Boosting Children's Language and Literacy Skills through Blueprint:

An Evaluation of Children's Literacy Initiative's Blueprint for Early Literacy 2017 - 2019

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About Research for Action

Research for Action (RFA) is a Philadelphia-based nonprofit organization. We seek to use research as the basis for the improvement of educational opportunities and outcomes for traditionally underserved students. Our work is designed to strengthen public schools and postsecondary institutions; to provide research-based recommendations to policymakers, practitioners, and the public at the local, state, and national levels; and to enrich the civic and community dialogue about public education. For more information, please visit our website at www.researchforaction.org.

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Executive Summary

Introduction

Children who have not learned to read by fourth grade are four times more likely to drop out of school, and this risk is even greater for low-income children.[1] In 2019, only a third of third-grade children at the School District of Philadelphia reached this important milestone, as measured by the Pennsylvania State Standardized Assessment.[2] Early language and literacy skill delays are largely due to family economic disadvantages that, to fully address, would require broad-based policies to reduce poverty.[3] Still, access to high-quality pre-K is increasingly recognized as a potential lever for preparing children disadvantaged by poverty to achieve developmentally-appropriate reading milestones as they age.[4]

Children's Literacy Initiative (CLI) aims to support the quality of pre-K environments and prepare children disadvantaged by poverty through its *Blueprint for Early Literacy* pre-K curriculum supplement teamed with workshops and individual coaching for pre-K educators. Table ES1 presents CLI's theory of action for this work.

Table ES1. Children's Literacy Initiative's support components and theory of action

IMPLEMENTATION	OUTCOMES FOR TEACHERS	OUTCOMES FOR CHILDREN
• Implementation of *Blueprint for Early Literacy* pre-K curriculum supplement • Professional development for pre-K educators through training and coaching	• Increased teacher knowledge and ability to implement effective early language and literacy instruction • Increased teacher ability to create a positive classroom culture and a literacy-rich classroom environment	• Increased engagement in language and literacy learning • Increased mastery of early literacy concepts and early language and literacy skills

About this Study

Research for Action (RFA) conducted a three-year external evaluation of this program from 2017-2019. In this study, we sought to understand CLI's impact on teachers' knowledge and ability to implement best practices for instructing language and literacy, classroom language and literacy environments, and children's engagement and skills in language and literacy. To do this, we conducted a rigorous causal impact study that employed a mixed-methods quasi-experimental research design involving 11 centers receiving CLI professional development and the *Blueprint for Early Literacy* curriculum supplement and 11 statistically similar centers serving as a comparison group. We also assessed the professional development CLI provides through training workshops and individual content-focused coaching for pre-K educators. This study draws on cross-verification of multiple methods of data collection and analysis: direct assessments of children's vocabulary, researcher observations of the classroom language and literacy environments, end-of-year teacher surveys, and interviews with CLI staff, center directors, and teachers.

1 Hernandez, Donald J (2011). "Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation." Retrieved from https://files.eric.ed.gov/fulltext/ED518818.pdf

2 School District of Philadelphia. (2020, February 10). SY 2018-19 *District Scorecard.* Retrieved January 2019 from https://www.philasd.org/performance/programsservices/school-progress-reports/district-scorecard/

3 Duncan, G. J. & Magnuson, K. A. (2005). Can family socioeconomic resources account for racial and ethnic test score gaps? *The Future of Children, 15,* 35-54.

4 Magnuson, K. A., Ruhm, C. J., & Waldfogel, J. (2004). *Does prekindergarten improve school preparation and performance?* (NBER Working Paper 10452). Cambridge, MA: National Bureau of Economic Research: https://www.nber.org/papers/w10452.pdf

Summary of Findings

Positive impacts despite higher-than-typical teacher turnover, along with teacher and center director descriptions of ease of use, suggest that CLI's early language and literacy supports are particularly well-suited for improving quality and outcomes in high-need pre-K environments.

In pre-K centers receiving CLI supports, teachers were more able to implement effective instructional practices and created richer classroom literacy environments, and children's vocabulary grew faster by an order of magnitude of two-and-a-half months, relative to teachers and children in similar pre-K centers. We observed these impacts consistently throughout the study even though year-to year teacher turnover was higher than national averages. We found that challenges associated with the high turnover inhibited consistently robust implementation of the CLI's intervention. Fewer than one in five teachers received the full intended level of support, and less than half of surveyed teachers reported implementing with fidelity all three of the key instructional approaches of the *Blueprint for Early Literacy* curriculum supplement (Message Time Plus, Intentional Read Aloud, and Power of Three). Nevertheless, despite variable dosage, the study finds statistically significant positive impacts for student learning and teacher practice.

Introduction

Children who have not learned to read by fourth grade are four times more likely to drop out of school, and this risk is even greater for low-income children.[1] In 2019, only a third of third-grade children at the School District of Philadelphia reached this important milestone, as measured by the Pennsylvania State Standardized Assessment.[2] Early language and literacy skill delays are largely due to family economic disadvantages that, to fully address, would require broad-based policies to reduce poverty.[3] Still, access to high-quality pre-K is increasingly recognized as a potential lever for preparing children disadvantaged by poverty to achieve developmentally-appropriate reading milestones as they age.[4]

There is a gap between "research-based" and "evidence-based" curricula to improve early language and literacy skills

With the goal of supporting a high-quality learning environment, most publicly-funded preschool programs require the use of a "research-based" curriculum.[5] Pennsylvania requires demonstration of alignment of pre-K curricula to early learning standards formulated with guidance from practitioners and program specialists.[6] Yet several popular early childhood curricula that meet state requirements offer limited or no empirical evidence of impact on child outcomes, including Creative Curriculum.[7, 8, 9] Creative Curriculum is utilized widely both nationally and in Philadelphia; three-fourths of Head Start programs nationally reported using Creative Curriculum in 2017,[10] and it has been adopted in the School District of Philadelphia and in the city's universal pre-K program (PHL pre-k). Local stakeholders indicate that they supported wide adoption of Creative Curriculum because it is aligns with state early learning standards and is therefore on the state's approved list of Pre-K curricula; it offers the benefit of an aligned assessment; and their teachers report that it is easy to use. Broad adoption of a single curriculum also facilitates the delivery of consistent professional development and support.

Children's Literacy Initiative developed *Blueprint for Early Literacy* to fill this gap and support children disadvantaged by poverty

Children's Literacy Initiative aims to address the challenge of supporting pre-K programs serving high-needs families and fill the gap in evidence-based curricula. CLI is a Philadelphia-based non-profit working with pre-K through 5th grade teachers to improve early literacy instruction and close the literacy

1 Hernandez, Donald J (2011). "Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation." Retrieved from https://files.eric.ed.gov/fulltext/ED518818.pdf

2 School District of Philadelphia. (2020, February 10). *SY 2018-19 District Scorecard.* Retrieved January 2019 from https://www.philasd.org/performance/programsservices/school-progress-reports/district-scorecard/

3 Duncan, G. J. & Magnuson, K. A. (2005). Can family socioeconomic resources account for racial and ethnic test score gaps? *The Future of Children, 15,* 35-54.

4 Magnuson, K. A., Ruhm, C. J., & Waldfogel, J. (2004). *Does prekindergarten improve school preparation and performance?* (NBER Working Paper 10452). Cambridge, MA: National Bureau of Economic Research: https://www.nber.org/papers/w10452.pdf

5 Jenkins, J. M., Whitaker, A. A., Nguyen, T., & Yu, W. (2019). Distinctions without a difference? Preschool curricula and children's development. *Journal of Research on Educational Effectiveness, 12,* 514-549.

6 Pennsylvania Department of Education (2020). *Learning Standards for Early Childhood – Infant/Toddler; Pre-Kindergarten; Kindergarten; Grade 1 and Grade 2.* Retrieved from https://www.education.pa.gov/Early%20Learning/Early%20Learning%20Standards/Pages/Infant-Toddler-Pre-K-Learning-Standards.aspx

7 Preschool Curriculum Evaluation Research Consortium (2008). *Effects of Preschool Curriculum Programs on School Readiness* (NCER 2008-2009). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Washington, DC: U.S. Government Printing Office.

8 National Center on Early Childhood Development, Teaching, and Learning. (2019). *Curriculum Consumer Report: Preschool.* Retrieved from https://eclkc.ohs.acf.hhs.gov/sites/default/files/featured_file/preschool-curriculum-consumer-report-032519.pdf

9 Institute of Education Sciences. (2013). What Works Clearinghouse Intervention Report: *The Creative Curriculum for Preschool, Fourth Edition.* Retrieved from: https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_creativecurriculum_030513.pdf

10 Bernstein et al. (2018). *A Portrait of Head Start Classrooms and Programs: FACES Spring 2017 Data Tables and Study Design.* OPRE Report 2019-10. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

achievement gap between disadvantaged children and their more affluent peers. CLI's supports for pre-K language and literacy combine an in-person professional development approach to teacher training and support for implementing instructional approaches with its *Blueprint for Early literacy* curriculum, which can be used on its own or supplement existing classroom curricula.[11]

Research for Action conducted a three-year study of implementation and outcomes to assess the quality and impact of CLI's supports for pre-K language and literacy

This report examines implementation and outcomes of CLI's supports as implemented in 11 high-quality Philadelphia pre-K centers over a two-and-a-half-year period, from January 2017 through June 2019. The study follows the 35 classrooms in these centers to track implementation successes and challenges as teachers implemented *Blueprint* alongside Creative Curriculum. This study also compares outcomes in these centers to those in 11 similar centers to assess CLI's impact on children, teachers, and classroom environments.

A. Organization of the Report

This report is comprised of five sections that describe CLI's supports for pre-K language and literacy; provide evidence of impact for children, teachers, and classroom environments; and present an examination of the extent and quality of implementation of CLI's professional development and *Blueprint for Early Literacy*.

- ***Section 1: Guiding Research Questions and Study Design.*** In this section, we provide an overview of the research questions, study design, characteristics of the study population, and data collection methods. This section also describes the focus of the study during each study year.
- ***Section 2: A Description of CLI's Supports for Pre-K Language and Literacy.*** In this section, we draw on observations of trainings, a review of curricular and training materials, and interviews with CLI staff and coaches to provide a rich description of CLI's *Blueprint for Early Literacy* curricular materials, professional development, and instructional approaches.
- ***Section 3: Impact of CLI's Supports for Pre-K Language and Literacy.*** Drawing on CLI's theory of action to guide our observations of impact, we examined outcomes for children, teachers, and classrooms. This mixed-methods causal impact study compares outcomes in 11 CLI-supported centers to a statistically equivalent group of 11 centers not receiving CLI supports. Data are triangulated across multiple methods to present a coherent, multi-faceted evaluation of impact.
- ***Section 4: Implementation of CLI's Supports in Philadelphia.*** This section presents results of a descriptive assessment of the extent and quality of CLI's teacher professional development and *Blueprint* curriculum implementation. We explore the successes and challenges of implementation in Philadelphia, a setting characterized by high need and above-average teacher turnover rates. These analyses draw on multiple methods of data collection, including administrative data on training and coaching, surveys of teachers, interviews with CLI staff and coaches, and interviews with center directors and teachers.
- ***Section 5: Conclusions and Implications.*** Our report ends with a review of key findings and implications for CLI's professional development approach and curriculum and a discussion of broader implications for early childhood decision-makers and practitioners.

11 https://cliblueprint.org/

Section 1: Guiding Research Questions and Study Design

Research for Action (RFA) conducted a three-year study of impact and implementation of CLI's *Blueprint for Early Literacy*. This section describes the research questions and study design that guided our approach to evaluation. We also discuss characteristics of the study population and describe our data collection activities. More information on study design and data collection can be found in the Appendix.

A. Research Questions

The research questions that guided this study are as follows:

1. What is the growth in the engagement and early language and literacy skills of children in classrooms with CLI *Blueprint* materials, training, and coaching, compared to children in similar classrooms without CLI supports?
2. What is the growth in teacher knowledge and ability to implement instructional practices in pre-K centers with the CLI supports, compared to teachers in similar classrooms without CLI supports?
3. What is the impact of CLI Blueprint on the early language and literacy environment in classrooms in pre-K centers with CLI supports, compared to classrooms without CLI supports?
4. What is the extent and quality of implementation of CLI's professional development and *Blueprint* for Early Literacy?

B. Study Design

This section describes the design of this research study, including the phases of the research, a description of data collection activities, study site selection, and characteristics of the study population.

I. Phases of research

Our research was phased over three years to understand both the implementation and impact.

- **Year One (Spring 2017).** The primary goal of the first year of research was to understand the research base for *Blueprint for Early Literacy*, factors that support strong implementation; training, and coaching; and cross-cutting challenges. While we refer to this phase as "Year One," the research began in January 2017 and represents six months of data collection.
- **Year Two (SY 2017-18).** In Year Two, we examined several specific challenges identified in Year One: providing professional development in the context of high teacher turnover; efforts to integrate *Blueprint* with curricula already in use; and differentiating instruction for all learners. We also began assessing the impact of CLI's supports on children, teachers, and classroom environments.
- **Year Three (SY 2018-19).** In Year Three, we continued to evaluate impact, and our implementation research focused more deeply on coaching as well as on the role of assistant teachers in *Blueprint* implementation.

Figure 1 provides a graphic illustration of this phasing.

Figure 1. Focal Areas of RFA's Evaluation of CLI's Supports for Pre-K Language and Literacy by Study Phase, 2017-2019

II. Data Collection Activities

This study included the following data collection activities (see Appendix for more information):

All Three Years:

- **CLI administrative data on training and coaching hours for lead teachers.** CLI provided data on participation in training and coaching for lead teachers each year of the study.[12]
- **Interviews with CLI staff and coaches.** In the spring of each study year, RFA interviewed relevant CLI staff and all four CLI coaches to deepen understanding of CLI's support, how *Blueprint* works, and of CLI's expectations for teachers implementing *Blueprint*.
- **Interviews with a sample of center directors and teachers at centers receiving CLI supports.** For a better understanding of perceptions of CLI's professional development and curricular materials, RFA interviewed a sample of center directors and teachers purposively selected each study year (N=69 total interviews). The Appendix describes sample selection criteria for each study year.
- **Observations of CLI professional development meetings and trainings.** Throughout the study period, RFA conducted 10 observations of CLI supports: four director meetings, one teacher meeting, and five CLI trainings. These observations provided background information to support the analysis of CLI professional development and *Blueprint* implementation.
- **Document review.** RFA reviewed curriculum and training materials to support the analysis of CLI professional development and *Blueprint* implementation.

Years Two and Three only:

- **Beginning- and end-of-year direct assessments of children's early language and literacy skills**, using the Peabody Picture Vocabulary Test, a measure of receptive vocabulary (N = 808 in Year Two and 783 in Year Three).[13]
- **End-of-year observations of classroom language and literacy environments** using the Early Language and Literacy Classroom Observation Pre-K tool[14] (N=74 classrooms each year).

Year Three only:

- **End-of-year teacher survey** administered online in Spring 2019 to lead pre-K teachers to assess teacher perceptions of children's outcomes and teacher knowledge and ability to implement effective instructional practices in early language and literacy (response rate rate=74%). Lead teachers in Blueprint centers were also surveyed about their perceptions and experiences with CLI training, coaching, and *Blueprint for Early Literacy* (response rate = 75%). We also surveyed assistant teachers about their role in whole group instruction (response rate = 65%).

III. Study site selection and characteristics of study population

This study was set in 22 Philadelphia pre-K centers recruited by CLI and selected for participation by Research for Action. The sample of centers includes 4 school-based centers and 18 community-based providers. Forty-two percent of classrooms were Head Start classrooms. Five were PHL pre-k classrooms.

12 We define "lead" teacher as the CLI teacher targeted to receive coaching. In some cases, this teacher was not officially a lead teacher but an assistant acting as lead because of staffing challenges. In other cases, there were technically two lead teachers in the classroom. However, CLI typically only coached one "lead" teacher per class.

13 Dunn, L. M., Dunn, D. M., Lenhard, A., Lenhard, W., & Suggate, S. (2015). *Peabody Picture Vocabulary Test* [manual]. Pearson.

14 Smith, M. W., Brady, J. P., & Anastasopoulos, L. (2008). *User's Guide to the Early Language & Literacy Classroom Observation Pre-K Tool*. Baltimore: Paul H. Brookes Publishing Co.

CLI used the following specific criteria to select centers for participation in this study:

- Centers that met a minimum quality standard (*i.e.*, at least a STAR 3 rating in Pennsylvania's Keystone STARS system[15]) in 2017;
- Centers with strong director buy-in and a willingness to adopt a new or additional curriculum; and
- Centers located in low-income areas with a high need for quality childcare. According to recent census data, study centers were in neighborhoods where at least a third of families were living in poverty.[16]

To ensure that we could assess impact and interpret outcome differences in Blueprint and comparison sites as causal, we selected comparison centers that were statistically similar, on average, with respect to characteristics of classrooms (e.g., size) and children (e.g., pretest vocabulary skills) related to early literacy instruction and outcomes. Our approach was to recruit four more comparison sites than needed, compare sites to those receiving CLI supports on key factors, and choose a subsample of 11 comparison centers similar on average to Blueprint centers (see Appendix for details). Table 1 provides some descriptive information about the classrooms and children in Blueprint and comparison, or "business-as-usual," classrooms.

Table 1. Characteristics of study classrooms and children, 2017-2019

CHARACTERISTICS	OVERALL	BLUEPRINT CLASSROOMS	BUSINESS-AS-USUAL CLASSROOMS
Curriculum being implemented	-	*Creative Curriculum and Blueprint*	*Creative Curriculum*
Number of pre-K centers	22	11	11
Number of pre-K classrooms[a]	74	36	38
% of Head Start classrooms	42%	42%	42%
Average number of pre-K classrooms in centers	3.6	3.4	3.7
Average class size	14.5	14.7	14.2
Number of children in study	1,591	727	864
Study Year Two (2017-18)	808	372	436
Study Year Three (2018-19)	783	355	428
Age at start of school year	4.3 years	4.2 years	4.3 years
% Identified by teacher as EL[b]	8.0%	6.9%	8.9%
Pre-test vocabulary assessment score[c]	110.97	111.69	110.36

[a] The number of open classrooms enrolled in our study changed from year-to-year, with some classrooms newly opened and others closed during the study period. We report classroom characteristics for classrooms in 2018-19 in this table. See Appendix for more details.

[b] Children identified by their teachers as English Learners were pre-screened for English proficiency prior to assessment. Children who did not pass the screener were not assessed. Thus, the child assessment analytic sample described here underestimates the number of EL children in study classrooms.

[c] Fall (pre-test) Peabody Picture Vocabulary Test growth scale score

15 The Pennsylvania Key (2018). Keystone Stars. Retrieved from https://www.pakeys.org/keystone-stars/.

16 United States Census Bureau. (2017). *TIGER/Line Shapefiles Data*. Retrieved from https://www.census.gov/geo/maps-data/data/tiger-line.html.

Curriculum being implemented in study sites. In this study, *Blueprint for Early Literacy* was implemented alongside Creative Curriculum in centers receiving CLI supports, except for one center, which was implementing Acelero's *Ready to Shine* curriculum. Similarly, all but one comparison center was implementing *Creative Curriculum*; the remaining center implemented HighScope. Thus, the treatment contrast or comparison for the impact study is *Blueprint for Early Literacy* plus *Creative Curriculum* compared to *Creative Curriculum* alone.

Characteristics of classrooms and children. Overall, there were 74 classrooms in the study, nearly half (42%) of which were Head Start classrooms. On average, there were between 3 and 4 classrooms in each center, with each classroom enrolling between 14 and 15 children. Additionally, this study involved vocabulary assessments of more than 1,600 children during the last two years of the study—about 800 children each year. The children in our assessment sample were, on average, a little younger than four-and-a-half years old when they started pre-K, and about 8% of children were identified by their teachers as English Learners.[17] Importantly, the children in CLI-supported and business-as-usual classrooms scored similarly on the pre-test assessment of vocabulary, strengthening our assumption that differences in post-test assessments can be attributed to CLI supports.

17 Because our primary outcome for children was English vocabulary, we only included English Learners who passed an English proficiency screener.

Section 2: A Description of CLI Supports for Pre-K Language and Literacy

There are two components of CLI's supports for pre-K language and literacy: 1) Curricular materials paired with research-based instructional practices and 2) CLI's professional development for classroom teachers. To provide a rich description of these components, we analyzed data from observations of trainings, curricular and training materials, and interviews with CLI staff, and coaches.

I. Support Component #1: *Blueprint for Early Literacy* curriculum supplement and research-based instructional practices

The *Blueprint for Early Literacy* curriculum supplement includes pre-K literacy materials such as daily lesson plans, more than 100 children's books, and 10 structured and sequential theme guides. *Blueprint* uses best practices in early childhood programs to strengthen language and literacy skills through play-based instruction.[18] The implementation of the curriculum, which can either be used on its own or paired with a curriculum already in use, is structured around three key elements:

- **Message Time Plus (MTP)** is a daily modeled writing and shared reading instructional practice. Teachers brainstorm, plan, and write text in front of children, then engage in a shared reading of the text.
- **Intentional Read Aloud (IRA)** is a daily structured practice during which teachers model fluent reading and reading behaviors as teachers and children think about, talk about, and respond to text before, during, and after reading.
- **Power of Three** is a tool to promote a classroom culture of responsibility and engagement. Power of Three is designed to shift teachers away from focusing on classroom rules toward encouraging children and teachers to share classroom responsibilities. Using the Power of Three as a framework integrated into the culture of the classroom, teachers seek to help children gain skills to "Take care of yourself, each other, and our classroom."

18 NAEYC (2018). *NAEYC Early Learning Program Accreditation Standards and Assessment Items.* Retrieved from https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/accreditation/early-learning/standards_and_assessment_web_0.pdf

II. Support Component #2: CLI Professional development for classroom teachers

CLI offers professional development for pre-K teachers through workshops on CLI's practices for early literacy instruction and individual coaching for educators.

- ***CLI trainings in instructional approaches.*** All lead and assistant pre-K teachers were invited to participate in three core half-day Blueprint trainings: 1) Introduction to Blueprint, 2) Message Time Plus (MTP), and 3) Intentional Read Aloud (IRA). These trainings, which were offered throughout the school year, were designed to introduce teachers to key concepts in early language and literacy instruction. The presentation of concepts was grounded in the research evidence upon which *Blueprint* was founded.[19] The goal of trainings was to train teachers in CLI's pre-K instructional approaches—MTP, IRA, and Power of Three.

- ***CLI content-focused coaching*.** Additionally, CLI paired each lead teacher with a coach that provides 20 hours of in-person, content-focused coaching annually. The goal of Blueprint coaching was for teachers to develop a solid understanding of *Blueprint* and its practices, increase teacher confidence and comfort with the curriculum, and strengthen teachers' adaptations of *Blueprint* to meet the needs of their learners. Coaching content was tailored to teachers' needs and evolved as teachers become more experienced with *Blueprint*. Each session in the CLI content-focused coaching model included three key elements: 1) a pre-conference, 2) lesson implementation, and 3) a post-conference. Typically, during the pre-conference, coaches and teachers focused on the objectives of the lesson to follow. Then, either the teacher, the coach, or both together implemented the lesson. In the post-conference the coach and teacher reflected on the lesson and identified what to work on between coaching sessions. This time for feedback and reflection is one of the central elements of an effective professional learning experience for teachers.[20]

19 *E.g.,* Strickland, D. S. & Riley-Ayers, S. (2006). *Early Literacy: Policy and Practice in the Preschool Years.* (National Institute for Early Education Research) Preschool Policy Brief Issue 10 Retrieved from http://nieer.org/policy-issue/policy-brief-early-literacy-policy-and-practice-in-the-preschool-years &
Yoshikawa et al. (2013). *Investing in Our Future: The Evidence Base on Preschool Education.* Retrieved from Society for Research in Child Development: https://www.fcd-us.org/assets/2013/10/Evidence20Base20on20Preschool20Education20FINAL.pdf
20 Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective Teacher Professional Development.* Palo Alto, CA: Learning Policy Institute.

Section 3: Impact of CLI's Pre-K Language and Literacy Supports on Children, Teachers, and Classrooms

Together, the core components of CLI's pre-K language and literacy supports–*Blueprint for Early Literacy* and CLI training and coaching for teachers–are expected to improve outcomes for children and teachers and improve classroom language and literacy environments. Table 2 outlines CLI's supports and theory of action, which provided a framework for our impact evaluation.

Table 2. Children's Literacy Initiative's Pre-K Language and Literacy Supports

IMPLEMENTATION	OUTCOMES FOR TEACHERS	OUTCOMES FOR CHILDREN
• Implementation of *Blueprint for Early Literacy* pre-K curriculum supplement • Professional development for pre-K educators through training and coaching	• Increased teacher knowledge and ability to implement effective early language and literacy instruction • Increased teacher ability to create a positive classroom culture and a literacy-rich classroom environment	• Increased engagement in language and literacy learning • Increased mastery of early literacy concepts and early language and literacy skills

To assess impact on outcomes, we conducted mixed-methods quasi-experimental study combining data from a range of sources: direct assessments of children's vocabulary skills, observations of classroom environments, surveys and interviews with lead teachers, and interviews with center directors.

This section of the report is divided into three sub-sections:

A. **Impact on Children's Skills and Engagement in Early Language and Literacy Activities.** This sub-section examines the impact of Blueprint on pre-K children's vocabulary gains. This section also examines teacher and center director perceptions of how Blueprint affects student engagement and learning.

B. **Impact on Teacher Knowledge and Practice.** This sub-section examines impact of CLI's pre-K language and literacy supports on teacher perceptions of knowledge and ability to implement effective language and literacy instructional practices. We also present findings on teacher self-reported frequency of implementing best instructional practices for teaching reading, oral language, and writing skills; and we asked Blueprint teachers to assess the utility of the curriculum for supporting specific teacher instructional practices such as planning a variety of activities and management classroom behavior. .

C. **Impact on Classroom Language and Literacy Environments.** In this sub-section, we examine impact of CLI's pre-K language and literacy supports on multiple dimensions of classroom language and literacy environments.

A. Impact on Children's Skills and Engagement in Early Language and Literacy Activities

CLI expects that by helping teachers increase their knowledge and skills in early language and literacy instruction, children will in turn become more engaged in language and literacy learning and gain language and literacy skills more rapidly than children otherwise would. In this section, we report evidence of the impact of CLI's pre-K language and literacy supports on children's early language and literacy skills. We report our findings from direct assessments of children's oral language skills as well as teacher perceptions of impact on skills and engagement in classroom activities.

I. Direct Assessments of Children's Oral Language Skills

To assess impacts of CLI's pre-K language and literacy supports on children's early language and literacy skills, we triangulated evidence from direct assessments of children's oral language skills in SY 2017-18 and 2018-19 (described below), interviews with center directors and lead teachers in Spring 2017 and 2018, and surveys of lead teachers in Spring 2019.

Key Findings: Impact on Children's Outcomes

- Direct assessments of children's receptive vocabulary showed that children in Blueprint classrooms outpaced their peers by two-and-a-half months of additional growth from fall to spring.
- Teachers who used *Blueprint* materials and approaches to instruction reported that their children learned a variety of foundational and higher-level skills for reading and writing.
- Teachers also described how the routines and intentionality of *Blueprint* supported children's engagement, including the specific elements of Message Time Plus and Intentional Read Aloud.

To assess impact on oral language skills, we observed growth over time in children's receptive vocabulary. Receptive vocabulary refers to the words that someone can comprehend, a key feature of early language acquisition and is strongly correlated with later literacy.[21] To measure receptive vocabulary, we employed the Peabody Picture Vocabulary Test (PPVT), a 10-minute assessment administered by trained assessors to each child twice per year in Years Two and Three of the study.[22]

Children in Blueprint classrooms outpaced their peers in vocabulary development by two-and-a-half months of growth

The first cohort of children attended pre-K in 2017-18 (N=808) and the second in 2018-19 (N=783). We assessed their baseline receptive vocabulary skills in the fall, before receiving instruction, and again in the spring. Then, we compared growth from fall to spring in Blueprint classrooms to classrooms where, on average, children scored similarly in the fall. The table that follows presents the results from our analysis.[23]

We present results disaggregated by study year and combined across study years (see Appendix for more information on our analysis).

21 Lonigan, C. J., and Shanahan, T. (2009) "Developing Early Literacy: Report of the National Early Literacy Panel. Executive Summary. A Scientific Synthesis of Early Literacy Development and Implications for Intervention." Retrieved from the National Institute for Literacy: https://lincs.ed.gov/publications/pdf/NELPSummary.pdf.
22 Dunn, L. M., Dunn, D. M., Lenhard, A., Lenhard, W., & Suggate, S. (2015). *Peabody Picture Vocabulary Test [manual]*. Pearson.
23 See Appendix for full statistical models, year-specific results, and a description of our approach to pooling data across years.

Table 3. Estimated spring children's vocabulary scores in Blueprint and business-as-usual classrooms, 2017-2019

Spring Vocabulary Scores for...	Blueprint Classrooms	Business-as-Usual Classrooms	Difference (p-value)	Average months of additional growth
All children (n=1,591)	119.7	116.7	3.0 (0.001)	2.5
Year Two (n=808)	120.0	116.4	3.6 (0.005)	2.8
Year Three (n=783)	119.6	116.9	2.7 (0.021)	2.4

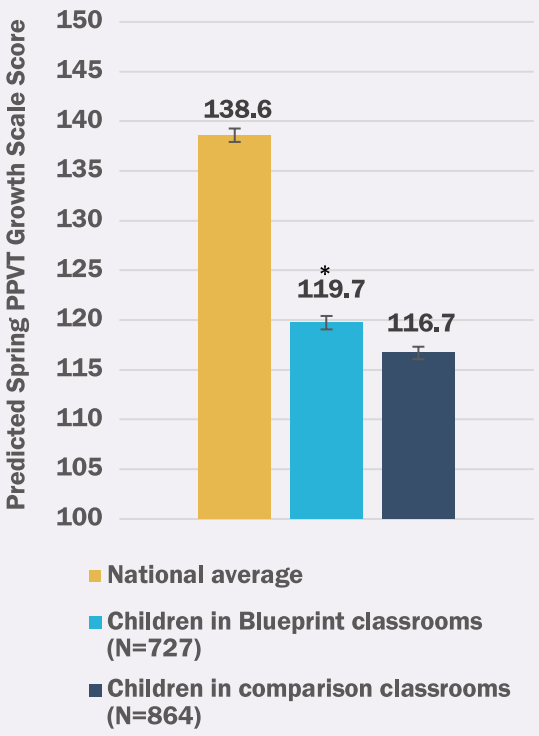
Source: RFA assessements of children's receptive vocabulary using the Peabody Picture Vocabulary Test (PPVT).

Notes: Children were not assessed in Year One of the study. To calculate the average the impact of CLI Blueprint in terms of the additional months of growth, RFA used normed scores across the age groups of the children in cohort sample. Full statistical models specified as children's scores nested in centers, with a fixed-effect for year of study and the following child-level covariates: age, EL status, and fall PPVT growth scale score.

Key findings:

- At the beginning of the year, children in our sample scored similarly in centers receiving CLI supports compared to business-as-usual sites (See Table 1, page 6). Spring scores, in contrast, were approximately three points higher for children in Blueprint classrooms compared to children in statistically comparable business-as-usual classrooms ($p<0.05$).
- This three-point difference translates to between 2 and 3 months of additional progress in vocabulary development in CLI-supported sites compared to children in similar classrooms not supported by CLI.[24]

Figure 2. Receptive vocabulary among children in Blueprint and comparison classrooms compared to national average, Spring 2018 and Spring 2019



Source: PPVT assessments, 2017-18 and 2018-19

Note: * indicates statistical significance at $p<0.05$ level from a multi-level regression model (see Appendix for more information). Model includes indicators for child age, EL status, and fall PPVT growth scale scores, and assessment cohort.

Notably, findings were similar across cohorts. While many programs see initial dips in outcomes as a result of teachers implementing something new, we did not see this post-implementation dip in Blueprint classrooms in Year Two. That we did not see additional gains in Year Three could be because an additional year of CLI supports does not produce stronger outcomes. It could also be because teacher turnover was quite high, which means that relatively few teachers received two years of the intervention. This factor is discussed in more detail in Section 4.

While these results are positive, comparing the study population scores to national averages is a sobering endeavor. For similarly aged children, the national average PPVT score of 139 is significantly higher than the average score of 120 in Blueprint centers, reflecting the high poverty rates of our study sites (discussed in Section 1).[25] This means that, compared to a national sample of similarly aged children, the children in our study lag over a year (14.8 months) behind their peers in vocabulary growth. As discussed in the introduction, this aligns with the consensus among researchers that, while

24 We also tested whether impacts were similar for young children (i.e., those under age 4 by the end of the school year) and for children who were English Learners. We did not find evidence of impact differences for younger children or for children whose native language is English compared to their English Learner peers. This may have been because we pre-screened for English proficiency prior to assessment, thus reducing the sample of EL's to those with a minimum skill level. Thus, our study does not provide definitive evidence of impact for children whose native language is not English.

25 Ibid.

access to high-quality curricula may improve outcomes for children disadvantaged by poverty, to fully address the impact of poverty in these communities would require broad-based policy changes to reduce or eradicate poverty altogether.

II. Teacher perceptions of language and literacy skills and children's engagement in classroom activities

While direct assessments of children's oral language skills demonstrate positive impact, the benefits of CLI's supports may be more wide-ranging. Though we were unable to assess multiple skills directly and in a comparative context, our interviews with Blueprint teachers suggest that there may be additional significant positive benefits of Blueprint for children's outcomes.

Teachers who used *Blueprint* materials and approaches to instruction reported that their children learned a variety of foundational and higher-level skills for reading and writing

In Spring 2017 and Spring 2018 interviews with at least one teacher or center director from all interviewed centers reported that, through Blueprint, their children were learning foundational and writing skills, high-frequency words, how to follow a story, and how to use a physical book. Some illustrative examples of what we heard are below.

- **Foundational skills**, such as sound awareness, letter recognition, and strong oral language skills. "They're learning… [sound] awareness which ultimately is allowing them to put the sounds together to make the word…so it's really not about the ABC song. They're really understanding what the letters are, what they mean, and how they become a word, and how they become a sentence, so I see that intentionality and I see how the children are picking it up."
- **Writing skills and conventions of print**, such as punctuation, spaces in between words, the direction of print, capital and lowercase letters, and how letters, words, and sentences work and work together. "They're learning how to write a sentence, how a writer writes, how a writer brainstorms and comes up with the ideas."
- **New words, both vocabulary words and** high**-frequency (snap) words.** "They're learning, like, cheers they can use, they're learning snap words and different ways to memorize those words. It's not just, 'Okay, this is on the word wall.' 'G-O. Go! What is it? G-O. Go! We're going to do a cheer to go with go!' So it kind of sticks with them a little bit more."
- **How to follow a story.** "They're learning story progression, they're learning content, they're learning how to read a book."
- **How to use a physical book.** "She sat on the floor, she sat beside me, and she was just talking to me, moving her lips. And she was pointing, and she was holding the book the proper way. And she was looking at it the proper way and she was turning the pictures and she actually went back and looked at different pictures. And she's only three."

Some Blueprint teachers and center directors also attributed the development of higher-level thinking skills to *Blueprint*, including asking questions, talking about ideas, comprehending text, making connections, predicting, and analyzing themes. One teacher indicated that children who came in with varying levels of readiness were exceeding her expectations in terms of applying higher-level thinking: "The kids are able to make connections with things that I would never have expected them to learn. Even the ones who struggle in the beginning. They get it."

> *The kids are able to make connections with things that I would never have expected them to learn. Even the ones who struggle in the beginning. They get it.*
>
> *– pre-K teacher*

Teachers and directors in Blueprint centers observed children building on this foundation by starting to read, write, and sound out words

In Spring 2017, a few teachers and directors described how *Blueprint* was helping them instill the foundation for children to become successful readers. One director explained, "They're learning the basic foundations of literacy in a whole bunch of areas." A teacher explained:

> *I think they're learning from Blueprint that vocabulary is very important. Of course, learning to read, learning about words, but just knowing that every letter makes a sound, and again, letters together make words. I think they're learning sentence structure, how to read from left to right. There's punctuation marks. Eventually, their reading fluency will be really good.*

A center director explained how the *Blueprint* advances children's learning:

> *They're learning awareness which ultimately is allowing them to put the letters—well, the sounds together to make the word. They're really understanding what the letters are, what they mean, and how they become a word, and how they become a sentence, so I see that intentionality and I see how the children are picking it up.*

Interviewed teachers described how the routines and intentionality of *Blueprint* supported children's engagement, including the specific elements of Message Time Plus and Intentional Read Aloud

In Spring 2017, teachers and directors from most interviewed centers reported that *Blueprint's* routines and procedures engaged students. CLI staff and coaches explained that *Blueprint* was designed to promote engagement and exposure to literacy practices, and teachers and administrators reported that the structures were effective. Additionally, we heard that *Blueprint* engages children in intentional and focused literacy practices. Teachers and directors noted that children are spending more time reading and writing in the classroom and are also more focused, engaged, and answer more questions than they had before implementing *Blueprint*.

A teacher explained:

> *Every day has an intent, so it's not like you're reading the book just to be reading it. You have something that you're focused on, you're looking for, you're telling the children, "This is what I want you to look for," or, "I need you to repeat this sentence that's over and over in the book." So when it's time for you to say the sentence, "Look what they heard him say," they know what they're looking for, and they're being a participant, and also teaching them other literacy skills because the kids literally see it, because you have it written, "Look what they heard him say."*

Every day has an intent, so it's not like you're reading the book just to be reading it.

-pre-K teacher describing read-alouds with Blueprint

In Spring 2017 and 2018 interviews, teachers, center directors, and coaches described in detail how specific elements of Blueprint support children's engagement:

Message Time Plus. Teachers especially noted children's strong engagement with Message Time Plus. One center director explained, "Message Time Plus is really beneficial. Just the structure involving the students and getting student voices is really beneficial, because it really helps build confidence and helps the students to get involved." Another interviewee described how MTP processes engaged students:

> *[It] grabs their attention really quickly, holds them for that time span… It keeps them engaged, 'cause they get to come up, and they use the pointer, and they just put the goggles on. It helps them to be interactive, which keeps their attention, which is what I think is successful in implementing in the classroom.*

Interviewees also reported that children seemed to enjoy working together and helping each other, especially during Message Time Plus. One teacher explained, "Sometimes they do like working together. They do like helping each other out with identifying letters. If a child gets it wrong, I'll ask them to call on a friend to help them."

Intentional Read Aloud. Some coaches and teachers said that, since classrooms adopted *Blueprint*, children are more engaged in stories. One coach explained, "They just seem so excited about the books, because we read [the same] books sometimes two or three times in a week." One teacher reported that children in her classroom act as the teacher during center time and reenact read-alouds. The teacher said, "I'm just listening and she's like, 'Well, this is the front cover of the book, and this is the back cover, and this is the title page. Don't you like the title page? Look how colorful it is.' … I'd say they're more engaged with the reading."

Teachers and directors reported that Blueprint's positive engagement resulted in an increased love of reading and writing, self-esteem, and parental engagement in literacy practices

In Spring 2017, we heard that children were learning the joys of reading and writing through *Blueprint*. A few teachers and directors said *Blueprint* supported an increased interest in reading and writing (including reading more often) and a greater engagement in the read-alouds since implementing *Blueprint* in their classrooms. Additionally, two directors reported that this exposure and engagement in intentional literacy activities led to signs of children's heightened self-esteem. These directors reported that children were excited to engage and share their new knowledge as their comfort with literacy practices increased. One center director explained that, "The fact that they can actually read a word and then a sentence at this level—they're really excited." Another director spoke of children's excitement about their growth, saying "They are learning to expand their sentences to be able to look at words and actually read it, want to do it, want to be engaged. They want to express what they learn, which is a great thing. I think their self-esteem is building because they are learning so much, and they're excited about it."

B. Impact on Teacher Practice and Classroom Environments

CLI expects their supports will help teachers become more intentional and knowledgeable about early literacy content and pedagogy and develop enhanced skills in the management of classrooms and the creation of a literacy rich environment. Below, we assess the impact of CLI's pre-K language and literacy supports on teachers' perceived knowledge and ability to implement effective practices for early literacy instruction. We also examined differences in Blueprint and comparison centers in the self-reported frequency of specific instructional practices for teaching reading, oral language, and writing skills.

Key Findings: Teacher Knowledge and Instructional Practice

- Relative to teachers in comparison centers, more surveyed Blueprint teachers reported considerable growth in ability to implement effective practices for early literacy instruction from fall 2018 to spring 2019. Smaller differences in teacher knowledge were evident but not statistically significant.
- Most surveyed teachers in spring 2019 reported that Blueprint is very useful for supporting instructional practices, both specific to language and literacy and more generally for creating a positive environment.
- In surveys, more Blueprint teachers reported frequently implemented some, but not all, best practices for instructing beginning reading and oral language skills, compared to teachers in business-as-usual classrooms.

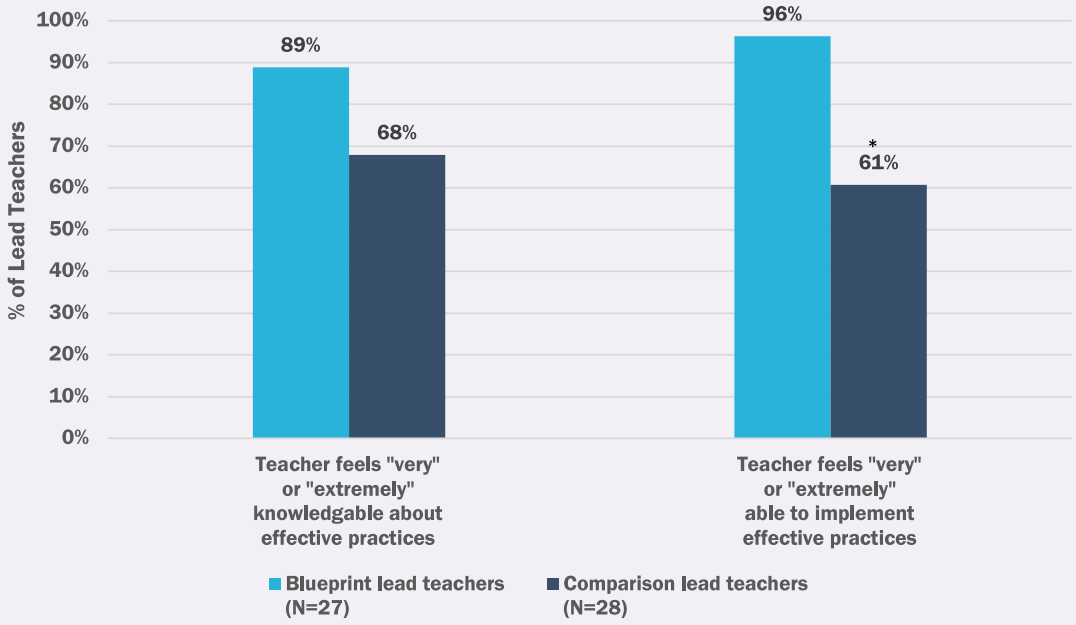
I. Teacher Perceptions of Knowledge and Ability to Implement Best Practices in Language and Literacy Instruction

At the end of Year Three of our study, we surveyed lead teachers in Blueprint and comparison classrooms about their perceived knowledge of and ability to implement effective instructional practices for early literacy. We then asked teachers to reflect on growth in their knowledge and ability to implement over the course of the school year and, for Blueprint teachers, if they felt CLI supports contributed to their growth. Because these data are self-reported perceptions, we interpret differences between Blueprint teachers and their peers as suggestive. Further research, for example drawing on direct observations of instruction and/or assessments of specific knowledge domains, would strengthen these findings.

Blueprint teachers reported higher levels of knowledge and stronger ability to implement effective instructional practices relative to teachers in comparison centers

Figure 3 shows the percent of lead teachers in Blueprint and comparison centers reporting strong knowledge and ability to implement effective instructional practices for teaching language and literacy in Spring 2019.

Figure 3. Percent of lead teachers in Blueprint and comparison centers reporting strong knowledge and ability to implement effective instructional practices for teaching language and literacy in Spring 2019



Source: RFA teacher survey, 2018-19

Note: * indicates statistical significance at p<0.05 level from a two-sample test of proportions. Lead teachers are defined as those CLI targeted for coaching in Blueprint centers. In comparison centers, lead teachers are those with responsibility for leading instruction.

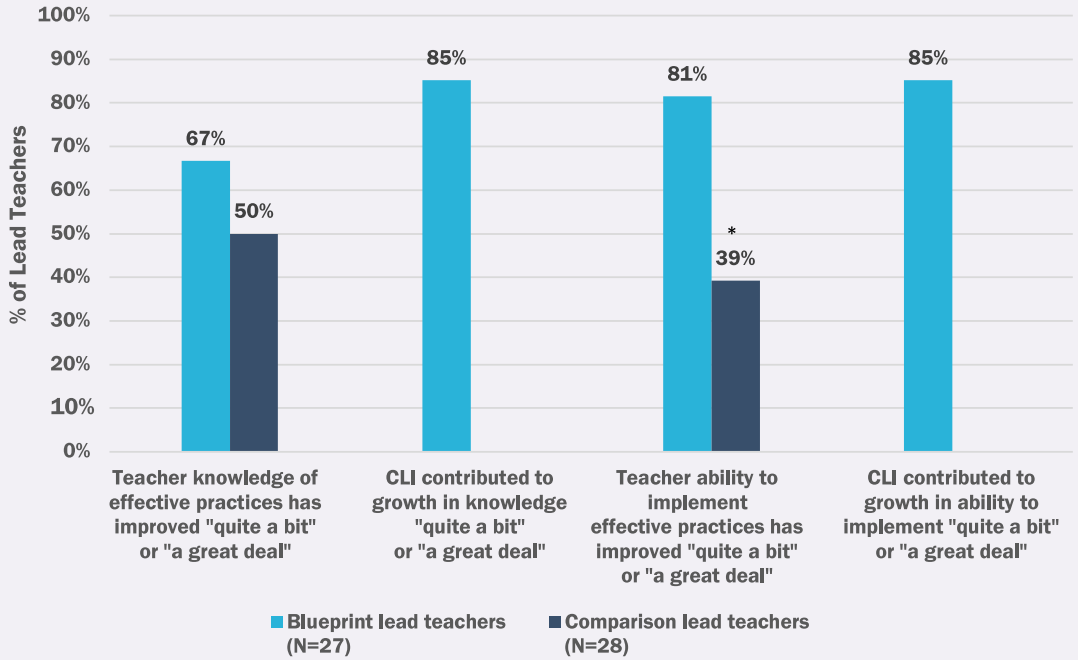
Findings:

- CLI's supports for pre-K may improve teacher ability to implement effective instructional practices for teaching pre-K children language and literacy. Nearly all (96%) of Blueprint teachers reported feeling able to implement effective instructional practices, compared to 61% of teachers in comparison centers, a statistically significant difference (p<0.001).
- Similarly, CLI may improve teacher knowledge of effective practices. Nearly all (89%) of Blueprint lead teachers reported high levels of knowledge about effective practices, compared to 68% of lead teachers in comparison centers (p<0.101). Though not statistically significant, this difference is substantively meaningful.

Twice as many Blueprint teachers reported considerable growth in ability to implement effective instructional practices from fall to spring

We asked teachers to reflect on their growth in knowledge and ability to implement effective instructional practices throughout the 2018-19 school year. We also asked Blueprint lead teachers to report if they felt their improvements could be attributed to the CLI professional development services they received.

Figure 4. Percent of lead teachers in Blueprint and comparison centers reporting considerable growth in knowledge and ability to implement effective practices for early language and literacy instruction from Fall 2018 to Spring 2019



Source: RFA teacher survey, 2018-19

Note: * indicates statistical significance at p<0.05 level from a two-sample test of proportions. Lead teachers are defined as those CLI targeted for coaching in Blueprint centers. In comparison centers, lead teachers are those with resposibility for leading instruction.

Specifically:

- More Blueprint teachers reported considerable improvements in knowledge and ability to implement effective instructional practices. Two-thirds (67%) of Blueprint lead teachers reported considerable growth in knowledge of best instructional practices from fall to spring, compared to half (50%) of lead teachers in comparison centers. Though this difference was not statistically significant (p<0.227), the size of the difference between groups is substantively meaningful.

- More than twice as many (81%) Blueprint lead teachers as comparison lead teachers (39%) reported considerable growth in their ability to implement effective practices from fall to spring, a statistically significant difference (p<0.001).

- Nearly all Blueprint teachers (85%) who reported growth in their knowledge and skill reported that CLI contributed either “quite a bit” or “a great deal” to their growth.

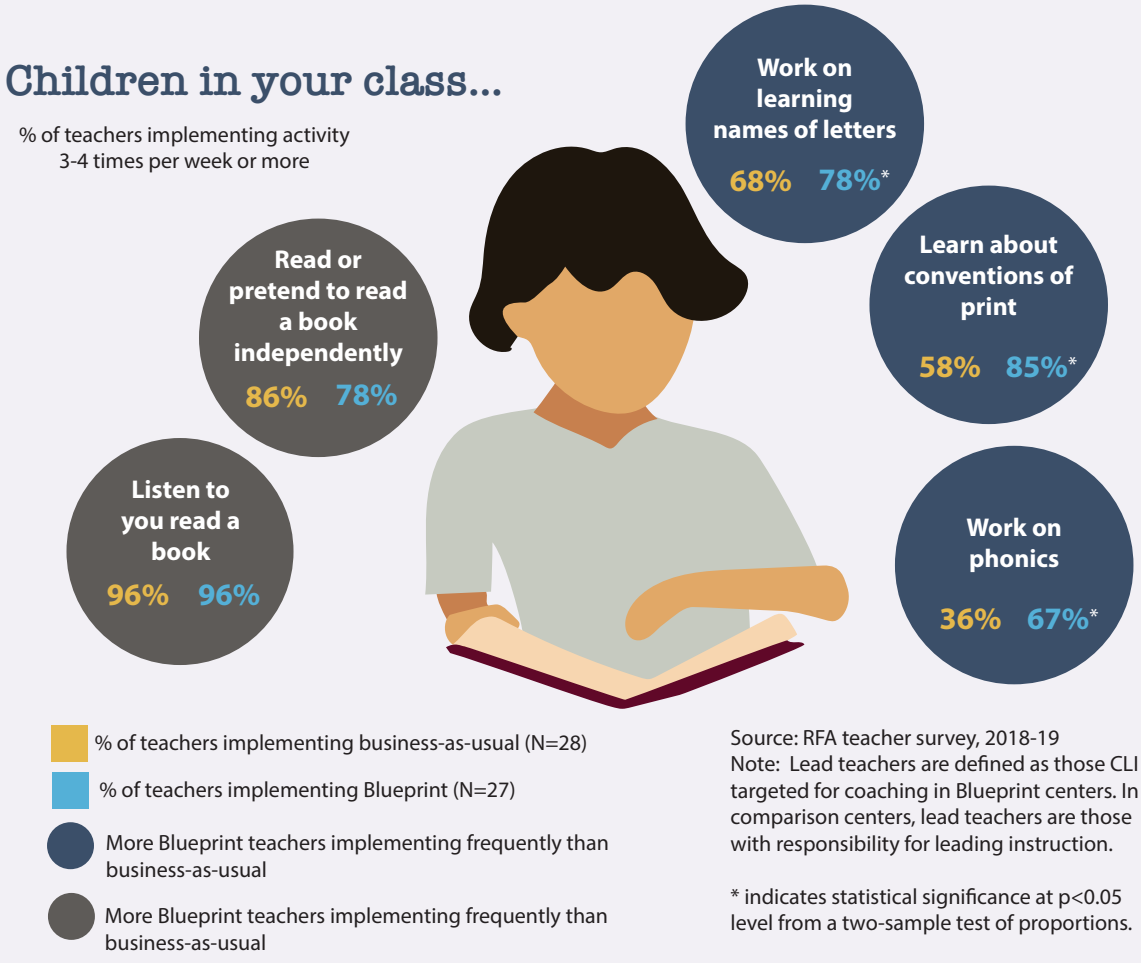
II. Frequency of Implementing Best Practices for Instructing Early Language and Literacy

We surveyed Blueprint teachers to determine the extent to which teachers frequently implemented effective language and literacy instructional practices.[26] Teachers were asked how many times in the past month their class engaged in specific language and literacy activities. We compared the percent of teachers that reported frequently implementing each activity, defined by engaging their class in the activity at least 3-4 times per week in the last month. We examined reading, oral language, and writing activities. Results are presented for each below (Tables 3-5). We ordered activities by the percent of comparison teachers that reported frequently engaging in each activity, which gives a sense from left to right of business as usual.

More Blueprint teachers frequently implemented some best practices for instructing beginning reading and oral language skills, but not writing skills

In Figure 5, we present teacher-reported frequency of reading activities, such as listening to the teacher read a book or working on phonics.

Figure 5. Percent of lead teachers in Blueprint and business-as-usual centers reporting frequently implementing various instructional activities for early reading, Spring 2019



Source: RFA teacher survey, 2018-19
Note: Lead teachers are defined as those CLI targeted for coaching in Blueprint centers. In comparison centers, lead teachers are those with responsibility for leading instruction.

* indicates statistical significance at p<0.05 level from a two-sample test of proportions.

26 This list was generated in partnership with CLI and drew on a national survey developed by NCES (Early Childhood Longitudinal Study-Birth Cohort).

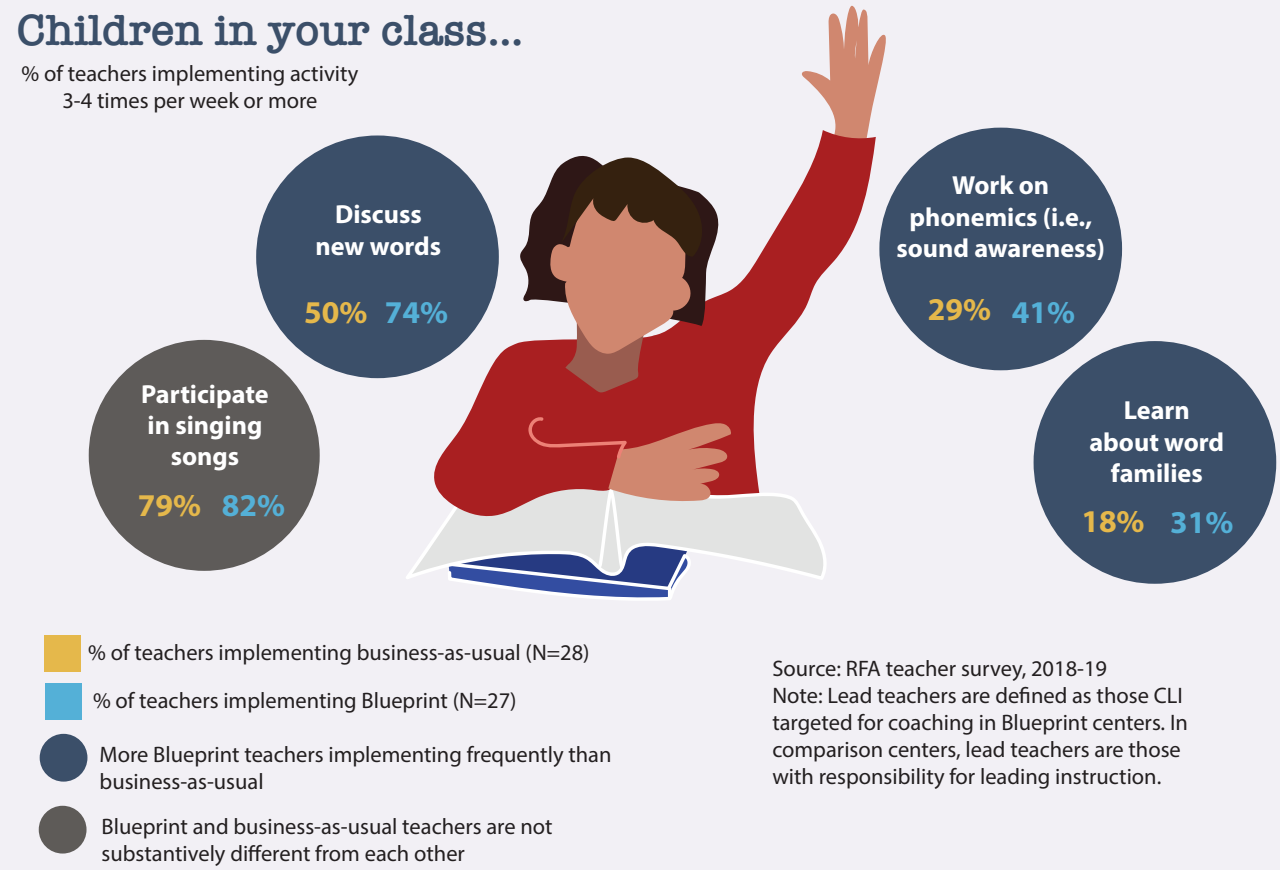
Notable findings:

- While there are some similarities in Blueprint and comparison classrooms (e.g., nearly all teachers, regardless of group, frequently have their class listen to them read a book), there are also important differences that suggest that more teachers in Blueprint classrooms frequently implement some best practices in reading instruction.

- Notably, for reading activities, more Blueprint teachers frequently implemented practices that, in business-as-usual condition, are not consistently implemented with high frequency: teaching about conventions of print and working on phonics. Compared to less than 60% of comparison teachers, 85% of Blueprint teachers reported frequently teaching their class about conventions of print ($p<0.05$), and compared to only 35% of comparison teachers, two-thirds of Blueprint teachers reported frequently having their class work on phonics ($p<0.05$).

We also asked teachers to reflect on the frequency of oral language activities, such as singing songs and discussing new words. Results are presented in Figure 6.

Figure 6. Percent of teachers reporting frequently implementing various instructional activities for oral language, Spring 2019



Source: RFA teacher survey, 2018-19
Note: Lead teachers are defined as those CLI targeted for coaching in Blueprint centers. In comparison centers, lead teachers are those with responsibility for leading instruction.

Notable findings:

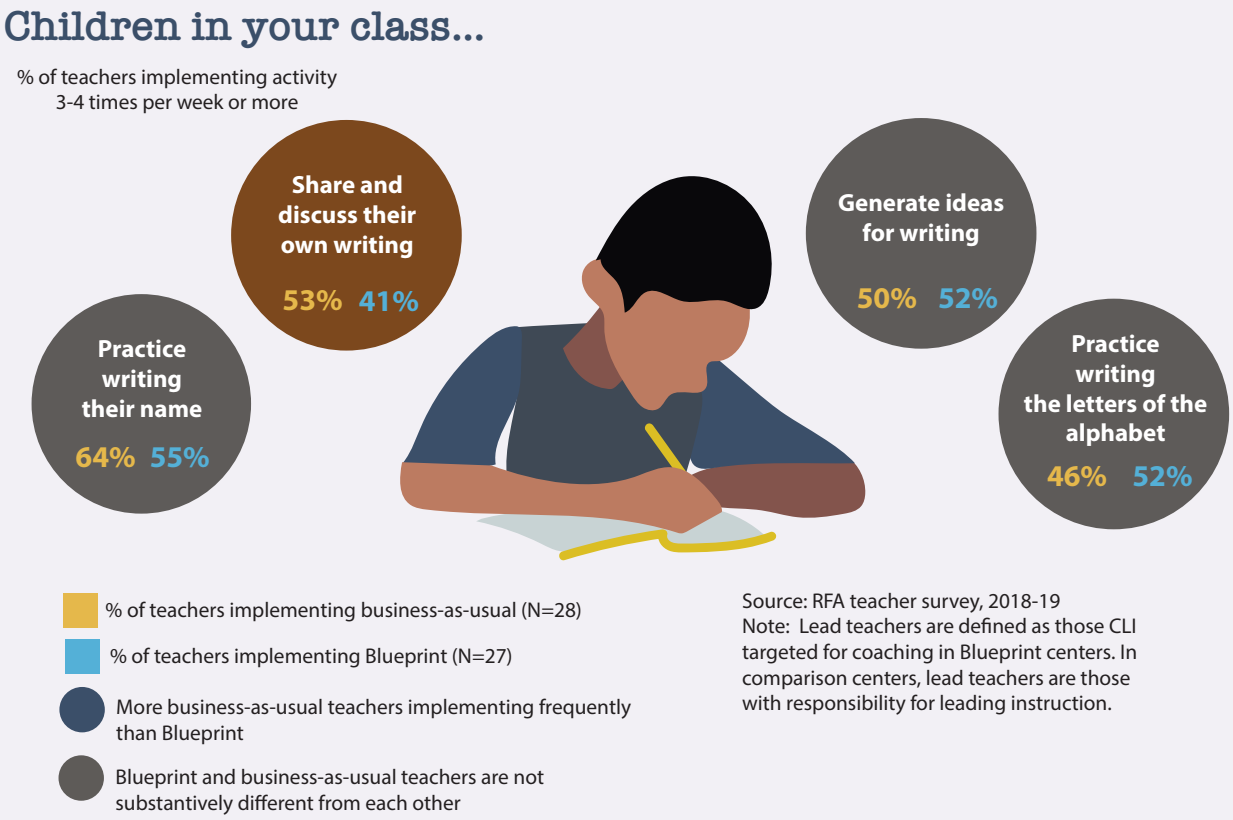
- There were no statistically significant differences between comparison and Blueprint teachers. Yet across all indicators, the pattern of responses suggests that a larger percent of teachers in

Blueprint classrooms were frequently implementing oral language activities.

- More Blueprint teachers reported frequently discussing new words than did comparison teachers (74% vs 50%), though this difference is not statistically significant. Similarly, though not statistically significant, more Blueprint teachers reported frequently working on phonemics (41%) and word families (31%) than did comparison teachers (29% and 18%, respectively).

We asked teachers to report how frequently they use a variety of instructional activities to support early writing. Results are summarized in Figure 7.

Figure 7. Percent of lead teachers in Blueprint and business-as-usual centers reporting frequently implementing various instructional activities for early writing, Spring 2019



Source: RFA teacher survey, 2018-19
Note: Lead teachers are defined as those CLI targeted for coaching in Blueprint centers. In comparison centers, lead teachers are those with responsibility for leading instruction.

Notable findings:

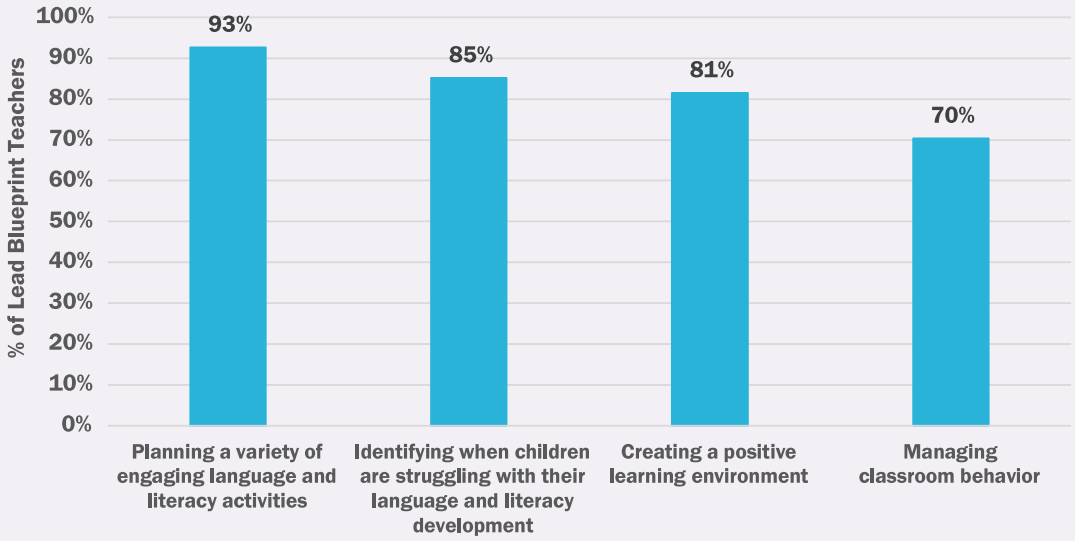
- Compared to other language and literacy activities, fewer teachers in both Blueprint and comparison classrooms frequently implemented best practices for instructing beginning writing skills.
- Unlike in reading and oral language activities, we see evidence for writing activities that more teachers in comparison classrooms are implementing some best practices for writing. More teachers in comparison classrooms reported that children in their classrooms practiced writing their own name (64%) and sharing their ideas in their own writing (54%), compared to Blueprint teachers (56% and 41%, respectively). These differences are substantively meaningful, but not statistically significant.

III. Utility of *Blueprint* for Supporting Teacher Instructional Practice

Most Blueprint teachers reported that *Blueprint* is very useful for supporting instructional practices

In 2019, we surveyed teachers in CLI-supported classrooms about their perceptions of the utility of the *Blueprint for Early Literacy* curriculum for supporting teacher instructional practices.

Figure 8. Percent of lead teachers who report that *Blueprint* is "very" or "extremely" useful, Spring 2019, N=27 teachers



Source: RFA Teacher Survey, 2018-19

Note: RFA defines "lead" teacher as the CLI teacher targeted to receive coaching

Findings:

- Most surveyed teachers reported that *Blueprint* is "very" or "extremely" useful for supporting a variety of instructional practices, including planning a variety of engaging language and literacy activities (93%), identifying when children are struggling with their language and literacy development (85%), creating a positive learning environment (81%), and managing classroom behavior (70%).

In Spring 2018 interviews, we asked the eight interviewed Blueprint teachers to reflect on what specifically they were learning from CLI supports and the *Blueprint* curriculum. Teachers provided examples of what they learned:

- **Information about the foundations of literacy.** One teacher reported learning about the role that phonemic awareness plays in early literacy development.
- **To set high expectations for students**. One teacher reported learning that setting high expectations contributes to strengthening children's confidence. Another teacher reported that, before using *Blueprint*, instruction was mostly focused on foundational literacy skills. Since introducing Message Time Plus, this teacher realized that students were ready to dive deeper into literacy and meaning-making. The teacher explained, "Before we started taking the CLI training, it was more like, you know, phonics, phonemic awareness, sounds, and rhyming words and things like that were more important than sentences, how to build a sentence, sentence structure. You would think that'll come more in the [later] grades. But seeing them utilize it [during Message Time Plus]—and the confidence it gives them when they do learn that—that's really important as well."

- **To make instruction more intentional and adapt it, when necessary.** A teacher said, "[*Blueprint*] really helped me dive into my goals and objectives…If you prepare before the kids get there, then you'll have a more rich experience." Another teacher described learning how to be a more intentional teacher through CLI training and coaching: "I know what I'm teaching. I know what I need to work on. I know my goals. I know my outcomes." This teacher explained that she learned to adapt her lessons extemporaneously because she became so aware of her specific, intentional instructional goals.

- **To make instruction engaging.** *Blueprint* taught a teacher that "if you're not excited, [your students] won't be excited about something." This teacher credited CLI coaching with adding tools like using movement to teach "snap" (high-frequency) words to make instruction more engaging. Another teacher reported learning "how to get the kids really interested in the books and stuff using my personality while reading the story."

Underlying these improvements may be an increase in teacher confidence. Half of the teachers interviewed in Spring 2018 reported that *Blueprint* increased their confidence and ability to be effective educators. One CLI staff person and one center director agreed that they saw teacher confidence improving throughout the intervention. A teacher confirmed this staff member's theory, explaining, "It just builds your confidence to come in. After you finish implementing [*Blueprint*] and you see the results, it's like, 'I have more confidence in doing this. I want to keep doing this.' I feel like that's what's really good about it."

C. Impact on Classroom Language and Literacy Environments

CLI also supports teachers with specific strategies to make their classrooms more literacy-rich, positing that a strong language and literacy environment will promote children's learning and engagement. To understand CLI's impact on classroom language and literacy environment, RFA observed Blueprint and comparison classrooms using the Early Language and Literacy Classroom Observation, Pre-K tool (ELLCO) in the spring of 2018 and 2019. In this section, we present results from data pooled across study Years Two and Three. More about the observation process and inter-rater reliability of RFA's observations can be found in the Appendix.

The ELLCO provides data on two aspects of the classroom environment:

The general classroom environment. This ELLCO subscale consists of two components: classroom structure and curriculum. *Classroom structure* addresses classroom organization and contents, children's access to and use of materials, management practices, and adult roles and professional focus. *Curriculum* consists of the curriculum environment, instructional strategies, opportunities for child choice and initiative, and recognition of diversity in the classroom.

The language and literacy environment. This subscale consists of three components: language environment, books and book reading, and print and early writing. *Language environment* addresses discourse climate in the classroom, opportunities for extended conversations, vocabulary development, and efforts to develop phonological awareness. *Books and book reading* addresses the organization and use of the book area, the characteristics of books available, the presence and use of books across content areas of the curriculum, and the quality and frequency of book reading. Finally, *print and early writing* includes the availability of writing materials, opportunities that build awareness of print and varied purposes of writing, instructional strategies, and use of environmental print.

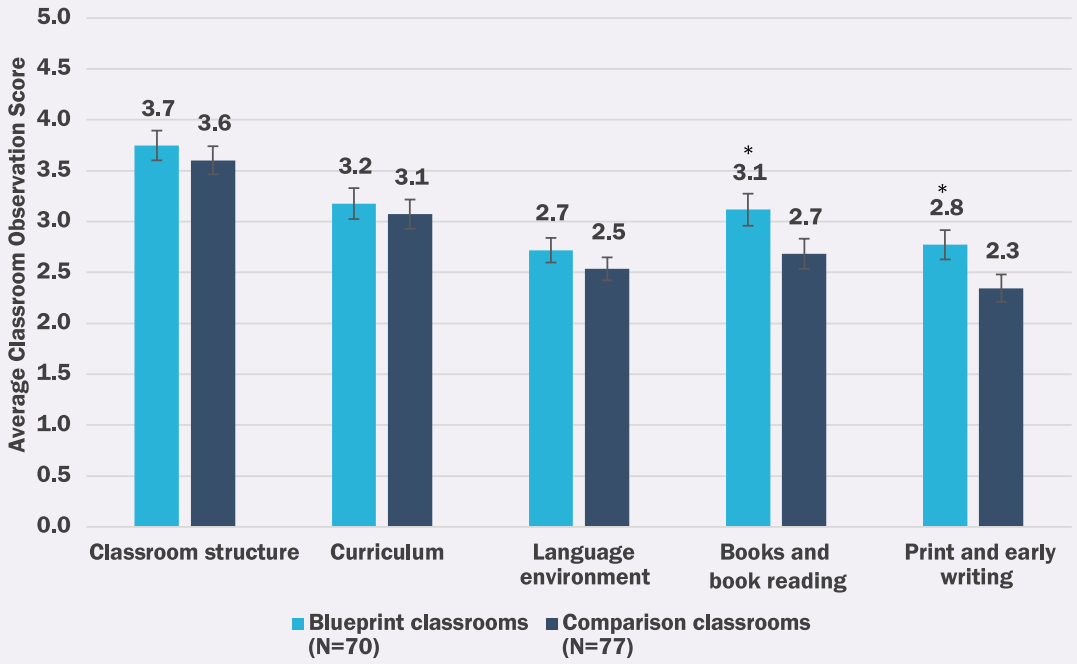
Scores for each scale range from 1 to 5. To analyze the impact of Blueprint on the classroom environment, we compared average scores in Blueprint and comparison classrooms.

A note about interpreting the size of effects. To examine the magnitude of impact, we also discuss the average differences between Blueprint and comparison classrooms in terms of *effect sizes* (we also use this nomenclature in the next section on Blueprint impacts for children's vocabulary). An effect size takes the difference in averages across groups relative to the known population variation in the scale (i.e., the population standard deviation). For classroom-level outcomes, an effect size of .8 is generally considered large, .5 is medium, and .2 is small.

Blueprint classrooms scored moderately higher on measures of classroom literacy environments than did comparison classrooms

Below, in Figure 9, we present the average scores on the five-point ELLCO scale for Blueprint and comparison classrooms and describe differences in terms of effect sizes.

Figure 9. Classroom environments of Blueprint and comparison classrooms, Spring 2018 and Spring 2019



Source: RFA observations of classrooms using ELLCO Pre-K tool; 2017-18 and 2018-19

Note: * indicates statistical significance at p<0.05 level from a t-test of mean differences.

Findings:

- On all measures of classroom language and literacy environments, CLI-supported classrooms scored higher than comparison classrooms. Though all differences represent small-to-medium effect sizes, differences are statistically significant for literacy subscales only: *Books and book reading* and *Print and early writing*. The effect sizes books and book reading (50%) and print and early writing (43%) are moderately-sized, statistically significant effects (at the p<0.05 level.)
- Differences in measures of classroom structure, curriculum, and language environments in CLI supported classrooms and comparison classrooms translate to small effect sizes: A 0.10-scale-point difference between average scores for CLI- and non-CLI supported classrooms translates to 20%, 14%, and 25% of a standard deviation for classroom structure, curriculum, and language environment, respectively. These differences are substatively meaningful, but not statistically significant.

Section 4: Implementation of CLI's Supports for pre-K Language and Literacy in Philadelphia

CLI's range of positive impacts for children, teachers, and classrooms is particularly notable because, as our implementation research found, there are many challenges to providing multiple years of professional development and implementing a new curriculum supplement in early childhood educational environments. In this section, we explore the extent to which teachers received the intended amount of support from CLI and discuss both challenges and successes of implementation.

This report section is organized into three sub-sections:

A. **Teacher turnover.** One of the biggest challenges of providing professional development support throughout the study period was the high level of teacher turnover. In this section, we describe the teacher staffing trends in Blueprint classrooms and review the implications for implementation of CLI's Blueprint. We also present teacher perspectives on what it takes to retain pre-K teachers, in a "spotlight on teacher turnover."

B. **Fidelity of CLI's Professional Development.** This section examines the extent and quality of CLI's training and coaching, including an in-depth description of coaching goals, key elements, focal areas for support; approaches to integrating assistant teachers in coaching sessions; and teacher-reported benefits of and satisfaction with CLI coaching.

C. **Quality of *Blueprint for Early Literacy* implementation in the classroom.** This section examines *Blueprint* implementation in the classroom, focusing on teacher fidelity of implementation of key *Blueprint* elements: Message Time Plus, Intentional Read Aloud, and Power of Three. We also provide descriptions of the instructional roles of lead and assistant teachers in their pre-K classrooms and discuss implications for supporting classroom instructional environments.

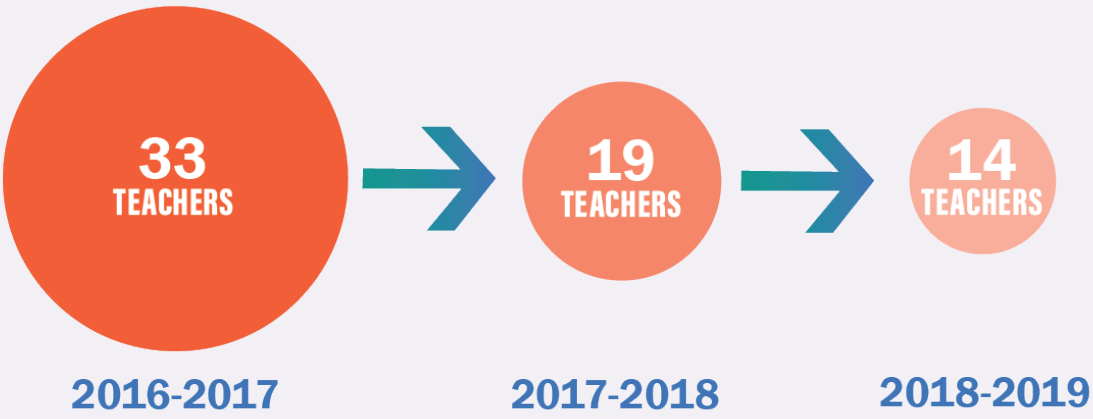
A. Lead Teacher Turnover in Blueprint Classrooms

RFA tracked lead teacher staffing in CLI-supported classrooms during the spring of each study year. As is typical of pre-K environments more generally, there were substantial over-time shifts in lead teacher staffing during this 3-year study period, and teacher attrition in study classrooms was substantial.

Only 40% of lead teachers from Year One of the study remained in their positions by the end of Year Three

As Figure 8 below shows, by the end of Year One in Spring 2017, there were 33 classrooms receiving supports from CLI, each with at least one teacher identified by CLI to receive Blueprint coaching and training. By the end of Year Two in Spring 2018, only 19 (or 58%) of these lead teachers remained in their positions. By the end of Year Three in Spring 2019, only 14 teachers (or 42%) who were enrolled in the study in Year One remained in their positions.

Figure 10. Number of lead teachers remaining in their roles from Spring 2017 to Spring 2019



Source: CLI administrative data, 2016-17, 2017-18, and 2018-19

Note: RFA defines "lead" teacher as the teacher CLI targeted to receive coaching.

Centers opened and closed classrooms throughout the three-year study period as well. By Year Three of the study, there were 36 classrooms operating in centers receiving CLI supports. Given teacher turnover rates, this meant that only 14 of the 36 classrooms had teachers leading instruction that had been involved in the project from the start (just about 40%).

The substantial staffing shifts over time resulted in an evolving target for CLI during their implementation of their supports for pre-K language and literacy. We discuss the implications of the significant staffing challenges throughout this section.

Spotlight on Teacher Turnover

Annual pre-K teacher turnover is estimated at 30% nationally. The pre-K centers in this study experienced teacher turnover at rates higher than national estimates--an average of nearly 50% per year. Here we present teacher perceptions from our interviews with teachers in spring 2018 of what is needed to support pre-K teacher retention.

Teacher feedback regarding retention:

- **Compensation—in wages and benefits—should support the cost of living.** Half of interviewed teachers mentioned the importance of being adequately compensated for their work. One teacher from a site with low turnover explained that a key reason that teachers continue to work in or leave pre-K sites is how much they are paid: "No matter how much you like your job, you still have to live." Another teacher, also from a site with low turnover, added that benefits are key factors in determining whether to stay at a site or leave: "I came from [another] preschool, and I couldn't stay… I didn't have good benefits, I was paying a lot of money for my benefits."

- **Professional growth should be supported.** Multiple teachers who worked in centers where they received support for their professional growth named this support as key to retention. One teacher reported that teachers want to continue working at sites that are "challenging you to grow and providing you with the tools." Another teacher agreed, explaining that their center director encouraged them to get a bachelor's degree, which enabled them to become a lead teacher.

- **Teachers' work in the classroom should be supported.** Most interviewed teachers mentioned the need to feel support from center management. A teacher from a site with high turnover explained, "I think a lot of teachers feel like they don't have the support from management that they need." Other teachers from sites with lower turnover rates pointed to support from the center administration or their colleagues as essential. One of these teachers highlighted the administration's support "communicating with parents [and] helping with the material that's needed in the classroom" as important, while another teacher identified a "wonderful" teaching partner as a key reason for continuing to work at her site for many years.

- **Teachers should feel valued.** One school district teacher described how critical it is to be valued for their work: "You know [as pre-K teachers,] we're still doing as much work as the grade teachers, if not more, because the students are very needy, and they're just learning these things for the first time. So, it's really important that you're valued on the same level as the grade teachers."

B. Blueprint Training and Coaching and Dosage

CLI provides lead pre-K teachers with training workshops on evidence-based practices for early literacy instruction and in-person, content-focused coaching to support their implementation of *Blueprint for Early Literacy*. In this section, we report training attendance and coaching hours received during the three-year study period.

Key Findings: Blueprint Training and Coaching and Dosage

- Fewer than one in five lead teachers received the full amount of intended training and coaching supports by the end of Year Three. However, almost three in four received at least a basic level of support, defined as participating in an introductory training and receiving 20 hours of coaching.
- Although high turnover and number of allotted coaching hours posed challenges for ideal CLI coaching, coaches implemented various strategies to maximize their support, like integrating assistant teachers into coaching when possible.
- Three in four lead teachers surveyed in 2019 reported that coaching sessions included pre- and post-conferences at least most of the time, though coaches reported that conferences were often shorter than ideal, and, because they occurred in the classroom, teachers' ability to focus was often inhibited.
- Despite challenges, teachers reported that they were very satisfied with the training and coaching they received, felt coaching prepared them to implement the Blueprint curriculum, and viewed the CLI's professional development as a substantial benefit.

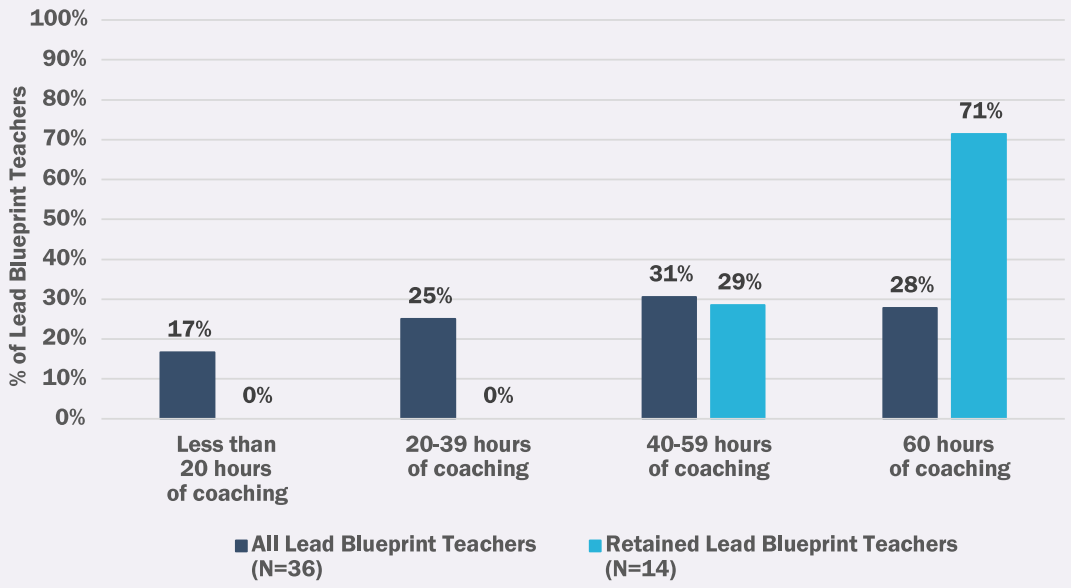
I. Training Attendance and Coaching Hours Received

In the following sections, we describe the extent of CLI training and coaching received among lead teachers who were working in classrooms at the end of the study, in Spring 2019.

By the end of the study, just two in five lead teachers had attended all three core CLI trainings

We used data from CLI's administrative records to assess how many lead teachers attended the three core CLI trainings by the end of Year Three (Figure 11).

Figure 11. Percent of lead teachers who attended core CLI trainings from 2017-2019



Source: CLI administrative data, 2016-17, 2017-18, and 2018-19

Note: Retained lead teachers are those that have been working as leads in centers since Spring 2017. RFA defines "lead" teacher as the teacher CLI targeted to receive coaching.

Findings:

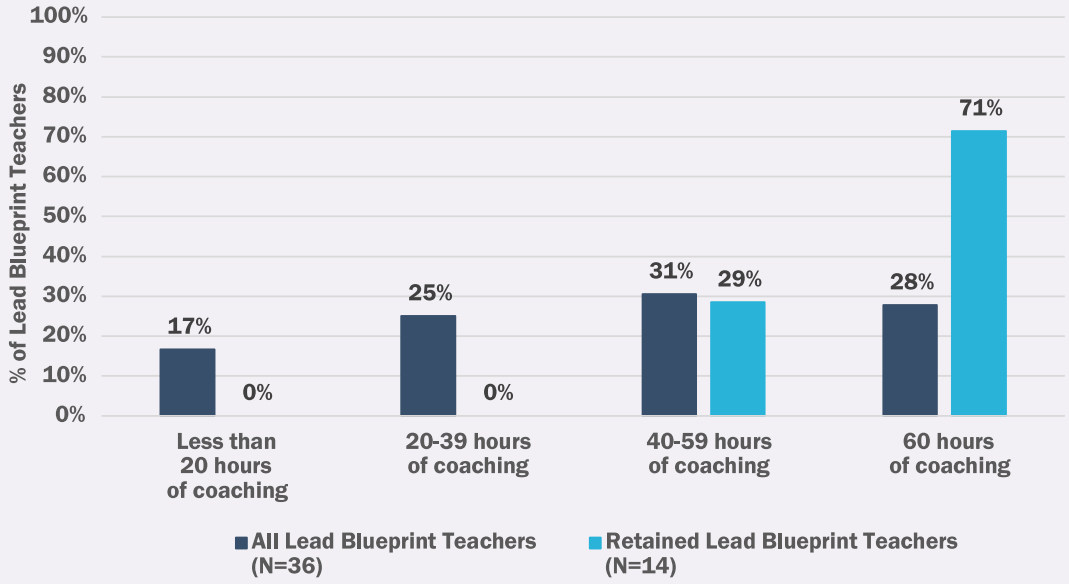
- Of the 36 lead teachers working in Blueprint centers in Spring 2019, only about 40% had attended all three core trainings. A majority (78%) attended an introductory training, which CLI offered at least once each year. Fewer lead teachers attended IRA and MTP trainings—61% and 47% respectively.
- Training attendance was higher for teachers that were in their positions at the start of the study in Spring 2017: about two-thirds (64%) of retained teachers attended all three trainings.

We investigated why training attendance, particularly for MTP and IRA training was relatively low, even for retained teachers. Several teachers and directors reported time conflicts and the need to use the weekend to recuperate after a long week kept them from attending weekend trainings and meetings. IRA and MTP trainings were offered less frequently than the introductory training, so newer teachers and teachers who had scheduling conflicts had fewer opportunities to make up those trainings.

By the end of the study, less than 30% of lead teachers had received the full amount of CLI coaching

As with the low training rates discussed above, the high rate of teacher turnover limited the extent to which teachers working in centers in spring 2019 had received the intended 60 hours of coaching cumulated over the three years of the study (Figure 12).

Figure 12. Percent of lead Blueprint teachers by hours of coaching received from 2017-2019



Source: CLI administrative data, 2016-17, 2017-18, and 2018-19

Note: Retained lead teachers are those that have been working as leads in centers since Spring 2017. RFA defines "lead" teacher as the teacher CLI targeted for coaching.

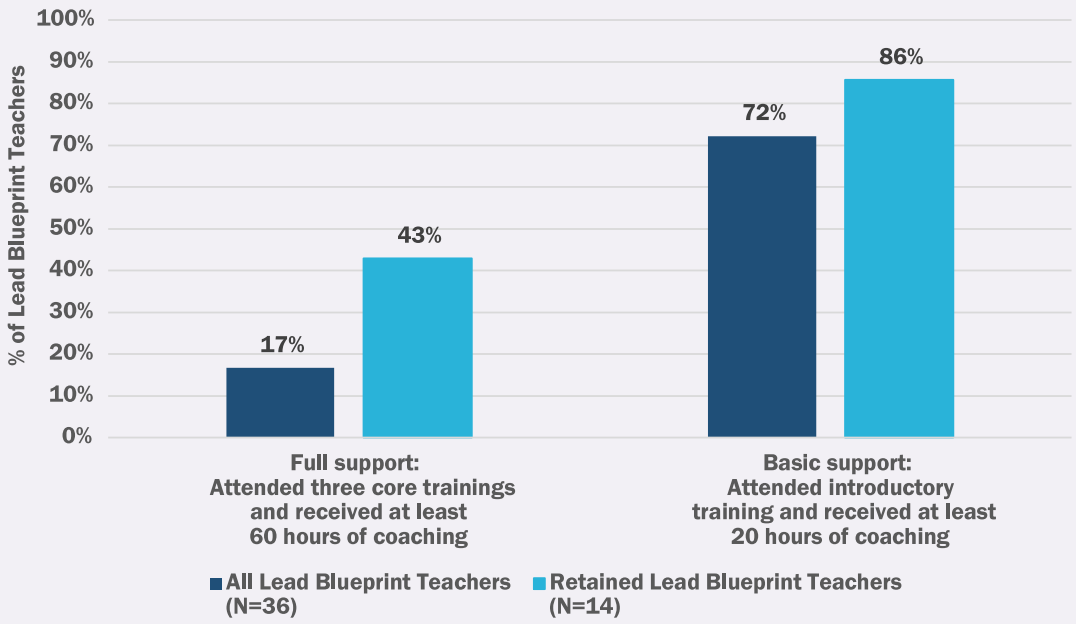
Findings:

- At the end of Year Three, only 28% of lead teachers had received at least 60 hours of coaching, or at least 20 hours annually for three years.
- As with training attendance, coaching received was higher among retained lead teachers: All retained leads received at least 40 hours of coaching, and 71% of retained lead teachers received at least the full 60 hours of CLI coaching.

Because of high turnover, less than 20% of lead teachers received the full dosage of CLI training and coaching by Year Three

Overall, CLI aimed to provide the full suite of supports for lead teachers in 11 Philadelphia pre-K centers by the end of Year Three, including three core trainings and 60 hours of in-person coaching. In Figure 11, we show the extent to which, by the end of the study, teachers working in CLI-supported centers had received a basic level of support (20 hours of coaching and an introductory training) and the full suite of CLI supports.

Figure 13. Percent of lead Blueprint teachers by level of CLI supports received from 2017-2019



Source: CLI administrative data, 2016-17, 2017-18, 2018-19.

Note: Retained lead teachers are those that have been working as leads in centers since Spring 2017. RFA defines "lead" teacher as the CLI teacher targeted to receive coaching.

Findings:

- Only 17% of lead teachers in Blueprint classrooms in Spring 2019 received the full intended amount of training and coaching.
- However, a majority—72%—had received a basic level of support, at least attending the introductory training and receiving at least one full year's worth of coaching (20 or more hours).
- It was difficult for CLI to deliver the full suite of services even for teachers that remained in their roles over time, in part because of teacher schedules and availability of makeup trainings discussed above. Though most (86%) received at least a basic level of support, less than half of retained teachers (43%) had received the full suite of CLI supports by the end of Year Three.

II. Successes of CLI Training and Coaching

Over 80% of surveyed teachers reported that CLI professional development helped them feel prepared to implement *Blueprint for Early Literacy*

In spring 2019, we surveyed teachers about the extent to which the CLI professional development components prepared them to implement the *Blueprint for Early Literacy.* Results are presented in Table 4, below.

Table 4. Surveyed teacher perceptions of the extent to which CLI trainings and coaching prepared them to implement *Blueprint for Early Literacy*, Spring 2019

	Of the 36 lead teachers in CLI-supported classrooms in spring 2019....		
Intervention Component	# of Teachers Participated in Intervention Component	# of Teachers that Responded to Spring 2019 Teacher Survey	% of surveyed teachers reporting component prepared them to implement Blueprint
Introduction to BP training	28	14	86%
IRA training[a]	17	9	100%
MTP training	22	18	83%
Coaching	26	26	87%

Source: RFA Teacher Survey, 2018-19

[a]Data for IRA training come from Spring 2018 survey because CLI did not offer an IRA training in Year Three.

Findings:

- Over 80% of surveyed teachers felt the trainings and coaching better prepared them to implement *Blueprint for Early Literacy*.

In spring 2017 interviews, a few teachers described how Blueprint trainings helped familiarize them with materials and approaches to using *Blueprint* in the classroom. One teacher explained how the training allowed her time and space to become comfortable with *Blueprint*:

> *I had looked in the book, but I didn't really have a firm foundation of what everything was... what was the purpose of it. And she [the trainer] really went through that book tooth and nail. We had a treasure hunt search with the book, so it allowed me time to look at it, not being at work, and I could really focus on [it].*

According to a few teachers, networking and collaborating at trainings also provided opportunities to problem-solve and learn by listening to other teachers' experiences. One teacher said, "It [training] helped me out so much because I heard from other teachers how it works, when they do it, what they do."

Teachers reported benefitting from different elements of coaching support

In Spring 2017 interviews, teachers offered examples of how different elements of coaching were beneficial, including:

- **Modeling**. Teachers described coach modeling as helpful in seeing how *Blueprint* should look in action. One teacher described how a coach used a gradual release model to support her in adopting new practices: "The first time she came, I was explaining to her my difficulties; some of these kids have never sat in a circle, and some of them are advanced, and she did the lesson for me. Then the next time—I did one part and she did the other part. Then the last time she came, I

did both parts." Another teacher explained that modeling supported her learning style. She said, "It helped me have a better insight on how it looks. I could do it, but if I saw her do it then it made sense. I'm a visual learner."

- **Feedback**. Teachers said that the feedback coaches provided after observing their lessons helped them strengthen *Blueprint* implementation. One teacher described how a coach helped her to implement MTP using a range of strategies, including supplying materials, discussion, modeling it and recording a lesson for coach-teacher discussion. She noted, "Accepting her criticism and feedback is also good."

- **Guidance with classroom environment and behavior management**. One teacher described how her coach helped her with multiple practical tasks, including putting up posters about the Power of Three and setting up the library. The coach also "did a lot of observations because I had a lot of behavior issues. She helped me. Everybody had to go to the bathroom, things like that, she helped me manage that kind of stuff in order to actually make my message time longer." This teacher saw direct links between coach support with classroom management and enhanced focus on instruction.

- **Troubleshooting specific challenges**. Coaches also helped teachers address specific challenges they encountered as they implemented *Blueprint*, such as differentiating lessons for a range of students. One teacher said, "I have two kids reading already. She helped me to build on what they already know, so they don't get bored. She provides activities for them. As well, some children, they're struggling a little bit…they still need certain skills. She helps to give us activities or strategies to help them."

- **Encouragement.** Adopting new classroom approaches can be daunting. One teacher described her coach telling her, "You're doing a good job. Don't be nervous."

III. Challenges for CLI Training and Coaching

Coaches and CLI staff reported that training and coaching in the context of high teacher turnover was a significant challenge

Training and coaching within the context of high teacher turnover posed major challenges for CLI. First, turnover required coaches to essentially 'start over' with new teachers, trying to bring them up-to-speed even though they missed the trainings. When this happened, coaches also needed to begin again with building the relationships which serve as the foundation for coaching.

The thing that is worrisome to me is there's so much turnover.

-CLI coach

As one coach said:

> *The thing that is worrisome to me is there's so much turnover. It seems like you just get a teacher who's rolling, who's gelling, and then… Yesterday, a teacher said to me, "Oh, I just got a new job." I said, "Are you kidding me? I just started with you." I had maybe eight hours in and we were hitting the ground running.*

In interviews with CLI staff and coaches, we probed deeper into this challenge. We found that it is difficult to productively coach new teachers before they receive training. CLI reported that they typically consider the number of new teachers that need training and the time of year that teachers start when deciding to have a make-up training for new teachers. During our study, not all new teachers were able to attend a training before they receive coaching. All four coaches reported that coaching new teachers before they have attended trainings is a challenge. One coach described new teachers' understanding of *Blueprint* as "kind of foggy until they attended the training." This coach continued to explain the importance of attending trainings to fully benefit from coaching:

> *When the teachers go for training, it's usually a five-hour training. When the coaches come into the classroom, we can stay no longer than between an hour to three hours, so we can't do everything in an hour, so it's really imperative that they attend the five-hour training. If they actively attend the five-hour training, a light bulb goes on to say, "Oh, this is what [my coach] meant."*

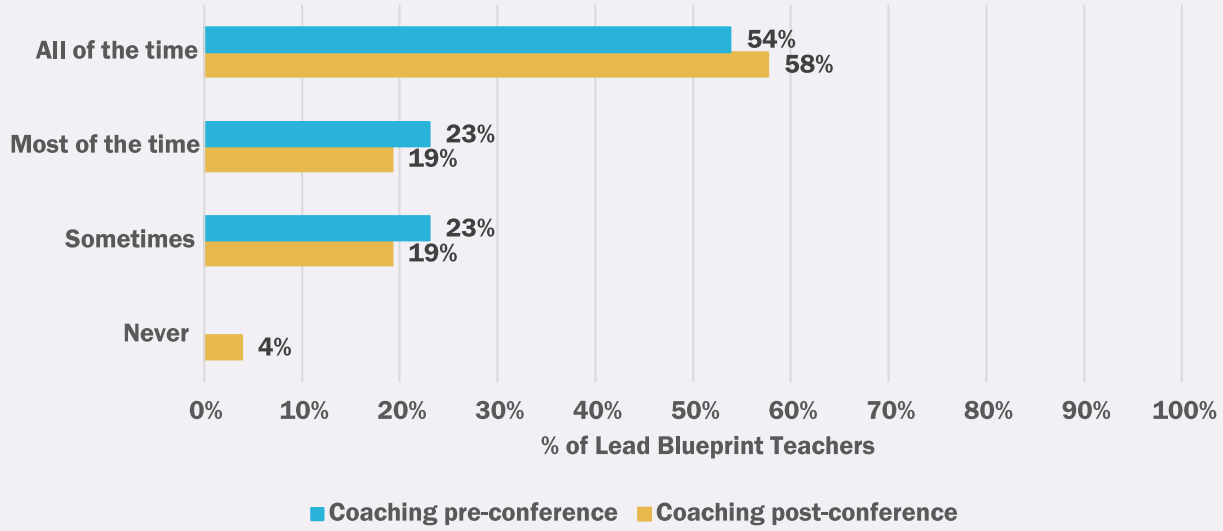
Finding adequate time for coach/teacher pre- and post-conferences was a common challenge across centers

One of the primary challenges to productive coaching was finding time for coach-teacher conferences during coaching sessions. Generally, pre-K teachers have no dedicated planning time or free periods. Moreover, sometimes teachers do not have an assistant in the room with them when the coach visits. In Year Two of the study, directors made more of an effort to ensure that teachers had time for coaching conferences, according to some coaches. However, overall, coaches and teachers continued to find it logistically challenging to find the time to conference during their coaching sessions. In Spring 2017 interviews, one teacher described the difficulty of having focused one-on-one meetings with the coach under such circumstances:

> *I just think that it should be sometimes away from the children. Sometimes, when [the coach] comes, there's nobody to cover the space so that we can really talk about it and analyze it. It doesn't take long sometimes, but I know one time, we had to do it inside of the classroom. I heard what she was saying, but you're making sure Johnny over here is doing the right thing in this center.*

Nonetheless coaches, teachers, and directors made it work. When surveyed in spring 2019, most teachers reported that they had pre- and post-conferences either "most of the time" or "always" (Figure 14), though about one in five teachers reported that they only were able to find time for pre- and post-conference "sometimes."

Figure 14. Percent of lead teachers reporting the frequency of coaching pre- and post-conferences during coaching sessions, Spring 2019, N=26



Source: RFA Teacher Survey, 2018-19

Note: RFA defines "lead" teacher as the teacher CLI targeted to receive coaching.

Challenges related to the pre-K context can reduce the quality of coach-teacher conferences

Though strategies were used effectively to make coaching conferences happen for the most part, we observed nuanced challenges to the quality of coach-teacher conferences related to time constraints and a lack of ability to maintain focus when conferences occur in the classroom in our spring 2019 interviews.

Often, time constraints made pre- and post-conferences shorter than ideal. Two coaches reported that pre- and post-conferences were often shorter than ideal. "The [pre-conference] is usually shorter than I would like it to be. It's hard to pull these teachers, especially early in the morning. They've got parents and breakfast and a lot going on. It could be as little as ten minutes," one coach explained. She added, "We don't always get to the post-conference, that's for sure." Another coach said that, although sometimes pre- and post- conferences lasted the ideal 15 to 20 minutes, there were times when they were both five minutes long.

In-class conferences inhibited teachers' ability to focus on coaching content. Unlike in K-3 settings, pre-K teachers rarely have time each week outside of the classroom to develop their instructional practice. As a result of this limitation, CLI coaches often must conduct coach conferences in the classroom, while teachers are still supervising children. In interviews, coaches and teachers reported in-classroom conferences can inhibit teachers' ability to completely focus on coaching content. One lead teacher explained that it was difficult to focus during these coaching conferences:

> *I'm taking my eyes off the children. So, that could be a little difficult. Trying to talk to [my coach] and talk to [the children]. Because sometimes when I'm talking to [my coach], [the children will] call me and then I have to redirect myself in all these different areas. So, that part is a little tricky.*

Another lead teacher explained:

> *I wish that we had more one-on-one time…the only time I can do it is lunch break and there's two teachers so you can only get a half hour. I wish that we just had more time to reflect without being in the classroom when the kids are there.*

All four CLI coaches also reported that in-the-classroom conferences posed a challenge to successful coaching. "I think we have their full attention outside of the classroom," one coach explained. "When they are in the classroom, they may miss something here or there, or misinterpret it, just because of the distractions, and may not always tell us until we observe something during the next visit." Another coach explained her perspective regarding the way it impacted the quality of coaching, noting that the lack of focus during in-class conferences can limit the depth of the coaching she is able to provide:

> *It definitely affects [the quality of the coaching], depending on the teacher and how well they're able to focus on the conversation and not be pulled by a behavior over here, or the classroom is too loud, or kids are coming over and interrupting. Some teachers are completely able to talk with me, but it's really hard. I would say the majority struggle with that. They can't quite focus.*

This coach explained that she tried to mitigate the challenge by talking fast to get as much information in as she could, prioritizing and making sure she said the things she needs to say, and occasionally meeting with teachers during their lunch time. She explained that meeting with teachers during lunch is not ideal as it could affect the quality of their coaching relationship. "It's really important to me to establish an easy relationship with them, not one where I'm pulling at them and taking away their [break]."

Spotlight on In-Class Coaching Conferences

Coaches and teachers described several challenges for productive coaching conferences that are specific to pre-K, in part because most pre-K centers do not have dedicated prep time and do not have adequate staff to cover the classroom while the coach and teacher meet. We asked coaches and teachers to describe how they make it work. Spring 2017 interviews with coaches and teachers revealed the following strategies:

- **Conferencing in the classroom while children are otherwise engaged.** Teachers and coaches described conferencing while children were napping, having lunch, or had center time or free play. However, teachers' attention was often divided at these times. One coach described center time as a good time to sit down and talk with teachers, but added, "It's not as easy as I'm making it [sound] because of supervision. They do have to keep their eyes on their children."

- **Coverage.** One coach reported that a center director was developing a system to have someone in the office cover for a teacher during a conference. Some sites could not provide this kind of coverage. One coach noted that, at the beginning of the year, teachers were often freed up for conferences, but "it fell apart across the board in most of my centers" as the year progressed. Now there is little substitute coverage. The coach said, "So I feel like I'm on this treadmill. I have to talk fast, get my points across with the post-conference, and schedule my next visit, and make sure the teacher's feeling okay about things." Overall, it appeared that few centers had consistent coverage for conferences.

- **Meeting with two teachers at once.** One coach working at a public school site met with two pre-K teachers during their common half-hour break. Eventually, later in the year, the teachers requested separate meetings.

- **Limiting conference time**. Some coaches and teachers made do with whatever amount of time they could grab. One coach described, "After they implement circle time, then there is the post, where I pull them aside. It just takes a few moments to tell them about the pros and cons of their presentation and how we can enhance that even more using *Blueprint*." In such situations, coaches were able to cover the essentials but may have lacked the opportunity to have a full debrief or give the teacher the opportunity to share questions and reflections.

C. Implementing *Blueprint for Early Literacy* in the Classroom

In this section we describe teacher and center director perceptions of the *Blueprint* materials and approaches to instruction, particularly in the early stages when teachers were new to CLI's approaches. We also provide an analysis of teacher implementation of key elements of *Blueprint* and an in-depth examination of the instructional role of assistant teachers.

Key Findings: Implementing *Blueprint* in the Classroom

- Upon initially adopting *Blueprint* in their classrooms, some teachers praised the curriculum as well-organized, more complete and engaging, and easier to use than the language and literacy components of other curricula. However, others were initially resistant to adopting a new approach.
- We learned through spring 2019 surveys that, though almost 80% of surveyed teachers felt knowledgeable about all three key elements of *Blueprint*, less than half of teachers reported implementing all three elements of *Blueprint* in the classroom with fidelity, i.e., daily use of Intentional Read Aloud and Message Time Plus and integration of Power of Three into the culture of the classroom.
- In response to early findings that some surveyed teachers reported that it is a challenge to adapt *Blueprint* to meet the needs of English Language Learners and younger children, CLI developed and shared through coaching some strategies to support these efforts.
- Assistant teachers play an important role in instruction in their pre-K classrooms; consistent with that, CLI coaches reported that they expect assistant teachers to support *Blueprint* instruction by assisting with MTP and IRA, using Power of Three language, taking anecdotal notes during whole-group instruction, and supporting *Blueprint* implementation in small groups.

I. Adopting *Blueprint for Early Literacy*

Respondents from every interview site reported positively about teachers' responses to *Blueprint*

When we asked in 2017 interviews for teachers' initial reactions to *Blueprint*, often, directors and teachers used words like "love" and "excitement" to describe how teachers felt. A director said, "For the most part all of them really love it." Another director said, "I think the teachers understand what's going on, and the more coaching they receive, the more excited they are…they like it." Another director commented on "the passion that the teachers have shown in utilizing it. They took it upon themselves to open the box and explore it. That was huge, so I really didn't have to push it… [Staff] love it. They more so want to use *Blueprint* than our other curriculum." For one teacher, the presence of *Blueprint* was an incentive to choose her current workplace during the hiring process. "That was a big reason why I wanted to work here, was the *Blueprint*. I just love literacy and having a structured literacy curriculum, and being able to show parents, 'This is what we're doing.'"

Some directors and teachers praised *Blueprint* as well-organized, providing everything needed for instruction

Also in Spring 2017, several directors and teachers said that they found *Blueprint* easier to implement than other curricula they have used in the past or were currently using. Multiple people voiced opinions such as, "Everything is right there" or "It's all there." A director said, "You don't have to go out looking for material. You don't have to go out looking for books and resources. Everything is basically right there as a blueprint. It's just a matter of them reading the material and implementing the material. I believe that it's a good curriculum." A teacher said:

> *I just love that it's a guide. I mean, everything is there for you. It's supportive for you, so if your coach wasn't there, or you couldn't get in contact with your coach, you probably wouldn't really need her, because you got that guide…They couldn't have made it easier. Everything is aligned, everything is step by step. Do this, that, this, that. Then you go to the back of the book, you find out what the activity's about, what you're doing them for, the purpose, the objective.*

A few teachers also praised the wealth of the more than 100 books available with *Blueprint*. Interviewees described the high-quality selection of books, which also provided multiple ways of addressing a theme. One teacher explained:

> *I had the same approach [before Blueprint], but we didn't have as much of a book variety. I found myself going to the library, picking out other books. … If I wanted to get in-depth, it was hard. With Blueprint I find that even if I don't want to stay on theme, there's another something that would match my theme. For instance, we were doing trees, but I also wanted to do shrubs and Blueprint had that.*

Teachers and center directors reported a preference for *Blueprint* relative to other curricula

In Spring 2017, several interviewees said that, in contrast to other curricula, *Blueprint* was easier to use; offered more engaging and higher-quality materials; and incorporated more skill building. Teachers described these aspects of *Blueprint*:

- **Easier to use:** "It's a little bit more detailed and broken down and a little bit more specific. It makes it plain. It makes everything a little bit simpler and easier to understand and to follow, as well."
- **More engaging, high quality materials: "**There's something about *Blueprint*. I think it's the coloring and the attractiveness of the book that keeps [children] looking. When I turn it around, it's like [gasp] so I think it's the attractiveness of it. It's short, sweet and to the point."
- **Incorporates more skill building:** "[With Creative Curriculum] I didn't do the letter recognition. I didn't do the punctuation. That part wasn't there."

However, some experienced a learning curve in adopting *Blueprint*, and some teachers were initially resistant to adopting it

Though many teachers reported that *Blueprint* was set up in a way that was easy to use, teachers were still, according to one coach, "working out all of the newness of the content and coaching" in the first year. Therefore, "I've noticed the second year is where it takes off." Teachers referred to needing time to "get it," or just to make the transition from their former way of doing things to the new way with Blueprint. A director said, "They've gotten used to their daily routine with their circle time, and the calendar, and different things that they were doing—they were used to doing, and now trying to switch gears into this Message Time Plus, and IRA, and not doing some things that they were used to doing for so long [is a challenge]."

In addition to a learning curve, multiple factors appeared to contribute to teacher resistance to adopting the curriculum, including teachers already feeling overloaded, experienced teachers being happy with how they were already teaching literacy, reluctance to change the classroom environment and, at a few sites, lack of participation in training.

Teacher buy-in after resistance was often facilitated by coach or CLI staff support and intervention. In another case, a director described working closely with one teacher and encouraging her to fully adopt Blueprint. "I'm just telling her it's not taking anything away from anything that you're doing because it's wonderful, but there's always room for improvement." One coach noted that as she worked with teachers and participated in training, they came to see the rationale for and benefits of Blueprint. "For the most part they're enjoying it now."

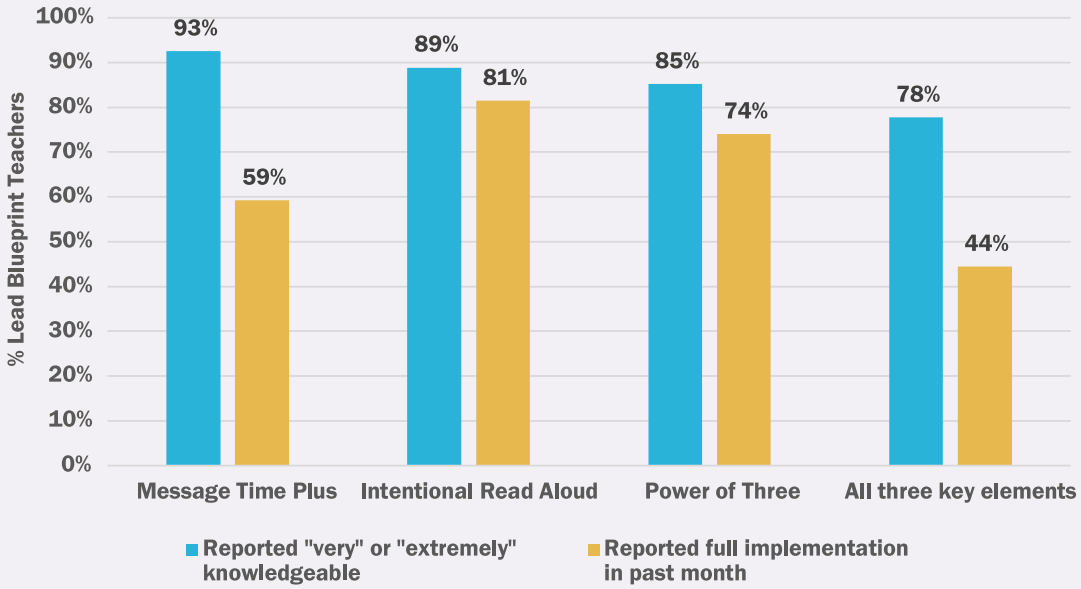
II. Implementing Key Elements of the *Blueprint* Curriculum

CLI recommends that teachers implement Message Time Plus and Intentional Read Aloud every day and integrate the Power of Three into the culture of the classroom.

Though almost 80% of surveyed lead teachers felt knowledgeable about all three key elements of *Blueprint*, less than half were consistently implementing *Blueprint* with fidelity

We surveyed lead Blueprint teachers about their knowledge and implementation of the three elements of the *Blueprint* curriculum (Figure 15).

Figure 15. Key elements of *Blueprint for Early Literacy*: Percent of lead teachers reporting high levels of knowledge and fidelity of implementation, Spring 2019, N=27



Source: RFA Teacher Survey, 2018-19

Note: RFA defines "lead" teacher as the teacher CLI targeted to receive coaching.

Findings:

- Nearly all surveyed teachers reported that they were either "very" or "extremely" knowledgeable about MTP, IRA, and Power of Three and most (78%) felt knowledgeable about all three elements of Blueprint.

- However, less than half (44%) of surveyed lead teachers reported that they implemented all three elements of Blueprint with fidelity in the month prior to the end-of-year survey.
- Examining each key element separately suggests that teachers may need more support in how to consistently implement Message Time Plus every day. Nearly all surveyed teachers (93%) reported that the felt "very" or "extremely" knowledgeable" about MTP, but only about 60% reported daily implementation. Gaps in knowledge and fidelity of implementation were less pronounced for Intentional Read Aloud and Power of Three.

In interviews, some teachers said that they did not implement *Blueprint* components every day because of the need to balance multiple curricula

One teacher said that she could not do MTP every day because of the need to also implement Creative Curriculum and because of the amount of sitting that is developmentally appropriate for children:

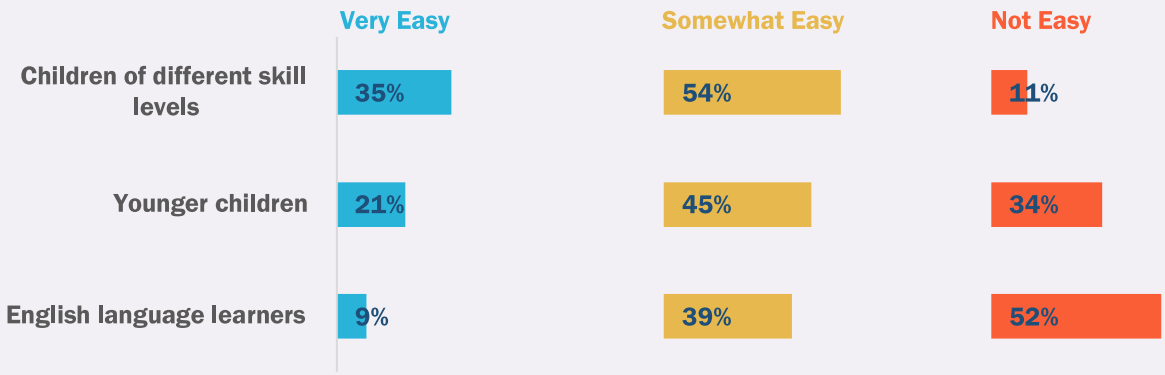
> *We do [intentional read-alouds] every day. Message time is not done every day only because I may have a different activity based off of Creative Curriculum. Message time takes [awhile]. I can't also have them sit on the carpet that long. They're not going to be able to sit there for a good 30 minutes.*

One coach noted that other teachers also don't do IRA and MTP every day. "They say, 'We just can't fit it in.'" Coaches noted that low or inconsistent use of *Blueprint* can lead to more problems in implementation. One coach said, "The teachers doing the *Blueprint* daily have gotten to that place where they can add on more specific writing instruction - shared writing, interactive writing." This coach went on to say, "The ones who aren't doing *Blueprint* daily feel more harried and scattered and less focused." In addition, teachers who use *Blueprint* regularly can more easily expand beyond MTP and IRA into other areas such as writing, according to CLI staff.

Adapting Blueprint for younger children and English Language Learners is challenging

To better understand teacher perceptions of use for all children, we surveyed teachers in spring 2018 about the adaptability of Blueprint for children with different learning needs (Figure 15).

Figure 16. Percent of lead teachers reporting ease of adaptability of Blueprint for children with different needs, Spring 2018, N=25 teachers



Source: RFA teacher survey, 2017-18

Note: Sample sizes vary by item from 24-26 teachers

Findings:

- Some teachers struggle to meet the needs of younger students and English Language Learners. Over a third (34%) of teachers reported that it was not easy to adapt *Blueprint* to meet the needs of younger students, and over half (52%) reported similarly for English Language Learners.

- In contrast, only 11% of teachers reported it was not easy to adapt *Blueprint* for children of different skill levels.

In Spring 2017, some teachers identified challenges differentiating for younger or less-skilled students and did not have a shared understanding of whether it was permissible or desirable to adapt *Blueprint* to meet students' needs. To address this challenge, CLI trained coaches and teachers in strategies to adapt Blueprint to meet the different needs of children. One coach described this as learning how to "break down a lesson and adapt it to the needs of the classroom." In Spring 2018 interviews, all four CLI coaches reported examples of varied strategies they shared with teachers to help them adapt the curriculum for children's varied needs:

- **Creating specific differentiated goals.** One coach said, "We tell them to set specific goals for children when they're conferring with each child." These goals can help teachers plan how to support each child's learning. The coach provided an example: "Maybe if a child is learning the beginning sounds of letters, we'll certainly provide...letters with pictures for children who need to rely on pictures to understand letters."

- **Using classroom staff strategically.** For classrooms with assistant teachers, one coach recommended asking the assistant teacher to work with three-year-olds while the lead teacher works with older children.

- **Adapting seating arrangements.** One coach said that they encourage English Language Learners or younger students to "sit close to the teacher."

- **Providing small-group work.** Coaches encouraged teachers to create a small group of students who need more instruction and "reteach" them lessons in a more targeted way.

- **Making learning more interactive.** Coaches listed interactive activities that could be used to engage children in the learning process, including "turn-and-talks," songs, and using more pictures.

- **Checking in on children's understanding.** One coach explained, "When they're reading a story, they should stop at least three times during the course of reading that story and ask open-ended questions or questions [relevant] to the story for comprehension to make certain that they do understand. You can't go so fast when you're working with children with different abilities."

- **Incorporating children's home languages.** A coach described one way of incorporating home languages, explaining that if there is a story that is in English and Spanish, "the teacher will read it in English and in Spanish and then she will create a follow-up activity that uses the Spanish words and English words."

In interviews, teachers also reported using Message Time Plus scaffolds, substituting books or spending more time on them, shifting lesson objectives, using *Blueprint's* tips for differentiating for English Language Learners, and connecting with families for extra support. Although differentiation strategies varied, teachers had a shared understanding that *Blueprint* lessons can be adapted to meet the needs of the children in their classrooms.

III. Instructional Role of Assistant Teachers

CLI targeted some assistant teachers to receive CLI supports in centers with high lead teacher turnover, and coaches and lead teachers integrated other assistants into coaching in various, less formalized ways. To inform CLI's expectations for assistant teachers to support *Blueprint* implementation and CLI's strategy for incorporating assistant teachers into coaching, we investigated the role that assistant teachers play in classroom instruction. We asked CLI coaches to describe their expectations for assistants in *Blueprint* implementation in spring 2019 and asked teachers to describe assistants' roles in classroom instruction more generally.

CLI coaches reported that assistant teachers should play a supporting role in *Blueprint* implementation

One coach said that assistant teachers must be flexible and responsive to the needs of the classroom: "The assistant really needs to know where they need to be most helpful." Another coach emphasized that the assistant teacher should be "just as much engaged as the teacher and not just doing paperwork." A third coach reported that assistant teachers should support Blueprint implementation the same way as the lead teacher. This coach said, "I don't make a distinction. I don't care what degree you have. Children are children, and they don't care either."

> *I don't make a distinction. I don't care what degree you have. Children are children, and they don't care either.*
>
> *-CLI coach*

Coaches elaborated on some of the ways that assistants could support Blueprint implementation:

- **Assisting with Message Time Plus and Intentional Read Aloud.** Although coaches reported that sometimes assistant teachers lead MTP and IRA, one coach said, "for the most part, they are acting as assistants to the leads." Rather than solely being led by the lead teacher, coaches recommended that assistant teachers support the implementation of these Blueprint elements.
- **Taking anecdotal notes during whole-group instruction.** Three coaches reported that they expected assistant teachers to support whole-group instruction in one specific way during whole-group instruction: taking anecdotal notes. One coach explained that the assistant teacher could be "just jotting down who found what at message time, jotting down who answered a question about comparing and contrasting characters, really just get some good information for the teacher because the teachers in pre-K especially do not have time to do that important work." This coach explained that these notes can inform instruction and support better communication with families. Another coach said that if assistant teachers take these notes, "the teachers will know where [children are] lacking or how they're becoming proficient at certain skills."
- **Using Power of Three language.** Two coaches said that assistant teachers should be using the Power of Three language consistently throughout the day.
- **Supporting *Blueprint* in small groups.** Two coaches said that assistant teachers should be supporting Blueprint implementation in small groups. One coach explained, "I try to encourage the assistants to be aware of the *Blueprint* applications and understand how to administer them to the children and use them with the children."

Consistent with CLI coach expectations, center directors expect assistants to play a substantial role in pre-K instruction

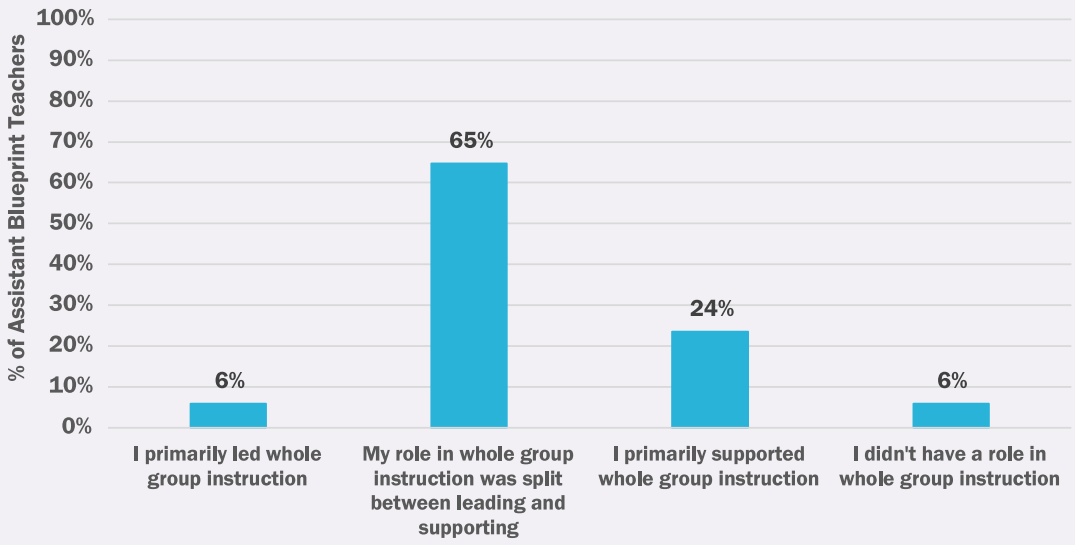
> *I'm looking for the same thing from both teachers…I don't really want to tell that it's a lead and an assistant in there.*
>
> *-pre-K center director*

Center directors expect assistant teachers to play a role in instruction. All three interviewed directors reported that both lead and assistant teachers should have a shared understanding of the instructional plans and process. Two directors said that lead and assistant teachers should be "co-teaching," or, as one of these directors explained, "I'm looking for the same thing from both teachers…I don't really want to tell that it's a lead and an assistant in there." The director explained her rationale for this stance, saying, "It could be a day where that lead's not going to be here, and so I don't want that assistant to be in a classroom acting like an assistant." The third director reported that lead teachers should take on more instruction and lesson planning responsibility than assistant teachers. This director reported expecting that "the lead teacher is more responsible for the delivery of [Blueprint] instruction, and then the assistant…they facilitate sort of the procedures around it."[27]

Nearly all assistant teachers report that they play a role in whole group instruction

We surveyed assistant Blueprint teachers to understand the extent to which assistants were leading or supporting whole group instruction. In Figure 17, we show teacher responses to their role in whole group instruction.

Figure 17. The role of assistant teachers in whole group instruction, Spring 2019, N=17 assistant teachers



Source: RFA teacher survey, 2018-19

Note: We received responses from 17 assistant Blueprint teachers, representing a 65% survey response rate among this group.

27 Expectations for lead and assistant teachers may be the same in some centers for some aspects of the work, though teachers in these positions typically have different credentials and education levels. It is well known that there is a significant wage difference by educational level of early childhood educators; some estimates indicate a $3-4 dollar hourly bump for those with a B.A. compared to those with an A.A. (DHHS 2016).

Findings:

- Only 6% of assistant teachers reported that they did not have a role in whole group instruction and almost two-thirds (65%) reported that their role in whole group instruction was evenly divided between leading and supporting.[28]

Consistent with this finding, teachers in all three interviewed sites reported that, in practice, assistant teachers shared instructional responsibilities with lead teachers – sometimes evenly. For example, a lead and assistant pair at one site reported that they alternated lesson planning and implementing every other week. The assistant teacher in another classroom at that site led MTP and IRA, but the lead teacher did the lesson planning. Even at a site where the lead teachers reported facilitating most whole group instruction, including MTP and IRA, assistants often supported small group instruction. Further, both interviewed assistants at that site reported delivering whole group instruction on some days: when the lead teacher was out or "it depends on basically how we feel that day." One of these assistant teachers said that she and her teaching partner were "interchangeable." Her partner also shared, "We're pretty good at picking up where the other one left off."

28 The survey response rate for assistant teachers was 65%. Even if all non-responding Blueprint assistants did not play a role in instruction, we would still see over 40% of assistants evenly dividing whole group instruction with lead teachers.

Section 5: Conclusions and Recommendations

In this section, we summarize high-level findings from this study and identify implications for CLI's *Blueprint for Early Literacy*. We end with a discussion of broader implications for early childhood decision-makers and practitioners.

Summary of Findings

Unlike many early childhood curricula, *Blueprint for Early Literacy*, coupled with CLI professional development supports, demonstrates positive impacts on both children's vocabulary and classroom literacy activities

Our report documents strong evidence of impact of CLI's pre-K language and literacy supports, notably for children's vocabulary and classroom literacy activities. These results were achieved in spite of the fact that levels of training, coaching, and curriculum implementation suffered because of higher than typical year-to-year teacher turnover. We find that children in classrooms implementing *Blueprint* alongside Creative Curriculum showed two-and-a-half months of additional growth in receptive vocabulary relative to their peers in business-as-usual classrooms implementing Creative Curriculum only.

Blueprint is particularly well-suited for supporting the early language and literacy growth of children in high-need pre-K environments

Positive impacts despite high turnover, along with teacher and center director descriptions of the ease of use, suggest that Blueprint is particularly effective in high-need pre-K environments. Staffing challenges in this study were higher than national averages, with nearly half of lead teachers leaving centers each year. This level of turnover posed significant challenges for CLI in providing the level of support they intended through this project. In January 2017, CLI targeted teachers in 33 classrooms to receive supports to improve outcomes for teachers and children. By Spring 2019, less than half of these teachers remained in their positions. As a result, by Spring 2019 fewer than one in five lead teachers in the 11 Blueprint centers had been to all three core Blueprint trainings and received 60 hours of coaching. Perhaps because of the interruption of supports due to turnover, we found that only 44% of teachers reported implementing all three elements of Blueprint—IRA, MTP, and Power of Three—with fidelity. This may be because, as we heard in interviews, teachers struggled at times to fit in these components when implementing alongside other curriculum.

Recommendations for CLI

The evidence of positive impact alongside evidence of inconsistent training and curriculum implementation fidelity suggests that *Blueprint for Early Literacy* is well-suited for implementation in challenging pre-K settings. We also interpret these findings to mean that, with more consistent support, impacts might be more pronounced. We offer the following suggestions for CLI to consider as a result of this study.

- As CLI continues to support pre-K in high-needs communities, we recommended that CLI offer trainings more often so that teachers who are new to centers or who missed trainings for other reasons have more opportunities to attend. We also recommend that CLI broaden the scope of training and coaching to more intentionally bring in and support assistant teachers, which could increase the chances of continuity of practices over time and higher fidelity of Blueprint implementation.
- CLI should also consider tailoring its professional development model by center, classroom, and/or teacher in order to maximize impact. Centers, classrooms, and teachers have varied strengths and needs; therefore, a one-size-fits-all approach might not be the best match for resources and maximum impact.

- We also suggest CLI consider developing a comprehensive curriculum with content in math, science, social studies, and other areas, given evidence that some teachers struggled to implement *Blueprint for Early literacy* with fidelity because of the challenge of implementing alongside other classroom curricula.

- Finally, this study did not include an assessment of cost, though generally it can be difficult to obtain the resources to implement well-designed in-person coaching models on a broad scale. As CLI continues to build out its supports for pre-K, we recommend examining the impact of the curriculum with and without coaching and exploring an analysis of cost-benefit of various models of service delivery in order to guide programs looking to invest in a new curriculum.

Implications for early childhood educators and policy makers

Because 4- and 5-year-old children with higher levels of early vocabulary and early literacy skills consistently have greater levels of academic success in elementary and middle school, state- and locally funded pre-K programs across the country have expanded significantly.[29] Evaluations of these programs have confirmed that enrolled children have better outcomes.[30] However, for many preschool programs, achieving instructional quality is a struggle.[31] Interventions that appear to work in demonstration trials fail to maintain positive impacts when programs are scaled.

This study of the impact of a curriculum supplement to improve instructional quality and child outcomes was met with many of the challenges that programs supporting pre-K teachers face when taken to scale, including high teacher turnover and difficulties implementing in-person coaching associated with staffing coverage. As such, this study offers lessons for early childhood educators and state and local policy makers, in Pennsylvania and more broadly.

- **The benefits of programs like CLI's may be significant but are unlikely to be large enough to address gaps driven by poverty.** The level of need for supporting the school readiness of preschool children in Philadelphia, which is shared by other large cities with a history of underfunded educational systems and intergenerational poverty, is significant. When we assessed children's vocabulary in the fall, prior to their pre-K year, the children in this study were over a year behind national average in vocabulary development. While Blueprint training, coaching, and curriculum implementation accelerated growth by over two months, the benefits do not come close to addressing developmental gaps that, as research shows, will grow as children enter formal schooling.[32]

- **Providing professional development in the context of high turnover is an unavoidable implementation challenge that requires specific strategies to overcome.** Pre-K staff turnover in Philadelphia, and nationally, is an unavoidable implementation challenge, given current teacher wages. Pre-K curriculum developers must contend with this challenge and create materials that are, at minimum, easy to implement without significant training. Our analysis of CLI also suggests that developers should consider offering flexible training options, potentially online training videos and/or artifacts that could support directors, for onboarding teaching staff mid-year so they can get the most out of their instructional materials.

29 Friedman-Krauss, A. H., Barnett, W. S., Garver, K. A., Hodges, K. S., Weisenfeld, G.G., & Dicrecchio, N. (2019). *The State of Preschool 2018.* Retrieved from: http://nieer.org/wp-content/uploads/2019/08/YB2018_Full-ReportR3wAppendices.pdf

30 Wong, V. C., Cook, T. D., Barnett, W. S., & Jung, K. (2007). An effectiveness-based evaluation of five state pre-kindergarten programs. Journal of Policy Analysis and Management, 27, 122–154. https://doi.org/10.1002/pam.20310

31 Burchinal, M., Kainz, K. & Cai, Y. (2011). *How well do our measures of quality predict child outcomes? A meta-analysis and coordinated analysis of data from large-scale studies of early childhood settings*. In M. Zaslow, I. Martinez-Beck, K. Tout, & T Halle (Eds), Quality Measurement in Early Childhood Settings (pp 11-31). Baltimore, MD: Brookes.

32 Duncan and Magnuson 2011 The nature and impact of early achievement skills, attention skills, and behavior problems. In Duncan and Murnane (eds) Whither Opportunity? Rising Inequality, Schools, and Children's life chances (p 47-69). New York, NY: Russell Sage Foundation.

- **Paraprofessionals in pre-K play an important instructional role in the classroom and expectations for their role should be considered when designing and implementing supports,** with more than half of those we surveyed reporting leading whole group instruction at least some of the time. In talking with CLI coaches and center directors, we found that expectations for assistant teachers are high; in our interviews, we found that respondents wanted to "not be able to tell the difference" between the lead and assistant teacher when observing instruction. However, many programs do not intentionally train or coach paraprofessionals in the classroom. Though CLI invited assistant teachers to trainings, and some assistants received coaching because they were the more stable staff in the classroom over time, we urge those who make decisions about who and how to train to recognize the expectations for assistant teachers and give them the tools to support implementation of curricular activities alongside the teacher formally leading instruction.

Appendix: Data Collection and Analytic Methods

A. Teacher Survey Sample Description

Instrument development. RFA developed a questionnaire with 30 open- and closed-response items for teachers to generate cross-sectional data on teacher perceptions of their knowledge and ability to implement effective practices in early literacy instruction and student learning and engagement. We also asked Blueprint teachers an additional 30 questions to reflect on experiences with Blueprint professional development and implementation of the Blueprint curriculum.

Sampling frame and survey administration. In May 2019, RFA used Qualtrics to program and administer a web-based survey to all lead teachers who were working at study sites who had consented to our study (N=78). The survey was live for four weeks, and three reminder emails were sent to non-respondents during that time. Teachers provided their email addresses when they signed consent forms.

Response rate. Of the 74 lead teachers that consented to the study, RFA received surveys from 55, a response rate of 74%. The lead teacher response rate was not statistically different across treatment and comparison sites (75% vs 73%, respectively, p=0.341). We also extended an invitation for assistant teachers in Blueprint classrooms to complete the survey (N=26). In treatment classrooms, we received 17 surveys from assistants, a response rate of 65%.

A note on representativeness of lead teacher survey data. Our analysis does not account for variation in the number of teachers per site and the number of teachers responding per site. This is due to a small overall sampling size. That is, the data cannot support strategies to account for the structure of the data, e.g., weighting results based on the number of classrooms per center or estimating multi-level models.

B. Interviews

Over the course of the study, we conducted 69 interviews with CLI staff, coaches, center directors, and lead and assistant teachers. Our research focus shifted each year to allow flexibility in our data collection to dig deeper into implementation successes and challenges we saw each year.

Protocol development. RFA developed open-ended and semi-structured interview protocols to understand each year of study's respective focus.

Focus by year. The focus of interviews shifted from year to year, to allow for in-depth investigation into specific strategies, successes, and challenges as the study progressed.

- In Year One, the focus of interviews was to understand general strengths, challenges, and perceived impact of the Blueprint intervention.

- In Year Two, the focus was to deepen understanding of implementation, especially challenges that were raised in Year One, and perceived impacts of CLI training and coaching on teacher and student outcomes.

- In Year Three, the focus was to deepen understanding of the implementation of Blueprint coaching and the role of assistant teachers in supporting a Blueprint classroom.

Participants. Each year, RFA interviewed relevant CLI staff (n=4 in Year One, n=3 in Year Two, n=2 in Year Three) and all four CLI coaches. We also interviewed treatment center directors and teachers, strategically sampled for deep understanding of each year's respective focus.

Year One. We interviewed all nine directors of centers for which we had approval to conduct research at the time. We conducted interviews with a total of 12 lead teachers at seven of the nine treatment centers where we received research approval. We chose these seven sites to achieve variation across several indicators, including type of center; geographic location; size; and literacy curricula used. Our goal was to interview two teachers at each center, and we used the following criteria to identify interviewees if there were more than two pre-K teachers:

- In 9 of 11 treatment sites, one teacher began receiving CLI supports in Fall 2016, as part of another grant. At sites which began implementation in one classroom in Fall 2016, we interviewed the early implementation teacher and a second teacher. At half of the sites, we asked to interview a teacher who was struggling with Blueprint or whose engagement the director was unsure of; at the other half we asked to interview a teacher very engaged in Blueprint.

- At sites without a fall implementation classroom, we asked the director to identify one teacher very engaged in Blueprint and one teacher who was struggling or whose engagement the director was unsure of.

At one site, we learned during our interview that the teacher began implementing Blueprint prior to school year 2016-17, and we excluded this interview from our analysis.

Year Two. RFA interviewed four directors and eight lead teachers in four treatment centers. We strategically sampled directors and teachers to go deeper into issues that were raised in Year One:

- **Director support and knowledge of Blueprint.** CLI staff reported that two selected sites had high director support and knowledge of Blueprint and two selected sites had low director support and knowledge of Blueprint.

- **Teacher turnover.** Two sites had high teacher turnover; two sites had low teacher turnover.

- **Differentiation of Blueprint.** Teachers in our sample had both high and low proportions of English Language Learners and younger learners.

- **Implementing Blueprint with Creative Curriculum.** All four sites balanced using Blueprint with Creative Curriculum.

- **Experience with Blueprint.** Half of the interviewed teachers were new to implementing Blueprint in Year Two; the other half implemented Blueprint in Year One

- **Strength of implementation.** Half of the interviewed teachers were identified by CLI coaches as strong Blueprint implementers; the other half were identified as weaker Blueprint implementers.

Year Three. RFA interviewed three directors, six lead teachers, and six assistant teachers in three treatment centers. We strategically sampled treatment centers and teachers to maximize variation in teacher tenure. In one center, assistant teachers taught at the center for longer than lead teachers, in the second, both lead teachers taught at the center throughout the study but had new assistant teachers this year. In the last center, all teachers taught at the center throughout the entire study. These sites also varied by type and included a pre-K center based in a school district school, an independent early childhood center, and an early childhood center that is part of a provider network. Each of the sampled centers had a different CLI coach.

Data analysis. Interviews were recorded (with consent), transcribed, and coded using the *dedoose* web application. The data were then systematically analyzed using a multi-stage analytic memo process.

C. Assessing Baseline Equivalence for Impact Analysis

Comparison Site Selection

In Year One of RFA's CLI Blueprint evaluation, CLI and RFA worked together to recruit a total of 26 STAR 3 and 4 pre-K centers in North, West, and South Philadelphia. Eleven of the centers received Blueprint training and coaching January 2017-June 2018, and 15 served as a comparison group. Drawing from STAR 3 and 4 centers across the city, we already reduced much of the variation in pre-K center quality. Additional key aspects of comparison site selection included:

- **High need.** To create a matched comparison group, CLI also selected comparison sites from areas with a high need for quality pre-K.

- **Geography.** CLI selected sites in the same geographic areas as the treatment sites.

- **Approval by district.** Because several SDP sites participated in the treatment group and because SDP provides supports to many centers, CLI submitted the list to SDP for their sign-off.

- **Relationship with CLI.** CLI sought sites with no previous relationship with CLI.

Methodological Strategies to Address Non-random Selection of Centers

In Year Two, we employed several strategies to address the non-random selection of centers in order to estimate impacts of Blueprint on teacher and student outcomes.

Specific strategies included:

- Collecting data via teacher surveys on characteristics of centers, directors, and teachers to more fully assess differences in the contexts of treatment and comparison centers;
- Collecting pre-test student outcome data to account for pre-existing differences across treatment groups; and
- Drawing from an over-recruited sample of comparison centers to identify a subset that most closely matched the centers in our treatment group.

We recommended dropping two centers for non-statistical reasons. One center served a high proportion of students with special needs, and the other had consistently had poor response rates across data collection activities.

To identify an additional two centers to exclude, we estimated a statistical model predicting treatment status based on two variables that are highly correlated with other center characteristics: baseline PPVT scores and whether the center was a school district or community provider site. Estimated predicted treatment status across treatment and comparison centers revealed limited overlap at the high end of the distribution of propensity scores. This created a disproportionately lower average propensity for treatment among comparison centers. To address this, we excluded the two comparison sites with the lowest propensity for treatment. This resulted in a more even distribution at the lower end to reduce disproportionately low propensity comparison sites.

Baseline Equivalence of Treatment and Control Centers

As Tables 1A and 1B show, the treatment and comparison sites were statistically equivalent on key characteristics relevant to early literacy. Importantly, the pre-test measure of the main outcome of interest is evenly distributed across groups. We examined baseline equivalence for child outcomes each year of the impact study.

Table 1A. Statistical comparison of center characteristics, t-tests, Year Two

Center Characteristics	Blueprint Centers (N = 11)	Business-as-Usual Centers (N = 11)	Difference	T-test p-value
Number of school district sites	2	2	-	-
Number of pre-K classes	3.09 (2.12)	3.54 (1.63)	0.45	0.579
Average class size	15.88 (4.06)	15.98 (3.06)	0.10	0.951
Average prop ELL per class	0.15 (0.29)	0.13 (0.24)	-0.01	0.912
Average prop IEP per class	0.05 (0.05)	0.08 (0.05)	0.03	0.211
Average prop "under 4s" per class	0.10 (0.08)	0.10 (0.04)	<0.01	0.958
Prop classes – Head Start	0.33 (0.40)	0.42 (0.35)	0.09	0.563
Prop classes – PreK Counts	0.23 (0.40)	0.39 (0.38)	0.15	0.367
Standard PPVT score	93.12 (7.00)	91.37 (3.93)	-1.75	0.479

Table 1B. Statistical comparison of center characteristics, t-tests, Year Three

Center Characteristics	Blueprint Centers (N = 11)	Business-as-Usual Centers (N = 11)	Difference	T-test p-value
Number of school district sites	2	2	-	-
Number of pre-K classes	4.65 (2.46)	4.30 (1.73)	-0.35	0.480
Average class size	14.21 (4.96)	14.70 (3.96)	0.49	0.635
Average prop ELL per class	0.10 (0.24)	0.21 (0.31)	0.11	0.101
Average prop IEP per class	0.11 (0.10)	0.15 (0.11)	0.04	0.111
Average prop of students under 4-years old in May per class	0.10 (0.16)	0.11 (0.13)	0.02	0.611
Prop classes – Head Start	0.41 (0.50)	0.43 (0.50)	0.01	0.910
Prop classes – PreK Counts	0.21 (0.41)	0.28 (0.45)	0.07	0.497
Average Standard PPVT score	94.14 (14.61)	93.29 (12.12)	-0.85	0.331

D. Observations of Classroom Language and Literacy Environments

The Early Literacy and Language Classroom Observation Research Edition Pre-K Tool (ELLCO) measures teacher language and literacy instruction and general classroom environments. Each ELLCO item is rated with a five-point anchored scale that provides descriptions of ratings at each level.

ELLCO Data Constructs. The 19 ELLCO observation items are grouped into five constructs:[1]

- The *Classroom Structure* construct measures the physical environment of the classroom, including the layout, traffic flow, an inventory of the materials, as well as how the children use them. It also includes observations of classroom management and adult roles within the classroom.

- The *Curriculum* construct measures the use of time throughout the observation, the integration of themes, and the recognition of child diversity and choice in the daily routine.

- The *Language Environment* construct measures the discourse climate, how teachers interact with the children, and how they build vocabulary and phonological awareness through extended conversations.

- The *Books* construct measures the organization, characteristics, availability, and use of books for learning. It also measures the teacher's approach to reading a book aloud to children and their general engagement during the read aloud.

- Finally, the *Print and Early Writing* construct measures the use of environmental print, writing materials, and writing instruction.

These five constructs are further grouped into two subscales – the General Classroom Environment subscale and the Language and Literacy subscale.

- The *General Classroom Environment* subscale is a composite of the Classroom Structure construct and the Curriculum construct.

- The *Language and Literacy* subscale is a composite of the Language Environment, Books and Book Reading, and Print and Early Writing constructs.

Smith et al. (2008) report an internal consistency of 0.86 for the Language and Literacy subscale and of 0.83 for the General Classroom Environment subscale. ELLCO observational scores are

[1] Smith, M. W., Brady, J. P., & Anastasopoulos, L. (2008). User's Guide to the Early Language & Literacy Classroom Observation Pre-K Tool. Baltimore: Paul H. Brookes Publishing Co.

predictive of children's receptive vocabulary (as measured by the Peabody Picture Vocabulary Test) and early literacy scores (as measured by the Profile of Early Literacy Development).

Observation training and inter-rater reliability. To establish inter-rater reliability, RFA observers received ELLCO training and practiced observing classrooms in March-May 2017. Practice sessions and debriefing conversations were used to calibrate ratings after each observation to achieve inter-rater reliability (i.e., agreement within one point on each item).

E. Student Outcomes: Direct Assessment

In Years Two and Three, RFA collected student vocabulary assessment data by administering the PPVT to students enrolled in study centers. Our sample included children who were proficient in English[2] and whose caretakers did not opt them out of participating. RFA staff and external consultants, hired by RFA, collected Year Two baseline data from October-December 2017, Year Two post data from March-June 2018, Year Three baseline data from October-December 2017, and Year Three post data from March-June 2018. Assessment data were considered valid if students passed the PPVT training items, had a raw score of at least 4, and completed the assessment.[3]

- **Final Year Two sample.** Students for whom RFA had valid data from fall and spring were included in the analysis (N=808, 70% of the full sample). There were not differential response rates across treatment and comparison groups (70% vs 69%). The final sample includes data from 32/34 treatment classrooms and 39/40 comparison classrooms.
    - **Fall 2017 sample.** Of the 1,242 students enrolled in study centers in Fall 2017, RFA collected valid assessment data from 1,092 students, a response rate of 88%. The sample was comprised of 458 students from treatment centers and 634 students from comparison centers.
    - **Spring 2018 sample.** Of the 1,121 students enrolled in study centers in Spring 2018, RFA collected valid assessment data from 1,063 students, a response rate of 95%. In the spring, 487 students were from treatment centers and 576 students were from comparison centers.
- **Final Year Three sample**. Children for whom RFA had valid data from fall and spring were included in the analysis (N=783, 88.2% of the full sample). There were not differential response rates across treatment and comparison groups (89% vs 87%). The final sample includes data from 33/36 treatment classrooms and 38/38 comparison classrooms.

[2] We initially collected baseline data for students proficient in Spanish using the Spanish-language version of the PPVT, the TVIP. We discontinued use of the TVIP during spring data collection because we determined the Spanish-language version was not comparable to the English version based on the following reasons: the TVIP is in black and white and less engaging for young children; the scoring process is different for the TVIP; the TVIP does not include the Growth Scale Value (GSV); and there are fewer total items in the TVIP, providing an advantage to earn a higher score to students taking the PPVT. In practice, we did not find these assessments to be parallel and ultimately excluded TVIP data from the sample.

[3] Dunn, L. M., Dunn, D. M., Lenhard, A., Lenhard, W., & Suggate, S. (2015). *Peabody Picture Vocabulary Test [manual].* Pearson.

- **Fall 2018 sample.** Of the 1,010 children enrolled in study centers in Fall 2018, RFA collected valid assessment data from 945 children, a response rate of 93.5%. The sample was comprised of 426 children from treatment centers and 519 children from comparison centers.

- **Spring 2019 sample.** Of the 1,136 children enrolled in study centers in Spring 2019, RFA collected valid assessment data from 1,050 children, a response rate of 92.4%. In the spring, 500 children were from treatment centers and 550 children were from comparison centers.

Dependent variable. The student outcomes measure was the Growth Scale Value (GSV) score from the PPVT assessment. The GSV was used because it can measure change in scores over time on a single, continuous scale, allowing us to compare scores over time and to determine a program's effectiveness.[4]

Multi-level model. RFA estimated a multi-level random intercept model, adjusting for the following student-level characteristics: baseline PPVT growth scores, ELL status, and age. Multi-level modeling provided an estimate of the difference in average GSV scores between treatment and comparison groups, accounting for clustering of students within centers and student-level controls.

$$PPVTSpring_{ij} = \gamma_{00} + \gamma_{01}Treatment\ + \gamma_{10}PPVTFall_i + \gamma_{20}ELLStatus_i + \gamma_{30}Age_i + \ e_{ij}\ + \ u_{0j}$$

Student-level model (Level 1). We began by modeling a child's GSV from spring PPVT as a function of select student-level characteristics (i.e., baseline scores, child's age, ELL status) and a student-level random error (i.e., e_i):

$$PPVTSpring_{ij} = \beta_{0j} + \beta_{1j}PPVTFall_i + \beta_{2j}ELLStatus_i + \beta_{3j}Age_i + \ e_i$$

Where, β_{0j} is the mean GSV score of center *j*, accounting for differences in children' baseline scores, age, and ELL status. e_i is the difference between an individual child's PPVT score and their center's mean.

Center-level model (Level 2). At the Level 2, we specified the adjusted center-level means are a function of the treatment condition. However, slope coefficients $\beta_1, \beta_2,$ and β_3 are assumed to be fixed at level 2. We examined an alternative specification that allowed these slope coefficients to vary with a random error at the center-level. This alternative model was rejected because it did not improve overall model fit compared to the model presented here.

$$\beta_{0j} = \gamma_{00} + \gamma_{01}Treatment\ + \ u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

[4] Ibid.

Where γ_{00} represents the grand mean of comparison centers, where treatment = 0 (i.e., comparison centers); γ_{01} represents the treatment effect, which is the difference between the treatment mean and comparison mean, adjusting for student-level covariates; γ_{10}, γ_{20}, and γ_{30} represent the effects of *PPVTFall*, *ELLStatus*, and *Age* on the dependent variable (*PPVTSpring*), respectively; and u_{0j} represents the center-level error term, i.e., the difference between a center's mean and the grand mean of all children.

Table 2A. Mixed-model coefficients for Year Two, N=808

Covariates	Coefficient	Standard error	P-value
Treatment effects (center level)	3.60**	1.30	0.005
Baseline (PPVT Fall GSV, student level)	0.62***	0.02	0.000
ELL status (student level)	-1.76	1.64	0.001
Age, under 4 in May (student level)	-4.46***	1.36	0.284
Intercept (adjusted grand mean)	49.35***	2.63	0.000

*p<0.05; **p<0.01; ***p<0.001

Table 2B. Mixed-model coefficients for Year Three, N=783

Covariates	Coefficient	Standard error	P-value
Treatment effects (center level)	2.65*	1.15	0.021
Baseline (PPVT Fall GSV, student level)	0.71***	0.02	<0.001
ELL status (student level)	.21	1.45	0.886
Age, under 4 in May (student level)	-4.03***	1.17	0.001
Intercept (adjusted grand mean)	37.53***	2.64	<0.001

*p<0.05; **p<0.01; ***p<0.001

Table 2C. Mixed-model coefficients for combined child sample, N=1,591

Covariates	Coefficient	Standard error	P-value
Treatment effects (center level)	3.05***	0.922	0.001
Baseline (PPVT Fall GSV, student level)	0.66***	0.02	<0.001
ELL status (student level)	-0.63	1.12	0.571
Age, under 4 in May (student level)	-4.33***	0.90	<0.001
Study year (Year Three==1)	-1.58**	0.51	0.002
Intercept (adjusted grand mean)	37.53***	2.64	<0.001

*p<0.05; **p<0.01; ***p<0.001

Effect size. RFA calculated effect size as the difference between treatment and comparison groups' mean GSV scores divided by the standard deviation of the normed population. The standard deviation of the GSV of the normed population sample varies by age. RFA calculated the effect size

of Blueprint based on the standard deviation of the normed population for the age group at the time of spring assessments (weighted average: 15.25).

Months of growth. RFA calculated average the impact of CLI Blueprint on study vocabulary in terms of the additional months of growth that children in treatment centers gained relative to their peers in control centers. To do this, we used normed scores across the age groups of the children in our sample, which is equivalent to 1.28 points of growth in PPVT scores per month. On average treatment children scored 3.05 points higher than their peers, translating to 2.38 months of additional growth (3.05/1.28=2.38).

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