Massachusetts Early Childhood Support Organization Initiative: Final Evaluation Report

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The MA ECSO Initiative

In 2020, the **Massachusetts Department of Early Education and Care** (EEC) and **New Profit** embarked on a public-private partnership to launch the Early Childhood Support Organization (ECSO) initiative. The goal is to improve the quality of early education and care programs across the state by giving program leaders (administrators and other instructional leaders at the sites) and educators the tools they need. This includes creating a positive work environment, offering hands-on professional learning, using high-quality curriculum and child assessments, and focusing on continuous quality improvement.

"This initiative has helped me grow immensely. It gave me the confidence to try new things and to realize that no matter how crazy it is, protected time to come together and reflect is super important and the key to quality improvement." *-Cohort 4 ECSO EEP Leader*

REPORT SUMMARY

- The ECSO initiative is a two-year program that gives personalized support to leaders and educators in community-based early education programs. It combines knowledge building with practical application of new knowledge.
- ECSO participation helped boost leader confidence and improve their practices and facilitated educator receipt of supports and use of curriculum/assessment tools. The evaluation showed positive impacts relative to a comparison group.
- The evaluation found a positive impact on some high-quality markers in ECSO pre-k classrooms relative to a comparison group using one observational measure but did not find a strong consistent impact on quality across age groups using a second observational measure.
- Learnings from this study are helping EEC shape the future of the ECSO initiative—especially in deciding what to keep and what to improve – and how to better support and train early education leaders across Massachusetts.

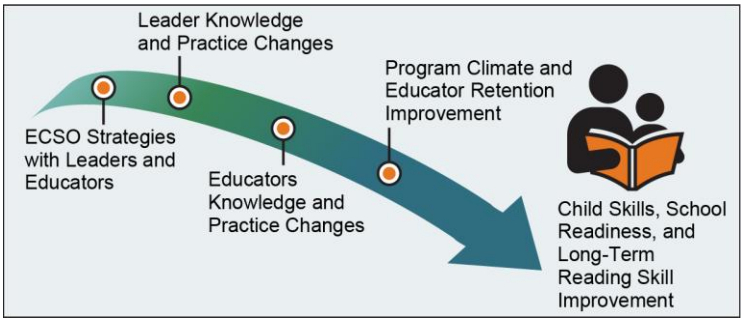
The initiative started as a pilot to facilitate EEC's understanding of how a program focused heavily on leadership-focused support could work. Over time, it has grown into a whole-site quality improvement effort. So far, ECSO has supported five cohorts of programs, reaching 135 licensed community-based providers.

How ECSO Works

The ECSO model is based on research on program leadership[1], a group that historically has received much less support than educators. By strengthening leadership and, somewhat less

[1] Senge, P. M. (2006). *The Fifth Discipline: The Art & Practice of the Learning Organization*. New York: Penguin Random House. Kirby, G., Douglass, A., Lyskawa, J., Jones, C., & Malone, L. (2021). *Understanding Leadership in Early Care and Education: A literature review.* OPRE Report 2021-02. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation.
Douglass, A., & Kirby, G. (2022). *Evaluating Leadership Development in Early Care and Education.* OPRE Report 2022-141. Washington DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation.

intensively, educators, the ECSO initiative aims to bolster the provision of high-quality instruction. The initiative's theory of change models the intended cascade of improvements beginning with improving program leadership to better support educator knowledge and practice, eventually improving outcomes for children.



Three intermediary organizations or ECSOs – the Children's Literacy Initiative (CLI), University of Florida Lastinger Center for Learning (Lastinger), and the Early Education Leaders Institute at UMass Boston (UMB) – each work with different programs. Each ECSO had a strong track record of program delivery prior to this initiative, but this was the first time they delivered their supports in new combinations and in a new context. Each organization uses its own approach (see Exhibit 1) to support programs but shares common strategies like:

- multi-modal learning opportunities for leaders;
- combining skill-building and real-world application; and
- supporting practices like data use, job-embedded professional development for educators, and leader identity.

Additional details about each organization's model are included in Appendix A.

Exhibit 1. ECSO Model Differences

	CLI	LASTINGER	UMB
Dosage	More intensive/higher dosage for educators	More intensive/higher dosage for leaders	Less intensive for both leaders and educators
Format	Primarily coaching/ technical assistance	Substantial Professional Learning Communities and online coursework	More professional development and less coaching for leaders
Educator Focus	Explicit educator coaching	Online coursework for educators	Very little direct educator support
Tools	*Blueprint for Early Learning* curriculum in pre-k classrooms	Coaching Certification for leaders	*Essentials 0-5 Survey*

Programs first apply to be part of the initiative. EEC reviews applications for readiness to engage in the supports and commitment to serving historically marginalized communities, then matches the most suitable applicants to an ECSO.

Evolving the Model

ECSO continues to evolve based on evaluation and participant feedback. Recent EEC adjustments include:

- requiring educator coaching (which was not directly specified in previous years and left to the discretion of each ECSO);
- selecting and supporting a specific high-quality curriculum; and

- extending support to a three-year model.

This report focuses mostly on the original model as implemented and does not address impacts of more recent improvements; the theory of change is included in Appendix B.

Learnings to Date

Since 2021, EEC and New Profit have partnered with Abt Global (Abt) to independently evaluate the ECSO initiative. Abt studied how the initiative was carried out and measured changes in outcomes for programs that received ECSO supports and, more recently, for comparison programs that did not receive those supports. In Years 2-4 of the evaluation, Abt shared summary reports of evaluation activities and findings. The evaluation found improvements over time on important outcomes for program leaders and, to a lesser extent, educators. Key takeaways from those reports are listed in Exhibit 2. It is important to note that all three of these reports have some limits. Some years had no comparison group so results only show progress, not cause and effect. Other years involved a limited sample and/or incomplete implementation, making findings inconclusive/preliminary.

Exhibit 2. High-Level Findings from Previous Abt ECSO Evaluation Reports

2022 (Year 2) Implementation and Growth Report

- ECSOs provided between 5 and 23 hours of monthly support to each program
- Leaders and educators in ECSO reported improvements on outcomes of interest
- Increases in pre-k and toddler classroom quality
- Bigger growth in programs that had more months of support

2023 (Year 3) Implementation and Preliminary* Impact Report

- ECSOs provided between 3 and 12 hours of monthly support to each EEP
- Leaders and educators had significantly better outcomes than comparison
- No impact on classroom quality relative to comparison group but bigger quality improvement after 2 years of participation rather than just 1

**1 of 2 cohorts, 1 of 2 years*

2024 (Year 4) Implementation and Preliminary* Impact Report

- ECSOs provided between 3 and 12 hours of monthly support to each EEP
- Leaders and educators had significantly better outcomes than comparison
- Suggestions of positive impact on program quality on discrete behaviors but not on standard quality measure

**2 of 2 cohorts, 1 of 2 years*

The Full Impact Evaluation

This final report looks at the impact of the two-year program on instructional leader confidence and practices; educator receipt of support, curriculum and assessment use, and desire to remain in the field; and classroom quality for two groups of programs—Cohort 3 (which started in fall 2022) and Cohort 4 (which started in fall 2023)[2]. These 46 programs are licensed center-based programs across 35 Massachusetts towns, mostly serving infants through preschoolers. Three of the 46 programs are Head Start sites.

How We Measured Impact

EEC did not randomly choose programs to receive ECSO support, so Abt used a Quasi-Experimental Design (referred to in this report as a **comparison study**) to evaluate the impact of the initiative. This

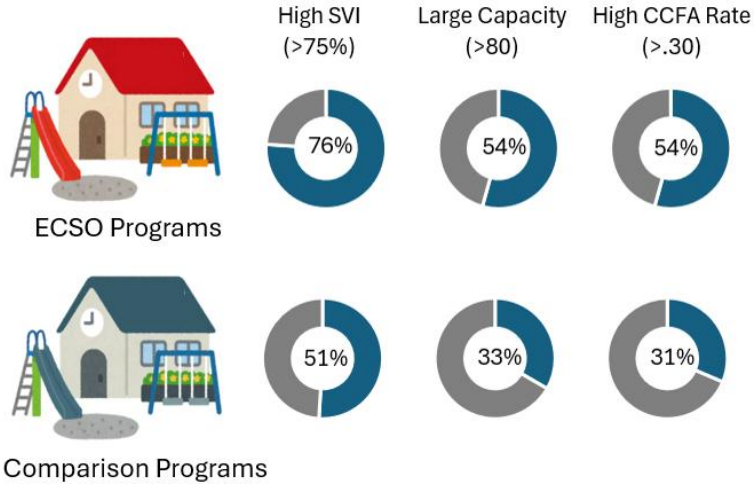
[2] Cohorts 1 and 2 were part of the initial pilot phase of the initiative, and Cohort 5 had not yet completed two years of participation at the time of this report, so those three cohorts were not included in the impact evaluation.

means Abt carefully matched ECSO-supported programs with 48 similar programs *that were eligible for ECSO supports but did not apply* based on location, size, and community need. Even with careful matching, ECSO programs tended to be larger, served more children receiving EEC Child Care Financial Assistance (CCFA), and served needier communities (as measured by the Social Vulnerability Index or SVI; an index of factors like poverty, transportation access, etc. in the community) than comparison programs. In total, the analysis included:

- 94 programs (46 ECSO, 48 comparison);
- 372 classrooms;
- 60 leaders; and
- 213 educators.

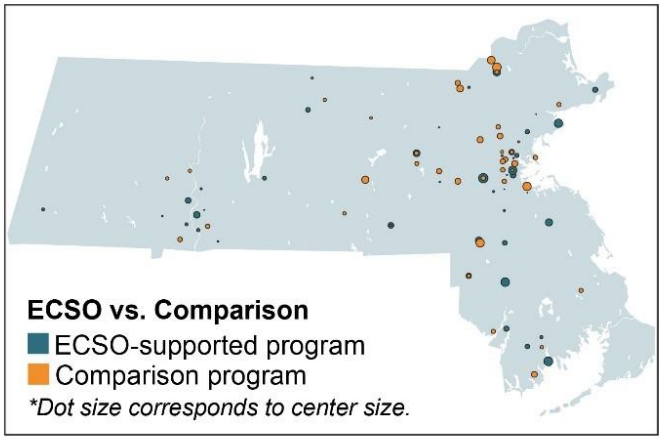
More details about the sample and methods are in Appendix C, and comparisons of program and participant characteristics at the start of the initiative ('baseline') are in Appendix D.

Exhibit 3. ECSO and Comparison Program Characteristics



On average, each programs served 96 children (ranging from 10 to 312 children) and are located in higher-density areas of the state (Exhibit 4). They serve communities with high levels of need (average SVI of 0.81, ranging from 0 to 1). Ten of the programs are also Head Start programs (3 in the ECSO group and 7 in the comparison group). Most program leaders and lead/co-lead educators identify as White women. Most leaders have a bachelor's degree or higher, and about half of the educators do (see Appendix C for more details). ECSO programs tended to have more diversity and slightly lower education levels among staff relative to comparison programs.

Exhibit 4. Location and Size of ECSO and Comparison Programs



The evaluation was designed to answer a set of research questions (show in the box below).

Primary Research Questions

- How much did **leader confidence and practices** *change* after two years of participation in the ECSO initiative compared to programs that did not get ECSO supports?
- What was the *impact* of two years of participation in the ECSO initiative on **leader confidence and practices** compared to leaders in programs that did not get ECSO supports?
- How much did **educator feelings of support, tool use, and desire to stay** *change* after two years of participation in the ECSO initiative compared to programs that did not get ECSO supports?
- What was the *impact* of two years of participation in the ECSO initiative on **educator feelings of support, tool use, and desire to stay** compared to educators in programs that did not get ECSO supports?
- How much did **classroom quality** *change* after two years of participation in the ECSO initiative compared to programs that did not get ECSO supports?
- What was the *impact* of two years of participation in the ECSO initiative **on classroom quality** compared to classrooms in programs that did not get ECSO supports?

Four types of data were used:

1) monthly support logs shared by each ECSO to understand how much support was provided;
2) leader surveys at the beginning and end of the two-year initiative to understand how their confidence and practices changed,
3) educator surveys at the beginning and end of the two-year initiative to look at changes in their feelings of support, tool use, and desire to stay, and
4) classroom observations at the beginning and end of the two-year initiative to measure classroom quality.

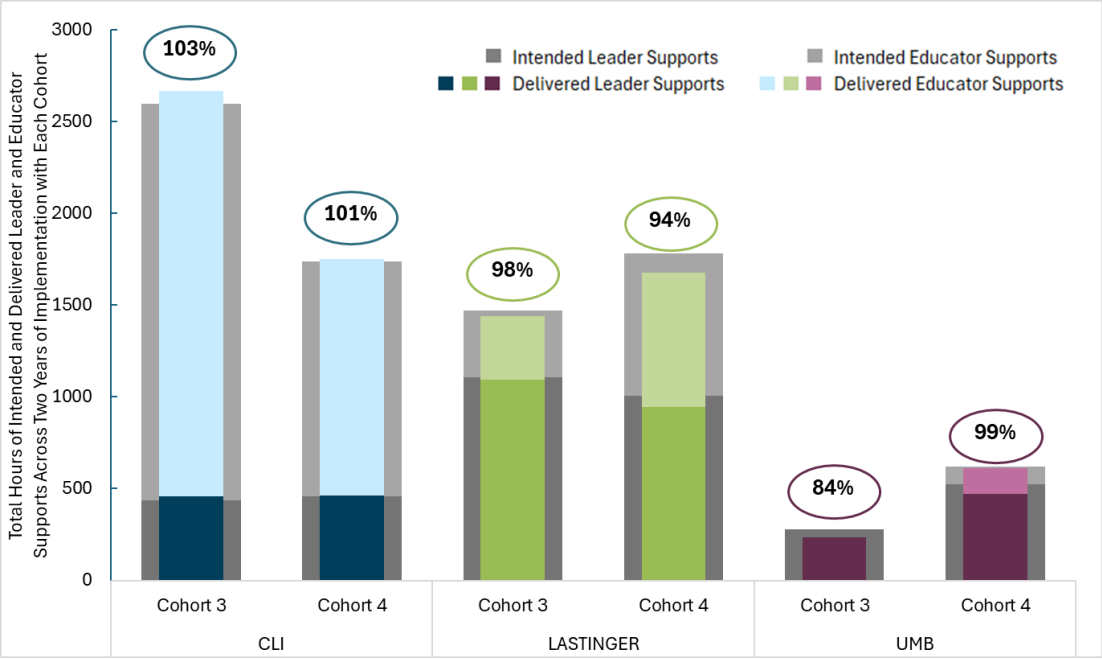
Appendix C explains these data sources in more detail.

Implementation

Over two years, ECSOs gave 8,381 hours of support to program leaders and educators in the 46 programs – 3,659 hours for leaders and 4,722 hours for educators. On average, each program received approximately 7.6 hours of interaction each month. ECSOs recorded both the hours they planned to provide and the hours they actually delivered. Differences between intended and delivered hours were mostly due to scheduling, attendance, and coordination challenges. Each ECSO met or nearly met its planned support goals. Exhibit 5 shows intended hours (gray columns) and delivered hours (blue, green, and purple columns) by target group, ECSO, and cohort. Variations in total hours reflect differences in ECSO models and in the number of programs each ECSO supported. The number of programs in each ECSO/cohort was different, and so the total hours of support provided (as reflected in the exhibits below) reflects those differences as well as model differences.

	Cohort 3 Programs	Cohort 4 Programs
CLI	9	8
Lastinger	9	8
UMB	5	7

Exhibit 5. Total Intended and Delivered Hours of Support by ECSO and Cohort



Read As: CLI delivered 103% of their intended hours to Cohort 3, comprised of ~460 hours of support delivered to leaders and over 2,200 hours of support delivered to educators.

EEC required ECSOs to offer the same core services, but there were no specifications about how *much* support to provide. Each ECSO used a different approach and level of intensity. CLI worked more closely

8,381

Hours of total support provided to leaders (3839) and educators (4839)

5,875

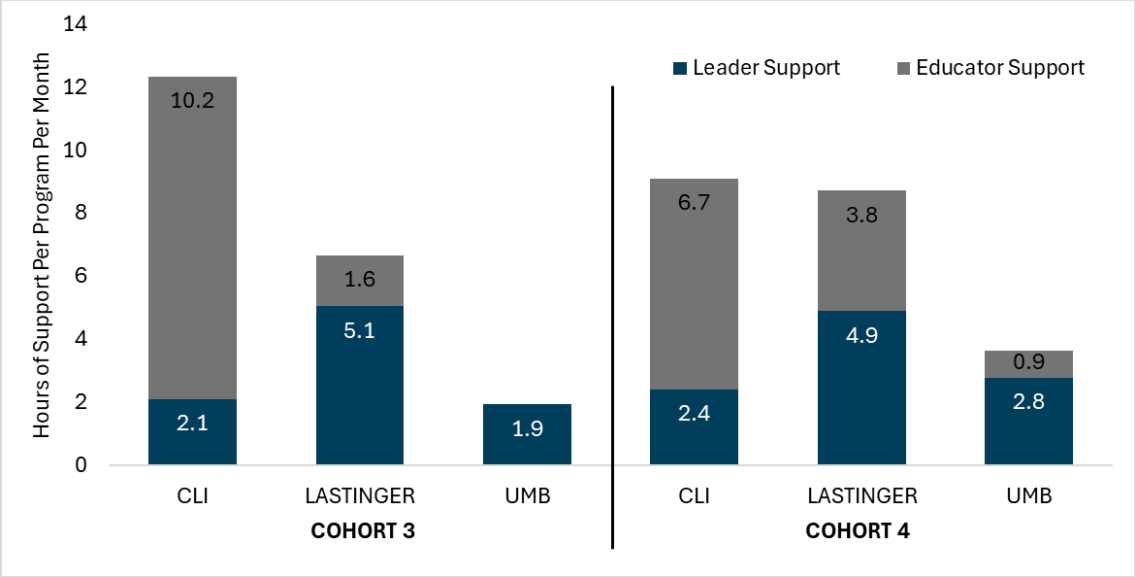
Hours of direct coaching provided to leaders and educators

7.6

Monthly hours of support provided to each program on average

with educators, and Lastinger focused more on supporting leaders and intentionally involved leadership teams instead of individuals.

Exhibit 6. Average Hours of Support per program per Month by ECSO and Cohort

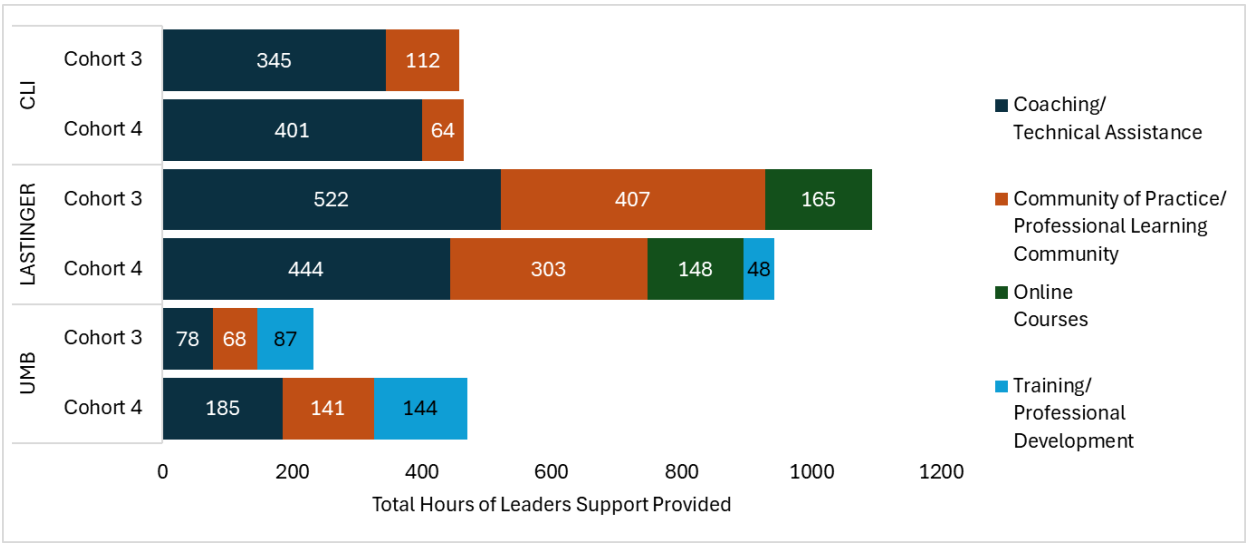


Read As: Across two years, CLI provided an average of 2.11 hours of leader support each month to each Cohort 3 program and an average of 10.23 hours of educator supports each month to each Cohort 3 program.

ECSOs also supported leaders using different formats (see Exhibit 7 below). Most support for leaders came through coaching/technical assistance and collaborative learning via communities of practice/professional learning communities. ECSOs also leveraged other formats like workshop-based training/professional development and online coursework (specific to Lastinger) to support leaders.

> *"The [ECSO] training workshops were incredibly beneficial to me. They provided me with new skills and knowledge in leadership, which significantly improved my ability to support the teachers. Interacting with other directors during the classes also had a positive effect, as it allowed for valuable exchange of ideas and insights, further enhancing my leadership capabilities. This indirectly benefited the children as well, as it enhanced the overall quality of care and education they received."* -Cohort 3 ECSO EEP Leader

Exhibit 7. Delivered Hours of Leader Support by Format, ECSO, and Cohort



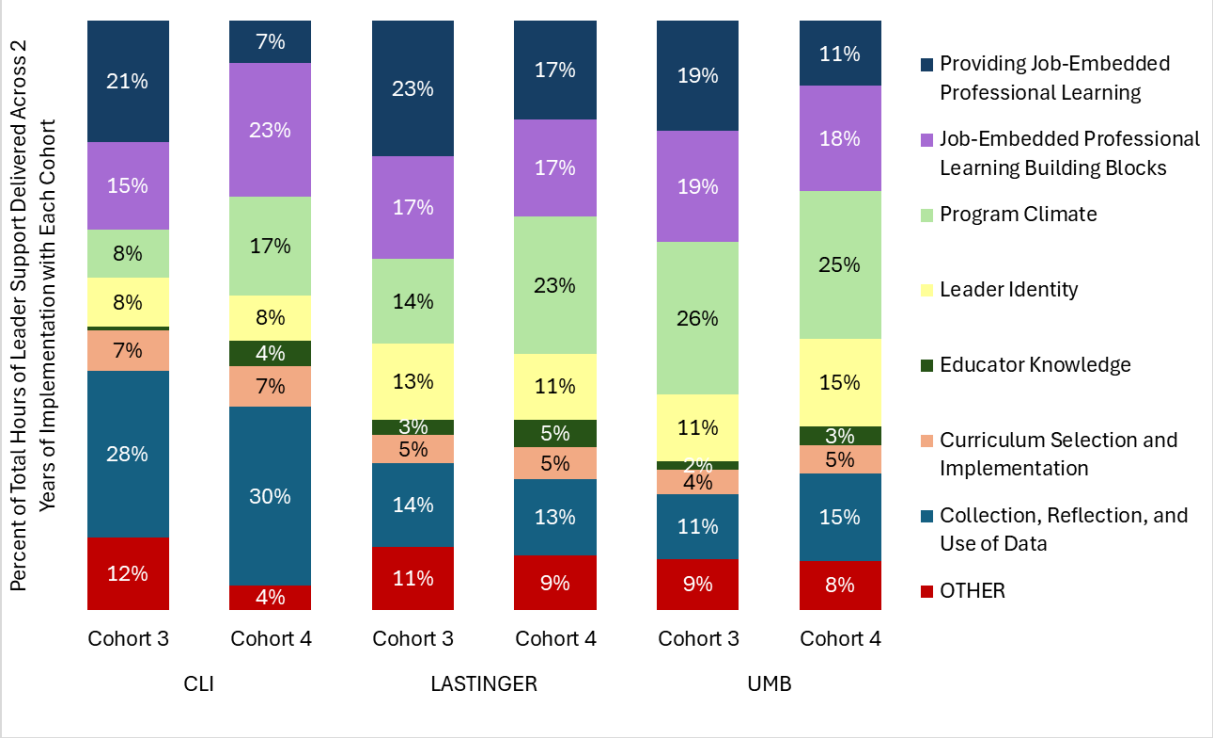
Read As: CLI supports for Cohort 3 consisted of 345 hours of coaching/technical assistance and 112 hours of Community of Practice/Professional Learning Community opportunities. UMB supports for Cohort 3 included 78 hours of coaching/technical assistance and 68 hours of Communities of Practice along with 87 hours of training/professional development.

Across ECSOs, the *topics* of leader supports were similar. ECSOs emphasized:

- using data effectively;
- creating a positive program climate;
- offering job-embedded professional learning and its building blocks including:
  - program management structures like classroom observation and feedback;
  - staff supervision; and
  - managing time effectively to deliver professional development.

These topics were addressed with similar intensity by all ECSOs (see Exhibit 8).

Exhibit 8. Delivered Hours of Support by Topic, ECSO, and Cohort



Read As: CLI supports for Cohort 3 focused on 8 topics and most heavily emphasized providing job-embedded professional learning (21% of the hours of leader support they provided focused at least in part on this topic), job-embedded professional learning building blocks (15%), and collection/reflection/use of data (28%). Note that any single hour of support could cover more than one topic.

No ECSO delivered its model exactly as planned, but each successfully implemented most key components for every cohort. Appendix A provides more details on how each ECSO's approach worked in practice.

Program Growth and Impact

The evaluation examined two things:

- ***growth*** - how much each group changed over two years, and
- ***impact*** – the size of the effect, or the size of the difference in growth by the two groups. To make results easy to compare, Abt converted impacts into a standard scale. This allows impacts to be compared across different outcomes and even against other studies. Abt looked at which impacts

were 0.20 standard deviations or more, a benchmark often considered a small but meaningful difference in education studies. *Positive impact* means that ECSO programs did better; *negative impact* means that the comparison programs did better.

Both kinds of analyses adjusted for differences in where programs/leaders/educators were at the beginning of the initiative. See Appendix C for technical details on the analytic approach and Appendix D for full data tables. Key findings are summarized below.

Leader Outcomes

Leaders in ECSO programs became more confident and improved their leadership practices over two years (see Exhibit 9). Leaders in comparison programs also improved, although not as much. This growth was often associated with a positive impact in the comparison group study (see the green dots in Exhibit 9).

- *Confidence:* Leaders rated how confident they felt about 21 leadership tasks related to key initiative goals. At the end of two years, leaders in ECSO programs felt 8-10% more confident on nearly all outcomes than they did at the start of the initiative, and comparison leaders did not improve as much. ECSO had a meaningful impact on three of the five confidence-focused outcomes in the comparison study.

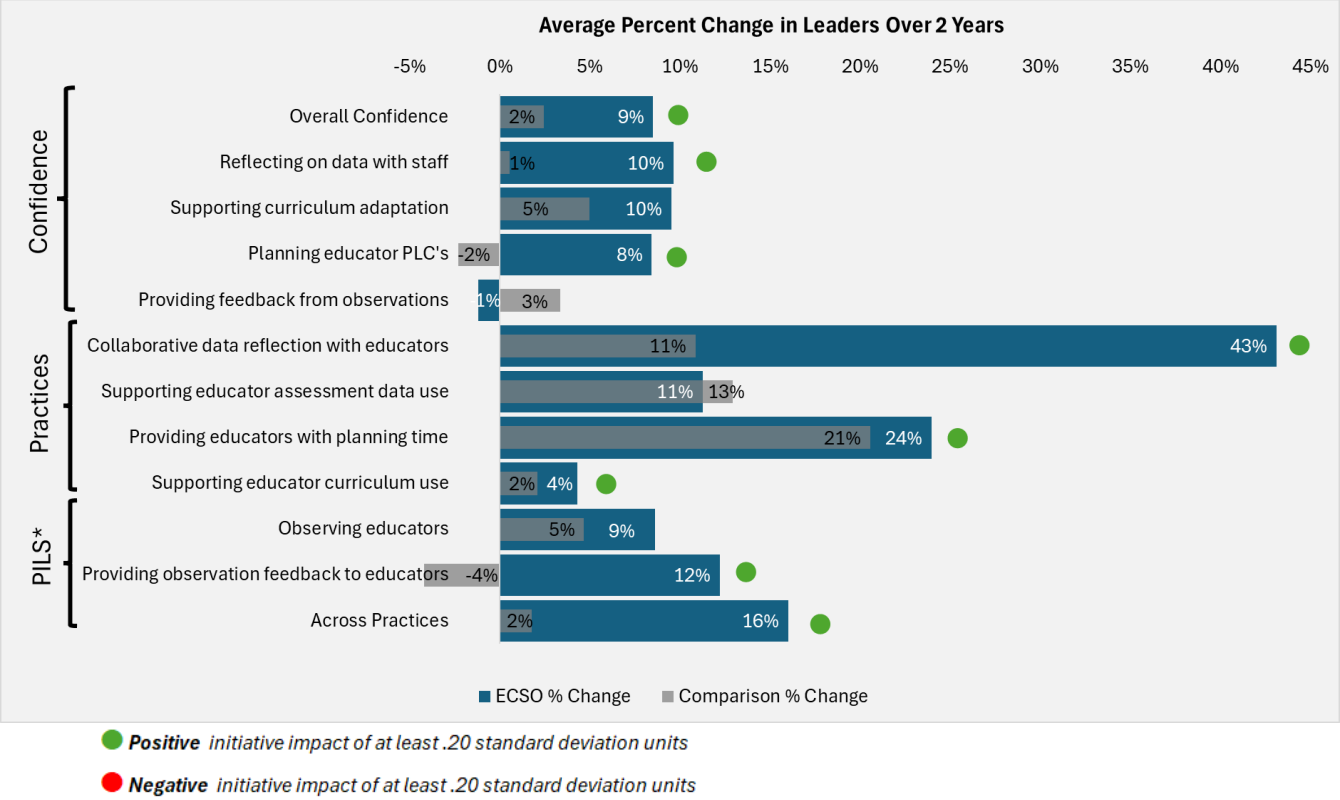
> *"I have gained confidence b/c this model served as a reminder that we do not have to have all the answers. Use the knowledge in the room to tackle challenges, collaborate and we all take responsibility!" -Cohort 3 ECSO EEP Leader*

- *Practices:* Leaders answered questions about how often they did certain activities such as working with staff to review data, helping educators use assessments effectively, helping educators set up and plan instructional goals, and helping educators put curriculum into practice. Leaders also completed the Preschool Instructional Leadership Scale (PILS[3]), which focuses on how often leaders engage in other positive leadership practices such as observing in classrooms and providing educators with feedback after observation. Leaders in the ECSO initiative improved the frequency with which they engaged in all these practices with the largest growth in collaborative data reflection with educators. Leaders in ECSO programs reported 16% growth in the frequency of PILS practices overall while comparison leaders only improved by 2% during this period. ECSO had a meaningful impact on five of the seven practice-related outcomes in the comparison study.

> *"Since our work with [ECSO], our observations, reviewing of data, and supporting staff collaboration have all increased and now have more sustainable systems around them. We have bene able to align all that we do so everything is more connected and more fluid." -Cohort 3 ECSO EEP Leader*

[3] Horsley, H.L. & Fong, K. (2017). *Preschool Instructional Leadership Survey.* Unpublished measure.

Exhibit 9. Changes in Leader Outcomes



Read As: Leaders in ECSO-supported programs had 9% higher overall confidence in their ability to engage in key leadership tasks after two years of participation in the initiative. Confidence in leaders of comparison programs only improved by 2% during this period.

Educator Outcomes

More educators in the ECSO initiative reported receiving support from leadership and were more likely to use curricula and child assessments after two years. The number of educators with intentions to stay in the *field* did not increase, although the number of those intending to stay in their *program* was maintained while the comparison number decreased (see Exhibit 10). Educators in ECSO programs improved on most outcomes after two years, and there was a positive impact on seven of the 13 educator outcomes in the comparison study, although gains were not as consistent as they were for leaders, a finding in line with the nature of the ECSO models and their heavier focus on leadership practices in the early years of the initiative.

- *Support for CQI:* Educators reported how often they received continuous quality improvement (CQI) supports from program leaders—adapting curriculum, observing in the classroom (ever and frequency, or how often), and receiving feedback after observations. This was the area where the evaluation found the greatest difference between ECSO educators and educators in comparison programs. More educators in ECSO programs reported feeling supported to adapt their curriculum after two years and were 25% more likely to be observed by a program leader after two years than when they began. However, they were less likely to receive feedback after an observation, which contrasts with leader reports. Both ECSO leaders and ECSO educators agreed that classroom observations

> *"Although it can make me a bit nervous, I do like getting observed by the leadership team. I want to know how I can improve my teaching." -Cohort 3 ECSO EEP Educator*

increased, but they disagreed whether feedback from those observations was given to educators. ECSO had a meaningful impact on three of the four CQI support-focused outcomes in the comparison study.

- *Planning Time:* After two years, educators in both ECSO and comparison program were less likely to receive planning time during the workday than they were at the beginning. The drop was greater for ECSO educators (associated with a negative impact of the initiative in the comparison study), which might reflect the ECSO demand on teacher time for other initiative components.

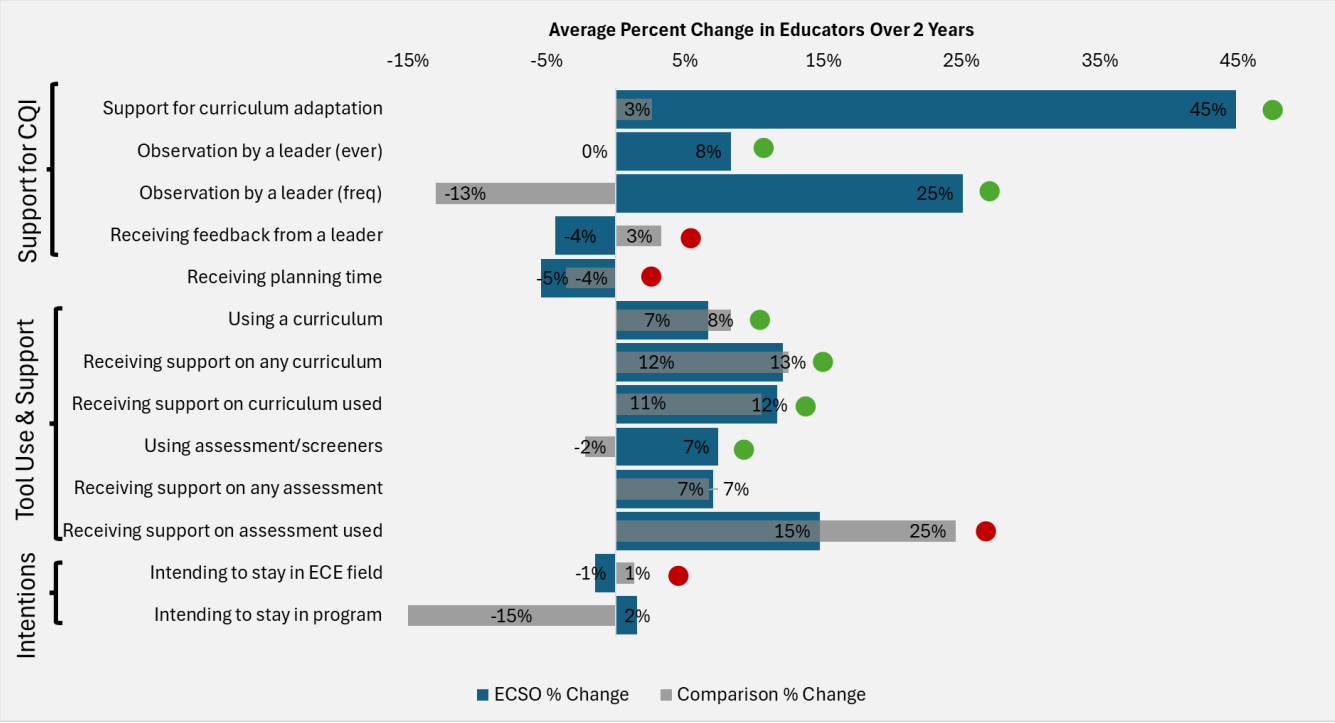
> *"Our teacher coach has listened to, supported, and developed teachers in a way I never knew was possible. The focus on intentionally planning and implementing teaching points in lessons the coach plans with each teacher is so helpful. The learning for the teacher has gone well beyond the lessons they work on together and transferred to other parts of their teaching practice. This has been incredible and we are very thankful to have experienced this transformation of our teaching team." -Cohort 3 ECSO EEP Leader*

- *Tool Use:* Educators described their specific use of and support to implement curricula and child assessments/screenings (even if the focus of the support was a tool that was different from what they actually use in their classroom). After two years, more ECSO educators reported using curricula and assessments/screeners and received more support to implement those instructional tools than before the initiative. Despite growth in the comparison group, the evaluation often found positive initiative impacts in this area in the comparison study (ECSO educators looked better on these outcomes after two years than comparison educators, accounting for differences in where they began). ECSO had a meaningful impact on four of the six tool use/support-focused outcomes in the comparison study.

- *Intentions to Stay:* Educators were asked about their intentions to stay in the field of early care and education and to stay at the same program. Over two years, ECSO educators maintained the same intentions to stay in their programs as they had shown at the beginning of the initiative, but fewer comparison educators had a desire to stay. This suggests that the ECSO initiative might preserve educators' intentions to stay in ways that educators in programs outside of ECSO do not experience. The initiative did not have a positive impact on the number of ECSO educators who desired to stay in the field.

> *"It is effective when Leadership seeks out my input to help a team member establish a common set of values related to instructions because it makes you feel valued and appreciated to be able to give your opinion and feel that matters. It gives other people a chance to learn from you and everyone benefits." -Cohort 3 ECSO EEP Educator*

Exhibit 10. Changes in Educator Outcomes



Positive *initiative impact of at least .20 standard deviation units*

Negative *initiative impact of at least .20 standard deviation units*

Read As: Educators in ECSO-supported programs were 45% more likely to have received support for curriculum adaptation after two years of participation in the initiative, compared to a 3% shift for educators in comparison programs during this period. This relative difference was associated with a positive initiative impact of at least .20 standard deviations in the comparison study.

Classroom Outcomes

The evaluation looked at classroom quality in two ways, with a well-known measure used across classroom age groups (the Classroom Assessment Scoring System, or CLASS®) and with a less well-known pre-k classroom measure (the Child Observation in Preschool/Teacher Observation in Preschool, or COP/TOP[4]) that captures distinct behaviors in the classroom and has evidence of stronger links to children's academic and social-emotional skill growth[5].

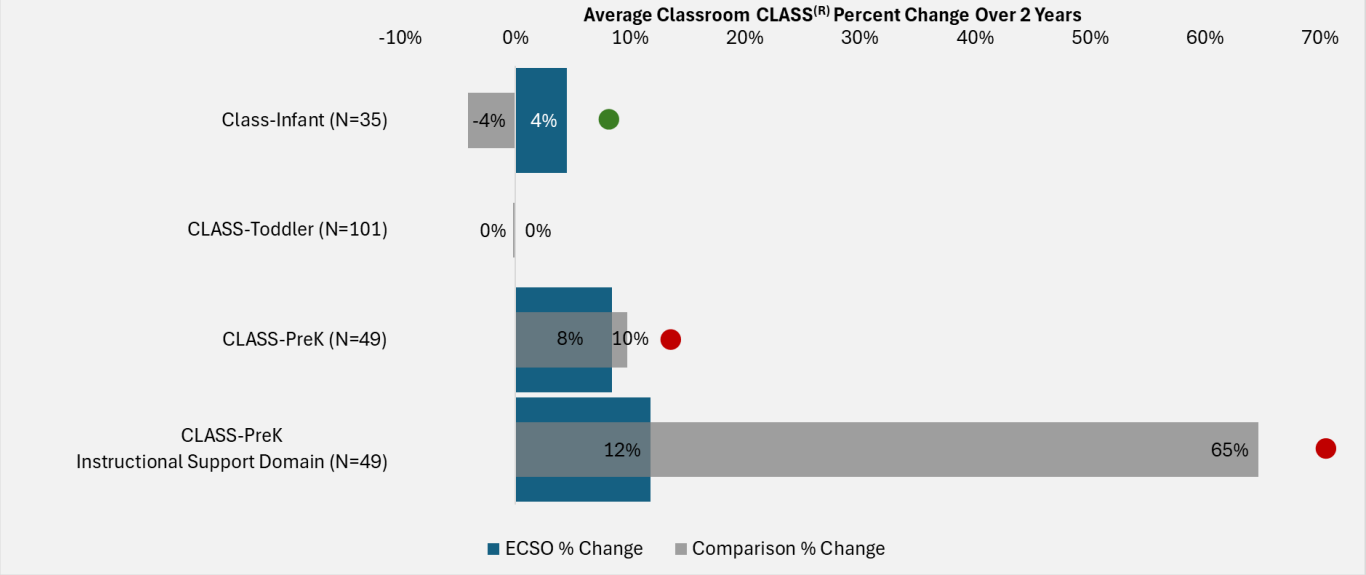
On the well-known CLASS® measure, quality in infant and pre-k classrooms in ECSO-supported programs improved after two years (Exhibit 11). Pre-k classrooms also showed improvement on the CLASS® Instructional Support domain. The CLASS® is a measure of the quality of interactions between educators and children; it is scored on a scale from 1 (representing lowest quality) to 7 (representing highest quality).

[4] Farran, D. C., Plummer, C., Kang, S., Bilbrey, C., & Shufelt, S. (2006). *Child Observation in Preschool*. Peabody Research Institute, Vanderbilt University.
Bilbrey, C., Vorhaus, E., Farran, D., & Shufelt, S. (2007). *Teacher Observation in Preschool.* Peabody Research Institute, Vanderbilt University.

[5] Miranda, B. M., Gebhart, T., Early, D. M., & McDoniel, M. E. (2024). Examining the child observation in preschool and teacher observation in preschool in community-based child care centers. *Early Childhood Research Quarterly, 66* (1), 98-108.

- *Infant classrooms* - ECSO infant classroom quality improved more after two years than infant classrooms in comparison programs (5.15 to 5.38 in ECSO programs; 4.83 to 4.63 in comparison programs). There was a substantial positive impact of the initiative on infant classroom quality in the comparison study.
- *Toddler classrooms* – CLASS® quality in toddler classrooms did not change over two years in either group.
- *Pre-k classrooms* –Pre-k classroom quality overall and on the Instructional Support domain improved in both groups after two years as measured with the CLASS®, but growth was bigger in comparison classrooms (4.15 to 4.50 overall in ECSO classrooms and 4.43 to 4.86 overall in comparison programs; 2.13 to 2.38 on Instructional Support in ECSO classrooms and 2.01 to 3.31 in comparison classrooms). Those relative gains were associated with negative initiative impacts in the comparison study. This study asked educators about the support they received from their leaders for curriculum, teaching practices, and even the CLASS® measure. However, it did not include a dedicated examination of other professional development and quality improvement opportunities in comparison programs, nor at programmatic features like capacity and quality history, which might help to speak to unexpected improvements in quality in those pre-k classrooms. As a result, it is difficult to hypothesize what might be driving these negative impacts.

Exhibit 11. Changes in Classroom Outcomes: CLASS®



Positive *initiative impact of at least .20 standard deviation units*

Negative *initiative impact of at least .20 standard deviation units*

Read As: Infant classrooms in ECSO-supported programs scored 4% better on the CLASS® measure after two years of participation in the initiative, compared to a 4% decline in comparison classrooms during this period. This relative difference was associated with a positive initiative impact of at least .20 standard deviations in the comparison study.

On the more nuanced COP/TOP measure, there was much larger growth in ECSO pre-k classrooms both overall and relative to the comparison group (Exhibit 12). The COP/TOP tool is less widely-used than the CLASS®. Instead of giving an overall classroom rating like the CLASS® does, the COP/TOP collects many short observations of teacher and child behavior. These 'snapshots' are combined to create a detailed picture of what children experience in the classroom. The COP/TOP is scored as the percentage of instances during a four-hour visit an observer watches a teacher or child and sees specific

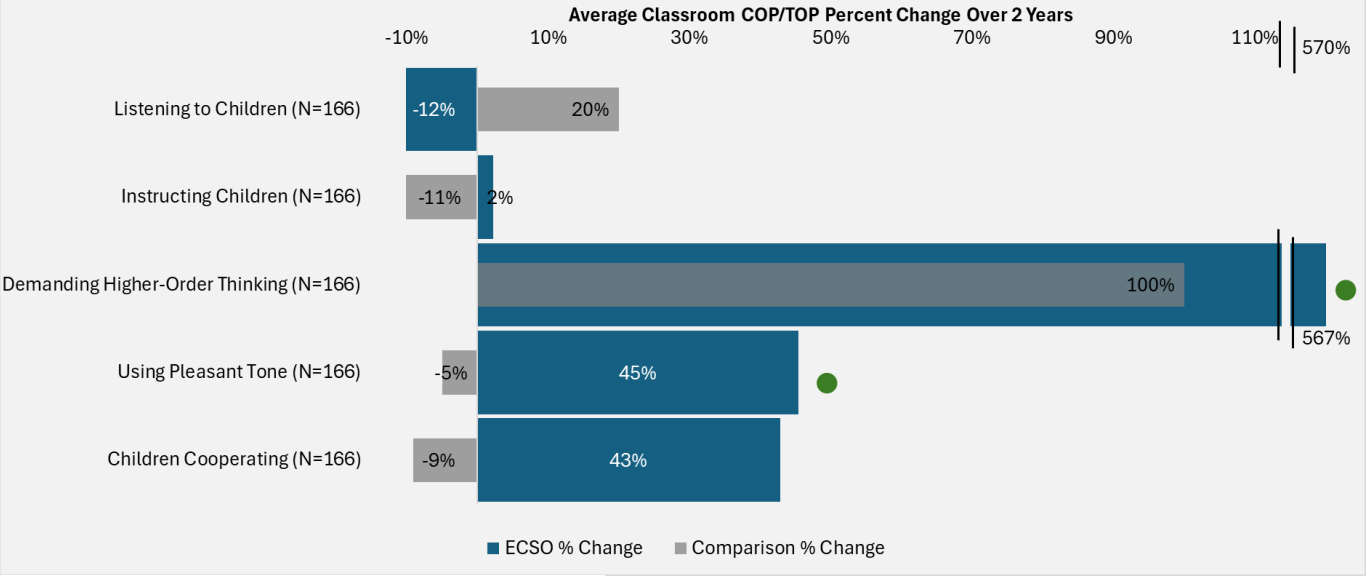
behaviors of interest. Research suggests the COP/TOP might be more closely linked to children's academic and social growth than broader quality measures[5].

Pre-k classrooms in ECSO-supported programs improved on four out of five key behaviors measured with the COP/TOP – and improved much more than comparison classrooms. For example:

- The average pre-k ECSO classroom saw a 45% growth in teacher use of a pleasant or vibrant tone/affect with the class (33% of the instances when an observer coded teacher behavior at baseline, that teacher was using a pleasant or vibrant tone/affect with the class; after two years, this percentage jumped to 48%). Observers saw this behavior less in the average pre-k comparison classroom after two years than they did at the beginning (40% to 38%).
- Demanding higher-order thinking was also associated with substantial growth but was an extremely low-frequency behavior at both time points. In the average pre-k ECSO classroom, 0.3% of the instances when an observer coded teacher behavior at the start of the initiative, that teacher was engaging with a child or children in a way that required the child to utilize higher-order thinking skills (inference, prediction, reflection, connection-making, etc.). After two years, this percentage jumped to 2%, a 567% growth. In the average comparison classroom, this percentage was 0.5% at baseline and 1% after two years (a 100% growth).

The comparison study found substantial positive impacts of the ECSO initiative on teachers requiring students to use high-level thinking and on teachers' use of a pleasant or vibrant tone in the classroom.

Exhibit 12. Changes in Classroom Outcomes: COP/TOP



Positive *initiative impact of at least .20 standard deviation units*

Negative *initiative impact of at least .20 standard deviation units*

Read As: Teachers in pre-k classrooms in ECSO-supported programs were 20% more likely to be observed listening to children after two years of participation in the initiative, compared to a 12% decline in comparison classrooms during this time period.

Moderator and Subgroup Analyses

Neither growth nor impacts were systematically different for any subgroup. The evaluation team did not find any *consistent patterns* of differences in growth or impact related to leader tenure, educator experience, or program characteristics including Head Start, SVI, capacity, or percentage of children

receiving Child Care Financial Assistance (see Appendix D). And, though participants in Cohort 3 tended to make bigger gains than in Cohort 4, the initiative impact was not significantly different by cohort (see Appendix D).

The evaluation also examined whether results varied by ECSO model (CLI, Lastinger, and UMB) or by the amount of support and coaching leaders received. No clear patterns emerged. Program gains were similar regardless of ECSO model or dosage. Full data tables can be found in Appendix D.

Discussion

The ECSO initiative has had a positive impact on participating early education leaders and educators, even in a field facing ongoing workforce challenges. The program boosted leader confidence, improved leadership practices, increased educator receipt of support, and encouraged the use of curricula and assessment tools during its early years. It also positively influenced some specific interactional quality behaviors in pre-k classrooms.

> *"By institutionalizing ECSO practices, they become ingrained in our everyday routines and are upheld as standard operating procedures. This includes providing training, resources, and support to staff members, enabling them to confidently carry forward ECSO principles in their roles. By embracing a mindset of continuous improvement, we ensure that ECSO practices remain relevant, effective, and responsive to the evolving needs of our children and families." -Cohort 3 ECSO EEP Educator*

What began as a pilot project in 2020 focused heavily on support for early childhood leadership has evolved into a grounded, comprehensive approach to improving early education and care programs for educators and the children they serve. Continuous evaluation and collaboration with ECSOs have helped EEC learn what works, identify challenges, and make changes to strengthen the model. Adjustments include expanding from two years of support to a three-year initiative, requiring all ECSOs to provide educator coaching, and specifying the use of high-quality curricula across all age groups. The unique ongoing implementation assessment and adjustments will continue as EEC sustains the initiative.

Some findings suggest that changes reported by leaders may not translate into noticeable improvements for educators. For example, ECSO leaders indicated they were providing more feedback after observations, yet educators did not report receiving more feedback. Similarly, leaders said they offered more dedicated planning time, but educators' responses showed no increase in access to such time after two years. These differences imply that what feels like a significant shift to leaders may be too small or inconsistent to make a meaningful impact on educators day-to-day experiences. And though the initiative did not *strengthen* educators' intent to stay in their programs, it may have helped *sustain* more positive sentiment—comparison educators showed a notable decline in their desire to stay working at their program.

The results of this evaluation offer some important insights for the field.

- *Change takes time.* It takes time to generate measurable change, particularly at levels more distal to the initiative's focus. Impacts on most leader and educator outcomes were even larger after two years of support than after one year of support (see Abt's Year 4 Evaluation Report).
- *Leadership matters.* Improvements that begin with supporting program leadership can cascade to facilitate higher-quality programming for young children. This evaluation's findings clearly indicate the critical role that leaders play in the progression of positive educator and classroom shifts in the early childhood space.

- *Continuous improvement of the model works.* Infusing continuous quality improvement into the process of *implementation* can optimize models in response to real-world participant experience and improve the initiative.

The evaluation also offers areas for future exploration:

- *What does it take for programs to fully engage?* Understanding more about program challenges with engagement and participation at both the leader and educator levels can help adjust the model to improve participant satisfaction and ultimate impact.
- *What happens in similar programs in the absence of ESCO supports?* There is a lot more to understand about programs that do not receive ECSO supports, including the comparison group in this evaluation. Programs might participate in other quality supports and initiatives, and findings from this evaluation suggest that there are other pathways to success in place in Massachusetts that need to be better understood. Other program structures and characteristics such as the strength of the leadership team, history of high quality, umbrella organization affiliation and support, and optimal staff recruitment strategies might influence key outcomes and their growth over time, as well.
- *How might more years of involvement support or change the findings?* Looking at whether impact continues to increase with three or four years of support can facilitate understanding of how long it takes for the initiative to fully take hold and impact desired outcomes.
- *How does staff turnover impact the strength of a multi-year initiative?* When leaders and/or educators are different from one year to the next, ECSO models might benefit from specific supports that target new staff as they begin to be part of the initiative.

As the ECSO initiative continues to grow and mature, its influence reaches beyond individual programs—it is shaping a culture of leadership, collaboration, and continuous improvement in early education. By investing in leaders and educators together, the initiative is laying the foundation for lasting, systemic change that benefits children, families, and communities across the Commonwealth.

Appendices

Appendices Contents

Appendix A: ECSO Models and Fidelity

Three ECSO Model Descriptions

Each ECSO approaches implementation using their own model-specific framework that is centered around the common expectations of all ECSOs in the initiative.

- **Children's Literacy Initiative (CLI)**
  CLI's model involves alternating monthly training and professional learning community meetings for instructional leaders as well as bi-monthly coaching for leaders and in-person coaching for educators. Leaders begin by covering leader identity, move to putting structures in place that support educator practice (like planning time, observation, etc.), then discuss supporting educators' curriculum implementation fidelity, making structural changes to support the use of continuous quality improvement and improved organizational climate, supporting professional learning for educators, and supporting the integration of child assessment data. Most of these topics are then revisited toward the end of the annual supports.
- **University of Florida Lastinger Center for Learning (Lastinger)**
  Lastinger's model focuses on leadership *teams* and involves monthly community of practice meetings, a six-month online instructional leadership course, one-on-one coaching, and coaching certification for program leadership teams, as well as online coursework for educators. The content that is covered through these activities generally begins with focusing on leadership characteristics and effective leaders, moves to the role of curriculum and staff support around curriculum, next covers aspects of data reflection and use like observation, extending teacher thinking, and use of data, and finishes with supporting teachers' professional development.
- **University of Massachusetts Boston (UMB)**
  UMB's model involves intensive coverage of the Essentials 0-5 Survey through five work sessions around getting to know the survey and data dialogue, root cause analysis, checking in on the plan-do-study-act cycle, and planning for sustainability along with end-of-year reflection and celebrations. UMB also supports leadership teams through monthly coaching sessions; topics for those sessions are tailored to suit individual team needs. Finally, UMB hosts monthly professional learning community meetings with leadership teams, culminating in an end-of-year Leadership Forum.

There are large model distinctions in how ECSOs historically provided direct support to educators. CLI's model has always involved the provision of substantial hours of coaching and training/professional development directly to infant, toddler, and pre-k educators in their first two years of participation. Lastinger offers substantial optional online coursework for educators in all of their programs but, like UMB, did not offer educator coaching until the 2024-25 year. All three ECSOs provided educator coaching to Cohort 4 educators in 2024-25.

Implementation Fidelity Summary

Abt supported each ECSO to complete a matrix assessing the degree to which they were able to put the initiative in place as they intended to in the first year of supports for Cohort 3 (2022-23) and Cohort 4 (2023-24) and in the second year of supports for Cohort 3 (2023-24) and Cohort 4 (2024-25). The matrices were developed with Abt in Year 2 of the initiative and adapted by the ECSOs each year as their models were refined. Exhibit A-1 shows whether each ECSO was able to implement their model as they intended with each cohort in each of the two years of implementation.

Exhibit A-1. Implementation Fidelity Summary by ECSO, Cohort, and Key Component

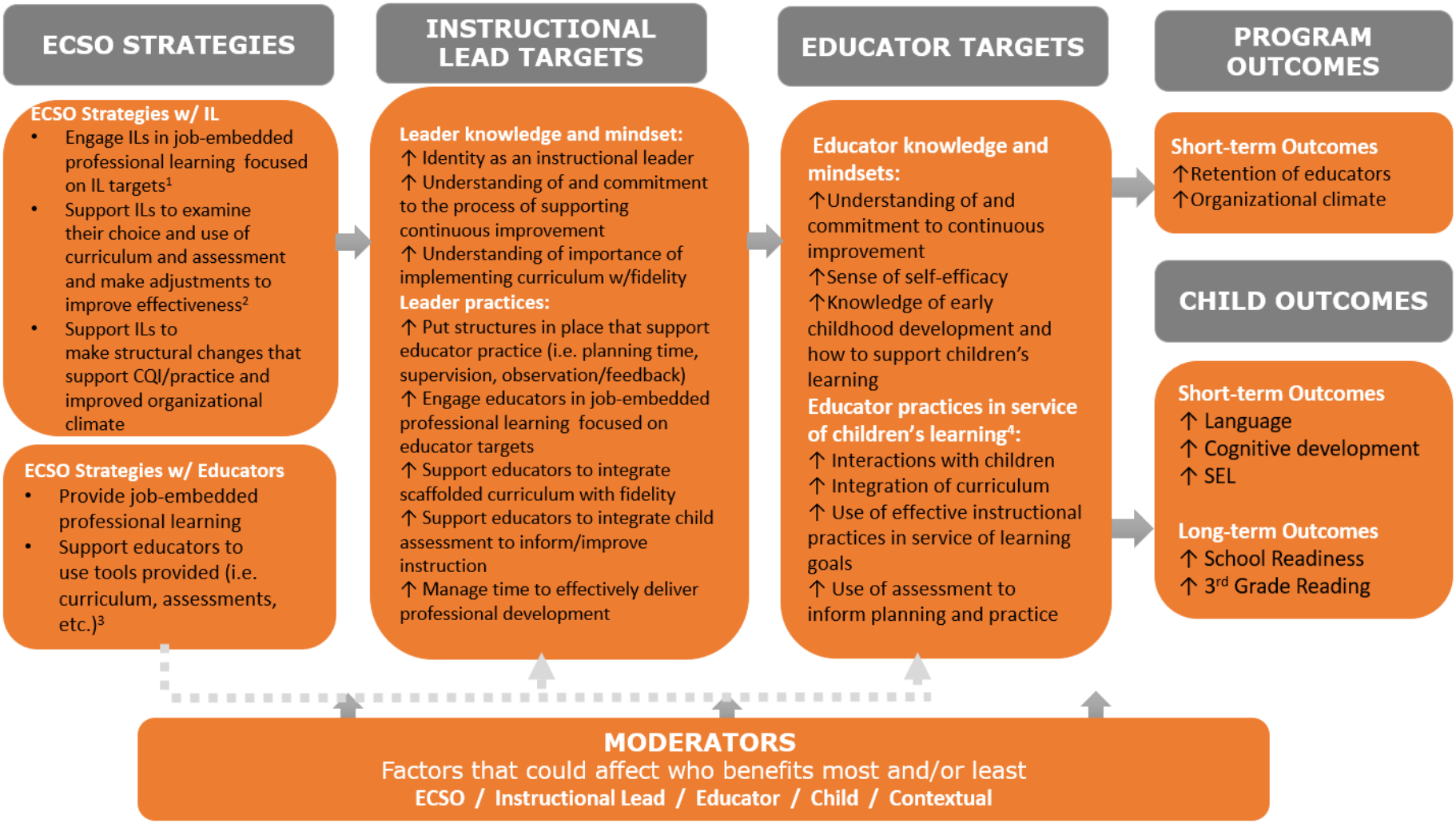
Key Component	Implemented with Fidelity in Cohort 3's 1st Year	Implemented with Fidelity in Cohort 3's 2nd Year	Implemented with Fidelity in Cohort 4's 1st Year	Implemented with Fidelity in Cohort 4's 2nd Year
CLI				
Core Service Model Components *(intake meetings, learning walks, strategic planning meetings, data analysis/stepback meetings)*	*N/A*	Yes	Yes	No
Leader Coaching	No	Yes	Yes	Yes
Leader Professional Learning Communities and Critical Friends		No	No	No
Teacher Coaching	Yes	Yes	Yes	Yes
Teacher Training		No	No	*N/A*
Financial Incentives/Materials *(training stipends + literacy materials + curricular materials)*	Yes	Yes	Yes	Yes
Leader Coaching Logs	*N/A*	No	No	*N/A*
Lastinger				
Community of Practice Sessions *(frequency and fidelity)*	No	Yes	No	Yes
One-to-one coaching *(for leaders only until Year 2 Cohort 4)*	Yes	Yes	Yes	No
Leader development course *(access and mastery)*	Yes	*N/A*	Yes	*N/A*
System of data collection and analysis *(sharing and discussing classroom observations)*	Yes	*N/A*	Yes	Yes
Educator coursework	Yes	Yes	Yes	Yes
Facilitation of Certified Coaching certification	*N/A*	Yes	*N/A*	Yes
Curriculum and Assessment Support	*N/A*	*N/A*	*N/A*	Yes
UMB*				
Essentials 0-5 Survey Use Training *(introduction, orientation, webinar, and work sessions)*	Yes	*N/A*	Yes	*N/A*
Survey Administration *(educator and parent survey participation)*	Yes	No	No	*N/A*
Training *(ELM Training modules)*	*N/A*	Yes	Yes	No
Coaching (Technical Assistance)	Yes	No	No	No
Peer Learning Communities	Yes	No	Yes	No
Transfer to Practice *(ELM Implementation)*	*N/A*	No	No	*N/A*

**Note from UMB about 2024-25 year: For FY25 we updated the strategies that we believe drive change and organized them by the three types of services we deliver (training, PLCs, and coaching). Both the number of hours for these three types of services and the content of our training and PLCs varies based on cohort (Cohort 3, 4, or 5) and on unit of implementation (ILs vs. educators) in order to be most responsive to their needs.*

Appendix B: Theory of Change

Initiative Theory of Change

Exhibit B-1. ECSO Initiative-Wide Theory of Change[6]



Source: Harvard Center on the Developing Child, version date 10/5/21.

[6] A revised version of the initiative-wide theory of change is currently being used for ECSO supports, although this Exhibit represents the working theory at the time of the implementation described in this report.

Appendix C: Sample and Methods

Sample Demographics

Within the scope of the evaluation (COMPARISON STUDY), Abt attempted to recruit similar programs to the treatment programs to serve as a comparison group (which was then further matched with baseline equivalence weighting). Cohort 3 matching was done in the summer of 2022, and Cohort 4 matching was done in the summer of 2023. For each cohort separately, Abt matched comparison programs to treatment programs based on three or four key variables[7] supplied by EEC: (1) capacity; a combination of (2) community need and (3) region; and (4) receipt of specific grant funding; each is defined below.

- *Capacity* is a categorization of the EEC 'licensed capacity' variable; Abt categorized the EEC information into programs that were *small* (less than 40 slots), *medium* (40-79 slots), *large* (80-120 slots), and *extra large* (more than 120 slots).
- *SVI x Region* is the combination of program Social Vulnerability Index (SVI, Zip) and Licensing Region. SVI (Zip) is the SVI score calculated by EEC using the program zip code. We categorized SVI into four groups: *low* (an SVI of 0.25 or less)*, medium low* (between 0.26 and 0.50)*, medium high* (between 0.51 and 0.75)*, and high* (over 0.75) and combined that categorization with the five Licensing Regions (Central, Metro Boston, Western, Northeast, and Southeast and Cape).
- *C3 Funding* (Commonwealth Cares for Children Grants) is the average per-seat C3 operational funding provided by EEC. We categorized it into 4 groups. Note that the average C3 funding per seat is highly correlated with SVI (SVI is one of the key components of the C3 formula). It is also correlated with subsidy slots (a variable not used in this matching procedure), as providers can qualify for an equity bonus either through their SVI or the percent of children served who are receiving subsidies.

Exhibit C-1. Analytic Sample

		Treatment				Comparison	Total
		CLI	Lastinger	UMB	Total		
programs in the Analytic Sample (included in any analysis)	Cohort 3	9	9	5	23	23	46
	Cohort 4	8	8	7	23	25	48
	Total	17	17	12	46	48	94
programs Represented in Quality Analyses	Cohort 3	9	9	5	23	21	44
	Cohort 4	8	8	7	23	25	48
	Total	17	17	12	46	46	92
Classrooms Aggregated in Quality Analytic Sample	Cohort 3	37	37	35	109	73	182
	Cohort 4	26	38	44	108	82	190
	Total	63	75	79	217	155	372
programs Represented in Leader Analyses	Cohort 3	4	6	4	14	13	27
	Cohort 4	2	5	5	12	13	25
	Total	6	11	9	26	26	52
Leaders in Analytic Sample	Cohort 3	4	7	4	15	14	29
	Cohort 4	2	7	7	16	15	31
	Total	7	15	11	31	29	60
programs Represented in Educator Analyses	Cohort 3	7	6	4	17	16	33
	Cohort 4	4	6	7	17	14	31
	Total	11	12	11	34	30	64
Educators in Analytic Sample	Cohort 3	30	24	22	76	49	125
	Cohort 4	7	14	33	54	34	88
	Total	37	38	55	130	83	213

[7] C3 funding was only used a matching variable for Cohort 3; Cohort 4 matching did not include this variable.

Exhibits C-2 through C-4 provide structural characteristics of programs as well as unadjusted demographic and professional characteristics of instructional leaders and educators in the analysis sample (any unit that was part of any analytic sample involving those units). 'CH' refers to Cohort.

Exhibit C-2. ECSO program Structural Characteristics for Analytic Sample

	ECSO Overall	Comparison Overall	CLI		Lastinger		UMB		ECSO Overall		Comparison	
			CH3	CH4	CH3	CH4	CH3	CH4	CH3	CH4	CH3	CH4
Number of programs	46	48	9	8	9	8	5	7	23	23	23	25
SVI												
Low (0-25%)	1	0	0	1	0	0	0	0	0	1	0	0
Medium Low (26-50%)	2	0	2	0	0	0	0	0	2	0	0	0
Medium High (51-75%)	8	24	1	1	4	2	0	0	5	3	12	12
High (76-100%)	35	24	6	6	5	6	5	7	16	19	11	13
Licensed Capacity												
Small (<40)	11	10	3	4	1	1	1	1	5	6	4	6
Medium (41-79)	10	22	2	1	3	2	1	1	6	4	9	13
Large (80-120)	14	9	2	3	3	3	0	3	5	9	6	3
Extra Large (>120)	11	7	2	0	2	2	3	2	7	4	4	3
Subsidy	0.40	0.23	0.26	0.51	0.28	0.42	0.34	0.63	0.29	0.52	0.19	0.27

Exhibit C-3. ECSO program Instructional Leader Demographic Characteristics

	ECSO Overall	Comparison Overall	CLI		Lastinger		UMB		ECSO Overall		Comparison	
			CH3	CH4	CH3	CH4	CH3	CH4	CH3	CH4	CH3	CH4
Sample Size	31	29	4	2	7	7	4	7	15	16	14	15
Female	90%	100%	100%	50%	100%	86%	75%	100%	93%	88%	100%	100%
Race/Ethnicity												
White	64%	74%	75%	0%	83%	43%	57%	84%	85%	47%	77%	71%
Hispanic/Latinx	25%	18%	0%	100%	0%	43%	0%	0%	0%	47%	15%	21%
Black	11%	4%	25%	0%	16%	14%	43%	15%	15%	6%	8%	0%
Asian	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
Highest Level of Education												
High School diploma or GED	10%	0%	0%	0%	29%	0%	0%	14%	13%	6%	0%	0%
Associate's degree/technical/ vocational degree	6%	10%	0%	0%	0%	29%	0%	0%	0%	12%	7%	13%
Bachelor's degree	55%	51%	0%	50%	71%	43%	50%	86%	47%	63%	50%	53%
Master's degree	23%	38%	75%	50%	0%	29%	25%	0%	27%	19%	43%	33%
Doctoral degree	6%	0%	25%	0%	0%	0%	25%	0%	13%	0%	0%	0%
Number of years of tenure	4.81	8.38	9.00	3.00	4.71	6.57	3.00	2.29	5.40	4.25	8.29	8.47

Exhibit C-4. ECSO program Educator Demographic and Professional Characteristics

	ECSO Overall	Comparison Overall	CLI		Lastinger		UMB		ECSO Overall		Comparison	
			CH3	CH4	CH3	CH4	CH3	CH4	CH3	CH4	CH3	CH4
Sample Size	129	84	30	7	24	14	22	33	76	53	49	35
Female	96%	98%	100%	100%	96%	93%	91%	97%	96%	96%	98%	97%
Race/Ethnicity												
White	63%	70%	67%	57%	92%	29%	73%	47%	76%	44%	74%	66%
Hispanic/Latinx	17%	18%	3%	14%	4%	21%	13%	44%	7%	33%	20%	14%
Black	13%	4%	13%	14%	4%	50%	9%	6%	9%	19%	0%	9%
Asian	5%	7%	17%	0%	0%	0%	5%	3%	8%	2%	4%	11%
Other	1%	1%	0%	14%	0%	0%	0%	0%	0%	2%	2%	0%
Highest Level of Education												
High School diploma or GED	31%	24%	7%	43%	42%	50%	14%	50%	20%	50%	31%	15%
Associate's degree/technical/ vocational degree	21%	23%	20%	43%	17%	25%	24%	14%	20%	22%	18%	30%
Bachelor's degree	36%	44%	50%	14%	25%	25%	57%	29%	44%	24%	41%	48%
Master's degree	12%	9%	23%	0%	17%	0%	5%	7%	16%	4%	10%	6%
Doctoral degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of years of experience	11.13	13.94	10.52	9.29	17.00	6.21	11.68	9.27	12.93	8.58	13.37	14.74

Data Sources

The evaluation leveraged data from **four primary sources** to answer key research questions in this evaluation.

1. ECSOs recorded the hours of support they provided to leaders/leadership teams and, where applicable, directly to educators, in monthly worksheets they shared with Abt. Worksheets included information about how many hours were *planned/intended*, how many hours were *delivered*, and what the format and topic(s) of those supports were.
2. Abt administered an electronic survey to leaders in the fall of the first year and spring of the second year of each cohort's participation in the initiative. The survey took less than 30 minutes to complete and asked questions about leaders' experience with the ECSO initiative (treatment group only), perspectives as a leader, and supports received and provided to staff. The survey protocol was developed specifically for use in this project but did contain some questions from publicly-available instruments along with project-developed material.
3. Abt administered an electronic survey to all lead-/co-educators in the fall of the first year and spring of the second year of each cohort's participation in the initiative. The survey took less than 30 minutes to complete and asked educators questions about their perspectives and experiences as an educator as well as supports they received from their program leadership. We provided a $25 electronic gift card to each educator who completed the survey. The survey protocol was developed specifically for use in this project but did contain some questions from publicly-available instruments along with project-developed material.
4. Trained and reliable Abt observers conducted structured classroom observations in a sample of classrooms in treatment and comparison programs in the fall of the first year and spring of the second year of each cohort's participation in the initiative. Observations in infant, toddler, and pre-k classrooms were 2.5 hours in length and utilized the age-specific version of the Classroom Assessment Scoring System (CLASS®). We also conducted 4-hour observations in a non-

overlapping group of pre-k classrooms using the Child Observation in Preschool[8]/Teacher Observation in Preschool[9], a more nuanced individual and behavior-specific observation tool.

Analytic Approach

Gain Calculation

To estimate gains made on each outcome of interest by each group, the evaluation team calculated the difference between the unadjusted pre/baseline estimate of each outcome and the covariate-adjusted post/follow-up means from the impact models and divided that difference by the unadjusted baseline mean to get the percent gain. Post-scores were weighted and adjusted for program variables (SVI, capacity and years of experience/tenure for educator and leader outcomes; SVI and capacity only for classroom quality outcomes) and baseline scores.

Impact Models

The evaluation team used regression analyses to provide covariate-adjusted average outcomes by condition (treatment and comparison) and to look at differential patterns by ECSO and cohort. Abt also used regression analyses to test whether differences in leader, educator, and program outcomes at the end of two years of the initiative emerged based on condition (treatment versus comparison). Impacts on leaders were analyzed in single-level regression models reflecting the near 1:1 leader: program structure; impacts on educators were analyzed in multi-level regression models with educators nested within programs; impacts on program quality were analyzed in multi-level regression models with classrooms nested within programs (separately by age level/measure). In all regression analyses, Abt controlled for the following variables: baseline scores, SVI, program licensed capacity, and cohort. Additionally, in leader analyses, Abt controlled for leaders' years of experience in their current program (tenure), whereas in educator analyses, Abt controlled for educators' years of experience in ECE broadly. For each outcome, a propensity score weight was calculated by modeling treatment as a function of (i) the baseline version of that outcome variable; and (ii) an additional set of balance variables. The propensity score weighting process is described in more depth in Appendix D. For each outcome, Abt calculated a Cohen's d effect size, which is the difference between the covariate-adjusted group posttest means divided by the standard deviation of the outcome variable.

Analytic samples were limited to complete cases – those cases with non-missing baseline and follow-up data. No key outcome or baseline data were imputed. Covariate data were complete for all leaders and educators in the analytic sample. Prior to all analyses, Abt examined variable distributions for extreme values; in analyses of Pre-K CLASS® outcomes, one extreme value was removed.

Moderator Analyses

In addition to the overall impact of the initiative, the evaluation team also investigated which contextual variables may be moderating the impact of ECSO supports. Abt analyzed moderators in regression models identical to impact models but with the additional parameter for the interaction of treatment condition and moderator of interest. Abt looked specifically at program SVI, program subsidy rate, and program capacity, and cohort as potential moderators for all outcomes, leader tenure for leader outcomes, and educator years of experience for educator outcomes.

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[8] Farran, D. C., Plummer, C., Kang, S., Bilbrey, C., & Shufelt, S. (2006). *Child Observation in Preschool*. Peabody Research Institute, Vanderbilt University.

[9] Bilbrey, C., Vorhaus, E., Farran, D., & Shufelt, S. (2007). *Teacher Observation in Preschool.* Peabody Research Institute, Vanderbilt University.

Appendix D: Data Tables

Baseline Equivalence

The evaluation compared leaders, educators, and classrooms in the treatment and comparison on key demographics and survey/observation variables at baseline (fall) before the initiative began. Because participants were not randomly assigned to be in the treatment or comparison condition in this study, establishing baseline equivalence is critical so that any observed differences in the outcomes (two-year follow-up) can be attributed to the initiative, rather than other preexisting differences.

Abt examined the effect size of the difference in outcomes between the treatment and comparison conditions, where an effect size of less than 0.25 indicated equivalence for that variable between conditions. Because of pre-existing differences on key variables between the treatment and comparison groups (illustrated in the Exhibits below), Abt constructed weights to better equate the two groups at baseline. The research team constructed a separate set of weights for each outcome by modeling treatment as a function of (i) the baseline version of that outcome variable; and (ii) an additional set of balance variables. The set of balance variables varied by level of the outcome, as follows: for educators this included educator's race, highest level of education, years of experience, and cohort; for leaders this included leader's race, highest level of education, years of experience, and cohort; and for classroom this included SVI, subsidy, capacity, region, and cohort. This model was used to construct inverse propensity weights and applied to all impact analyses. The use of propensity score weighting successfully reduced the baseline effect sizes.

Exhibit D-1. Baseline Equivalence for Key Leader Outcomes

	Before Weighting			After Weighting		
	Treatment Mean	Comparison Mean	Effect Size	Treatment Mean	Comparison Mean	Effect Size
Confidence						
Average leader confidence	3.76	3.70	0.08	3.73	3.75	-0.02
Confidence in reflecting on data collaboratively with staff	3.53	3.55	-0.02	3.53	3.53	0.00
Confidence in supporting educators to adapt curriculum	3.67	3.83	-0.14	3.75	3.76	-0.01
Confidence in planning PLCs for educators	3.57	3.46	0.08	3.50	3.50	0.00
Confidence in providing constructive feedback from observations	4.20	3.86	0.32	4.05	4.07	-0.02
Frequency of Leadership Practices						
Collaborative data reflection with educators	1.74	1.93	-0.21	1.95	1.88	0.08
Educator child assessment data use support	2.22	2.24	-0.02	2.24	2.23	0.01
Educator planning meetings	2.42	2.14	0.28	2.26	2.29	-0.02
Educator curriculum implementation support	3.25	2.86	0.32	3.04	3.05	-0.01
Observations of educators	2.79	3.00	-0.20	2.97	2.93	0.04
Provision of observation feedback to educators	2.54	2.38	0.17	2.47	2.46	0.01
PILS	2.25	2.24	0.02	2.26	2.24	0.03

Exhibit D-2. Baseline Equivalence for Key Educator Outcomes

	Before Weighting			After Weighting		
	Treatment Mean	Comparison Mean	Effect Size	Treatment Mean	Comparison Mean	Effect Size
Educator Support for Continuous Quality Improvement						
Support for curriculum adaptation	0.58	0.76	-0.51	0.65	0.63	0.03
Observation by program leader	0.84	0.84	-0.02	0.84	0.84	0.00
Frequency of observation by program leader	2.27	2.69	-0.25	2.42	2.41	0.01
Provision of feedback by program leader	0.92	0.91	-0.04	0.91	0.91	-0.02
Educator Planning Time						
Received planning time	0.74	0.83	-0.31	0.78	0.77	0.03

	Before Weighting			After Weighting		
	Treatment Mean	Comparison Mean	Effect Size	Treatment Mean	Comparison Mean	Effect Size
Educator Curriculum and Screener/Assessment Use						
Used any curriculum	0.90	0.84	0.33	0.88	0.88	0.01
Received support on any curriculum	0.79	0.72	0.22	0.75	0.76	-0.01
Received support on curriculum used	0.64	0.57	0.20	0.61	0.61	0.00
Used any assessment/screener	0.88	0.90	-0.16	0.88	0.88	0.01
Received support on any assessment/screener	0.71	0.74	-0.10	0.72	0.72	0.01
Received support on assessment/screener used	0.61	0.62	-0.02	0.60	0.60	0.02
Educator Plans to Stay						
Intent to stay in ECE field	0.68	0.75	-0.21	0.71	0.70	0.01
Intent to stay in ECE program	0.64	0.73	-0.27	0.67	0.66	0.03

Exhibit D-3. Baseline Equivalence for Key Classroom Quality Outcomes

	Before Weighting			After Weighting		
	Treatment Mean	Comparison Mean	Effect Size	Treatment Mean	Comparison Mean	Effect Size
Classroom Assessment Scoring System (CLASS®)						
Infant Quality	5.09	5.07	0.02	5.10	5.17	-0.08
Toddler Quality	4.66	4.67	-0.01	4.69	4.77	-0.09
PreK Quality	4.26	4.43	-0.18	4.22	4.38	-0.17
PreK Instructional Support Quality	2.29	2.01	0.26	2.05	2.01	0.04
Child Observation in Preschool/Teacher Observation in Preschool (COP/TOP)						
Listening to Children	0.06	0.05	0.08	0.05	0.06	-0.04
Instructing Children	0.26	0.28	-0.04	0.27	0.27	0.00
Demanding Higher-Order Thinking	0.00	0.01	-0.38	0.01	0.00	0.12
Using Pleasant Tone	0.33	0.40	-0.18	0.36	0.38	-0.05
Children Cooperating	0.07	0.08	-0.04	0.07	0.08	-0.03

Impact Findings from the Comparison Study

Exhibits D-4 through D-10 provide covariate-adjusted treatment and comparison means, impact estimates and standard errors, and effect sizes and p-values for the outcomes associated with all primary research questions.

Exhibit D-4. Impacts on Leader Confidence

Outcome	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
Average Leader Confidence	4.08	3.79	0.29	0.19	0.39	0.133
Confidence reflecting on data collaboratively with staff	3.87	3.57	0.30	0.24	0.31	0.209
Confidence supporting educators to adapt curriculum	4.02	4.02	0.00	0.24	0.01	0.983
Confidence planning PLC's for educators	3.86	3.38	0.48	0.29	0.45	0.108
Confidence providing constructive feedback from observations	4.15	3.99	0.16	0.29	0.16	0.574
Sample Size	30	28-29				

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, baseline scores, and years of tenure at program; units were weighted by propensity score weights) on a 5-point scale ranging from 1 (not at all confident) to 3 (neutral) to 5 (extremely confident)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Exhibit D-5. Impacts on Leader Practice

Outcome	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
Collaborative data reflection with educators	2.49	2.14	0.36	0.27	0.36	0.196
Educator child assessment data use support	2.47	2.53	-0.07	0.26	-0.07	0.803
Educator planning meetings	3.00	2.58	0.42	0.32	0.44	0.201
Educator curriculum implementation support	3.39	2.92	0.47	0.35	0.38	0.184
Observations of educators	3.03	3.14	-0.10	0.34	-0.09	0.758
Provision of observation feedback to educators	2.85	2.28	0.56	0.23	0.67	0.019
Preschool Instructional Leadership Scale (PILS)	2.61	2.28	0.34	0.14	0.59	0.017
Sample Size	23-24	29				

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, baseline scores, and years of tenure at program; units were weighted by propensity score weights) on a 5-point scale ranging from 1 (never) to 3 (once/week) to 5 (every day)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Exhibit D-6. Impacts on Educator Support for Continuous Quality Improvement

Outcome	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
Support for curriculum adaptation (yes/no)	84%	78%	0.07	0.08	0.27	0.415
Observation by program leader (yes/no)	91%	84%	0.07	0.06	0.41	0.209
Frequency of observation by program leader	2.84	2.34	0.49	0.26	0.32	0.059
Provision of feedback by program leader (yes/no)	88%	94%	-0.06	0.07	-0.31	0.352
Sample Size	122-128	81-84				

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, baseline scores, and years of experience; units were weighted by propensity score weights); frequency was on a 5-point scale ranging from 1 (never) to 5 (every day)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Exhibit D-7. Impacts on Educator Planning Time

Outcome	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
Received planning time (yes/no)	70%	80%	-0.11	0.09	-0.32	0.217
Sample Size	121	82				

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, baseline scores, and years of experience; units were weighted by propensity score weights)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Exhibit D-8. Impacts on Educator Curriculum and Assessment Use

Outcome	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
Used any curriculum	96%	91%	0.05	0.05	0.53	0.294
Received support on any curriculum	88%	81%	0.07	0.07	0.32	0.262
Received support on curriculum used	72%	63%	0.09	0.08	0.26	0.226
Used any assessment/screener	94%	88%	0.06	0.03	0.59	0.064
Received support on any assessment/screener	76%	79%	-0.03	0.06	-0.09	0.688
Received support on assessment/screener used	70%	76%	-0.07	0.06	-0.21	0.295
Sample Size	120-121	81				

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, baseline scores, and years of experience; units were weighted by propensity score weights)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Exhibit D-9. Impacts on Educator Plans to Stay

Outcome	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
Intent to stay in ECE field	67%	76%	-0.09	0.07	-0.27	0.231
Intent to stay in ECE program	65%	62%	0.03	0.06	0.09	0.582
Sample Size	118	78-80				

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, baseline scores, and years of experience; units were weighted by propensity score weights)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Exhibit D-10. Impacts on Program Quality

Outcome (T Sample Size, C Sample Size)	Treatment Group Mean[1]	Comparison Group Mean[1]	Impact Estimate[2]	Standard Error[3]	Effect Size[4]	*p*-Value[5]
CLASS						
Infant Quality (24, 11)	5.39	4.64	0.75	0.36	0.73	0.039
Toddler Quality (69, 32)	4.64	4.66	-0.02	0.22	-0.02	0.937
PreK Quality (26, 23)	4.48	4.84	-0.36	0.17	-0.44	0.042
PreK Instructional Support Domain Quality (26, 23)	2.33	3.26	-0.93	0.22	-0.86	0.000
PreK Instructional Support: Concept Development Dimension Quality	1.62	2.26	-0.64	0.26	-0.60	0.013
PreK Instructional Support: Language Modeling Dimension Quality	2.75	3.58	-0.83	0.22	-0.66	0.000
PreK Instructional Support: Quality of Feeback Dimension Quality	2.62	3.91	-1.29	0.30	-0.97	0.000
COP/TOP						
Listening to Children (85, 81)	5%	6%	-0.01	0.01	-0.10	0.375
Instructing Children (85, 81)	27%	25%	0.02	0.02	0.07	0.269
Demanding Higher-Order Thinking (85, 81)	2%	1%	0.01	0.01	0.47	0.138
Using Pleasant Tone (85, 81)	48%	38%	0.10	0.04	0.24	0.015
Children Cooperating (85, 81)	10%	7%	0.02	0.01	0.17	0.118

[1] Covariate-adjusted group averages (models controlled for cohort, SVI, capacity, and baseline scores; units were weighted by propensity score weights)
[2] Estimated value of the treatment impact from the regression model (difference between the adjusted treatment mean and the adjusted comparison mean)
[3] Standard error of the impact estimate
[4] Cohen's d standardized effect size (impact estimate in standard deviation units)
[5] Statistical significance of the impact estimate

Pre and Post Means

Exhibits D-11 through D-13 provide unadjusted pre/baseline and covariate-adjusted post/follow-up means from the impact models. Post-scores are weighted and adjusted by program variables (SVI, capacity and years of experience/tenure for educator and leader outcomes; SVI and capacity only for classroom quality outcomes) and baseline scores. 'CH' refers to Cohort.

Exhibit D-11. Adjusted Descriptives for Leader Outcomes by ECSO and Cohort

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
Average Leader Confidence									
Treatment	3.84	3.98	0.14	3.70	4.19	0.49	3.76	4.08	0.32
CLI	4.10	3.67	-0.43	3.88	3.61	-0.27	4.03	3.69	-0.34
Lastinger	3.96	4.14	0.18	3.73	3.91	0.18	3.85	4.00	0.15
UMB	3.18	4.05	0.87	3.63	4.73	1.10	3.49	4.53	1.04
Comparison	3.39	3.87	0.48	3.98	3.69	-0.29	3.70	3.79	0.09
Confidence reflecting on data collaboratively with staff									
Treatment	3.36	3.81	0.45	3.69	3.89	0.20	3.53	3.87	0.34
CLI	3.25	3.68	0.43	4.00	3.23	-0.77	3.50	3.69	0.19
Lastinger	3.57	3.90	0.33	3.86	3.44	-0.42	3.71	3.65	-0.06
UMB	3.00	3.81	0.81	3.43	4.70	1.27	3.30	4.45	1.15
Comparison	2.79	3.49	0.70	4.27	3.69	-0.58	3.55	3.57	0.02
Confidence in supporting educators to adapt curriculum									
Treatment	3.86	4.03	0.17	3.50	3.97	0.47	3.67	4.02	0.35
CLI	4.75	3.87	-0.88	3.50	3.36	-0.14	4.33	3.73	-0.60
Lastinger	3.71	4.25	0.54	3.71	3.53	-0.18	3.71	3.90	0.19
UMB	3.00	3.65	0.65	3.29	4.80	1.51	3.20	4.53	1.33
Comparison	3.50	4.22	0.72	4.13	3.87	-0.26	3.83	4.02	0.19
Confidence in planning PLCs for educators									
Treatment	3.64	3.72	0.08	3.50	4.06	0.56	3.56	3.86	0.30
CLI	4.00	3.64	-0.36	3.50	3.35	-0.15	3.83	3.65	-0.18
Lastinger	3.86	4.08	0.22	3.57	3.81	0.24	3.71	3.81	0.10
UMB	2.67	2.74	0.07	3.43	4.61	1.18	3.20	4.12	0.92
Comparison	3.31	3.11	-0.20	3.60	3.55	-0.05	3.46	3.38	-0.08
Confidence in providing constructive feedback from observations									
Treatment	4.43	4.12	-0.31	4.00	4.21	0.21	4.20	4.15	-0.05
CLI	4.50	3.59	-0.91	4.00	4.36	0.36	4.33	3.82	-0.51
Lastinger	4.57	4.63	0.06	3.86	3.75	-0.11	4.21	4.12	-0.09
UMB	4.00	3.72	-0.28	4.14	4.74	0.60	4.10	4.45	0.35
Comparison	3.57	4.14	0.57	4.13	3.82	-0.31	3.86	3.99	0.13
Collaborative data reflection with educators									
Treatment	1.44	1.83	0.39	1.93	3.17	1.24	1.74	2.49	0.75
CLI	1.67	1.70	0.03	2.00	3.12	1.12	1.80	2.44	0.64
Lastinger	1.25	1.81	0.56	1.60	3.20	1.60	1.44	2.36	0.92
UMB	1.50	2.25	0.75	2.14	3.16	1.02	2.00	2.69	0.69
Comparison	1.64	1.98	0.34	2.20	2.28	0.08	1.93	2.14	0.21
Educator child assessment data use support									
Treatment	1.78	2.05	0.27	2.50	3.13	0.63	2.22	2.47	0.25
CLI	1.33	2.26	0.93	3.00	1.62	-1.38	2.00	2.29	0.29
Lastinger	2.25	1.86	-0.39	2.20	2.87	0.67	2.22	2.49	0.27

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
UMB	1.50	2.29	0.79	2.57	3.03	0.46	2.33	2.60	0.27
Comparison	1.86	2.02	0.16	2.60	2.69	0.09	2.24	2.53	0.29
Educator planning meetings									
Treatment	2.20	2.81	0.61	2.57	2.96	0.39	2.42	3.00	0.58
CLI	3.00	3.15	0.15	3.50	2.44	-1.06	3.20	3.20	0.00
Lastinger	2.00	3.02	1.02	2.40	2.90	0.50	2.20	3.04	0.84
UMB	1.50	1.72	0.22	2.43	3.20	0.77	2.22	2.79	0.57
Comparison	1.86	2.55	0.69	2.40	2.79	0.39	2.14	2.58	0.44
Educator curriculum implementation support									
Treatment	3.00	3.18	0.18	3.43	3.38	-0.05	3.25	3.39	0.14
CLI	3.67	3.42	-0.25	3.50	4.02	0.52	3.60	4.07	0.47
Lastinger	3.00	2.91	-0.09	3.40	3.12	-0.28	3.20	3.11	-0.09
UMB	2.00	3.81	1.81	3.43	3.36	-0.07	3.11	3.32	0.21
Comparison	2.71	3.00	0.29	3.00	3.04	0.04	2.86	2.92	0.06
Observations of educators									
Treatment	2.70	2.78	0.08	2.86	3.14	0.28	2.79	3.03	0.24
CLI	2.67	2.93	0.26	4.00	3.39	-0.61	3.20	3.14	-0.06
Lastinger	2.60	2.72	0.12	2.80	2.96	0.16	2.70	3.87	1.17
UMB	3.00	2.65	-0.35	2.57	3.18	0.61	2.67	3.21	0.54
Comparison	2.71	3.05	0.34	3.27	3.34	0.07	3.00	3.14	0.14
Provision of observation feedback to educators									
Treatment	2.30	2.68	0.38	2.71	2.99	0.28	2.54	2.85	0.31
CLI	2.33	3.04	0.71	3.00	3.36	0.36	2.60	3.30	0.70
Lastinger	2.40	2.32	-0.08	2.60	2.52	-0.08	2.50	2.43	-0.07
UMB	2.00	3.33	1.33	2.71	3.22	0.51	2.56	3.13	0.57
Comparison	2.14	2.20	0.06	2.60	2.36	-0.24	2.38	2.28	-0.10
PILS									
Treatment	2.11	2.54	0.43	2.36	2.64	0.28	2.25	2.61	0.36
CLI	2.31	3.18	0.87	2.50	2.19	-0.31	2.39	2.95	0.56
Lastinger	2.06	2.15	0.09	2.31	2.70	0.39	2.19	2.42	0.23
UMB	1.91	2.51	0.60	2.36	2.77	0.41	2.26	2.61	0.35
Comparison	2.03	2.17	0.14	2.44	2.43	-0.01	2.24	2.28	0.04

Exhibit D-12. Adjusted Descriptives for Educator Outcomes by ECSO and Cohort

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
Support for curriculum adaptation (yes/no)									
Treatment	0.41	0.87	0.46	0.81	0.79	-0.02	0.58	0.84	0.26
CLI	0.52	0.84	0.32	0.71	0.82	0.11	0.56	0.83	0.27
Lastinger	0.29	0.84	0.55	0.71	0.90	0.19	0.45	0.88	0.43
UMB	0.41	0.96	0.55	0.88	0.68	-0.20	0.69	0.82	0.13
Comparison	0.65	0.75	0.10	0.91	0.81	-0.10	0.76	0.78	0.02
Observation by program leader (yes/no)									
Treatment	0.85	0.97	0.12	0.82	0.83	0.01	0.84	0.91	0.07
CLI	0.90	0.94	0.04	0.71	0.68	-0.03	0.86	0.87	0.01
Lastinger	0.74	1.01	0.27	0.82	0.86	0.04	0.76	0.93	0.17
UMB	0.90	0.94	0.04	0.85	0.92	0.07	0.87	0.94	0.07
Comparison	0.85	0.83	-0.02	0.82	0.85	0.03	0.84	0.84	0.00
Frequency of observation by program leader									

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
Treatment	2.31	2.87	0.56	2.22	3.18	0.96	2.27	2.84	0.57
CLI	2.76	3.29	0.53	2.14	3.27	1.13	2.64	3.23	0.59
Lastinger	1.87	2.59	0.72	2.55	2.46	-0.09	2.09	2.53	0.44
UMB	2.15	2.55	0.40	2.21	3.34	1.13	2.19	2.92	0.73
Comparison	2.53	2.35	-0.18	2.91	2.25	-0.66	2.69	2.34	-0.35
Provision of feedback by program leader (yes/no)									
Treatment	0.90	0.88	-0.02	0.94	0.77	-0.17	0.92	0.88	-0.04
CLI	0.90	0.75	-0.15	1.00	0.62	-0.38	0.92	0.73	-0.19
Lastinger	0.91	0.96	0.05	0.82	0.90	0.08	0.88	0.94	0.06
UMB	0.90	0.97	0.07	0.97	0.90	-0.07	0.94	0.97	0.03
Comparison	0.89	0.97	0.08	0.94	1.00	0.06	0.91	0.94	0.03
Received planning time (yes/no)									
Treatment	0.72	0.68	-0.04	0.78	0.69	-0.09	0.74	0.70	-0.04
CLI	0.81	0.54	-0.27	1.00	0.92	-0.08	0.85	0.67	-0.18
Lastinger	0.57	0.68	0.11	0.82	0.65	-0.17	0.65	0.66	0.01
UMB	0.76	0.93	0.17	0.70	0.74	0.04	0.72	0.79	0.07
Comparison	0.79	0.77	-0.02	0.88	0.90	0.02	0.83	0.80	-0.03
Used any curriculum (yes/no)									
Treatment	0.86	0.95	0.09	0.96	0.96	0.00	0.90	0.96	0.06
CLI	0.86	1.01	0.15	1.00	0.82	-0.18	0.88	0.94	0.06
Lastinger	0.87	0.93	0.06	1.00	1.00	0.00	0.91	0.98	0.07
UMB	0.86	0.90	0.04	0.94	1.02	0.08	0.91	0.97	0.06
Comparison	0.83	0.92	0.09	0.84	0.91	0.07	0.84	0.91	0.07
Received support on any curriculum (yes/no)									
Treatment	0.69	0.89	0.20	0.92	1.02	0.10	0.79	0.88	0.10
CLI	0.71	0.99	0.28	1.00	0.91	-0.09	0.77	0.95	0.18
Lastinger	0.70	0.79	0.09	1.00	0.82	-0.18	0.79	0.79	0.00
UMB	0.67	0.87	0.20	0.88	0.99	0.11	0.79	0.93	0.14
Comparison	0.71	0.81	0.10	0.73	0.71	-0.02	0.72	0.81	0.09
Received support on curriculum used (yes/no)									
Treatment	0.58	0.78	0.20	0.73	0.65	-0.08	0.64	0.72	0.08
CLI	0.61	0.89	0.28	0.86	0.62	-0.24	0.66	0.79	0.13
Lastinger	0.57	0.75	0.18	0.82	0.50	-0.32	0.65	0.65	0.00
UMB	0.57	0.65	0.08	0.69	0.72	0.03	0.64	0.73	0.09
Comparison	0.52	0.66	0.14	0.64	0.67	0.03	0.57	0.63	0.06
Used any assessment/screener (yes/no)									
Treatment	0.85	1.00	0.15	0.92	0.87	-0.05	0.88	0.94	0.06
CLI	0.75	0.98	0.23	1.00	0.90	-0.10	0.79	0.95	0.16
Lastinger	0.87	1.00	0.13	1.00	0.89	-0.11	0.91	0.95	0.04
UMB	0.95	1.01	0.06	0.88	0.88	0.00	0.91	0.96	0.05
Comparison	0.96	0.93	-0.03	0.82	0.85	0.03	0.90	0.88	-0.02
Received support on any assessment/screener (yes/no)									
Treatment	0.64	0.76	0.12	0.81	0.80	-0.01	0.71	0.76	0.05
CLI	0.57	0.80	0.23	0.67	0.85	0.18	0.59	0.82	0.23
Lastinger	0.52	0.70	0.18	0.82	0.94	0.12	0.62	0.80	0.18
UMB	0.86	0.80	-0.06	0.81	0.78	-0.03	0.83	0.77	-0.06
Comparison	0.75	0.82	0.07	0.73	0.78	0.05	0.74	0.79	0.05
Received support on assessment/screener used (yes/no)									
Treatment	0.52	0.70	0.18	0.75	0.80	0.05	0.61	0.70	0.09
CLI	0.43	0.68	0.25	0.67	0.80	0.13	0.47	0.71	0.24
Lastinger	0.43	0.65	0.22	0.82	0.96	0.14	0.56	0.76	0.20
UMB	0.71	0.81	0.10	0.72	0.75	0.03	0.72	0.74	0.02

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
Comparison	0.60	0.81	0.21	0.64	0.72	0.09	0.61	0.76	0.15
Intent to stay in ECE field (yes/no)									
Treatment	0.69	0.65	-0.04	0.66	0.76	0.10	0.68	0.67	-0.01
CLI	0.75	0.59	-0.16	0.67	0.55	-0.12	0.74	0.58	-0.16
Lastinger	0.61	0.65	0.04	0.40	0.93	0.53	0.55	0.77	0.22
UMB	0.70	0.75	0.05	0.74	0.68	-0.06	0.73	0.68	-0.05
Comparison	0.71	0.74	0.03	0.81	0.81	0.00	0.75	0.76	0.01
Intent to stay in ECE program (yes/no)									
Treatment	0.68	0.63	-0.05	0.57	0.76	0.19	0.64	0.65	0.01
CLI	0.68	0.64	-0.04	0.50	0.66	0.16	0.65	0.68	0.03
Lastinger	0.61	0.59	-0.02	0.30	0.94	0.64	0.52	0.71	0.19
UMB	0.75	0.67	-0.08	0.68	0.63	-0.05	0.71	0.60	-0.11
Comparison	0.72	0.58	-0.14	0.75	0.70	-0.05	0.73	0.62	-0.11

Exhibit D-13. Adjusted Descriptives for Classroom Quality Outcomes by ECSO and Cohort

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
Infant Quality									
Treatment	5.320	5.940	0.620	5.030	4.950	-0.080	5.150	5.380	0.230
CLI	4.800	5.580	0.780	4.850	4.530	-0.320	4.830	5.110	0.280
Lastinger	5.340	5.995	0.655	5.240	5.520	0.280	5.290	5.840	0.550
UMB	5.430	6.220	0.790	4.810	4.020	-0.790	5.080	4.922	-0.158
Comparison	5.390	4.330	-1.060	4.350	4.980	0.630	4.830	4.630	-0.200
Toddler Quality									
Treatment	4.990	4.530	-0.460	4.298	4.620	0.322	4.640	4.640	0.000
CLI	4.995	4.840	-0.155	4.175	4.700	0.525	4.710	4.780	0.070
Lastinger	4.710	4.270	-0.440	4.430	4.710	0.280	4.540	4.590	0.050
UMB	5.190	4.460	-0.730	4.240	4.440	0.200	4.660	4.430	-0.230
Comparison	5.130	4.420	-0.710	4.380	4.760	0.380	4.670	4.660	-0.010
PreK Quality									
Treatment	3.930	4.300	0.370	4.317	4.510	0.193	4.150	4.500	0.350
CLI	3.940	4.630	0.690	4.640	4.570	-0.070	4.330	4.600	0.270
Lastinger	3.120	3.600	0.480	3.810	4.890	1.080	3.550	4.560	1.010
UMB	4.520	4.520	0.000	4.500	4.180	-0.320	4.510	4.260	-0.250
Comparison	4.098	4.320	0.222	4.870	5.260	0.390	4.430	4.860	0.430
PreK Instructional Support Quality									
Treatment	2.290	2.280	-0.010	2.010	2.250	0.240	2.130	2.380	0.250
CLI	2.320	2.030	-0.290	2.380	1.690	-0.690	2.350	1.880	-0.470
Lastinger	1.511	1.680	0.169	1.540	2.770	1.230	1.530	2.530	1.000
UMB	2.830	3.630	0.800	2.110	2.210	0.100	2.430	2.530	0.100
Comparison	1.770	2.780	1.010	2.330	3.720	1.390	2.010	3.310	1.300
Listening to children (yes/no)									
Treatment	0.070	0.050	-0.020	0.040	0.045	0.005	0.057	0.050	-0.007
CLI	0.070	0.030	-0.040	0.030	0.050	0.020	0.060	0.040	-0.020
Lastinger	0.050	0.060	0.010	0.040	0.040	0.000	0.050	0.050	0.000
UMB	0.080	0.050	-0.030	0.050	0.050	0.000	0.060	0.050	-0.010
Comparison	0.050	0.060	0.010	0.050	0.055	0.005	0.050	0.060	0.010
Instructing children (yes/no)									
Treatment	0.320	0.340	0.020	0.180	0.199	0.019	0.264	0.270	0.006
CLI	0.310	0.330	0.020	0.220	0.197	-0.023	0.290	0.280	-0.010

Outcome	CH3 Pre	CH3 Post	CH3 Change	CH4 Pre	CH4 Post	CH4 Change	CH3&4 Pre	CH3&4 Post	CH3&4 Change
Lastinger	0.345	0.360	0.015	0.197	0.210	0.013	0.288	0.290	0.002
UMB	0.310	0.310	0.000	0.160	0.190	0.030	0.225	0.240	0.016
Comparison	0.280	0.290	0.010	0.270	0.197	-0.073	0.280	0.250	-0.030
Demanding Higher-Order Thinking (yes/no)									
Treatment	0.003	0.030	0.028	0.003	0.006	0.003	0.003	0.020	0.017
CLI	0.003	0.010	0.007	0.000	0.004	0.004	0.002	0.009	0.007
Lastinger	0.002	0.060	0.058	0.008	0.008	0.000	0.004	0.040	0.036
UMB	0.003	0.009	0.007	0.001	0.004	0.003	0.002	0.007	0.005
Comparison	0.007	0.010	0.003	0.004	0.016	0.012	0.005	0.010	0.005
Using Pleasant Tone (yes/no)									
Treatment	0.346	0.540	0.194	0.313	0.387	0.074	0.330	0.480	0.150
CLI	0.296	0.570	0.274	0.290	0.550	0.260	0.296	0.570	0.274
Lastinger	0.423	0.540	0.117	0.300	0.340	0.040	0.377	0.440	0.063
UMB	0.310	0.510	0.200	0.330	0.350	0.020	0.320	0.430	0.110
Comparison	0.430	0.390	-0.040	0.380	0.330	-0.050	0.400	0.380	-0.020
Children Cooperating (yes/no)									
Treatment	0.071	0.110	0.040	0.070	0.097	0.027	0.070	0.100	0.030
CLI	0.069	0.130	0.060	0.070	0.080	0.010	0.070	0.100	0.030
Lastinger	0.071	0.098	0.028	0.067	0.110	0.043	0.070	0.110	0.040
UMB	0.074	0.094	0.024	0.080	0.080	0.000	0.080	0.090	0.010
Comparison	0.080	0.090	0.010	0.080	0.050	-0.030	0.077	0.070	-0.007

Moderator and Subgroup Analyses

Moderators: Program Characteristics and Participant Demographics

Exhibits D-14 through D-16 provide the results of moderator analyses investigating the extent to which initiative impact differed according to program leader tenure (for leader outcomes), educator experience (for educator outcomes), program SVI, program licensed capacity, and/or program subsidy rate.

Exhibit D-14. Investigating Moderators of Impacts on Leader Outcomes

Outcome	Leader Tenure		SVI		Capacity		Subsidy	
Confidence	Interaction coefficient	p-value	Interaction coefficient	p-value	Interaction coefficient	p-value	Interaction coefficient	p-value
Average leader confidence	0.35	0.53	-0.22	0.39	-0.45	0.02	-0.28	0.22
Confidence in reflecting on data collaboratively with staff	-0.46	0.34	-0.22	0.36	0.13	0.57	-0.36	0.10
Confidence in supporting educators to adapt curriculum	-0.73	0.02	-0.07	0.78	0.25	0.32	-0.10	0.68
Confidence in planning PLCs for educators	-0.54	0.08	-0.21	0.43	0.04	0.87	-0.32	0.21
Confidence in providing constructive feedback from observations	-0.12	0.63	-0.22	0.33	0.76	0.01	-0.16	0.48
Frequency in Leadership Practices								
Collaborative data reflection with educators	-0.28	0.21	0.01	0.98	0.00	0.99	-0.16	0.52
Educator child assessment data use support	0.23	0.39	-0.20	0.48	-0.22	0.47	-0.42	0.10
Educator planning meetings	-0.12	0.62	-0.43	0.28	-0.07	0.88	-0.51	0.15
Educator curriculum implementation support	-0.12	0.66	-0.01	0.99	0.05	0.88	0.09	0.77
Observations of educators	-0.04	0.86	-0.57	0.09	0.15	0.70	-0.39	0.15
Provision of observation feedback to educators	0.01	0.98	-0.12	0.68	0.02	0.96	0.24	0.44
PILS	0.07	0.78	-0.23	0.45	0.22	0.50	-0.17	0.47

Exhibit D-15. Investigating Moderators of Impacts on Educator Outcomes

Outcome	Educator Years in Program		SVI		Capacity		Subsidy	
Continuous Quality Improvement	Interaction coefficient	p-value	Interaction coefficient	p-value	Interaction coefficient	p-value	Interaction coefficient	p-value
Support for curriculum adaptation (yes/no)	0.30	0.01	0.01	0.98	-0.28	0.27	-0.24	0.13
Observation by program leader (yes/no)	0.00	0.99	-0.17	0.18	0.00	0.98	-0.32	0.02
Frequency of observation by program leader	-0.24	0.22	0.13	0.34	-0.41	0.06	-0.09	0.55
Provision of feedback by program leader (yes/no)	0.01	0.96	0.08	0.66	0.11	0.70	0.01	0.98
Planning Time								
Received planning time (yes/no)	-0.17	0.07	0.00	0.98	-0.16	0.40	0.03	0.90
Curriculum and Assessment Use								
Used any curriculum	0.00	0.99	0.11	0.65	-0.24	0.38	-0.26	0.15
Received support on any curriculum	-0.07	0.67	0.09	0.59	-0.53	0.02	-0.05	0.80
Received support on curriculum used	-0.21	0.06	0.07	0.71	-0.44	0.03	0.00	0.99
Used any assessment/screener	0.08	0.49	-0.03	0.76	-0.26	0.05	-0.09	0.16
Received support on any assessment/screener	0.06	0.64	0.29	0.03	-0.13	0.39	-0.16	0.89
Received support on assessment/screener used	0.13	0.26	0.28	0.01	-0.20	0.17	0.06	0.58
Impacts on Educator Plans to Stay								
Intent to stay in ECE field	0.08	0.58	-0.12	0.49	0.38	0.03	-0.11	0.55
Intent to stay in ECE program	-0.08	0.49	-0.14	0.34	0.05	0.74	-0.07	0.73

Exhibit D-16. Investigating Moderators of Impacts on Classroom Quality Outcomes

Outcome	SVI		Capacity		Subsidy	
CLASS	Interaction coefficient	p-value	Interaction coefficient	p-value	Interaction coefficient	p-value
Infant Quality	-0.78	0.03	0.18	0.84	-0.72	0.01
Toddler Quality	0.34	0.19	0.18	0.60	0.18	0.48
PreK Quality	-0.28	0.43	0.84	0.00	-0.40	0.17
PreK Instructional Support Quality	0.13	0.61	0.83	0.00	0.27	0.24
COP/TOP						
Listening to Children	-0.22	0.28	-0.16	0.34	-0.26	0.17
Instructing Children	-0.03	0.86	-0.09	0.60	-0.12	0.46
Demanding Higher-Order Thinking	0.01	0.95	0.11	0.29	0.14	0.53
Using Pleasant Tone	0.09	0.64	0.24	0.27	-0.08	0.76
Children Cooperating	0.06	0.75	-0.43	0.06	-0.48	0.08

Moderator: Cohort

Exhibits D-17 through D-19 provide the results of moderator analyses investigating the extent to which initiative impact differed according to cohort.

Exhibit D-17. Investigating Cohort Moderation of Impacts on Leader Outcomes

Outcome	Cohort	
Confidence	Interaction coefficient	p-value
Average leader confidence	0.20	0.59
Confidence in reflecting on data collaboratively with staff	0.45	0.14
Confidence in supporting educators to adapt curriculum	0.20	0.70
Confidence in planning PLCs for educators	-0.63	0.28
Confidence in providing constructive feedback from observations	0.34	0.54
Frequency in Leadership Practices		
Collaborative data reflection with educators	0.59	0.28

Educator child assessment data use support	-0.30	0.57
Educator planning meetings	-0.24	0.68
Educator curriculum implementation support	0.11	0.88
Observations of educators	-0.39	0.55
Provision of observation feedback to educators	-0.27	0.60
PILS	-0.23	0.40

Exhibit D-18. Investigating Cohort Moderation of Impacts on Educator Outcomes

Outcome	Cohort	
Continuous Quality Improvement	Interaction coefficient	p-value
Support for curriculum adaptation (yes/no)	-0.10	0.45
Observation by program leader (yes/no)	-0.13	0.22
Frequency of observation by program leader	-0.04	0.93
Provision of feedback by program leader (yes/no)	-0.05	0.79
Planning Time		
Received planning time (yes/no)	-0.09	0.55
Curriculum and Assessment Use		
Used any curriculum	0.04	0.71
Received support on any curriculum	0.11	0.42
Received support on curriculum used	-0.06	0.69
Used any assessment/screener	0.01	0.88
Received support on any assessment/screener	0.09	0.41
Received support on assessment/screener used	0.13	0.25
Impacts on Educator Plans to Stay		
Intent to stay in ECE field	-0.03	0.80
Intent to stay in ECE program	-0.06	0.61

Exhibit D-19. Investigating Cohort Moderation of Impacts on Classroom Quality Outcomes

Outcome	Cohort	
CLASS®	Interaction coefficient	p-value
Overall Quality	-0.62	0.09
Infant Quality	-1.06	0.15
Toddler Quality	-0.21	0.68
PreK Quality	-0.55	0.17
PreK Instructional Support Quality	-1.15	0.03
COP/TOP		
Listening to Children	0.01	0.67
Instructing Children	-0.06	0.15
Demanding Higher-Order Thinking	-0.03	0.07
Using Pleasant Tone	-0.17	0.04
Children Cooperating	0.02	0.60

Gains and Dosage within the Treatment Group

Similar to the analyses of potential moderators of impact, it is reasonable to hypothesize that gains made during the impact year might be larger for programs that received more ECSO support and more direct leader coaching. We investigated total hours of leader support and total hours of leader coaching as predictors of gains within the treatment group for each leader, educator, and classroom outcome in separate regression models (Exhibits D-20 – D-22).

Exhibit D-20. Investigating Associations of Dosage and Leader Outcomes

Outcome	Total Leader Support Hours		Leader Coaching Hours	
Confidence	Beta coefficient	p-value	Beta coefficient	p-value
Average leader confidence	0.00	0.71	-0.03	0.35
Confidence in reflecting on data collaboratively with staff	0.00	0.80	-0.05	0.28
Confidence in supporting educators to adapt curriculum	0.00	0.92	-0.03	0.35
Confidence in planning PLCs for educators	0.01	0.57	-0.01	0.88
Confidence in providing constructive feedback from observations	0.01	0.44	-0.03	0.55
Frequency in Leadership Practices				
Collaborative data reflection with educators	-0.01	0.50	-0.04	0.35
Educator child assessment data use support	0.00	0.93	-0.03	0.46
Educator planning meetings	-0.02	0.33	0.03	0.55
Educator curriculum implementation support	-0.03	0.19	0.06	0.47
Observations of educators	-0.03	0.03	-0.10	0.05
Provision of observation feedback to educators	-0.04	0.00	-0.10	0.05
PILS	-0.02	0.12	-0.01	0.83

Exhibit D-21. Investigating Associations of Dosage and Educator Outcomes

Outcome	Total Leader Support Hours		Leader Coaching Hours	
Continuous Quality Improvement	Beta coefficient	p-value	Beta coefficient	p-value
Support for curriculum adaptation (yes/no)	0.00	0.71	0.00	0.49
Observation by program leader (yes/no)	0.00	0.86	-0.02	0.11
Frequency of observation by program leader	-0.02	0.08	-0.03	0.40
Provision of feedback by program leader (yes/no)	0.00	0.24	-0.01	0.38
Planning Time				
Received planning time (yes/no)	0.00	0.64	-0.01	0.23
Curriculum and Assessment Use				
Used any curriculum	0.00	0.54	0.00	0.61
Received support on any curriculum	-0.01	0.04	-0.01	0.40
Received support on curriculum used	0.00	0.51	0.01	0.35
Used any assessment/screener	0.00	0.96	0.00	0.66
Received support on any assessment/screener	0.00	0.95	0.01	0.21
Received support on assessment/screener used	0.00	0.62	0.01	0.34
Impacts on Educator Plans to Stay				
Intent to stay in ECE field	0.00	0.38	0.00	0.90
Intent to stay in ECE program	0.00	0.83	0.00	0.66

Exhibit D-22. Investigating Associations of Dosage and Classroom Observation Outcomes

Outcome	Total Leader Support Hours		Leader Coaching Hours	
CLASS	Beta coefficient	p-value	Beta coefficient	p-value
Infant Quality	0.03	0.04	0.05	0.23
Toddler Quality	0.00	0.88	0.02	0.41
PreK Quality	0.01	0.16	0.04	0.03
PreK Instructional Support Quality	0.02	0.00	0.16	0.34

COP/TOP				
Listening to Children	0.00	0.66	0.00	0.87
Instructing Children	0.00	0.22	0.00	0.62
Demanding Higher-Order Thinking	0.00	0.07	0.00	0.05
Using Pleasant Tone	0.00	0.55	0.01	0.22
Children Cooperating	0.00	0.79	0.00	0.66