schools and education, the creation of new roles around data may be necessary to ensure that improvement methodologies are effectively incorporated into training and other capacity-building mechanisms. For example, Strive partnerships are required to build a local data committee, and Menomonee Falls has appointed a data director to oversee measurement and guide district-wide data collection. Regardless of the initiatives and roles necessary to incorporate data into system processes, building data literacy among the players in a system is an important strand to sustain continuous improvement.

All three organizations also invested heavily in building the capacity of the staff to use continuous improvement methodologies and tools in their work. They emphasized the importance of adult learning as much as student learning, recognizing that incorporating new skills and developing different mindsets about the work requires deliberate instruction and practice. Both Menomonee Falls and Montgomery County used the training-the-trainer model, starting with outside consultants who developed the skills of key administrators, instructional coaches, and teachers in the districts, who then supported others in the district. Strive leveraged members of the business community with continuous improvement experience to train and develop others in the network.

Conclusions and Recommendations

This scan analyzed 11 distinctive organizations that are, to varying degrees and approaches, engaged in continuous improvement. These organizations were identified via a snowball sampling method, and three of these (i.e., School District of Menomonee Falls, Montgomery Country School District, and Strive Cincinnati) were selected as elaborative case examples to illustrate findings. Data were collected through literature scans and interviews. While an attempt was made to include organizations that were broadly representative of the larger educational field and of the different entry points to continuous improvement, this paper does not contend that the discussion and conclusions above are generalizable to all educational organizations, whether school districts or otherwise.

Despite this caveat, the organizational analysis herein revealed three distinct avenues, encapsulated respectively by the three case examples, through which organizations committed to a continuous improvement

approach.. Organizations can be categorized as focusing on instructional improvement at the classroom or school level, system-wide improvement at the district level, or collective impact at the community level. These avenues are distinctive, yet not exclusive: indeed, there is substantial overlap in the work of the three case example organizations. Moreover, this research uncovered six themes common to the organizations engaged in continuous improvement studied for this scan, regardless of the avenue or entry point chosen. These cross-cutting themes were: leadership and strategy, communication and engagement, organizational infrastructure, methodology, data collection and analysis, and building capacity.

While the three case example organizations were intended to be more or less illustrative of a continuum of organizational types, they also serve to highlight at least four noteworthy findings. At the most basic level, these three organizations stand as three distinctive existence proofs of education organizations who are engaged in continuous improvement in a systematic way. This alone is no small accomplishment: improvement methodologies have not been adopted with fervor (or integrity) in the field of education, despite substantial (though not universal) success in other sectors (e.g., Grayson 2009, 2010).

Secondly, the case examples showcase that the entry points to continuous improvement in education are not mutually exclusive, but rather are inherently interrelated. They are not separate categorical choices, but are nested one within the other: the classroom and school are nested within the school district, which in turn is situated within a particular community. For improvement purposes, this is significant. As processes within a particular system (e.g., classroom, school, district) become less variable and more effective, the reach of actors and actions within that system expands to influence inputs and processes that were previously 'out-of-system' (Langley et al. 2009). For example, if teachers in schools engaged in instructional improvement at the classroom level are expected to become experts at utilizing data to transform instructional practice, they must certainly, at one point or another, move beyond the bounds of their classroom and act collectively and coherently as a set of educators to advance a shared vision of student outcomes via a common methodology. This in turn has implications for teacher professional development, specialization, and larger personnel decisions (e.g., hiring and placement).

The third and fourth points are related. The aforementioned case examples show that while organizations do not have to work on all aspects of the educational system simultaneously, neither is continuous improvement a cafeteria-style approach to fixing sub-optimal processes. In other words, the third point is that committing to improving the efficacy of inputs for desired student outcomes by focusing on processes does not mean attempting to alter all characteristics of districts or schools while concurrently expanding capacity for data collection and analysis. This would be overwhelming for any superintendent or principal who is faced with already stretched resources, both human and otherwise. Moreover, it would be inconsistent with improvement methodologies, which advocate iterative and cyclical tests of change. Fourth, the iterative nature of these tests does not, on the other hand, warrant employing them in an ad hoc way with little thought given to either the context of the larger system or other elements that may be impacted by the change. Rather, tests should be devised in a rigorous fashion that is both thoughtful and transparent.

In summary, this white paper represents an initial attempt to identify and describe how continuous improvement methodology is being applied, specifically in the field of education, and to offer concrete illustrations of organizations that are so engaged, albeit at different levels. As such, this research is descriptive in nature and could be further supplemented by either additional organizational examples (i.e., existence proofs) or micro-analyses of specific methods in particular contexts. However, if continuous improvement is to be an essential means of rendering the educational system more efficient, effective, and equitable, future research should seek to fill knowledge gaps in the tripartite improvement framework of will, ideas, and execution (Reinertsen, Bisognano and Pugh 2008): political and organizational will are necessary to execute strong ideas for improvement in order to make positive and palpable changes over time. Currently, none of these three elements (i.e., will, ideas, and execution) is either commonly agreed upon or ubiquitous in education, a reality which must change if educators are to move beyond the input-outcome polemic and begin to unpack the black box of educational processes in ways that promote their improvement.

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APPENDIX A
Selected Continuous Improvement Methodologies

The Model for Improvement

Plan: State the objective, questions and predictions, the plan to carry out the cycle, and the plan for data collection.

Do: Carry out the plan, document problems and unexpected observations, and begin analysis of the data.

Study: Complete the analysis of the data, compare data to predictions, and summarize what was learned.

Act: For the next cycle, what changes are to be made?

- **Forming the team:** Including the right people on a process improvement team is critical to a successful improvement effort. The team's makeup will vary according to the organization's needs.
- **Setting aims:** Aims should be time-specific and measurable. They should also define the specific population that will be affected.
- **Establishing measures:** Use quantitative measures to determine if a specific change actually leads to an improvement.
- **Selecting changes:** Ideas for change may come from the insights of those who work in the system.
- **Testing changes:** The PDSA cycle is shorthand for testing a change in a real work setting by planning it, trying it, observing the results, and acting on what is learned.
- **Implementing changes:** After testing a change on a small scale, learning from each test and refining the change through several PDSA cycles, the team may implement the change on a broader scale.
- **Spreading changes:** After successful implementation of a change/package of changes, the team can spread these to other parts of the organization or to other organizations.

Sig Sigma (DMAIC)

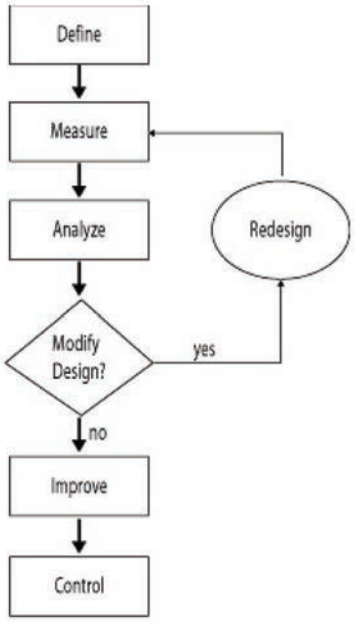
Define a problem or improvement opportunity.

Measure process performance.

Analyze the process to determine the root causes of poor performance; determine whether the process can be improved or should be redesigned.

Improve the process by attacking root causes.

Control the improved process to hold the gains.



Lean

- Specify value from the standpoint of the end customer by product family.
- Identify all the steps in the value stream for each product family, eliminating whenever possible those steps that do not create value.
- Make the value-creating steps occur in tight sequence so the product will flow smoothly toward the customer.
- As flow is introduced, let customers pull value from the next upstream activity. As value is specified, value streams are identified, wasted steps are removed, and flow and pull are introduced, begin the process again and continue it until a state of perfection is reached in which perfect value is created with no waste.

Results-Oriented-Cycle of Inquiry (ROCI)

Plan: Create actionable plans that break down yearlong goals into achievable quarterly, weekly, and even daily objectives, allocating time, resources, and actions to achieve those goals.

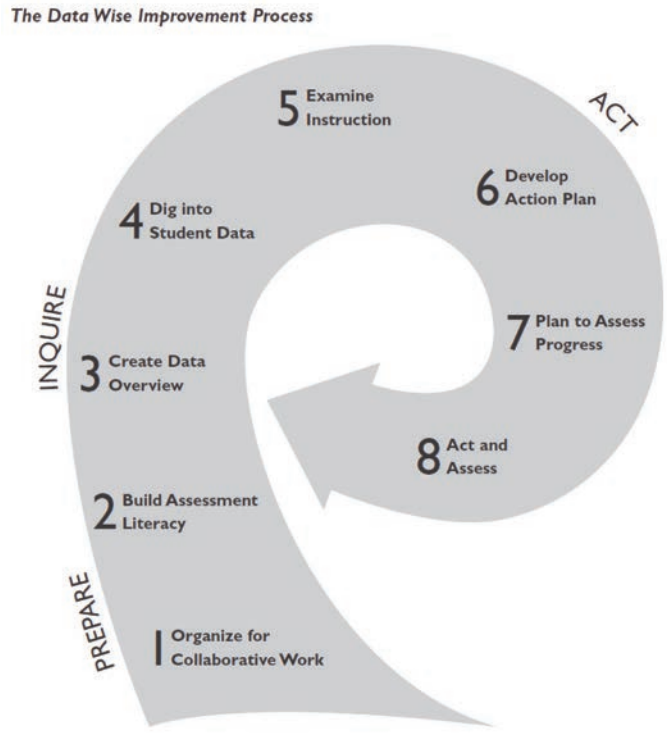
Act: Distribute leadership and communicate expectations. Provide coaching, modeling, thought-partnership, and collaboration in order to build the capacity of teachers and leaders to implement their plans effectively

Assess: Support school leaders and teachers to establish a regular habit of using data to understand results (i.e., students' learning, instructional quality).

Reflect and adjust: Learn from what is working and adjust practice to ensure that goals will be met.

Set goals: Understand gap between the school's vision and their current reality. Collaboratively define goals which will focus everyone's attention on the most important levers and indicators of progress.

Data Wise



PREPARE

1 **Organize for collaborative work:** Build a "culture of inquiry" within a school, creating infrastructure to encourage faculty collaboration.
2 **Build assessment literacy:** Help faculty develop a working knowledge of how to interpret assessment results.

INQUIRE

3 **Create data overview:** Construct displays of assessment results that will engage school faculty in conversations.
4 **Dig into student data:** Fully understand the learner-centered problem, which is defined as a problem of understanding or skill that underlies students' performance on assessments.
5 **Examine instruction:** Understand the learning and teaching dimensions of a problem, integrating analysis of both assessment and instructional data.

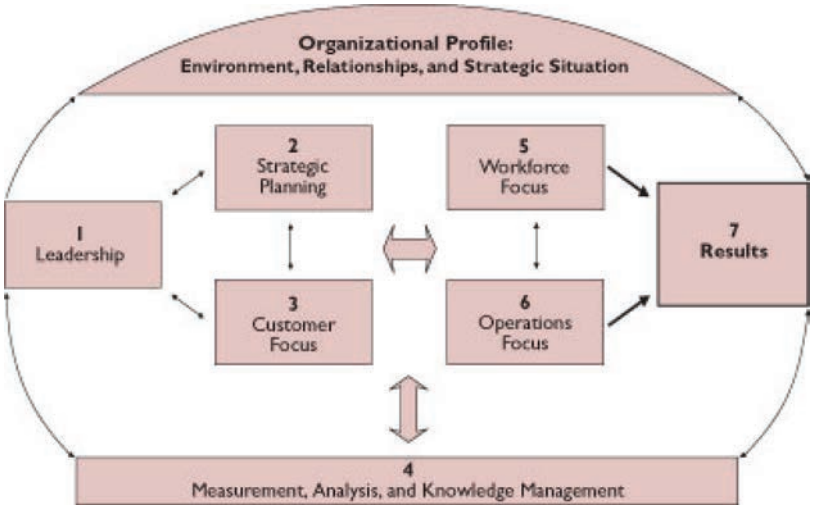
ACT

6 **Develop action plan:** Develop and commit to an action plan which articulates particular strategy or strategies for instructional improvement.
7 **Plan to assess progress:** Assessing progress is an integral part of the improvement process. Schools benefit from setting clear goals for student improvement and proficiency, and from deciding in advance how and when they will measure progress toward those goals.
8 **Act and assess:** The school tests its theories of how instructional strategies lead to student learning. School leadership clearly communicates the action plan to faculty and supports them in implementing the plan.

APPENDIX B
Baldrige Education Criteria for Performance Excellence Framework

The Baldrige Program, a national public-private partnership dedicated to performance excellence, holds four distinct roles. It raises awareness about the importance of performance excellence in driving the U.S. and global economy; provides organizational assessment tools and criteria; educates organizations from a variety of industries (e.g., education, healthcare, manufacturing, government, service, and small business) in process and performance management; and administers the Malcolm Baldrige National Quality Awards annually to a handful of organizations for their accomplishments. School districts that have won the award include Montgomery County Public Schools (2010) and Iredell-Statesville Schools (2008).

The criteria for education are organized into seven categories: leadership; strategic planning; customer focus; measurement, analysis and knowledge; management; workforce focus; operations focus; and results. Collectively, the criteria in these categories serve as guidelines for understanding and meeting the needs of key stakeholders, establishing mechanisms for managing key processes and capabilities, and fostering organizational learning. The Baldrige program has spawned a number of state Baldrige associations, consultants, and technical assistance organizations that support school districts interested in process and performance management and applying for the Baldrige award.



Source: National Institute for Standards and Technology (www.nist.gov) [accessed 11/30/2012]

The **LEADERSHIP** category examines how your organization's senior leaders' personal actions guide and sustain your organization. Also examined are your organization's governance system and how your organization fulfills its legal, ethical, and societal responsibilities and supports its key communities.

The **STRATEGIC PLANNING** category examines how your organization develops strategic objectives and action plans. Also examined are how your chosen strategic objectives and action plans are implemented and changed if circumstances require, and how progress is measured.

The **CUSTOMER FOCUS** category examines how your organization engages its students and stakeholders for long-term market success. This engagement strategy includes how your organization listens to the

voice of its customers (your students and stakeholders), builds customer relationships, and uses customer information to improve and identify opportunities for innovation.

The **OPERATIONS FOCUS** category examines how your organization designs, manages, and improves its work systems and work processes to deliver student and stakeholder value and achieve organizational success and sustainability. Also examined is your readiness for emergencies.

The **MEASUREMENT, ANALYSIS, and KNOWLEDGE MANAGEMENT** category examines how your organization selects, gathers, analyzes, manages, and improves its data, information, and knowledge assets and how it manages its information technology. The category also examines how your organization uses review findings to improve its performance.

The **RESULTS** category examines your organization's performance and improvement in all key areas—student learning and process outcomes, customer-focused outcomes, workforce-focused outcomes, leadership and governance outcomes, and budgetary, financial, and market outcomes. Performance levels are examined relative to those of competitors and other organizations with similar programs and services.

The **WORKFORCE FOCUS** category examines your ability to assess workforce capability and capacity needs and build a workforce environment conducive to high performance. The category also examines how your organization engages, manages, and develops your workforce to utilize its full potential in alignment with your organization's overall mission, strategy, and action plans.

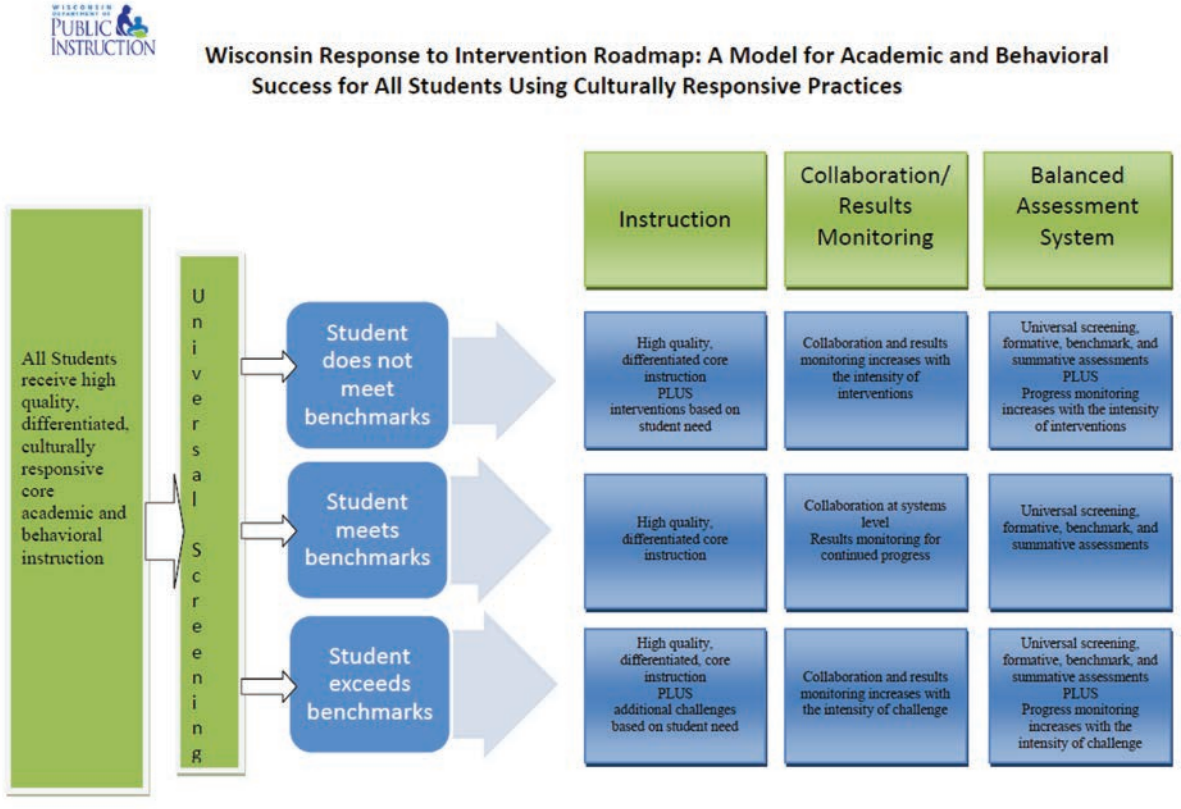
Table B.1. Baldrige educational criteria process and results items

Criteria categories	Process and results items	Points
Organization profile	Organizational description	–
	Organizational situation	–
Leadership	Senior leadership	70
	Governance and societal responsibilities	50
Strategic planning	Strategy development	40
	Strategy implementation	45
Customer focus	Voice of the customer	45
	Customer engagement	40
Measurement, analysis and knowledge management	Measurement, analysis, and improvement of organizational performance	45
	Management of information, knowledge, and IT	45
Workforce focus	Workforce environment	40
	Workforce engagement	45
Operations focus	Work systems	45
	Work process	40
Results	Student learning and process outcomes	120
	Customer-focused outcomes	90
	Workforce-focused outcomes	80
	Leadership and governance outcomes	80
	Budgetary, financial, and market outcomes	80

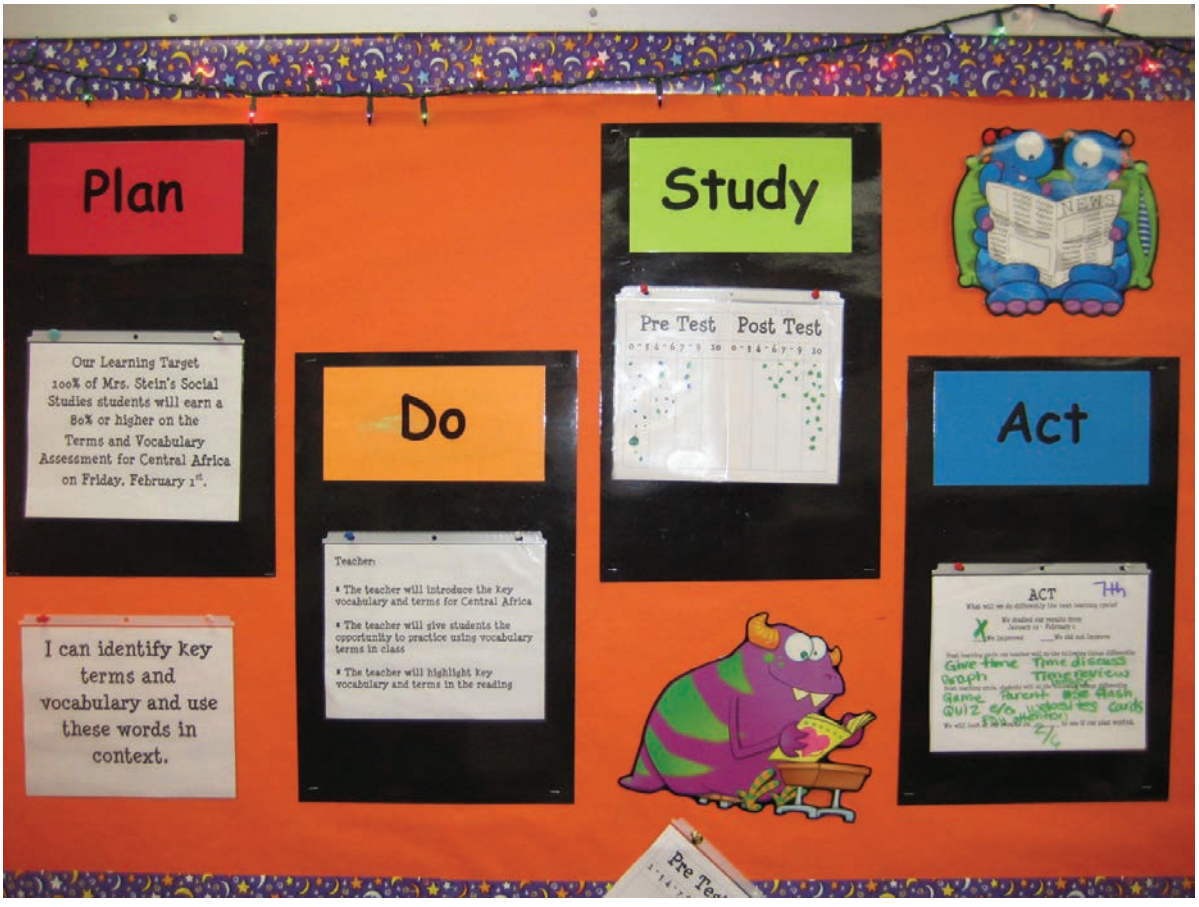
Source: NIST (2012)

APPENDIX C
Examples of Improvement Artifacts from the School District of Menomonee Falls, Wisconsin

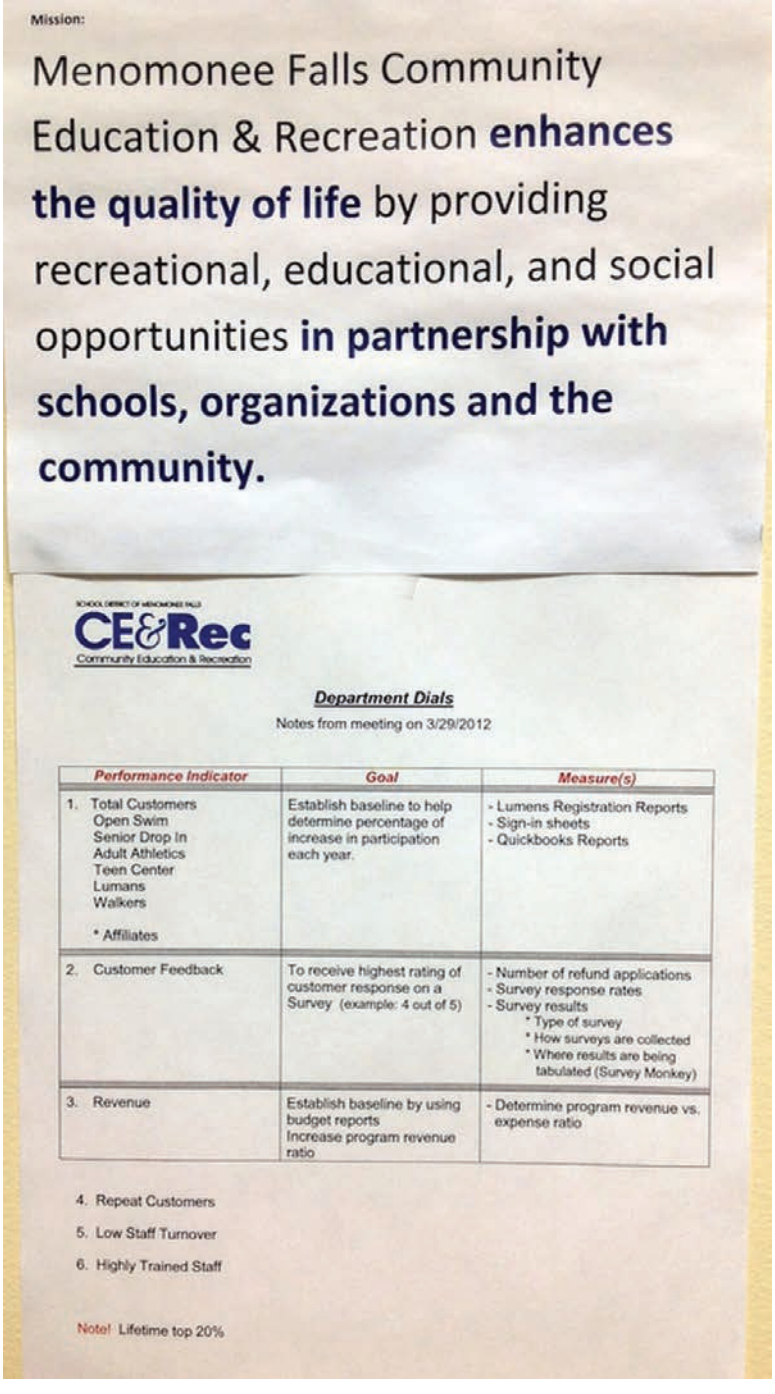
Artifact C. 1



Artifact C.2 Classroom Example of a Plan-Do-Study-Act Cycle



Artifact C.3 School Example of Measurement for Improvement



Mission:

Menomonee Falls Community Education & Recreation **enhances the quality of life** by providing recreational, educational, and social opportunities **in partnership with schools, organizations and the community.**

CE&Rec
Community Education & Recreation

Department Dials

Notes from meeting on 3/29/2012

Performance Indicator	Goal	Measure(s)
1. Total Customers Open Swim Senior Drop In Adult Athletics Teen Center Lumans Walkers * Affiliates	Establish baseline to help determine percentage of increase in participation each year.	- Lumens Registration Reports - Sign-in sheets - Quickbooks Reports
2. Customer Feedback	To receive highest rating of customer response on a Survey (example: 4 out of 5)	- Number of refund applications - Survey response rates - Survey results * Type of survey * How surveys are collected * Where results are being tabulated (Survey Monkey)
3. Revenue	Establish baseline by using budget reports Increase program revenue ratio	- Determine program revenue vs. expense ratio

4. Repeat Customers
5. Low Staff Turnover
6. Highly Trained Staff

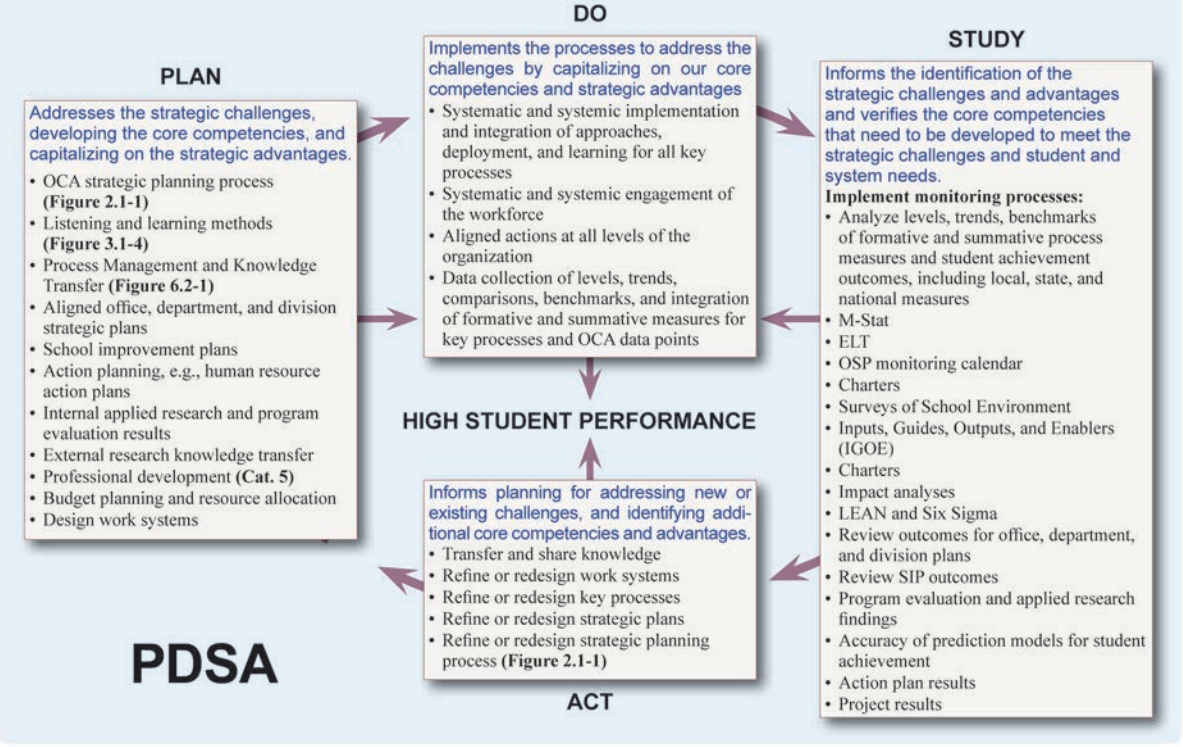
Note! Lifetime top 20%

APPENDIX D
Examples of Improvement Artifacts from Montgomery County Public Schools, Maryland

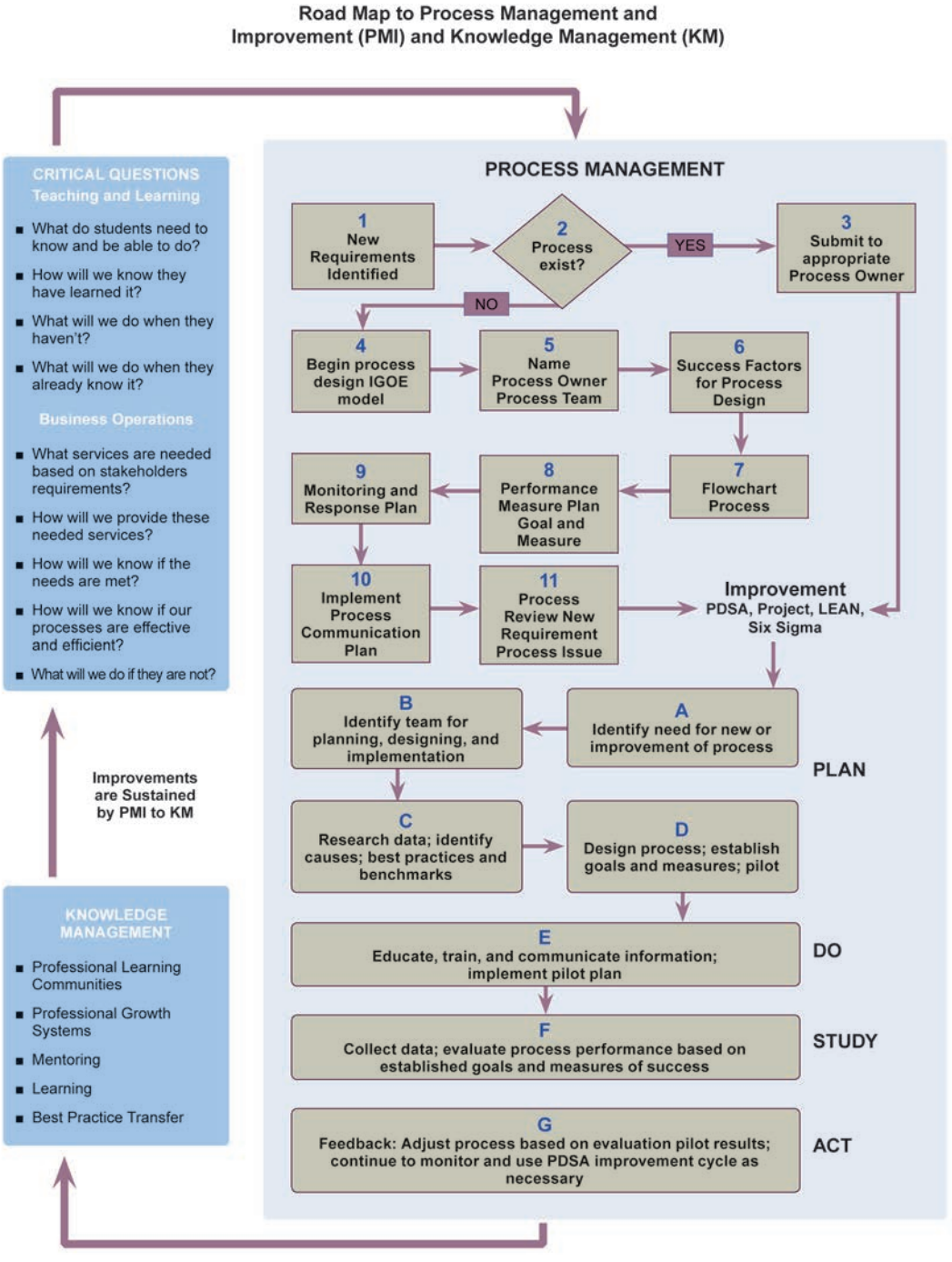
Artifact D.1 MCPS Performance Improvement System and PDSA

Performance Improvement System (PIS)

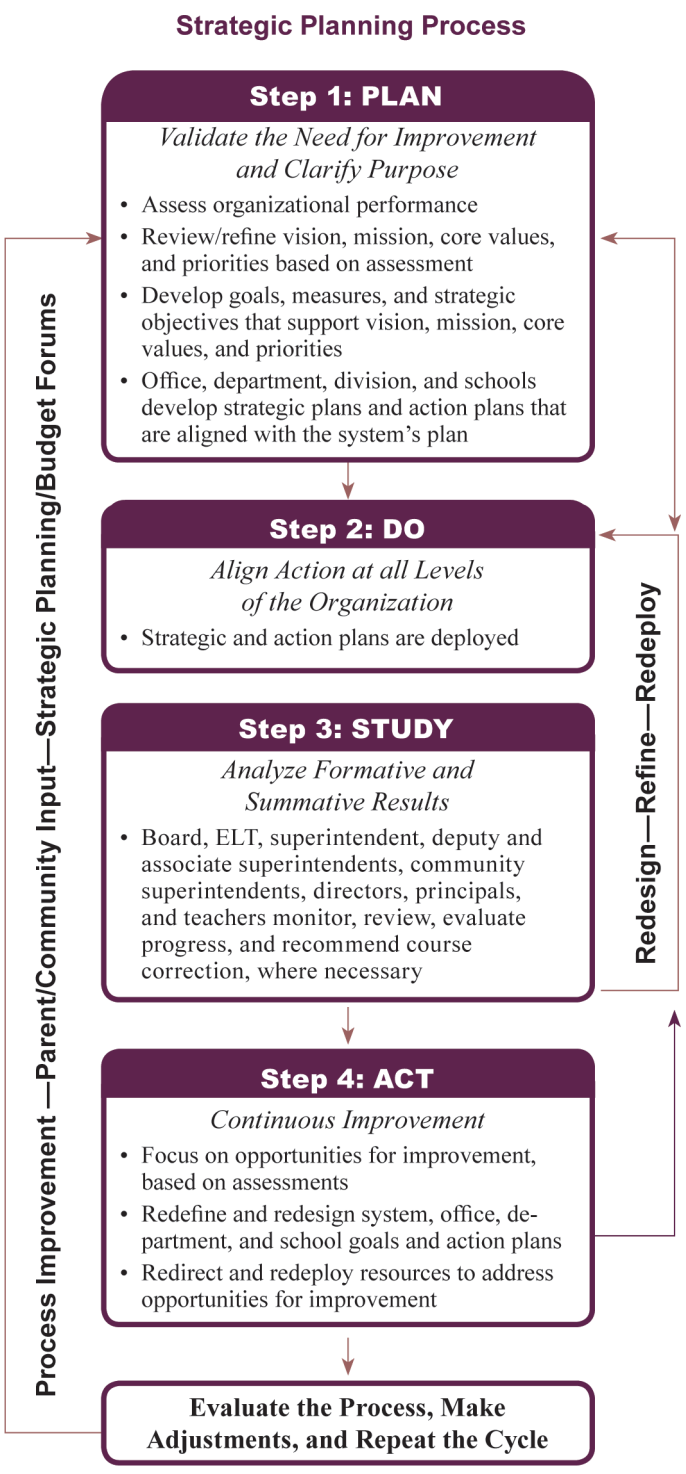
The foundation of the MCPS performance improvement system is OCA, which drives everything we do and is used by senior leaders to determine how well the organization is performing. The goals, milestones, objectives, performance measures, data points, targets, and strategies and initiatives are monitored semimonthly using a variety of processes. Consistent with our continuous improvement culture, these review processes drive changes to the action plans developed by senior leaders and their staffs and serve as the catalyst for process evaluation, improvement, innovation, and knowledge transfer **(Figure 6.2-1). Figure P.2-C** describes the components of the MCPS performance improvement system.



Artifact D.2

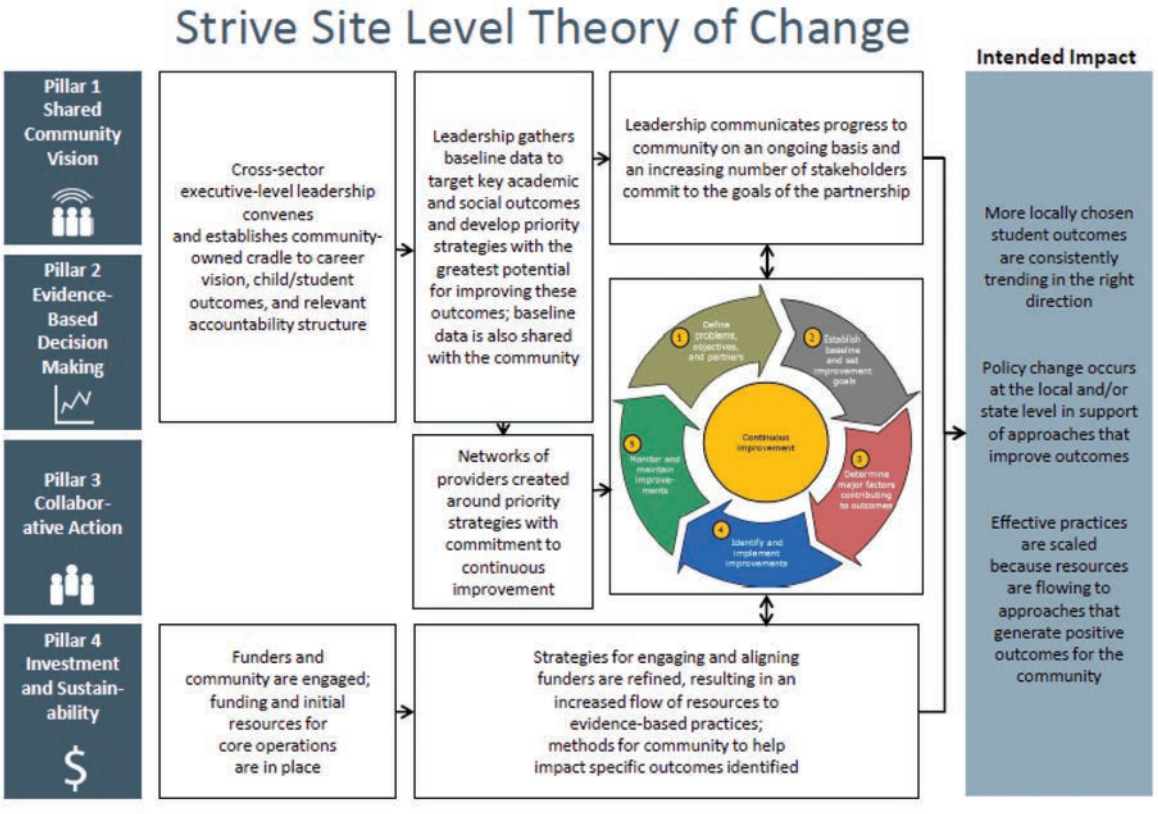

Road Map to Process Management and Improvement (PMI) and Knowledge Management (KM)
CRITICAL QUESTIONS
Teaching and Learning
What do students need to know and be able to do?
How will we know they have learned it?
What will we do when they haven't?
What will we do when they already know it?
Business Operations
What services are needed based on stakeholders requirements?
How will we provide these needed services?
How will we know if the needs are met?
How will we know if our processes are effective and efficient?
What will we do if they are not?
Improvements are Sustained by PMI to KM
KNOWLEDGE MANAGEMENT
Professional Learning Communities
Professional Growth Systems
Mentoring
Learning
Best Practice Transfer
PROCESS MANAGEMENT
1 New Requirements Identified
2 Process exist?
YES
NO
3 Submit to appropriate Process Owner
4 Begin process design IGOE model
5 Name Process Owner Process Team
6 Success Factors for Process Design
7 Flowchart Process
8 Performance Measure Plan Goal and Measure
9 Monitoring and Response Plan
10 Implement Process Communication Plan
11 Process Review New Requirement Process Issue
Improvement
PDSA, Project, LEAN, Six Sigma
A Identify need for new or improvement of process
B Identify team for planning, designing, and implementation
C Research data; identify causes; best practices and benchmarks
D Design process; establish goals and measures; pilot
PLAN
E Educate, train, and communicate information; implement pilot plan
DO
F Collect data; evaluate process performance based on established goals and measures of success
STUDY
G Feedback: Adjust process based on evaluation pilot results; continue to monitor and use PDSA improvement cycle as necessary
ACT

Artifact D.3 MCPS PDSA Cycle on Strategic Planning

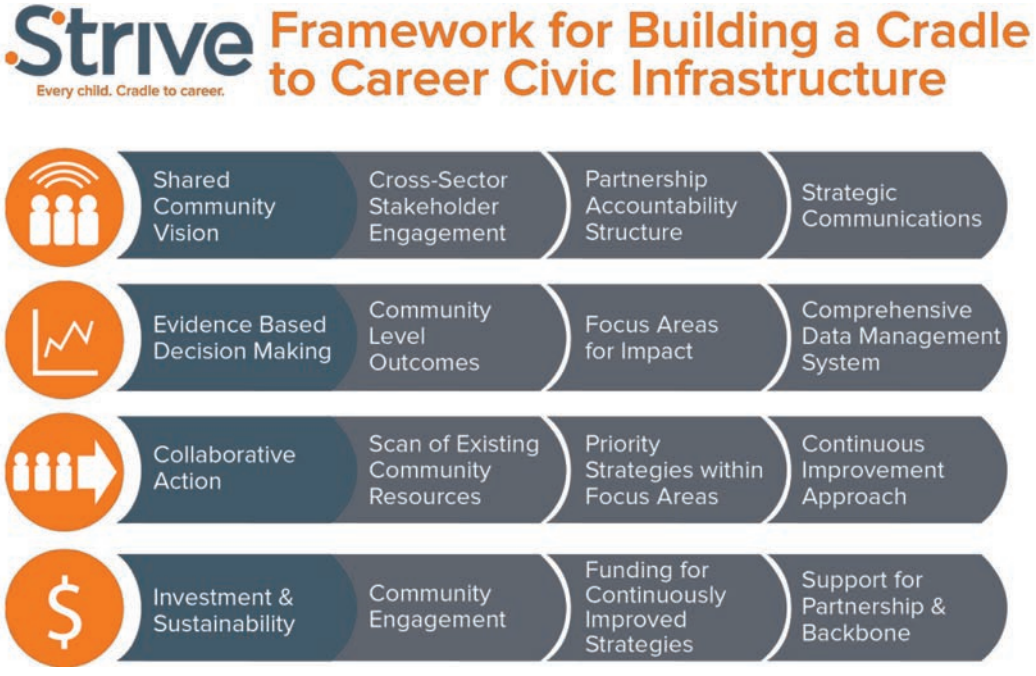


APPENDIX E
Examples of Improvement Artifacts from Strive Partnership Cincinnati

Artifact E.1 Strive Partnership Theory of Change



Artifact E.2 Strive Partnership Cradle to Career Framework



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