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# Evaluation of the Networks for School Improvement Initiative

INTERIM REPORT

## School-Level Implementation of Continuous Improvement

Michael S. Garet, Laura B. Stein, Ryan C. Eisner, Kathleen T. Jones, Matthew J. Farmer, Sara Mitrano, Beth C. Gamse, Kianna Medina, Shelley Rappaport, and David D. Liebowitz

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# Abstract

The Networks for School Improvement (NSI) initiative, established and funded by the Bill & Melinda Gates Foundation, supports networks of schools in using continuous improvement (CI) processes to improve outcomes for students who are Black, Latino, or experiencing poverty. Three cohorts of NSI were awarded five-year grants, starting in 2018-19, 2019-20, and 2020-21. The foundation sponsored an evaluation to build evidence on the NSI approach. This report summarizes what we have learned to date regarding one of the evaluation's three main research questions: To what extent do participating schools implement CI activities?

Specifically, we examine the following topics: the nature, frequency, and completeness of inquiry cycles; the implementation of other core components of CI (parameters); how CI teams address equity; variation in implementation; and the conditions that enable schools to implement CI. Analyses are based on data for 25 NSI participating in the initiative, primarily collected in 2021-22 and 2022-23. The COVID-19 pandemic, which emerged in late winter 2020, affected the work of all three NSI cohorts.

**Disciplined Inquiry Cycles.** Based on artifact data, 20 of the 25 NSI (80 percent) implemented inquiry cycles in at least some of their schools. Across NSI, about 61 percent of schools engaged in cycles. We do not know whether NSI that did not engage in cycles postponed the start of cycle work until later years, or whether they did not provide artifacts showing evidence of inquiry cycle work. We do know that of the initiated cycles for which we received artifacts, 50 percent were complete, on average—that is, there was documented evidence that teams conducted activities related to the Plan, Do, Study, and Act (PDSA) phases. For those CI teams that engaged in cycle activities, the average number of initiated cycles was 3.2 per year, which is consistent with prior research on the number of cycles schools typically engage in. A substantial majority of teams in NSI schools used data in their CI work, including data collected as part of cycle work on the implementation of change ideas and outcome data.

Most cycles with an Act phase concluded by adapting the change idea, rather than adopting or abandoning it. NSI took two approaches to inquiry cycle work. In most NSI, schools used the PDSA model, in which cycles are planned individually, with each designed to build on the lessons of a prior cycle. However, schools in some NSI used a model in which cycles are part of a longer term arc, with data gathered periodically to assess progress toward a semester- or year-long goal.

**Other Core Parameters of CI.** In general, a majority of schools laid the groundwork for CI by conducting a root cause analysis, developing a clear and specific aim statement, creating a theory of practice improvement, and selecting change ideas to test. Nearly three-quarters of schools conducted a root cause analysis to develop an understanding of the problem they

sought to address at some point during their work, either on their own or with guidance from the intermediary. Most schools also developed a clear and specific aim statement articulating what, specifically, team members planned to accomplish through their CI work.

In about half of the NSI, all schools developed a theory of practice improvement to articulate how changes in practice would lead to changes in student outcomes. Almost all of the schools in these NSI also developed a driver diagram—a visual representation of the theory of practice improvement—clearly related to the aim. In most of the remaining NSI, some schools developed driver diagrams or theories of practice improvement, while others did not. Although we may have expected teams to select change ideas derived from drivers, fewer than two-thirds of schools (58 percent) chose change ideas in this way.

**Attention to Equity.** Most schools showed evidence of attention to equity in their aim statements or root cause analyses, with more evidence found in aim statements than root cause analyses.

**Variation in CI Implementation.** Implementation varied both across NSI and across schools within NSI. One factor that appeared to be related to implementation was entry point—that is, whether NSI focused on instructional, early warning and response, or well-matched postsecondary entry points.

**Enabling Conditions.** Although many schools had conditions in place that were intended to facilitate CI implementation, some did not. About half of the schools offered teachers at least five hours of individual planning time a week, and about a quarter of schools freed up time for teams to meet. In a little less than half of the schools, the principal was very involved with the school CI team.

# Acknowledgments

We would like to recognize the entire study team for their contributions to collecting, analyzing, reviewing, and making meaning of the data collected for this report. This includes Shanette Porter and our partners at Gamse Partnership, the University of Oregon, MDRC, and Westat Insight (formerly Insight Policy Research).


Abena Acheampong • Emily Agopian • Natalie Bills • Damon Blair • Tammie Causey
Connie Chandra • Yuliya Cheban • Grace Cole • Emily Collins • Aimee Dang
Maria Dracopoli • Ryan C. Eisner • Matthew J. Farmer •Lawrence Friedman • Michael S. Garet
Keegan Giffels • Maggi Ibis • Lara Iqbal • Jasmine James • Kathleen T. Jones
Julie Jung • Shaheen Khan • Alex Kistner • Julie Kochanek • Yining Li • Bob McMahon
Sara Mitchell • Sara Mitrano • Orrin Murray • Sarah Mae Olivar • Stephanie McCarty
Ivana Párraga • Sugey Paz • Ronald Pena • Nicole Sochaczevski • Laura B. Stein
Angela Su • Nina Wetoska • Julia Wilkinson • Emma Wilson


Beth C. Gamse


David D. Liebowitz • Claire Zhang


Amanda Martin-Lawrence • Kianna Medina • Shelley Rappaport • Janey Woo


Kelsey Gray • Hollie Harsanyi • LaShawn Richburg-Hayes

# Introduction

The Bill & Melinda Gates Foundation established the Networks for School Improvement (NSI) to increase the proportion of Black students, Latino students, and students experiencing poverty who are on track for high school graduation and college enrollment.[1] The initiative supports networks of schools in using continuous improvement (CI) methods to identify and test strategies designed to improve teachers' practices and student supports. Each NSI consists of an intermediary organization leading a network of about 20 schools (ranging from fewer than 10 to more than 50 schools) and supporting teams of school staff in conducting CI. These intermediaries have partnered with almost 800 schools across approximately 150 districts and charter networks to identify, test, refine, and scale strategies to improve students' academic and behavioral outcomes.

The foundation funded three cohorts of five-year grants between 2018 and 2020, totaling more than $300 million in funding (see Exhibit 1).[2] Most intermediaries leading NSI are non-profit education organizations and university-affiliated centers; three are school districts and one is a charter school network (see Appendix C for a full list of NSI grantees). Each NSI focused its grant on improving student outcomes in one or more of the following areas:

- **8th- or 9th-Grade On Track:** The proportion of 8th- or 9th-grade students who meet a set of academic and behavioral outcomes related to high school graduation and college enrollment
- **College-ready On Track:** The proportion of 11th- and 12th-grade students who are on track academically to enroll in a college with a graduation rate of at least 50 percent
- **Well-matched Postsecondary Enrollment:** The proportion of 12th-grade students who complete the steps needed to enroll in a college with a graduation rate of at least 50 percent

**Exhibit 1. NSI Grant Years by Cohort**

| Cohort | 2018-19 school year | 2019-20 school year | 2020-21 school year | 2021-22 school year | 2022-23 school year |
|---|---|---|---|---|---|
| 1 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
| 1B/2 | | Year 1 | Year 2 | Year 3 | Year 4 |
| 3 | | | Year 1 | Year 2 | Year 3 |

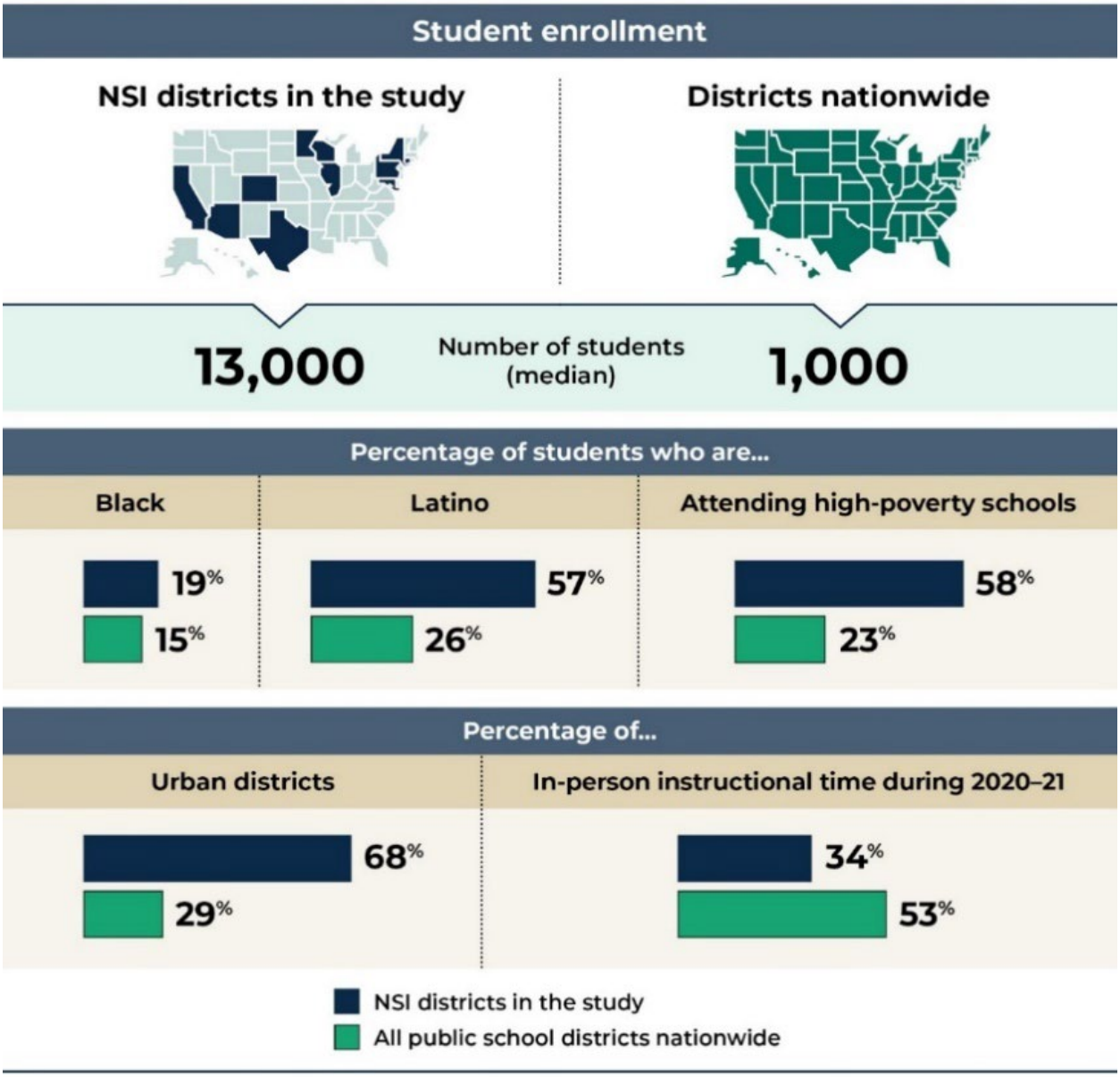
Notes: The foundation awarded two sets of grants in the 2019-20 school year (the Cohort 1B and 2 grants). The evaluation treats these two sets of grants as a single cohort because the NSI started work at nearly the same time.

The foundation also categorized each NSI in one of three "entry points" based on the primary focus of their CI activities: early warning and response (working to create more supportive, connected school environments); instructional (working to improve the quality of instruction within classrooms); and well-matched postsecondary (working to support postsecondary application, enrollment, and persistence). Entry points are similar but not identical to outcome areas. For example, an NSI that aims to improve college-ready on-track outcomes might use an instructional entry point or early warning and response entry point to achieve that outcome.

The NSI partnered with large, mostly urban districts that served a higher proportion of students who are Black, Latino, or experiencing poverty, compared to districts nationally (Exhibit 2). The median enrollment of districts with NSI schools was 13,000 students, compared to 1,000 for districts nationally. In addition, the NSI districts had more than double the percentage of Latino students and students attending high-poverty schools than districts nationally.

The COVID-19 pandemic affected the work of all three cohorts of NSI grants. The first two NSI cohorts had already commenced at the onset of the pandemic in late winter 2020, and the pandemic delayed the start of Cohort 3 in fall 2020 by six to nine months. After shifting to virtual instruction in spring 2020, NSI districts provided in-person instruction for about a third of the 2020-21 school year, on average. NSI adapted their grant activities to help educators respond to pandemic-related disruptions and the challenges of virtual instruction. The disruptions to schooling during this period contributed to lost learning opportunities and larger achievement gaps (Goldhaber et al. 2022; Jack et al. 2023; Fahle et al. 2023). Although schools returned to in-person instruction in the 2021-22 school year, they continued to face challenges, with chronic absenteeism, student mental health, and academic recovery (Dee 2024; Liu et al. 2021; Cattan et al. 2023).

**Exhibit 2. Characteristics of Districts with NSI Schools in the Evaluation, Compared to Districts Nationwide**




Source: U.S. Department of Education Common Core of Data for the 2017-18 school year; Return 2 Learn Tracker for the 2020-21 school year.
Notes: The exhibit shows average district characteristics weighted by the number of students in NSI schools (NSI districts) or by the number of students in the district (districts nationwide). High-poverty schools are defined as schools with at least 75 percent of students eligible for free or reduced-price lunch.

## The NSI Evaluation

The foundation sponsored an evaluation to build evidence on the NSI approach. Despite growing efforts to support school networks in using CI to test and refine solutions to educational challenges, there is limited evidence on implementation and impact (Feygin et al. 2020). In particular, there is little evidence on the characteristics of effective school networks (Bush-Mecenas et al. 2020), and there are few studies on the use of CI in education settings (Garet et al. 2021). The NSI initiative provides a valuable opportunity to address these evidence gaps and learn about the formation of school networks, the use of CI in schools, and the impact of these efforts on student outcomes. The evaluation addresses three main research questions:

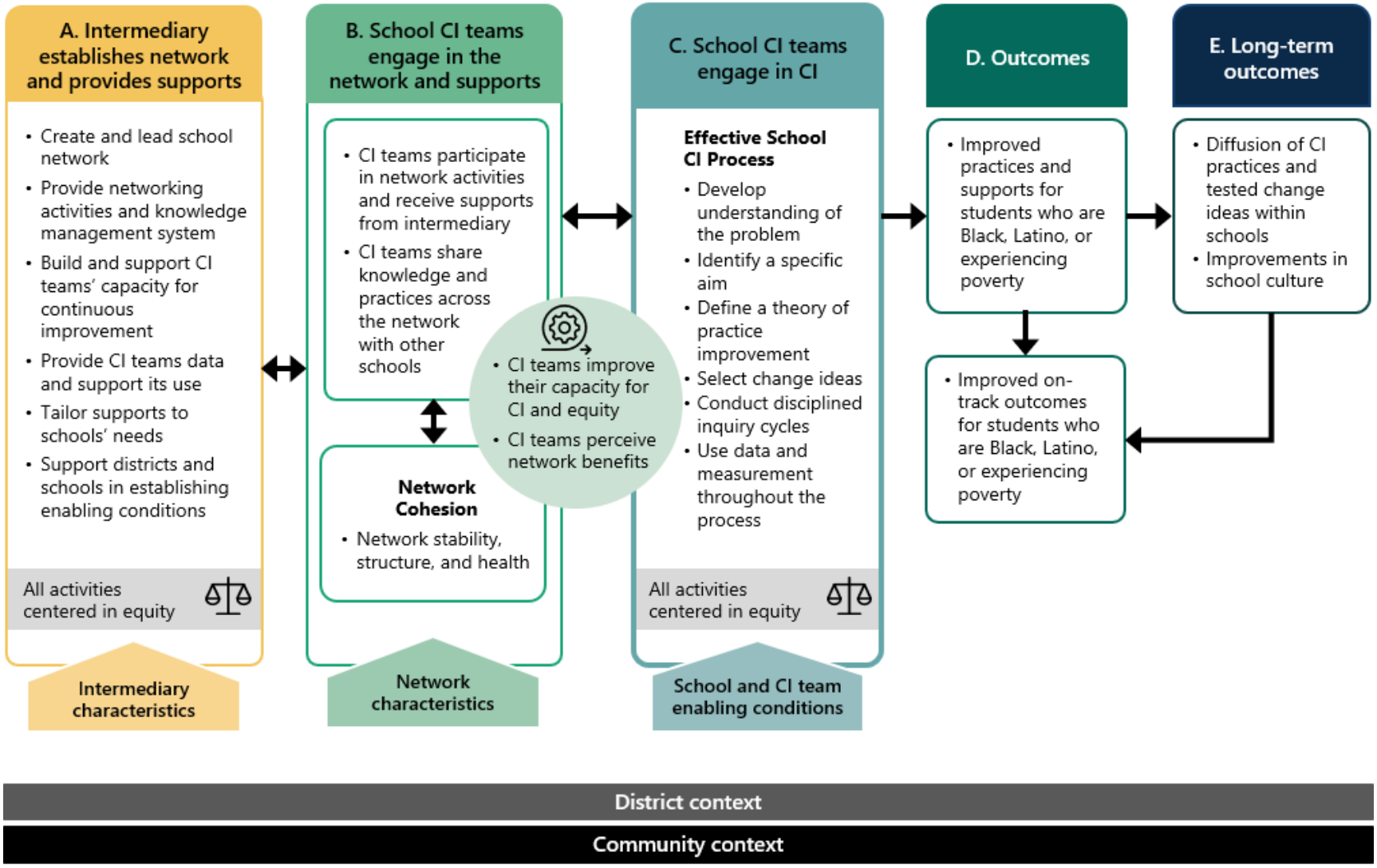
1. How do intermediaries design and implement their NSI?
2. To what extent do participating schools implement CI activities?
3. What is the impact of the NSI on student outcomes? What aspects of the NSI approach are related to impacts on students?

Each research question is addressed by a different evaluation partner: RAND leads work on Research Question 1, the American Institutes for Research (AIR) leads work on Research Question 2, and Mathematica leads work on Research Question 3. The first set of evaluation reports (interim reports) describes implementation of the NSI through the 2022-23 school year (Research Questions 1 and 2) and impacts on student outcomes through the 2021-22 school year (Research Question 3). A second set of reports (final reports) in 2026 will describe two more school years of NSI implementation and impacts. This report and the accompanying technical documentation present preliminary findings for Research Question 2. It is important to note that the preliminary findings presented in this report are based on school years heavily affected by the COVID-19 pandemic. In addition, the foundation assumed that three years were needed for NSI to develop connections among schools in their networks, and to test and refine solutions through continuous improvement.

## The NSI Initiative's Conceptual Framework

The foundation outlined a broad structure for NSI while also providing flexibility for intermediaries to adapt their approach. The evaluation teams developed a conceptual framework to describe the key features of the NSI approach and guide the evaluation (Exhibit 3).

## Exhibit 3. NSI Conceptual Framework



According to this framework, intermediaries create and support networks of schools in using CI to improve practices related to their outcome area (Box A in Exhibit 3). At the intermediary, network, and school levels, the NSI initiative centers equity to ensure schools focus on improving outcomes for students who are Black, Latino, or experiencing poverty.[3] Schools in the network form teams of teachers, counselors, administrators, and other staff (called CI teams) to participate in the NSI (Box B). Intermediaries provide coaching and professional learning to school CI teams to develop their capacity to engage in meaningful CI processes. Intermediaries also provide additional supports to CI teams, which typically include data to understand the challenge, a knowledge management system to document what CI teams learn, and network convenings to strengthen connections between teams and share learning across the network.

The foundation expects school CI teams to engage in CI processes that include six core parameters (Box C). These parameters mirror the six core principles of CI outlined by the Carnegie Foundation for the Advancement of Teaching (Bryk et al. 2015). The NSI core parameters focus on developing an understanding of the problem and its root causes; identifying a specific goal or aim to address the problem; describing the key factors and conditions needed to accomplish the aim (the theory of practice improvement); selecting specific strategies—called change ideas—to achieve the aim; and using disciplined inquiry cycles and data to test and refine the change ideas. We provide examples of these parameters in this report.

Schools' participation in the NSI and their use of CI processes are expected to improve educators' practices and student supports, and to ultimately improve on-track outcomes for students who are Black, Latino, or experiencing poverty (Box D). In the long term, effective strategies identified by CI teams can be shared with other educators in participating schools and more broadly across a district or charter network (Box E). Building educators' capacity to develop and test strategies that address ongoing challenges is expected to improve school culture. The success of the NSI depends on a set of underlying intermediary and network characteristics, as well as enabling conditions at the school and CI team levels.

The analysis in this report focuses on Box C in Exhibit 3: How school CI teams engage in CI.

## BOX 1. STUDY DESIGN

**What was the focus of our study?** The evaluation aims to understand the ways in which participating schools implemented CI in relation to the six core parameters of CI, as well as the factors associated with implementation.

**What data were collected?**

- **CI artifacts.** We asked representatives from each NSI to share relevant artifacts (e.g., documents) generated by their networks' CI teams, including (but not limited to) root cause analyses, meeting notes and agendas, and descriptions of change ideas that have been tested.[4]
- **NSI school leader surveys.** We invited a leader from each NSI school to complete an online survey about school context (e.g., available teacher planning time) and work being conducted to improve student learning.[5]
- **Intermediary interviews.** Intermediary staff (such as CI coaches who interacted with school teams) participated in semi-structured, virtual interviews.[6] Prior to the interviews, a representative from each intermediary filled out a form with closed-ended questions about their NSI's approach to CI.
- **Climate surveys.** We examined data from existing climate surveys administered to teachers in selected districts to examine the relationship between school climate and CI implementation.
- **Case study interviews.** Two or three staff per school, in 12 schools working with six NSI, were invited to participate in semi-structured, virtual interviews (in 2021-22 and 2022-23) about supports for teaching and learning and aspects of CI.[7]

**Which schools and time points were included in our sample?** The study sample includes the schools associated with 25 NSI.[8] We collected data from all cohorts in 2020-21. Beginning in 2021-22, we collected data for NSI in grant year 3 or grant year 5.[9] The table below shows the number of NSI included in the evaluation and the timing of the grants, by cohort. In some NSI, all schools began participating in the first year of the grant. In other NSI, some schools began participating in later years.

**Number of NSI and Grant Year by Cohort**

| Cohort | *N* of NSI | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|---|---|
| 1 | 5 | 1 | 2 | 3 | 4 | 5 |
| 1B/2 | 10 | | 1 | 2 | 3 | 4 |
| 3 | 10 | | | 1 | 2 | 3 |

*Note.* Data for the years shaded in green and yellow serve as the focus of this report. Most of the results presented are based on 2021-22 data for Cohort 1B/2 and 2022-23 data for Cohorts 1 and 3.

**How were data analyzed and presented?**

- **Descriptive analyses.** Most of the analyses presented show equally weighted averages of the NSI overall or by entry point (early warning and response (EWR), instructional, or well-matched postsecondary (WMPS)). In some analyses, we present overall counts of NSI instead of percentages of schools or NSI.
- **Variation.** We report on variation in implementation across schools and NSI by calculating the percentage of the variation between NSI. If 100 percent of the variation were between NSI, that would indicate that practices differ across NSI, and that all schools within an NSI engage in the same practices. If there were no variation between NSI, that would indicate that practices do not systematically differ across NSI, and that variation occurs among schools within the same NSI.
- **Regression analyses.** To further examine factors related to variation in CI implementation, we estimated multilevel linear and logit regression models. We examined 12 total implementation measures related to the core parameter constructs. For each measure, we included the following predictors: two characteristics of NSI (cohort and entry point), one school factor (years in the NSI), and school year. The sample, variable definitions, and model specifications are described in Appendix E.

## What We Are Learning

This report addresses the following research questions:

1. To what extent do schools implement CI activities?
2. To what extent do the activities undertaken reflect the core parameters and other evidence-based practices of CI?
3. What change ideas do schools select for testing and implementation as part of CI?
4. To what extent do CI teams explicitly focus on improving outcomes for Black students, Latino students, or students experiencing poverty?
5. Does the level of implementation of key CI features differ by cohort, entry point, calendar year, or years in the NSI?
6. What enabling conditions support schools' implementation of CI?

Each section relies on the data we gathered to examine and identify patterns related to each research question. We have summarized what we have learned in **bold** text. Most of the analyses of CI presented in this report are based on artifacts (documents) generated by CI teams in the course of their work (Box 1). The literature on CI argues that documentation of CI processes is key to capturing what is learned; maintaining institutional knowledge; and sharing results within each school, with other schools working with an NSI, and beyond the NSI community (Russell et al. 2019; Taylor et al. 2014). For this reason, CI teams in NSI schools were expected to document their work. NSI developed systems to support this documentation.

We relied on artifacts for several reasons. First, artifacts allow us to gain insight into the CI work underway in the roughly 500 schools affiliated with the 25 NSI in the study. This permits us to examine variation in CI practices between NSI—and among schools working with the same NSI—in a way that would not be possible using data from a smaller sample. This contrasts with much of the available literature on CI in schools, which is based on case studies. (For a review of the literature on CI, see Garet et al. [2021]. While we supplemented artifacts with data from case studies, case studies were feasible in only a small subset of schools.) Second, artifacts provide concrete evidence of the nature of the CI work, as documented by the NSI and school teams. Artifacts provide much more detail than could feasibly be collected through surveys or interviews with participants.

Although artifacts have a number of advantages in describing CI work underway, interpreting artifacts has a number of challenges. In particular, schools may have done CI work without documenting it. If so, this work is not reflected in our analyses (see Box 2). In addition, by drawing primarily on artifacts, we are able to portray the content, timing, and frequency of CI work, but we are less able to convey the beliefs and mindsets of the staff involved. It is possible

that the beliefs and mindsets of CI team members might have changed during the CI work in ways not reflected in the artifacts.

### BOX 2. INTERPRETING EVIDENCE FROM ARTIFACTS

We coded artifacts for the presence of documented evidence that specific CI activities had occurred, recognizing that documenting work for the purposes of knowledge sharing is one of the expectations of CI. If artifacts do *not* contain such evidence, we do not know definitively that a process or activity did not occur; we only know the NSI did not share artifacts containing evidence that the process or activity occurred. Consequently, reported values (based on artifact data) may underestimate the true prevalence of specific CI processes and activities.

We often present results for the average level of implementation across schools working with all the NSI for which we have data. For some aspects of implementation, the level of implementation differed by "entry point." For these aspects, we present the average level of implementation for the three entry points; see Box 3 for a description of NSI entry points. In other cases, all schools working with the same NSI had the same or nearly the same level of implementation. In this situation, because all or most of the salient variation was at the NSI level, we present the count of NSI with different levels of implementation.

### BOX 3. DESCRIPTION OF NSI ENTRY POINTS

- **Early warning and response (EWR).** NSI work with grade-level or cross-functional teams within schools to create more supportive school environments where young people are connected to adults, each other, and the school community.
- **Instructional.** NSI work with math or English language arts teams within schools—often including instructional coaches, special education teachers, and English learner/multilingual teachers—to improve the quality of instruction within classrooms.
- **Well-matched postsecondary (WMPS).** NSI work with school-based teams of counselors, service providers, district and school leaders, teachers, and other staff on evidence-based strategies and processes that support postsecondary application, enrollment, and persistence.

*Source.* Bill & Melinda Gates Foundation. "Lessons from Networks for School Improvement: School Year 2020-2021. Bill & Melinda Gates Foundation, 2022.

Considering that many schools started this work during and in the immediate aftermath of the COVID-19 pandemic, school-based staff were simultaneously addressing the myriad unprecedented challenges of remote and hybrid learning and the persistent repercussions of the pandemic for student learning and well-being. Despite these challenges and repercussions, school staff worked to implement CI in their schools. However, the CI activities in which schools

engaged were not universal within or across NSI, raising questions about the depth and consistency of CI implementation at the school level.

## To What Extent Do Schools Implement CI Activities?

**Inquiry cycles** are a core component of CI work and help distinguish CI—as articulated by Anthony S. Bryk and others at the Carnegie Foundation for the Advancement of Teaching — from other related evaluation or improvement activities. According to Bryk, CI is anchored in "disciplined inquiry"; teams "engage in rapid cycles of plan, do, study, act (PDSA) to learn fast, fail fast, and improve quickly (Bryk et al 2015)"Although this definition of disciplined inquiry cycles includes an expectation that cycles are rapid, the foundation did not specify a particular model (e.g., PDSA), approach, or frequency for inquiry cycles.

As one way of understanding how the implementation of inquiry cycles varied across CI teams, we examined the number of cycles initiated by CI teams and the number of cycles completed by CI teams. If, as Bryk asserts, meaningful improvement requires a relatively quick iterative inquiry process, then the number of cycles conducted could be interpreted as one indicator of the quality with which CI has been implemented.

It can be challenging to count the number of cycles conducted by a team. For example, a team might test a change idea in several classrooms. Each classroom test could be considered a separate cycle, or the tests in multiple classrooms might be considered a single cycle, since they are focused on the same change idea over the same period. In addition, in many cases, the inquiry cycle templates NSI provided to schools broke the year into "action periods," with each action period typically covering a quarter of the school year. These templates might lead teams to consider all work conducted during an action period as a single cycle, even if there were multiple iterations during the action period. The artifacts we received often explicitly indicated cycle numbers. When cycle numbers appeared, we used them to distinguish cycles. When explicit cycle numbers did not appear, we used other information in the artifacts, such as dates, to distinguish cycles. (See Appendix D for more information on how cycles were coded.)

To quantify the number of cycles initiated by each school team, we defined an *initiated cycle* as one with documentation of activity related to at least one phase of the inquiry cycle process—Plan, Do, Study, or Act—and a *completed cycle* as a cycle with evidence of activity related to all four phases of the process. See Box 4 for information on how we coded for evidence of each phase of inquiry cycle work.

### BOX 4. CODING FOR EVIDENCE OF PLAN, DO, STUDY, AND ACT PHASES

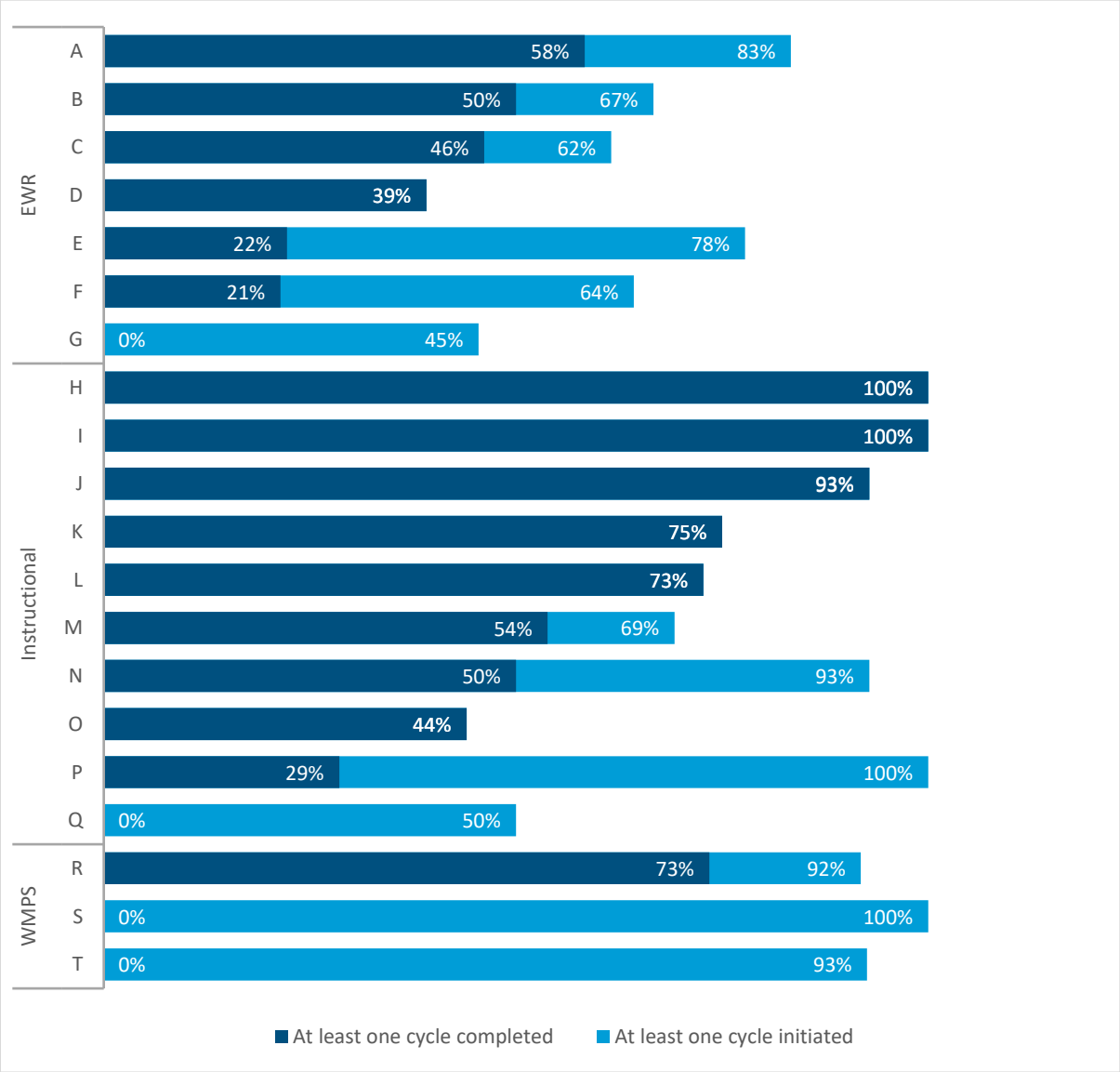
We developed a framework for coding activities based on the four-phase PDSA cycle and then linked artifacts to phases based on the nature of activities reflected in the artifacts. For artifact coding, we defined evidence of the four inquiry cycle phases as follows:

- **Plan** – any evidence of selecting a change idea and developing a plan that determines how it will be tested
- **Do** – any evidence of implementing the change idea and collecting relevant data
- **Study** – any evidence of assessing the results based on the collected data
- **Act** – any evidence of using the results to determine whether to adapt, abandon, or adopt the change idea

The coding focused on activities described in the documentation of inquiry cycle processes, rather than the specific terms used by CI teams. However, because most NSI and participating schools used the PDSA model, we used this language to characterize the phases of inquiry cycles.

**Most NSI shared artifacts showing evidence that at least some schools engaged in inquiry cycle work.** Based on artifact data, 80 percent of NSI (20 of 25 NSI) engaged in inquiry cycle work in at least three schools. The remaining NSI may have postponed the start of cycle work until later years or did not provide artifacts showing evidence of inquiry cycle work. The percentage of schools that initiated and completed at least one cycle varied substantially across NSI (Exhibit 4). On average, 61 percent of schools engaged in cycle work.

**Exhibit 4. Percentage of Schools with At Least One Cycle Initiated and Completed, by NSI**



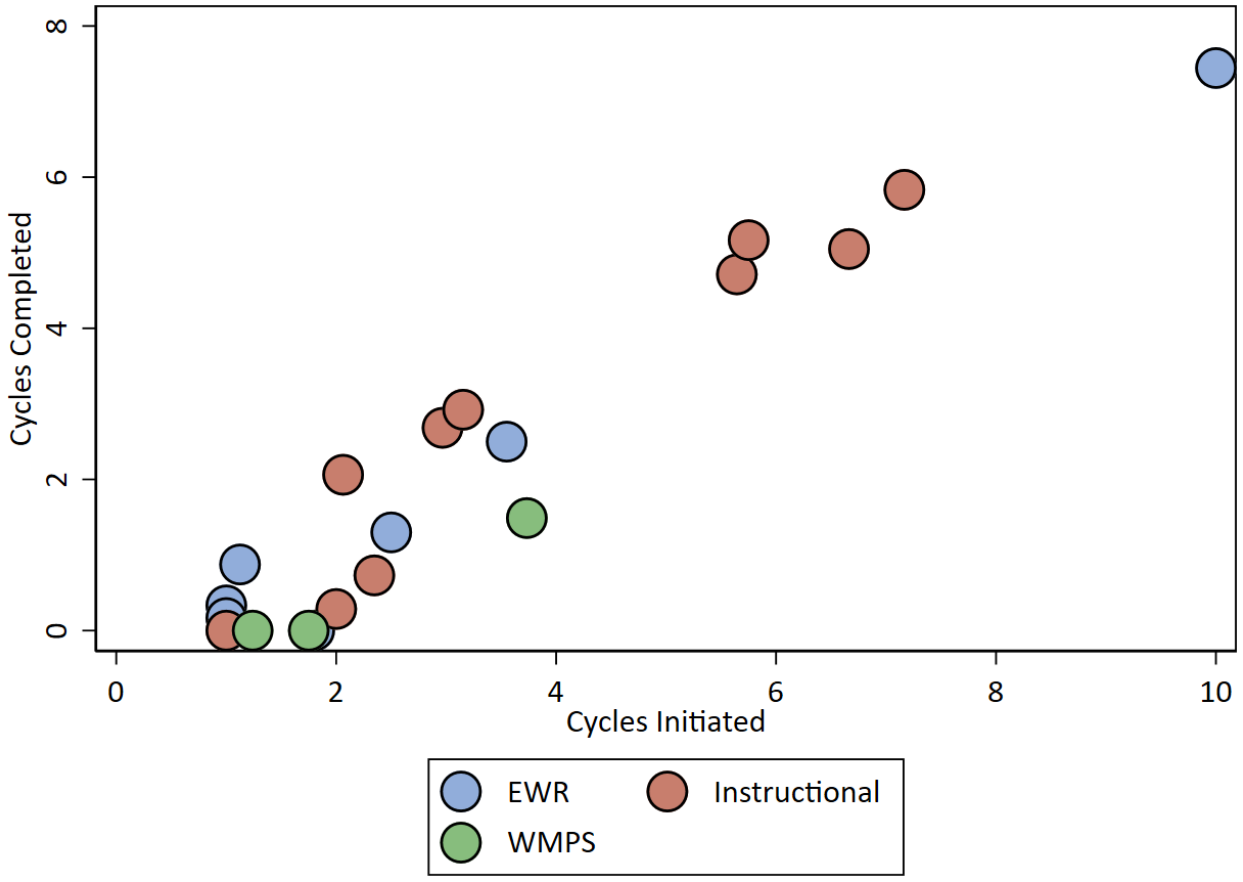

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 20. EWR indicates Early Warning and Response NSI, and WMPS indicates Well-matched Postsecondary NSI. Analyses are based on cycle-level data. The analysis includes all schools with artifact data. Each bar represents one NSI, and we assign each NSI an anonymized alphabetic identifier, A-T. The five NSI with no cycles initiated are not shown. Bars that are entirely dark blue indicate that all cycles that were initiated were completed. Bars that are entirely light blue indicate that no cycles were completed.

**On average, schools that engaged in cycle work initiated about 3.2 cycles per year and completed 2.1 cycles per year.** These results are consistent with prior research on inquiry cycles. For example, Garet et al., in a 2021 research synthesis, found an average of about two cycles per year for schools engaging in CI, though the studies reviewed included a far smaller number of schools. These results align with results from other studies of CI, which show that

despite growing interest, implementation of CI in schools remains challenging (Kinlaw et al. 2020; Gallagher et al. 2022).

**There was considerable variation across NSI in both the number of cycles initiated and the number completed by schools within each NSI.** In Exhibit 5, each dot represents one NSI and the three colors represent the three NSI entry points. In the majority of NSI, schools *initiated* an average of five or fewer cycles per year and *completed* about half of those (two completed cycles per year, on average). In one NSI, schools initiated an average of more than 10 cycles and *completed* about seven cycles per year, on average.

**Exhibit 5. Average Number of Cycles Initiated and Completed per School, by NSI**




*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 20. EWR indicates Early Warning and Response NSI, and WMPS indicates Well-matched Postsecondary NSI. Analyses are based on cycle-level data. The analysis includes all schools with evidence of at least one cycle and excludes NSI with no schools that engaged in cycles. The average number of cycles (initiated or completed) in a school is calculated as the equally weighted mean of the cycles computed by each CI team within the school. Schools with more than 10 cycles are truncated to 10. The average number of cycles for an NSI is computed as the equally weighted mean for the schools within the NSI.

As shown in Exhibit 6, the average number of cycles initiated and completed differs for NSI depending on entry point. That difference is significant in both cases.

**Exhibit 6. Average Number of Cycles Initiated and Completed per School, by Entry Point**

| Entry point | Cycles initiated | Cycles completed |
|---|---|---|
| **EWR** | 2.7 | 1.6 |
| **Instructional** | 3.8 | 2.8 |
| **WMPS** | 2.2 | 0.5 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals seven for the EWR entry point, 10 for the instructional entry point, and three for the WMPS entry point. Analyses are based on cycle-level data. The analysis includes all schools with evidence of at least one cycle and excludes NSI with no schools that engaged in cycles. The average number of cycles (initiated or completed) in a school is calculated as the equally weighted mean of the cycles initiated (or completed) by each CI team within the school. Schools with more than 10 cycles are truncated to 10. The average number of cycles for an NSI is computed as the equally weighted mean for the schools within the NSI.

The next section includes further discussion about the nature of school-level inquiry cycle work (see the Disciplined Inquiry Cycles section) along with a discussion of other core parameters of CI.

## To What Extent Do the Activities Undertaken Reflect the Core Parameters and Other Evidence-Based Practices of CI?

School teams participating in the NSI were expected to engage in activities that reflect the following six core parameters of CI, as defined by the Bill & Melinda Gates Foundation and informed by the Carnegie Foundation for the Advancement of Teaching (Bill & Melinda Gates Foundation n.d.):

1. An understanding of the problem, the systems that produce current inequitable outcomes, and the opportunities and assets of the community and their students (root cause analysis)
2. A clear, specific, and measurable goal centered on achieving equitable outcomes for students who are Black, Latino, or experiencing poverty (aim statement)
3. An equity-centered theory of practice improvement for how to reach the goal
4. Disciplined inquiry cycles to test interventions and collect and analyze data to assess if changes represent an improvement
5. Collaborative and diverse teams comprised of people with time, expertise, experience, and the will to tackle the problem
6. Use of locally relevant and valued data from multiple sources, relevant research, and measurement as keys to improvement

To understand the nature of CI at the school level, we examined each of these six core parameters in turn.

### *Root Cause Analysis*

CI work is expected to begin by identifying some of the root causes of the performance problem that is the focus of the improvement work. Once the root cause has been identified, team members seek potential change ideas to test.

A root cause analysis process is designed to help teams understand what underlies the causes of inequitable outcomes, instead of jumping straight to solutions that may not address the underlying issues. Such analyses may be conducted either by individual schools or collectively by schools within an NSI. The latter approach allows schools to consider conditions shared across schools, collaborate on interpreting information from the root cause analysis, and consider differences to help understand causes.

**Many schools conducted a root cause analysis, particularly in the early years of the grant.** To examine the extent to which schools conducted a root cause analysis, we focused on the sample of schools that provided artifacts for both years in which we collected data (ordinarily 2020-21 and either 2021–22 or 2022–23, when cohort 1 was in years 3 and 5 of their grant, cohort 1B/2 in years 2 and 3, and cohort 3 in years 1 and 3). Overall, schools in 23 of the 25 NSI provided artifacts in both years. On average, 72 percent of the schools working with these NSI conducted a root cause analysis in at least one of the two years for which we collected data.

For 9 of the 23 NSI with data in both years, a majority of schools conducted a root cause analysis only in the first year for which we collected artifacts. In 5 of the 23 NSI, a majority conducted a root cause analysis in both years. In only one of the NSI did a majority conduct a root cause analysis in the second year but not the first. In the remaining 8 NSI, a majority of schools did not conduct a root cause analysis in either year.

The greater prevalence of root cause analyses in the earlier years may mean that schools continued to rely on the initial root cause analysis to determine their problem focus in later years. This hypothesis is consistent with interviews with intermediary staff: 16 of 25 NSI (64 percent) reported that they conducted root cause analyses prior to grant year 3 or 5. See Box 5 for examples of root cause analysis in case study schools.

### BOX 5. ROOT CAUSE ANALYSIS IN CASE STUDY SCHOOLS

Overall, evidence from case studies suggests that root cause analysis was not a priority for CI teams in later grant years. Most case study teams did not conduct new root cause analyses in the most recent year or explicitly revisit root cause analyses from previous years.

One CI team that conducted a root cause analysis surveyed students to determine what factors were preventing students from succeeding in their math class. The survey revealed that students were not comfortable sharing in class. In follow-up empathy interviews, students said they were afraid of making a mistake, particularly in front of the entire class. The team used this information to brainstorm change ideas to help students become more comfortable speaking up in class. The team did not further explore why students were shy or afraid of making a mistake,

In another NSI, the CI team did not conduct a root cause analysis to determine the problem focus or to select a change idea. Instead, the team first settled on a change idea and then used a fishbone diagram to organize six factors that team members hypothesized might hinder the success of the change idea. The team did not appear to examine the six factors further or use the fishbone diagram to help select or prioritize change ideas for subsequent inquiry cycles.

*Source.* Case studies from 2022-23.

**Among the 17 NSI in which at least some schools conducted a root cause analysis in the most recent year for which we collected data, the root cause analysis was more commonly conducted at the school level than at the network level. Schools relied on a root cause analysis at the network level in only a few NSI (Exhibit 7).** In some NSI, the level at which the root cause analysis was conducted varied between schools working with the NSI, with some schools conducting their own root cause analyses while others relied on a network analysis. Overall, among all schools with artifact evidence of a root cause analysis, the analysis was conducted at the school level in 58 percent of schools, at the network level in 22 percent of schools, and at the intermediary level in 3 percent of schools.

**Exhibit 7. Number of NSI in Which All Schools Conducting a Root Cause Analysis Did So at the School or Network Level**

| School level | Network level | Unclear | Varied between schools within NSI |
|---|---|---|---|
| 8 | 2 | 2 | 5 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 17. The count of NSI includes all NSI with at least one school with artifacts showing evidence of a root cause analysis.

### *Aim Statement*

A clear and specific aim statement articulates a team's desired outcomes. Typically, an aim statement is expected to include a specific numerical target based on one of the Bill & Melinda Gates Foundation's outcome areas. For example, for the eighth-grade on-track outcome area, an aim statement may read: "By June 2025, 60 percent of eighth graders will be proficient or above in algebra." Strong aim statements are specific, measurable, attainable, relevant, and timebound—the five characteristics of "SMART" goals.

**Most schools developed a clear and specific aim statement.** Among all schools, we found artifact evidence that 79 percent had developed an aim statement.

**In the majority of NSI, schools developed a shared, network-specific aim statement (Exhibit 8).** In 10 of the 19 NSI in which at least one school had evidence of an aim statement, all schools shared a network-specific aim statement. In 5 of the 19 NSI, schools developed district- or school-specific aim statements. A few NSI showed variation across schools; some had their own aim statements while others had a shared, network-specific aim statement. Shared aim statements (across networks and/or districts) can foster goal sharing and alignment among multiple teams and team members, provide a common language and vision, and help teams name what is important in their CI work. On the other hand, individual school statements may better reflect the circumstances of individual schools.

**Exhibit 8. Number of NSI in Which Schools Had Network or School/District Aim Statements**

| Network specific | District/school specific | School and network each had aim statements | Varied between schools within NSI |
|---|---|---|---|
| 10 | 5 | 1 | 3 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 19. The count of NSI includes all NSI with at least one school with evidence of a clear and specific aim, and where it was clear whether the aim statement applied to the network, the school or district, or both.

**More than half of the NSI had at least some schools with aim statements that had evidence of all five SMART goal characteristics (Exhibit 9).** There was substantial variation across NSI in the degree to which aim statements aligned with particular SMART goal characteristics. However, a large majority of schools across all NSI (between 89 percent and 100 percent) developed aim statements that were coded as "relevant"—one of the five SMART characteristics.

**Exhibit 9. Number of NSI in Which Schools Had Evidence of All Five SMART Goal Characteristics**

| No schools | Some schools | All schools |
|---|---|---|
| 10 | 5 | 8 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 23. The count of NSI includes all NSI with at least one school with evidence of a clear and specific aim.

### *Theory of Practice Improvement*

A theory of practice improvement is a hypothesis, ideally informed by a root cause analysis, about how and why adopting a particular change idea will help address the problem and achieve a desired aim. CI teams often use driver diagrams to articulate the theory of practice improvement in a way that team members can readily discuss and agree upon. Developing a driver diagram to visually represent a team's theory of practice improvement—where the identified drivers clearly relate to the team's aim—can help a team focus on change ideas with greater potential to achieve the desired aim.

**In about half of the NSI, all schools developed a theory of practice improvement, and almost all of these schools developed a driver diagram that clearly related to the aim (Exhibit 10).** This pattern is supported by intermediary interviews, where about half of the NSI (14 of 25) reported that teams developed a driver diagram. Our artifact analysis indicates that in the remaining half of NSI, some schools developed driver diagrams or a theory of practice improvement and some did not. In a few NSI, none of the schools developed driver diagrams or theories of practice improvement. Schools without evidence of these activities may not have developed a theory of practice improvement or a driver diagram, may have developed driver diagrams that did not clearly relate to the aim, or may have developed driver diagrams in previous school years.[10] In fact, intermediary interviews revealed that about one-third of NSI (7 of 25) reported that teams developed a driver diagram in a previous school year.

**Exhibit 10. Number of NSI in Which Schools Had Evidence of a Theory of Practice Improvement or Driver Diagram**

| District/school specific | Yes | No | Varied between schools within NSI |
|---|---|---|---|
| Theory of practice improvement | 11 | 2 | 12 |
| Driver diagram that relates to aim | 11 | 4 | 10 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 25. The count of NSI includes all NSI with at least one school with artifacts.

**Although we might expect selected change ideas to derive from drivers, fewer than three out of five schools (58 percent) chose change ideas in this way.** This is consistent with results from a formative evaluation of the first two years of NSI implementation (Kinlaw et al. 2020), which showed that five of the nine networks studied did not connect cycle results to the network's theory of improvement.

There is some evidence that the extent to which change ideas were derived from drivers varied by entry point. Fewer than half of schools in EWR NSI had evidence of change ideas that were clearly derived from drivers. A larger portion of schools in instructional and WMPS NSI had evidence of change ideas that were clearly derived from drivers (Exhibit 11).[11]

**Exhibit 11. Percentage of Schools with Evidence of Change Ideas that Derive from Drivers, by Entry Point**

| Entry point | EWR | Instructional | WMPS | % variation between NSI |
|---|---|---|---|---|
| ***N* of NSI** | **8** | **13** | **4** | |
| ***N* of schools** | **111** | **175** | **143** | |
| | **Mean** | **Mean** | **Mean** | |
| Change ideas derive from drivers | 47% | 59% | 74% | 90% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note*. The number of NSI equals 25. Analyses are based on school-level data. The *N* includes all schools with artifacts. The mean is the equally weighted mean of the percentages for the NSI included in the analysis. The percentage variation between NSI is the intraclass correlation coefficient (ICC) from a null two-level model, with the school as the unit of analysis.

### *Disciplined Inquiry Cycles*[12]

As stated earlier, a key underlying premise of CI is that improvement involves an iterative inquiry process in which ideas are perfected through repeated feedback. However, the specific approach to inquiry can take different forms. Schools may adopt the PDSA model, in which cycles are planned individually or iteratively, with each designed to build on the lessons of a prior cycle. Other schools may engage in cycles as part of a longer term arc, gathering data periodically to assess progress toward a semester- or year-long goal, but not necessarily to test and improve specific change ideas iteratively. In addition to examining artifacts containing evidence of inquiry cycle work, we interviewed representatives from each intermediary about their overall approach to conducting CI.

**Interviews with intermediaries indicate that most NSI categorized their approach to engaging in CI as supporting school teams to implement cycles that teams planned one at a time, using a standard framework such as the four-phase PDSA model (Exhibit 12).** We refer to such

cycles as individually planned, as opposed to setting a semester- or year-long goal at the beginning of the school year and periodically checking progress toward the goal. Intermediary interview data indicated that all instructional NSI (13 of 13) school teams implemented individually planned cycles. There was more variation in how EWR and WMPS NSI categorized their approach to CI. One possible explanation for this is that instructional NSI test instructional routines that can be implemented and tested in a few lessons, and possibly even a single lesson. In contrast, EWR and WMPS NSI may focus on outcomes that can only be assessed at the end of a semester or year—for example, grading policy or college applications. See Box 6 for examples of approaches to engaging in CI from intermediary interviews.

**Exhibit 12. NSI Approach to Engaging in CI, by Entry Point**

| Approach | Definitions | EWR | Instructional | WMPS |
|---|---|---|---|---|
| **Individually planned** | In each cycle, CI teams plan a specific change idea to test; implement the practice specified in the change idea; gather data on the practice; examine data to assess whether the practice worked; and then adopt, adapt, or abandon the change idea. Ideas are typically tested over a sequence of cycles. | 5 | 13 | 2 |
| **Long-term arc** | **Goal setting.** CI teams set an end-of-semester or end-of-year goal, establish a plan to meet the goal, and then assess progress toward the goal over the identified time frame. | 2 | 0 | 2 |
| | **Regularly gather and assess data.** CI teams regularly gather and assess data to identify students who need specified support(s), provide services to those students, and reassess data to determine how those students progress. | 1 | 0 | 0 |

*Source.* Intermediary interviews from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).

**BOX 6. EXAMPLES OF APPROACHES TO ENGAGING IN CI**

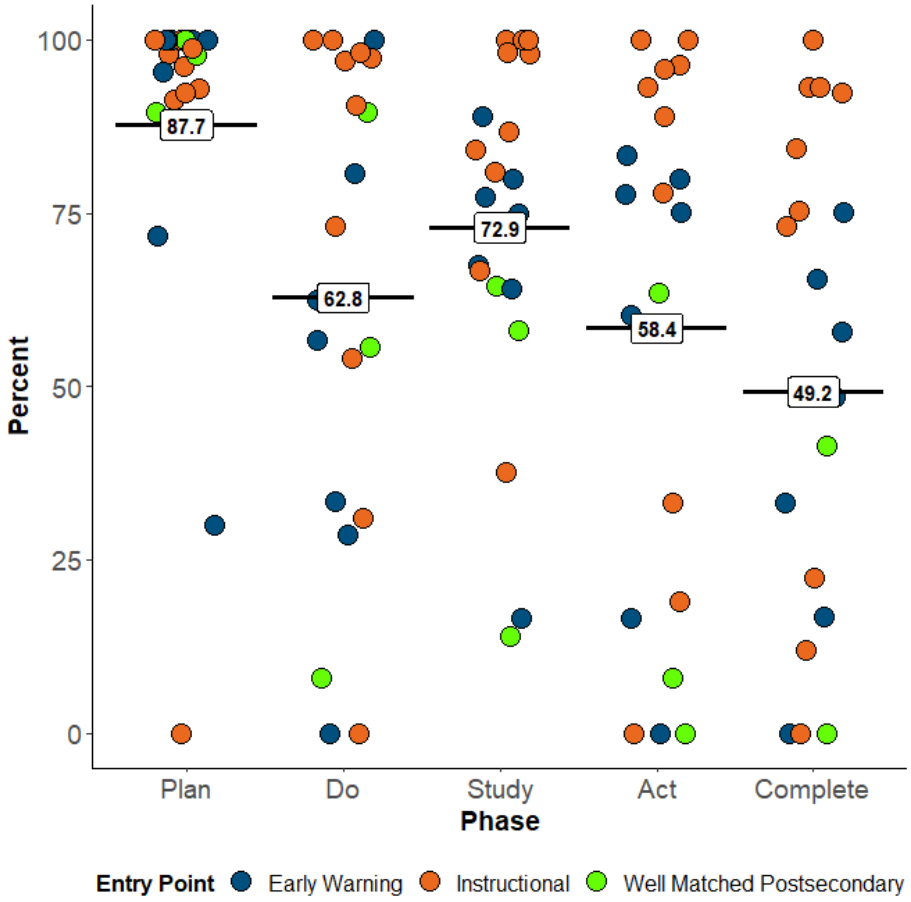
- **Example of short iterative inquiry cycles.** A lead from one Cohort 3 NSI described in an intermediary interview how CI teams tested out a math language routine using PDSA cycles. "[Teams tested the routine] for a week, they collected data, and we were able to examine how the routine took shape and took place, and then also what came out of it. They had some opportunities to make some predictions and compare the predictions to the actual outcome."
- **Example of a long-term arc.** One Cohort 2 NSI initiated the process by setting goals during convenings related to Free Application for Federal Student Aid (FAFSA) completion. The teams then worked toward their goal and maintained a data-tracking spreadsheet. Teams tracked progress toward meeting their goal and conducted run chart analyses with support from intermediary staff. Finally, teams discussed progress toward their goal and identified a plan for moving forward.

*Source*. Intermediary interviews from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).

**Consistent with the results of the intermediary interviews, data based on artifacts indicate that the majority of NSI (10 of 18) planned cycles individually rather than as part of a longer arc.** In just two NSI, school teams primarily planned cycles as part of a long-term arc. In one-third of NSI (6 of 18), schools within the NSI varied; some planned cycles individually while others planned cycles as part of a long-term arc.

**Cycles differed in whether they included Plan, Do, Study, and Act phases (Exhibit 13).** Although many NSI engaged in inquiry cycles, the artifacts for many cycles did not show evidence of all four phases. The percentage of cycles exhibiting PDSA phases, as well as the percentage of cycles that were complete (incorporating all four phases), showed substantial variation across NSI. We do not have clear evidence of why some cycles were incomplete. Incomplete cycles could arise in artifact data if teams completed phases without documenting them, or if artifacts were generated but not shared with us. Alternatively, cycles could have been launched and not completed, or artifacts could span multiple cycles, making it difficult to assess which phases occurred. For example, a CI team may have planned its second cycle concurrently with the Act phase of its first cycle, making it appear from artifacts that one of those phases did not occur. Some phases may also have been easier for teams to document. On average, Plan phase activities were the most likely to be documented within cycles, followed by Study phase activities. Act phase activities were least likely to be documented within cycles.

### Exhibit 13. Percentage of Cycles with Each PDSA Phase, by NSI




*Source*. Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 20. Analyses are based on cycle-level data. The analysis includes all schools with evidence of at least one cycle and excludes NSI with no schools that engaged in cycles. Five NSI for which fewer than three schools have cycle data were excluded from the analysis. The percentage for each school is calculated as the equally weighted mean of the cycles within the school with evidence of a particular phase. The percentage for each NSI is the equally weighted mean of each school's percentage within the NSI, represented by individual points for each phase. Finally, the reported mean is the equally weighted mean of each NSI, represented by a horizontal black line within each phase.

**Among cycles with evidence of an Act phase, CI teams most commonly tested change ideas again with slight modifications; abandoning an idea completely was quite rare (Exhibit 14).**

**Exhibit 14. Percentage of Cycles with Evidence of Abandoning, Modifying, or Adopting Change Idea during the Act Phase, by Entry Point**

| Entry point | EWR | Instructional | WMPS | % variation between NSI | % variation between schools |
|---|---|---|---|---|---|
| N of NSI | 6 | 7 | 2 | | |
| N of schools | 33 | 68 | 38 | | |
| The idea was … | Mean | Mean | Mean | | |
| **Slightly modified and tested again** | 57% | 71% | 59% | 42% | 11% |
| **Significantly modified and tested again** | 3% | 10% | 23% | 32% | 7% |
| **Accepted and adopted more widely** | 40% | 15% | 17% | 15% | 14% |
| **Abandoned** | 0% | 4% | 0% | 14% | 73% |

*Source*. Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 15. Analyses are based on cycle-level data. *N* includes all schools with artifacts showing evidence of an Act phase. The percentage for each school is calculated as the equally weighted mean of the cycles within a school with evidence of an Act phase. The percentage for each NSI is calculated as the equally weighted mean of each school's percentage within an NSI by entry point. The percentage of variation between NSI and between schools within NSI is based on the ICCs from a null three-level model, with cycles as the unit of analysis and with cycles nested in schools.

Boxes 7 and 8 describe specific examples from case study schools of CI teams adapting and adopting change ideas.

### BOX 7. EXAMPLE OF CI TEAM MEMBERS ADAPTING A CHANGE IDEA BY MAKING SLIGHT MODIFICATIONS

The NSI's CI coach provided CI team members with a reading fluency protocol. One teacher had been testing various iterations of the protocol for two years. Every two weeks, the teacher met with the intermediary and other teachers in the network to discuss how things were going. Further adaptations were made to the fluency protocol based on students' particular needs and progress, such as placing the writing rubric in a clearly visible location rather than in a folder, or changing the materials that students used. The teacher tried each adaptation for two weeks and monitored student progress, continuing to adapt the fluency protocol to reflect students' needs.

*Source*. Case studies from 2022-23.

### BOX 8. EXAMPLE OF CI TEAM MEMBERS ADOPTING A CHANGE IDEA

Survey data showed that students were uncomfortable sharing their responses or ideas with the whole class. The CI team implemented a change idea to try to increase student participation in classroom discussion. Students' responses to post-change surveys indicated that they were more comfortable sharing with the whole class after participating in the activity a few times. Recognizing that the change idea was effective in addressing the problem, the team stopped testing the idea and adopted it as necessary.

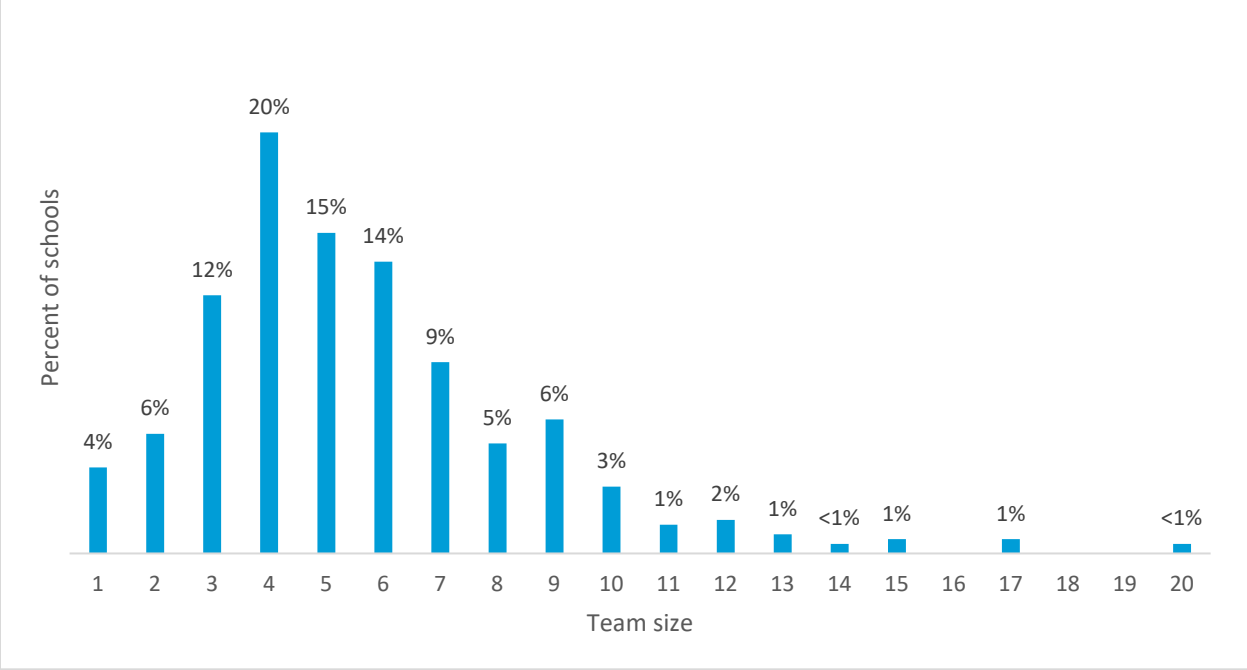
*Source*. Case studies from 2022-23.

### *Teams*

In almost all NSI, CI work was led by school-level CI teams, including teachers, administrators, other school staff, and, in some cases, students. Several team-level characteristics may be related to team effectiveness. For example, larger teams may have more capacity than smaller teams, teams with stable membership may be better able to engage in long-term learning, and teams that meet more frequently may be better able to engage in rapid cycle improvement. We also examined the roles of CI team members and whether members represented different organizational levels (e.g., school level versus district level).

**The majority of CI teams had between three and seven members.** More than two-thirds of teams (70 percent) had between three and seven members, with four members being the most common (20 percent). Just 10 percent of school teams had fewer than three members, while approximately 9 percent of teams had 10 or more members (Exhibit 15).

### Exhibit 15. CI Team Size, as Measured in Spring 2022 (Cohort 1B/2) or Spring 2023 (Cohorts 1 and 3)




*Source.* NSI school and staff rosters, as collected by the RQ1 team. Analysis includes 445 schools in 25 NSI.

**CI teams generally had stable membership over the course of a single school year.** Nearly 90 percent of CI team members served on the team in both the fall and spring of a school year. However, teams experienced more turnover between school years. Approximately 60 percent of team members who were present in spring 2022 were also present in spring 2023 (Exhibit 16).

### Exhibit 16. CI Team Stability

| | *N* of NSI | *N* of schools | Mean | % variation between NSI |
|---|---|---|---|---|
| **Percentage of CI team members on team for both fall and spring** | 25 | 445 | 87% | 52% |
| **Percentage of CI team members serving in spring 2023 who also served in spring 2022** | 15 | 220 | 60% | 36% |

*Source.* NSI school and staff rosters, as collected by the RQ1 team.
*Note. N* includes all schools that provided a roster. Roster data for the cross-year stability analysis were available only for schools present in 2022-23. Because the main results for Cohort 1B/2 were for 2021-22, we excluded those cohorts from the cross-year analysis. The mean is the equally weighted mean of the percentages for the NSI included in the analysis. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

**CI teams varied considerably in how frequently they met, ranging from weekly to quarterly to a few times a year (Exhibit 17).** For more than one third of the teams, the artifacts did not permit us to determine whether teams had a regular meeting time. Among schools with evidence of a regular meeting time, the most common meeting frequency was monthly. Few teams met less than once per month.

### Exhibit 17. Frequency of Team Meetings Based on Artifact Evidence

| | All cohorts | |
|---|---|---|
| ***N* of NSI** | **25** | |
| ***N* of schools** | **429** | |
| | **Mean** | **% variation between NSI** |
| **Weekly or more often** | 10% | 82% |
| **Biweekly** | 11% | 67% |
| **Monthly** | 28% | 82% |
| **Bimonthly** | 2% | 34% |
| **Quarterly** | 3% | Φ |
| **Two or three times a year** | 5% | Φ |
| **Annually** | 1% | 47% |
| **No evidence of a regular meeting time** | 41% | 78% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note. N* includes all schools with artifact evidence relating to teams. The mean is the equally weighted mean of the percentages for the NSI included in the analysis. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis. Φ indicates that the percentage of the variation between NSI could not be estimated because the variance between was too close to 100 percent, or the overall percent of schools with the attribute shown was too close to zero or 100 percent.

## *Use of Data*

CI teams are expected to draw on data during various CI activities, including when conducting root cause analyses or setting aims, developing driver diagrams, and, most importantly, conducting inquiry cycles. We examined the use of all types of data, including both quantitative and qualitative data used in any aspect of the CI process, such as the root cause analyses and inquiry cycles.

**Artifacts show that a substantial majority of teams used data in their CI work.** All school teams in WMPS NSI made use of some form of data at some point in the CI process. Most of the schools in the EWR and instructional NSI also used data, with three-quarters of schools in EWR NSI and 86 percent of schools in instructional NSI using data. Many NSI provided at least some schools with a common form for collecting data, and more than one-third of NSI provided all of

their schools with a common form for collecting data (Exhibit 18). Schools within six NSI did not use a common form for collecting data across their schools.

### Exhibit 18. Number of NSI in Which Schools Use a Common Form for Data Collection

| Used a common form provided by the NSI | Did not use a common form | Varied between schools within NSI |
|---|---|---|
| 8 | 6 | 8 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 22. The count of NSI includes all NSI with at least one school with evidence of using data to inform their work.

Although we would expect to see data used throughout the CI process, use of data is particularly central to studying results generated during inquiry cycles. We looked for evidence of data collection and/or use for two types of data: cycle implementation data (e.g., describing CI teams' actions) and cycle outcome data (e.g., describing what happened, such as a measure of student learning or attendance, or teacher notes from check-in conversations with students).

**Schools used various types of data in the Study phase (Exhibit 19).** Schools used cycle implementation data most often (31 percent of cycles). Schools used data relating to cycle outcomes in 26 percent of cycles and used both types of data in 19 percent of cycles.

### Exhibit 19. Percentage of Cycles in Which Teams Used Data in the Study Phase

| | All cohorts | |
|---|---|---|
| ***N* of NSI** | **19** | |
| ***N* of schools** | **198** | |
| | **Mean** | **% variation between NSI** |
| **Cycle implementation data** | 31% | 53% |
| **Cycle outcome data** | 26% | 25% |
| **Both types of data** | 19% | 47% |
| **None** | 24% | 28% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* Analyses are based on cycle-level data. *N* includes all cycles with artifacts showing evidence of a Study phase. The percentage for each school is calculated as the equally weighted mean of the cycles within a school with evidence of a particular phase. The percentage for each NSI is calculated as the equally weighted mean of each school's percentage within an NSI. The mean is the equally weighted mean of the percentages for the NSI included in the analysis.

We also examined the specific data types used by teams during the Study phase. Student activity data (i.e., data on student behavior or actions not related to academic work, such as attendance or FAFSA completion) were the most common type of data used by all teams.

However, use of these data was notably more common among CI teams in WMPS NSI, which used such data in 80 percent of cycles, than among schools in EWR or instructional NSI (Exhibit 20). Another data type commonly used in instructional NSI was student voice data, used in 36 percent of cycles and represented by student self-efficacy scales and other data collected from students, such as surveys or interviews. See Box 9 for examples of data types used by CI teams in case study schools.

### Exhibit 20. Percentage of Cycles in Which Teams Used Specific Types of Data in the Study Phase, by Entry Point

| Entry point | EWR | Instructional | WMPS | % variation between NSI | % variation between schools |
|---|---|---|---|---|---|
| ***N* of NSI** | **7** | **10** | **3** | | |
| ***N* of schools** | **45** | **91** | **49** | | |
| | **Mean** | **Mean** | **Mean** | | |
| **Student activity data (e.g., attendance rate, FAFSA completion)** | 27% | 30% | 80% | 55% | 33% |
| **Observations of students** | 25% | 18% | 16% | 55% | 29% |
| **Student test score results (teacher- or school-developed)** | 15% | 11% | 0% | 57% | 26% |
| **Student test score results (externally developed—e.g., state tests)** | 5% | 3% | 0% | Φ | 74% |
| **Student work samples (e.g., data related to homework)** | 2% | 11% | 0% | Φ | 90% |
| **Student self-efficacy scales** | 0% | 6% | 8% | 9% | 63% |
| **Other data collected from students (e.g., surveys or interviews of students not specifically connected to in-class work)** | 19% | 30% | 14% | 17% | 60% |
| **Teacher self-efficacy scales** | 1% | 4% | 0% | 14% | 53% |
| **Data relating to families** | 7% | 0% | 9% | 45% | 47% |
| **Fidelity of implementation scales** | 3% | 8% | 0% | 86% | 10% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* Analyses are based on cycle-level data. *N* includes all schools with artifacts showing evidence that data were used and/or collected as part of a Study phase in at least one cycle. The percentage for each school is calculated as the equally weighted mean of the cycles within a school with evidence of a change idea. The percentage for each NSI is calculated as the equally weighted mean of each school within an NSI. The percentage for each entry point is the equally weighted mean of the percentages for the NSI included in the analysis. The percentage of variation between NSI and between schools within NSI is based on the ICCs from a null three-level model, with the cycles as the unit of analysis and cycles nested in schools. Φ indicates that the percentage of the variation between NSI could not be estimated because the variance between was too close to 100 percent, or the overall percent of schools with the attribute shown was too close to zero or 100 percent.

### BOX 9. EXAMPLES OF DATA USED BY CI TEAMS

The case study team found that CI teams collected and used the following types of data:

- **Student test scores.** One team used biweekly vocabulary quizzes to determine whether student knowledge was increasing.
- **Student activity data.** One team tracked FAFSA completion rates via the intermediary dashboard. Another collected data about student attendance at an afterschool program.
- **Student self-efficacy scales.** One team conducted a survey asking students what would help them succeed in math class. The team implemented the change idea multiple times, following up with a post-change survey after each round.

*Source.* Case studies from 2022-23.

## What Change Ideas Do Schools Select for Testing and Implementation as Part of CI?

Inquiry cycles are designed to test and improve specific change ideas, and thus selecting a change idea is a key part of the Plan phase of an inquiry cycle. Our analyses examined multiple aspects of choosing a change idea, including the topic, the scale (i.e., the number of students and classrooms involved), and the focal group (e.g., Black or Latino students or students experiencing poverty).

**In most schools with evidence of at least one Plan phase as part of an inquiry cycle (86 percent), a change idea or intervention was selected for testing.** Some teams engaged in the Plan phase of inquiry cycles without clearly specifying the change idea being tested. Often, these teams engaged in goal setting without specifying how the goal would be reached. We coded these situations as "no evidence of a change idea."

**There is evidence that most NSI guided CI teams through the change idea selection process and that almost all teams had some flexibility to adjust change ideas.** In interviews with intermediary staff, 22 of 25 NSI reported that CI teams selected change ideas with at least some guidance from the NSI. Artifacts corroborate the interview data, indicating that CI teams commonly selected change ideas from a predetermined list prepared by the NSI (Exhibit 21).

### Exhibit 21. Number of NSI by CI Team Role in the Creation of Change Ideas to Implement in Inquiry Cycles

| CI team created themselves | CI team selected from a list created by the network or intermediary | Other | Varied between schools within NSI |
|---|---|---|---|
| 5 | 10 | 1 | 3 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 19. The count of NSI includes all NSI with at least one school for which the coding team could determine how CI teams created their change ideas.

However, CI teams almost always adjusted change ideas to suit their local contexts. According to evidence from artifacts, in nearly all schools in which change ideas were created by someone who was *not* on the CI team, team members typically altered change ideas before implementing them. Very few of the change ideas (less than 5 percent) were "branded interventions"—that is, interventions developed outside the network.

We found that the CI team lead played a large role in selecting change ideas to test. In eight NSI, the team lead in every school in the NSI selected the change ideas to test (Exhibit 22). In seven other NSI, the selection process varied across schools, but the team lead selected the ideas to test in some schools within the NSI. In one NSI, change ideas were typically selected by the CI team (i.e., the team members as a group). In another, the selection process varied by cycle.

### Exhibit 22. Number of NSI by CI Team Role in the Selection of Change Ideas to Test in Inquiry Cycles

| Always selected by CI team lead | Always selected by team | Varied by cycle | Varied between schools within NSI |
|---|---|---|---|
| 8 | 1 | 1 | 7 |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* The number of NSI equals 17. The count of NSI includes all NSI with at least one school for which the coding team could determine how CI teams selected their change ideas.

To understand the focus of change ideas, we classified each change idea into topics based on a taxonomy developed by the foundation. See Box 10 for examples of change ideas related to various topics. See Appendix A for full definitions of each change idea topic area.

### BOX 10. EXAMPLES OF CHANGE IDEAS SELECTED IN CASE STUDY SCHOOLS

- **Shifting pedagogic practice.** To help students become more comfortable speaking up in math class, one CI team introduced the Four Corners activity, which is an active learning technique. Students are asked a question with four different options as answers. Each corner of the classroom represents one of the answer options. Students go to the corner that has the answer they most agree with and talk to other students with similar or the same responses. Team members first conducted the exercise with questions unrelated to math. As the students became more comfortable with the process, they moved on to discussing math topics.
- **Academic advising and tutoring.** Another CI team implemented an extended day program. This program offered ninth-grade students time after school to catch up on work they had missed.
- **College access and affordability.** During the previous school year, CI team members noticed that it took too much time to meet with students one on one to help them complete college applications. In response, they decided to meet with small groups of seniors, based on the belief that grouping students with similar goals and academic standing would be more efficient, because they would likely have similar questions.

*Source.* Case studies from 2022-23.

**In general, change idea topics varied considerably by entry point (Exhibit 23).** Schools in EWR NSI selected a variety of different change idea topics. Most of these school teams chose change ideas that focused on building relationships between adults and students; still, teams selected these types of change ideas in fewer than a quarter of cycles (22 percent). In schools in instructional NSI, teams selected change ideas related to shifts in pedagogic (instructional) practices for more than half of the cycles tested (58 percent). In schools in WMPS NSI, more than three-quarters of change ideas related to college access and affordability (79 percent). In these schools, a smaller number of cycles tested change ideas focused on college-going culture (16 percent); no other change idea topic was selected in more than 3 percent of cycles. Certain change idea topics, notably social-emotional learning and family connections, were rarely selected by any school team in any NSI, regardless of entry point.

**Exhibit 23. Percentage of Change Ideas Focused on Specific Topics, by Entry Point**

| Entry point | EWR | Instructional | WMPS | % variation between NSI | % variation between schools |
|---|---|---|---|---|---|
| *N* of NSI | 7 | 9 | 3 | | |
| *N* of schools | 54 | 99 | 92 | | |
| | Mean | Mean | Mean | | |
| **Shifts to pedagogic practices** | 12% | 58% | 3% | 73% | 16% |
| **Changes in classroom culture** | 16% | 12% | <1% | 58% | 25% |
| **Curricular changes** | 0% | 7% | 0% | 34% | 44% |
| **Adult–student relationships and school culture** | 22% | 4% | 1% | 56% | 4% |
| **Identifying students in need of academic support** | 13% | 7% | 0% | 72% | 0% |
| **Academic advising and tutoring** | 13% | 5% | <1% | 47% | 35% |
| **Social-emotional learning** | 0% | 1% | 0% | Φ | Φ |
| **Family connections** | <1% | 0% | 0% | 0% | 77% |
| **College access and affordability** | 4% | 0% | 79% | 98% | 0% |
| **College-going culture** | 2% | 0% | 16% | 72% | 0% |
| **School systems and policies** | 9% | 3% | <1% | 59% | 6% |
| **Other** | 8% | 4% | 0% | 41% | 34% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* Analyses are based on cycle-level data. *N* includes all schools with artifacts showing evidence that a change idea was selected as part of a Plan phase in at least one cycle and in which the change idea topic could be determined. The percentage for each school is calculated as the equally weighted mean of the cycles within a school with evidence of a change idea. The percentage for each NSI is calculated as the equally weighted mean of each school's percentage within the NSI. The percentage for each entry point is calculated as the equally weighted mean of each NSI's percentage within an entry point. The percentage of variation between NSI and between schools within NSI is based on the ICCs from a null three-level model, with cycles as the unit of analysis and cycles nested in schools. Φ indicates that the percentage of the variation between NSI could not be estimated because the variance between was too close to 100 percent, or the overall percent of schools with the attribute shown was too close to zero or 100 percent.

In addition to varying by topic, inquiry cycles ranged from focusing on a single student or a few students in one or a few classrooms to focusing on all students in a grade level, school, or district. To examine the focal scale of the change effort tested, we examined whether change ideas focused on subsets of students and whether they focused on specific populations of students (e.g., Black or Latino students or students experiencing poverty).

**School CI teams from instructional NSI were more likely to test change ideas with smaller groups of students than school CI teams from EWR or WMPS NSI, which often tested change ideas with all students within a grade (Exhibit 24).** Schools in EWR and WMPS NSI most commonly tested change ideas for all students within a grade (28 percent of cycles among schools in EWR NSI and 59 percent of cycles among schools in WMPS NSI). In contrast, in schools in instructional NSI, about a quarter of change ideas focused on a specific classroom (23 percent) and just under a quarter focused on a small group of students within a class (17 percent). Change ideas rarely focused on an individual student or all students within the network or district.

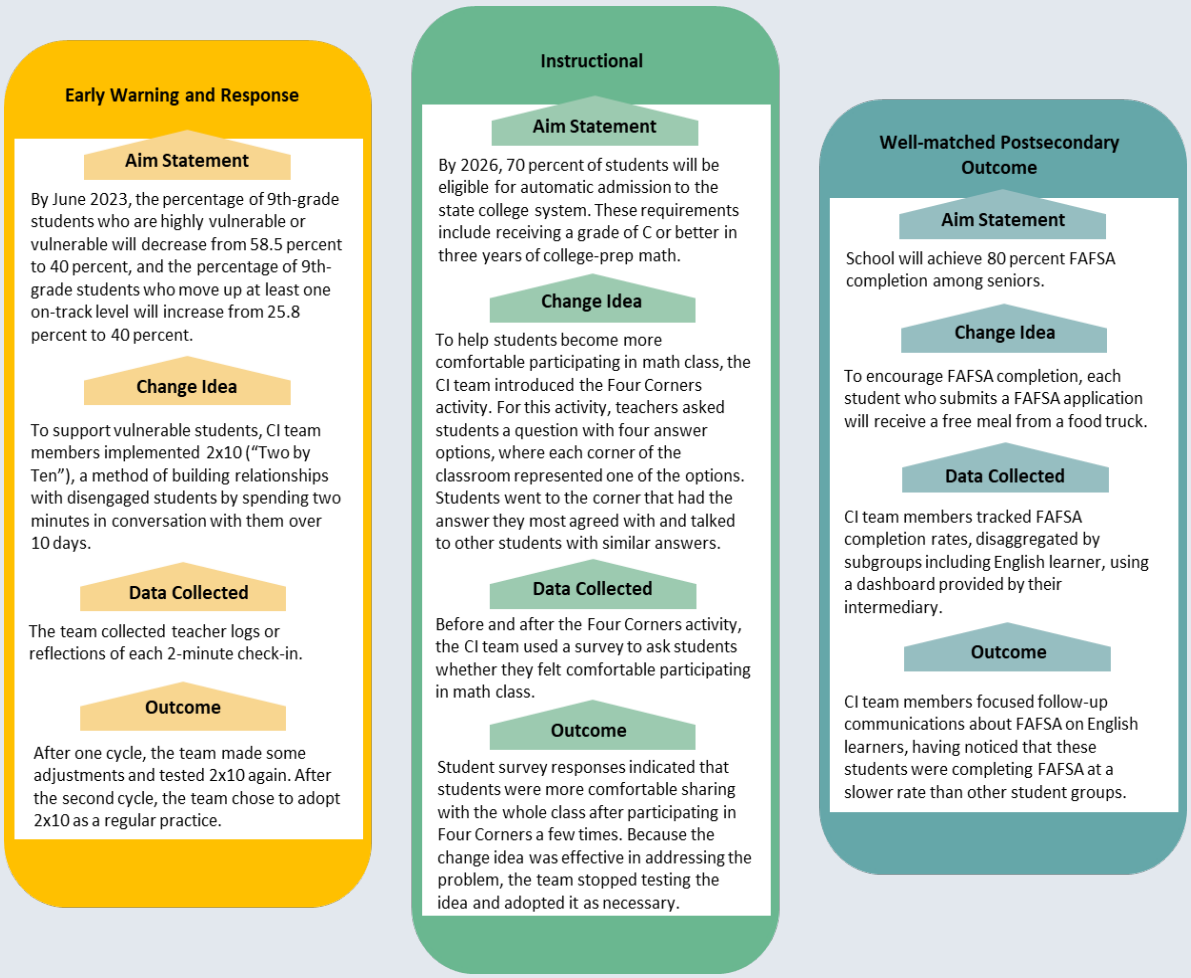
### Exhibit 24. Percentage of Cycles in Which the Change Idea Had a Particular Scale, by Entry Point

| Entry point | EWR | Instructional | WMPS | % variation between NSI | % variation between schools |
|---|---|---|---|---|---|
| ***N* of NSI** | **7** | **9** | **3** | | |
| ***N* of schools** | **55** | **100** | **92** | | |
| | **Mean** | **Mean** | **Mean** | | |
| **An individual student** | 4% | 2% | 0% | Φ | Φ |
| **A subset of students within a class** | 3% | 17% | 2% | 49% | 40% |
| **A subset of students within a grade** | 20% | 11% | 27% | 36% | 27% |
| **All students within a class** | 20% | 23% | 4% | 57% | 26% |
| **All students within a grade** | 28% | 9% | 59% | Φ | Φ |
| **A subset of students across grades but within a school** | 9% | 16% | 6% | 24% | 29% |
| **All students in a school** | 8% | 11% | 1% | 64% | 10% |
| **All students in a network or district** | 2% | 0% | 0% | 68% | Φ |
| **Other** | 6% | 12% | 2% | 46% | Φ |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note.* Analyses are based on cycle-level data. *N* includes all schools with artifacts showing evidence that a change idea was selected as part of a Plan phase in at least one cycle and in which the change idea granularity could be determined. The percentage is calculated as the equally weighted mean of the cycles within a school with evidence of a change idea, followed by taking the equally weighted mean of each school's percentage within an NSI, and then taking the equally weighted mean of each NSI's percentage within an entry point. The percentage of variation between NSI and between schools within NSI is based on the ICCs from a null three-level model, with cycles as the unit of analysis and cycles nested in schools. Φ indicates that the percentage of the variation between NSI could not be estimated because the variance between was too close to 100 percent, or the overall percent of schools with the attribute shown was too close to zero or 100 percent. For almost all cycles coded as "Other," the grain size was unclear.

The discussion above focused separately on each core parameter of CI (e.g., developing an aim statement, engaging in inquiry cycles to test a change idea, using data). To illustrate how these components fit together in CI work, Box 11 illustrates CI activities for three NSI schools, each working with a different NSI focused on one of the three entry points. These examples provide an indication of the range of CI activities that occurred in NSI schools.

## BOX 11. EXAMPLES OF CI ACTIVITIES IN NSI SCHOOLS, BY ENTRY POINT




*Source*. Case studies and artifacts from 2022-23.

**Overall, there is limited evidence from artifact analysis that CI teams explicitly selected Black students, Latino students, or students experiencing poverty as the focus of their change ideas.** Six percent of change ideas focused on Black students, 8 percent focused on Latino students, and 3 percent focused on students experiencing poverty. Because most NSI schools enroll high percentages of students in these groups, CI teams may not have believed that it was necessary to document the selection of these subgroups of focal students. In the next section,

we examine other ways in which CI teams explicitly focused on Black students, Latino students, or students experiencing poverty.

## To What Extent Do CI Teams Explicitly Focus on Improving Outcomes for Black Students, Latino Students, or Students Experiencing Poverty?

The NSI initiative was designed to improve outcomes for Black students, Latino students, and students experiencing poverty. Artifact evidence of attention to equity in the CI process varied among NSI, from a general focus on improving outcomes for all students to a much more specific focus on addressing systemic inequities in schools so that Black students, Latino students, and students experiencing poverty, specifically, had increased opportunity and improved outcomes.

We examined the extent to which individual school CI teams focused on equity in various core components of the CI process, including conducting a root cause analysis, developing an aim statement, and establishing a theory of practice improvement and related driver diagrams. As one way of assessing the focus on equity, we examined the specificity of the focus. Namely, we examined whether attention to equity was part of a general focus on improved outcomes, specific attention to underserved groups, or specific attention to underserved groups coupled with explicit reference to a theory of action.[13]

**More than half of the schools that engaged in root cause analysis showed evidence of attention to equity in their work, either as part of a general focus on improving outcomes for all students or by giving specific attention to underserved groups (Exhibit 25).** In about 40 percent of the schools that engaged in a root cause analysis, there was no explicit attention to equity issues in their root cause analysis documentation.

**Exhibit 25. Percentage of Schools Giving Specific Types of Attention to Equity Issues in Root Cause Analysis**

| | All cohorts | % variation between NSI |
|---|---|---|
| ***N* of NSI** | **17** | |
| ***N* of schools** | **154** | |
| | **Mean** | |
| **Part of a general focus on improved outcomes** | 30% | 82% |
| **Specific attention to underserved groups** | 13% | 47% |
| **Specific attention to underserved groups and reference to theory of action to promote equity/justice** | 16% | 99% |
| **No evidence of explicit attention to equity** | 40% | 86% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note*. Analyses are based on cycle-level data. *N* includes all schools with evidence of a root cause analysis. The mean is the equally weighted mean of the percentages for the NSI included in the analysis. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

**Evidence of explicit attention to equity in the aim statements developed by CI teams was more common than evidence of attention to equity in root cause analyses, with most schools across all entry points showing evidence of attention to equity in their aim statements (Exhibit 26).** At least three-quarters of schools from all NSI with a clear and specific aim had aim statements with evidence of attention to equity issues. The majority of these schools had evidence of attention to specific underserved groups, without reference to a theory of action to promote equity/justice. The nature of the attention given to equity in aim statements differed by entry point. More than 40 percent of schools from instructional NSI also showed evidence of a theory of action to promote equity. About a fifth of schools in EWR NSI showed no evidence of attention to equity in their aims.

**Exhibit 26. Percentage of Schools Giving Specific Types of Attention to Equity Issues in Aim Statement, by Entry Point**

| Entry point | EWR | Instructional | WMPS | % variation between NSI |
|---|---|---|---|---|
| ***N* of NSI** | **7** | **13** | **3** | |
| ***N* of schools** | **75** | **156** | **75** | |
| | **Mean** | **Mean** | **Mean** | |
| **Part of a general focus on improved outcomes** | 17% | 8% | 33% | 85% |
| **Specific attention to underserved groups** | 56% | 41% | 64% | 95% |
| **Specific attention to underserved groups and reference to theory of action to promote equity/justice** | 6% | 43% | 1% | 99% |
| **No evidence of explicit attention to equity** | 21% | 8% | 1% | 0% |

*Source.* Artifacts from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note. N* includes all schools with evidence of a clear and specific aim. The mean is the equally weighted mean of the percentages for the NSI included in the analysis. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

In addition, we examined attention to equity, guided by a shared equity framework developed in partnership with the evaluation team focusing on Research Question 1. See Box 12 for more details on our equity framework.

## BOX 12. EQUITY FRAMEWORK FOR EVALUATION PARTNERS

To help ground our understanding of equity in CI work, the evaluation partners collaboratively developed a framework for conceptualizing equity informed by Gutiérrez (2007, 2012) and Scott (2001). Like Gutiérrez, our framework comprises four equity dimensions (access, achievement, identity, and agency). The table below illustrates how we defined each dimension and provides examples of what evidence of each dimension might look like in CI work.

| Dimension | Definition | Example of attention to equity in CI work |
|---|---|---|
| Access | Access to (a) teachers who are attentive to student needs (e.g., addressing teacher mindsets); (b) supplies for effective learning (e.g., equipment, software, materials in multiple languages); (c) a classroom environment that encourages student participation (e.g., perhaps using pedagogical tools that consider how students learn differently); and (d) support/opportunities (e.g., tutoring, afterschool programs for outside learning) | Schools and CI teams provide resources and/or opportunities to students to increase use and/or participation by Black and Latino students and those experiencing poverty (e.g., participation in advanced coursework). |
| Achievement | Enabling students to achieve traditional outcomes, including grades, test scores, course taking, graduation, and postsecondary attendance; documenting outcomes and disaggregating data to identify gaps | Schools and CI teams gather and focus on data used to identify patterns of disparity, particularly around grades and scores on standardized tests for Black and Latino students and those experiencing poverty. |
| Identity | Resources and interventions that are attentive to a student's or teacher's background and that may include personal characteristics; family and community histories; and their membership in social groups based on race, ethnicity, gender, class, status, ability, sexual orientation, religion, language, and many others<br>Identity situates education as a cultural practice in which learners can see themselves and others favorably | Schools and CI teams engage in activities designed to raise awareness of the role a person's background plays in their interactions and how one's identity (both externally and internally constructed) influences interactions with others. |
| Agency | Resources and interventions that provide students from nondominant backgrounds with increased opportunity to use their voices and express agency to challenge contemporary inequalities within and beyond school walls, with the goal of engendering structural change | Schools and CI teams implement programs and policies that work toward the transformation of identity into efficacy and toward moving students from belonging to solidarity. |

**Among NSI that had schools with a theory of practice improvement, nearly three-quarters had at least one school with evidence of attention to the *achievement* dimension of equity. The *agency* dimension of equity was the least evident in artifacts relating to a theory of practice improvement.** The dimensions of equity differed across entry points. Just over one-quarter of EWR NSI or instructional NSI showed evidence of attention to the access dimension of equity, whereas more than half of these NSI showed attention to the achievement dimension of equity. An equal number of WMPS NSI showed attention to access and achievement. Attention to agency was the least common among EWR and WMPS NSI. However, more than one-third of instructional NSI had evidence of attention to the agency dimension in their theory of practice improvement work (Exhibit 27).

**Exhibit 27. Count of NSI with At Least One School Focusing on Specific Dimensions of Equity in a Theory of Practice Improvement or a Driver Diagram, by Entry Point**

| Entry point | EWR | Instructional | WMPS |
|---|---|---|---|
| ***N* of NSI** | **7** | **11** | **3** |
| | **NSI** | **NSI** | **NSI** |
| **Access** | 2 | 2 | 2 |
| **Achievement** | 4 | 9 | 2 |
| **Identity** | 3 | 4 | 0 |
| **Agency** | 1 | 4 | 1 |

*Note.* The count of NSI includes all NSI with at least one school which the coding team could determine focused on at least one specific dimension of equity in a theory of practice improvement or a driver diagram.

## Does the Level of Implementation of Key CI Features Differ by Cohort, Entry Point, Calendar Year, or Years in the NSI?

To examine factors related to variation in CI implementation, we conducted exploratory analyses of 12 of the CI implementation measures discussed in the preceding sections. For each measure, we assessed whether implementation was related to two NSI characteristics (cohort and entry point), one school factor (years in the NSI), and school year. The sample, variable definitions, and model specifications are described in Appendix E. The full results are presented in Appendix F.

Overall, the analyses suggested that entry point and calendar year were the two characteristics most commonly related to the measures of CI implementation. In some instances, cohort and years in the NSI were significantly related to implementation, but this was less common than entry point.

With respect to entry point, the results indicate that schools in instructional and WMPS NSI initiated more cycles than schools in EWR NSI. Schools in instructional NSI were also more likely to have complete cycles, an aim statement with attention to equity, and a root cause analysis. This may reflect the nature of the change ideas on which schools in instructional NSI tended to focus. These schools often focused on instructional routines, which could be implemented in a few class sessions or a single class. This may have facilitated their ability to conduct more cycles.

Schools in WMPS NSI were more likely to have evidence of data use for CI. This may reflect the fact that schools in WMPS NSI tended to focus on outcomes such as FAFSA completion or college applications. Data on these outcomes had to be assembled and tracked to assess progress.

It is not clear why schools working with EWR NSI had lower levels of CI implementation. They may have had more difficulty implementing CI because change ideas common to EWR NSI were less familiar to schools and teachers than change ideas in the WMPS and instructional entry points.[14]

We gathered data for three calendar years: 2020-21, 2021-22, and 2022-23. Implementation of CI differed by calendar year across almost all measures of implementation. In general, in calendar year 2021-22, schools had lower levels of CI implementation compared to 2020-21 and 2022-23. One possible explanation for this is student and staff fatigue from the COVID-19 pandemic. Even as schools attempted to return to "normal" operations, they experienced increased levels of staff burnout and resignations, as well as student absenteeism and mental health concerns.[15]

These results are exploratory. Additional analyses will be conducted, and the full series of data will be presented in the final report.

## What Enabling Conditions Support Schools' Implementation of CI?

CI teams do not carry out their work in a vacuum. Their efforts to improve student outcomes may be influenced by factors such as school-level policies, procedures, and initiatives that give educators time to collaborate; school support, including professional development, coaching, and leadership support; support from intermediaries; a school culture that encourages shared decision making; a supportive climate; and systems for knowledge management. There may also be other contextual factors about the schools and districts in which CI teams operate (e.g., school size, the proportion of students who are identified as from low-income families) that enable or hinder teams' ability to engage in and drive change through CI.

In the analyses that follow, we describe the presence or absence of these key enabling conditions in NSI schools, measured in the most recent year for which we have data for each NSI (2022-23 for Cohorts 1 and 3 and 2021-22 for Cohort 1B/2). This section ends with a series

of exploratory analyses in which we examine relationships between enabling conditions and implementation of CI.

### *Planning Time*

One factor hypothesized to enable CI implementation is adequate time for CI teams to plan and meet. We assessed this through the school leader survey. Specifically, we asked school leaders to describe the amount of time allocated for educators in their schools to plan individually and meet in groups, as well as the timing and frequency of CI team meetings.

**About half of the leaders in NSI schools reported that educators in their schools had at least five hours each week for individual planning time (51 percent).** Although much of this time could be used for routine instructional tasks (e.g., lesson planning, grading), some of this individual planning time could be used to carry out CI-related activities (e.g., planning to implement a change idea, examining data, collaborating with other educators who had the same release time). Leaders in the other 49 percent of schools reported that educators had fewer than five hours per week for planning time.

Another factor that may enable schools to implement CI more effectively is having a dedicated, regular time for teams to convene. **It was not common for schools to reduce teacher workloads so that teachers could participate in the NSI (23 percent). However, approximately half of schools (48 percent) created a common time for their CI teams to meet (Exhibit 28).** These results align with the literature, which shows inconsistent availability of protected collaboration time and leadership support (Myung et al. 2020).

**Exhibit 28. Percentage of Schools Providing Meeting Times for CI**

| | *N* of NSI | *N* of schools | Mean | % variation between NSI |
|---|---|---|---|---|
| **The principal reduced teacher workloads to free up time to participate in the NSI** | 24 | 294 | 23% | 6% |
| **The school created a common planning period for staff on the team** | 24 | 298 | 48% | 13% |

*Source.* School leader survey data from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note. N* includes all schools that responded to the school leader survey and also had artifacts available for analysis; however, the number of responses to each item varied. The percentage is calculated as the equally weighted mean of each NSI's percentage. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

### *School Supports for CI Teams*

Schools can provide supports to teams in other ways that may facilitate CI implementation, including principal involvement and professional development.

**School leaders reported varied levels of involvement in their CI teams' work (Exhibit 29).** In slightly less than half of participating schools (46 percent), principals reported that they were very involved in the team's CI process, attending most CI team meetings and/or network events or actively leading or facilitating the team. Administrators' engagement with CI teams may empower teams to enact changes in the building and embed CI practices within a school's culture.

**Leaders in more than 60 percent of participating schools reported that their school provided professional development to teachers to support their CI work. A slightly lower percentage of leaders reported that the school provided targeted coaching to educators to facilitate their participation.** The professional development and coaching that schools provided to teachers may have focused on a variety of topics, including data use, specific change ideas, or issues related to equity, and it may have been provided by the intermediary, school, or district. However, we lack data on these features.

### Exhibit 29. Percentage of Schools Providing Supports for CI Teams

| | *N* of NSI | *N* of schools | Mean | % variation between NSI |
|---|---|---|---|---|
| **The school provided targeted professional development to facilitate participation in the network** | 24 | 299 | 62% | 9% |
| **The school provided targeted coaching to facilitate network participation** | 24 | 291 | 54% | 3% |
| **The principal reported being very involved in the school's CI team** | 24 | 336 | 46% | 24% |

*Source.* School leader survey data from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note*. *N* includes all schools that responded to the school leader survey and also had artifacts available for analysis; however, the number of responses to each item varied. The percentage is calculated as the equally weighted mean of each NSI's percentage. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

## *Supports from Intermediaries*

**School leaders agreed that intermediary organizations provided support for teams in using and accessing the data they needed for CI work, and that intermediaries provided schools with tools and processes that teams needed to document their CI activities.** More than 90 percent of school leaders indicated that their intermediaries provided support for teams in using and accessing needed data to carry out their CI cycles. NSI also provided CI teams with tools and processes they could use to document their NSI activities. About 68 percent of school

leaders agreed that the intermediary organization provided their schools with these tools and processes, and an additional 25 percent strongly agreed.

### *A School Culture that Encourages Shared Decision Making*

Aside from specific tools and resources, one might hypothesize that CI implementation would be facilitated by a school culture that enables stakeholders to participate in decision making.

**The majority of schools provided opportunities for parents, families, communities, and educators to participate in key decision making (Exhibit 30).** According to surveyed school leaders, slightly more than half of schools across all NSI (56 percent) provided opportunities for parents, families, and the community to participate in strategic decision making for the school. A higher percentage of principals reported that their school engaged teachers and staff in decision making (84 percent).

**Exhibit 30. Percentage of Schools Reporting Opportunities for Shared Decision Making**

| | *N* of NSI | *N* of schools | Mean | % variation between NSI |
|---|---|---|---|---|
| **School provided opportunities for parents, families, and community members to participate in the development of shared priorities and goals** | 24 | 323 | 56% | 0% |
| **School engaged all teacher and staff voices in the decision-making process** | 24 | 321 | 84% | 0% |

*Source.* School leader survey data from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).
*Note. N* includes all schools that responded to the school leader survey and also had artifacts available for analysis; however, the number of responses to each item varied. The percentage is calculated as the equally weighted mean of each NSI's percentage. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

### *Supportive School Climate*

We hypothesized that a supportive school climate would be a precondition to engage in CI. Two aspects of climate might be particularly salient: perceptions of leader effectiveness, including trust; and perceptions of collaboration.[16] Effective school leadership is required to build and sustain a positive environment for change, and inter-educator trust and willingness to work together is needed for effective collaboration.

**Schools that were selected for NSI were not very different from district averages in terms of measures of school climate, as assessed in the first year of participation (Exhibit 31).** On average, schools were 0.10 standard deviations above their district averages for teacher ratings of leader effectiveness. Schools were similar to the rest of their districts in terms of collaborative teachers, with this domain scoring 0.05 standard deviations below the district average.

**Exhibit 31. Average Measures of School Climate in Schools' First Year of Participation**

| | *N* of NSI | *N* of schools | Mean | % variation between NSI |
|---|---|---|---|---|
| **Effective leaders** | 9 | 137 | 0.10 | 0% |
| **Collaborative teachers** | 11 | 151 | -0.05 | 0% |

*Source.* Climate survey data from Chicago Public Schools, New York City Department of Education, Philadelphia City Schools, and CORE districts.
*Note. N* includes all schools that had school climate data in their first year of NSI participation and also had artifacts available for analysis. The percentage is calculated as the equally weighted mean of each NSI's average. The percentage variation between NSI is the ICC from a null two-level model, with the school as the unit of analysis.

### *Intermediary Knowledge Management Expectations*

To facilitate shared learning among CI teams in an NSI, each team is expected to document its work throughout the CI process (Russell et al. 2019; Taylor et al. 2014). CI teams typically do so by capturing meeting minutes or completing forms or templates associated with specific core components of CI work (e.g., fishbone diagrams for root cause analysis, PDSA templates for disciplined inquiry cycles). During our intermediary interviews, we asked NSI leads about the knowledge management systems that CI teams used to store documents related to their CI work. The team also asked about NSI expectations regarding how CI teams should document their work and whether those expectations had changed, from when the work started with Bill & Melinda Gates Foundation funding until now. We hypothesized that intermediaries' knowledge management expectations regarding how CI teams document their work would be an enabling condition to support their ability to implement CI practices.

**The majority of NSI (22 out of 25) provided a knowledge management system for CI teams to use to upload and/or store documentation related to their CI work.** For example, some intermediaries set up a Google Drive platform that teams could use to document their work. We found that knowledge management systems provided by intermediaries served multiple purposes. For example, some CI teams used a knowledge management system as a daily tool to conduct CI work at the team level. Others used knowledge management systems to upload CI documents based on ad hoc requests from NSI staff, or to facilitate learning across the network.

**Slightly more than half of NSI (13 of 25) described strong expectations for how CI teams should document their CI work. Almost half of NSI (12 of 25) tightened their expectations over time.** Box 13 shows definitions for the three levels of documentation used in the analysis (strong, moderate, and minimal) and provides an example of each level from the intermediary interviews. Exhibit 32 shows how those expectations changed from the start of the intermediary's NSI work with foundation funding until now. The exhibit shows that by Year 3

and Year 5, the majority of NSI indicated that they maintained strong knowledge management expectations for CI teams or had tightened their existing knowledge management expectations.

### BOX 13. NSI EXPECTATIONS FOR HOW CI TEAMS SHOULD DOCUMENT THEIR CI WORK

| Expectations for documentation | Examples from intermediary interviews, including quotes from NSI leads |
|---|---|
| **Strong expectations:** NSI expects CI teams to document their CI work using NSI-developed or NSI-provided templates. | A Cohort 1B NSI expects teams to use NSI-created slide decks and templates to document CI work. However, NSI staff understand that not all teams will fill out these templates in the same way:<br>"We would give them a slide deck and then they would enter their information, like their problem, how they refined their problem statement. Next time they could come back with their fish bone diagram, with their five whys, but we would always give them the template to be able to share out… then we would give them a worksheet, so it held the way to conduct a PDSA cycle, with the guiding questions included, with tables and ways to organize the work. We did expect them to complete that worksheet, to fill out, and then where we were moving towards, and some people were there because they'd been a part of the NSI longer, is that we were also housing that in Simple QI, a platform for organizing all of the continuous improvement work that they're doing."<br>*– Cohort 2 NSI lead* |
| **Moderate expectations:** The NSI provides teams with templates that CI teams can use to document their CI work but does not expect all teams to use these templates. | A Cohort 2 NSI expects teams to document their CI work but does not expect CI teams to document their work using NSI-created templates. For example, some teams use NSI-created documents while others use their own school's running agendas:<br>"We have told our teams that the expectation is that you do document what is happening somewhere, but it looks different across all of our schools. Some schools used the document that we shared with them when we kicked off or rolled out CI in November for this year and that is the source of where they kept their information. Some schools, in their running agendas is where they documented their progress. Some schools in our coaching meetings, in the coaching agendas with the AP is where you would see the documentation of their CI progress."<br>*– Cohort 2 NSI lead* |
| **Minimal or no expectations:** The NSI does not provide CI teams with templates or tools to document their CI work. | Cohort 2 NSI coaches document CI teams' work using an NSI-developed implementation tracker, but CI teams do not have access to this tool or do not use it:<br>"I don't know that I have expectations for how they should document their work. I think that's something that I see as being within the purview and agency of the people that we work with, how they want to keep track of things. That's not something that I have ever communicated to them that they should be tracking."<br>*– Cohort 2 NSI lead* |

*Source.* Intermediary interviews from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).

**Exhibit 32. NSI Knowledge Management Expectations for CI Teams and Change over Time**

| Expectations for knowledge management and change over time | Number of NSI |
|---|---|
| **Strong expectations; tightened expectations over time** | 8 |
| **Strong expectations; no change over time** | 4 |
| **Moderate expectations; tightened expectations over time** | 4 |
| **Minimal expectations; loosened expectations over time** | 4 |
| **Moderate expectations; loosened expectations over time** | 3 |
| **No data** | 2 |
| **Total** | 25 |

*Source.* Intermediary interviews from 2021-22 (Cohort 1B/2) and 2022-23 (Cohorts 1 and 3).

### *Relationship Between Enabling Conditions and CI Implementation*

We estimated a series of preliminary multilevel regression models in which we examined the relationship between enabling conditions and school-level implementation of CI. These analyses did not yield many statistically significant results. (See Appendix E for the methods and Appendix F for the results.) The analyses we have completed so far focused on the latest year of data for the schools working with each NSI, and the sample was generally restricted to schools that provided artifact data and responded to the school leader survey.[17] In addition, the analyses focus on the relationship between individual enabling conditions and measures of implementation. We are continuing to delve into these relationships, and we plan to conduct analyses involving multiple years of data and multiple indicators of enabling conditions and implementation. These analyses will be discussed in our final report (expected in early 2026).

## Summary and Looking Ahead

This report provides an initial look at how and to what extent schools participating in NSI implement CI activities, and how school conditions are related to implementation. School teams participating in NSI are expected to engage in activities that reflect the six core parameters of CI, as defined by the Bill & Melinda Gates Foundation and informed by the Carnegie Foundation for the Advancement of Teaching. We found that most NSI schools engaged in at least some aspects of the CI process. We also found substantial variation in how (and to what extent) schools implemented many of these activities. The overall level of implementation should of course be interpreted in the context of the COVID-19 pandemic, which emerged in the early years of the initiative and has had lasting disruptive effects on schools across the country.

Thus far, we have observed that many school CI teams conducted a root cause analysis to understand the problem and developed a theory of practice improvement articulating the levers to focus on. Most schools also developed a clear and specific aim statement to guide their work and then selected a change idea to test; however, only a small majority of schools selected change ideas derived from drivers. In most NSI, school CI teams engaged in disciplined inquiry cycles—a cornerstone of CI work—though the evidence suggests that many cycles were incomplete (i.e., they did not include all four phases [PDSA]). Nearly all CI teams used data in their CI work, especially as part of the Study phase of inquiry cycles, and cycles typically resulted in teams adapting (rather than adopting or abandoning) the tested change idea. Most CI teams met weekly or monthly, though we lack evidence of a regular meeting time for more than one-third of schools.

Implementation of CI varied across NSI in nearly every regard. For example, inquiry cycles followed the PDSA model in most NSI but were part of a longer arc in some NSI (in which teams gathered data periodically to assess progress toward a semester- or year-long goal). Schools also varied in the whether they provided conditions such as planning time expected to enable the implementation of CI.

We are in the process of collecting new data from schools in Cohort 1B/2 during the 2023-24 school year, and we will collect data from schools in Cohort 3 during the 2024-25 school year. These data will include interviews with intermediaries, artifacts from participating schools, and surveys of school leaders. Drawing on these data, we will update the portrait of CI implementation provided in this report. In particular, we will extend our analyses of variation across NSI and across schools within NSI, focusing on the relationships between supports offered by NSI, school-level enabling conditions, and CI implementation. When data collection is complete, we will have three years of data for most NSI, which may facilitate analyses of whether CI implementation improves with more years of participation.

In addition, we will examine new research questions, including the following:

- To what extent is the level of CI implementation associated with school-level changes in educator practices (such as adoption and diffusion of effective interventions, diffusion of CI practices, ambitious instruction, and collaboration) and educator perceptions of collective efficacy and self-efficacy?
- To what extent do schools sustain CI after foundation funding ends? What intermediary-, network-, district-, and school-level characteristics are associated with sustainability beyond foundation funding?

# Endnotes

[1] We use the term Latino to refer to peoples of Latin American descent. While we acknowledge the use of Latinx to indicate gender inclusivity, we also understand that Latinx and other iterations (e.g., Latin@, Latine) may not be accepted by those from Latin American communities (Salinas 2020). Given this context, we use Latino because it is generally embraced by the communities that are reflected in this work without violating their sociolinguistic norms.

[2] The foundation awarded 31 grants to intermediary organizations that funded 34 individual networks. One intermediary, Partners in School Innovation, received a single grant that funded four networks. See Appendix C for a complete list of NSI intermediaries and networks.

[3] The evaluation views educational equity as providing students with resources, experiences, and environments—allocated based on circumstances and needs—so that students have equal access to opportunities for success (Thompson and Thompson 2018).

[4] The protocol used for coding artifacts can be made available upon request. See Appendix D for information about our approach to coding artifacts.

[5] See Appendix G for the survey instrument that was administered to school leaders.

[6] See Appendix G for the pre-interview form and protocol used for these interviews.

[7] See Appendix D for the case study sampling plan and Appendix G for a sample interview protocol used with stakeholders from case study schools.

[8] Evaluation resources permitted us to include only 25 of the 31 NSI in our study. The 25 NSI selected are representative of the full set in terms of cohort and outcome area.

[9] See Appendices C and D for additional details about data collection activities in each school year.

[10] Similar to the approach used in coding root cause analysis, coders marked a theory of practice improvement and/or driver diagrams as present in the year coded if the theory of practice improvement or driver diagram appeared in the artifacts for that year, regardless of whether it was created in the current year or a previous year.

[11] The analysis focuses on whether change ideas were explicitly linked to a driver, as intended according to the core parameters of CI. It is possible that, in practice, the content of the change ideas may not differ between those that are and are not linked to drivers.

[12] Pages 10–14 describe the number of cycles schools initiated and completed, by entry point.

[13] See also a discussion of attention to specific demographic groups in change ideas on page 34.

[14] As of 2014-15, only about half of schools in the country had an early warning response system. See https://www2.ed.gov/rschstat/eval/high-school/early-warning-systems-brief.pdf.

[15] See https://ies.ed.gov/schoolsurvey/spp/2022_SPP_Staffing.pdf.

[16] These two measures were derived from the Consortium on School Research's "5Essentials." See https://consortium.uchicago.edu/surveys/5Essentials-FAQs. For a discussion of the measures used in the evaluation, see Appendix D.

[17] The number of schools included in these analyses is shown in Appendix F.

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