Pre-K 4 SA Evaluation Report

YEAR 3

Final Report Submitted to

Early Childhood Education Municipal Development Corporation

August 30, 2016

This publication is prepared by Edvance Research under a Professional Services Agreement for the Program Assessment for Pre-K 4 SA Program with the San Antonio Early Childhood Education Municipal Development Corporation, a Texas Municipal Development (City of San Antonio). The content of the publication does not necessarily reflect the views or policies of the San Antonio Early Childhood Education Municipal Development Corporation, a Texas Municipal Development or the City of San Antonio, nor does mention of trade names, commercial products, or organizations imply endorsement by the City of San Antonio.

CONTENTS

EXECUTIVE SUMMARY

Pre-K 4 SA served more than 1,700 children during its third year of implementation. The Year 3 evaluation of Pre-K 4 SA sought to address research questions across three categories: *Descriptive*, *Implementation*, and *Outcome* questions.

Pre-K 4 SA served slightly more boys (51.9%) than girls (48.1%) during Year 3. The majority of Pre-K 4 SA children were Hispanic (76.1%), with the remaining children identified as Black (10.0%), White (8.0%), and other ethnicities (6.0%). Almost 74% of children attended Pre-K 4 SA for free; 7% on scholarship; and 19% were tuition-paying children. Of those children who attended Pre-K 4 SA for free, 90.6% did so based on income eligibility.

Average attendance for Pre-K 4 SA children was 92.5%, which increased slightly to 93.6% when children who withdrew were excluded. Attendance rates have been stable over the first 3 years of implementation. Family engagement events were attended by family members of 99.5% of the Pre-K 4 SA children and included attendance by more than 6,000 individuals. Sixty-four percent of those attending family engagement events were mothers.

Edvance (a wholly owned subsidiary of Westat) conducted classroom observations using the Classroom Assessment Scoring System (CLASS) to assess the quality of teacher-child interactions in Pre-K 4 SA classrooms. Overall, teachers were observed displaying high levels of emotional support and relatively high levels of classroom organization. Instructional support was, on average, nearing the middle of the mid-range and improved the most of the three quality domains since the inception of the program. Significant improvements were seen across all three domain scores since the inception of the program, and the level of quality across all three domains was above fiscal year (FY) 2015 average quality scores of the nation's Head Start grantees. Across centers, however, the East center consistently had the lowest domain quality scores, indicating more support toward improving teacher-child interactions should be provided to the East center.

Implementation study findings indicated the majority of Pre-K 4 SA teachers report, and were observed, implementing program principles and standards as intended. Pre-K 4 SA instruction appears to be based on multiple curricular resources, with daily opportunities for children to engage in active learning through varied learning settings. The majority of teachers report feeling prepared and supported in their positions. Although challenges exist (behavior management most often reported), 98% of teachers plan to continue teaching with Pre-K 4 SA.

Pre-K 4 SA children's kindergarten readiness outcomes (measured by the *Teaching Strategies GOLD*) were compared to a nationally representative sample of children for six outcomes: cognitive, literacy, mathematics, oral language, physical, and social-emotional. Results indicated that although Pre-K 4 SA children started the school year significantly below the normed sample in all six outcomes, they surpassed the normed sample in three of the six outcomes (cognitive, literacy, and mathematics) by the end of the year, were not statistically different in oral language or social-emotional, and closed the gap in the physical outcome by 74%.

Looking further into the Pre-K 4 SA sample with regard to center differences, children attending the North and South centers were found to have greater gains across all six GOLD outcomes than children from the East and West centers. No significant differences were found for GOLD outcomes by level of family engagement.

Limitations of the evaluation include the lack of a control group of children for a comparison to a more similar group of children, as well as lack of a direct child assessment measure. Classroom observation data were also based on one observation of each classroom during the spring; therefore, no inferences can be made about changes in classroom quality over time.

INTRODUCTION

Improving children's kindergarten readiness and narrowing the achievement gap are twin education goals receiving considerable attention throughout the United States (Barnett, 2011). Public investments in preschool education programs have been promoted on the grounds that they can accomplish these twin goals and produce benefits that lead to a high rate of return over time (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010; Reynolds, Temple, White, Ou, & Robertson, 2011; Rolnick & Grunewald, 2003).

As a result of the evidence for high-quality early education and the recent loss of state-funded seats and slow growth of state programs, new initiatives are emerging. This includes programs at the city level to increase school readiness, decrease achievement gaps, and align early care and education programs with K–12 education systems. San Antonio, Texas, is among several cities that have opted for investing in preschool education, in addition to state mandates, much like the Boston pre-K program (National League of Cities, 2012). San Antonio is unique because the city has funded the program through a voter-approved 1/8 cent increase in local sales tax rates starting April 1, 2013. The program, called Pre-K 4 SA, serves many children who are at risk for falling behind their peers and for lacking in kindergarten readiness, with the goal of increasing early childhood quality and school readiness across the city of San Antonio. Pre-K 4 SA completed a third year of implementation as of the completion of the 2015–16 school year.

The purpose of the current report is to present Year 3 evaluation findings of the Pre-K 4 SA program. Investigations included: (1) descriptive information concerning child attendance, family engagement, and classroom and teacher quality information; (2) implementation results; and (3) outcome analysis results of the *Teaching Strategies Gold* assessment system (GOLD), which is the primary outcome of interest at the end of the pre-K year.

RESEARCH QUESTIONS

The Year 3 (2015–16) evaluation of Pre-K 4 SA sought to address research questions in three study categories:

1. *Descriptive Research Questions*:
    - What were the reported levels of child attendance during the pre-K year?
        - Are attendance rates stable over implementation years?
    - What were reported levels of formal family engagement during the pre-K year?
        - Who were the family members that engaged most often?
    - What was the overall observed teacher-child interaction quality in Pre-K 4 SA classrooms in Year 3?
        - Did the Year 3 interaction quality vary by center?
        - Has improvement been observed in interaction quality since the inception of the program (Year 1)?

2. *Implementation Research Questions:*
    - Was the Pre-K 4 SA program implemented with fidelity to program standards?
3. *Outcome Research Questions:*
    - How do Pre-K 4 SA children compare to a nationally representative normed sample of children on GOLD outcomes?
    - Do differences in gains in GOLD outcomes vary significantly by center or amount/level of family engagement?

EVALUATION SAMPLE AND METHODS

Sample

Table 1. Children who attended Pre-K 4 SA by District

District name	*Number of children*	*Percentage (%) of total children*
Northside	505	28.3
San Antonio	326	18.3
North East	234	13.1
Edgewood	118	6.6
Harlandale	61	3.4
Southwest	49	2.8
Southside	18	1.0
Tuition	340	19.1
Scholarship	132	7.4
Total	1,783	100.0

Note: Children counted by district attend the program at no cost.

Data were provided for 1,783 children in Year 3. Pre-K 4 SA served slightly more boys (51.9%) than girls (48.1%). Of those more than 1,700 children, the majority represented three districts: Northside ISD, San Antonio ISD, and North East ISD.[1] In addition, 19% of children paid tuition, and slightly more than 7% received scholarships (all other children attended for free). Table 1 includes the percentage of children per represented school district.

The average age of attending children on the first day of school (August 24, 2015) was 4.46 years.[2] The majority of Pre-K 4 SA children were Hispanic (76.1%) with the remaining children reported as Black (10.0%), White (8.0%), and other ethnicities (6.0%). Out of all children enrolled (both tuition and free attending), almost 75% were considered economically disadvantaged. Of the children who attended for free, this number rose to 90.6%. It is important to note, 132 scholarship children would have also likely met income eligibility criteria; however, they were not in an attendance zone of a partner school district. Table 2 includes the percentage of children, by eligibility, who attended Pre-K 4 SA for free.

[1] These same three districts were also the majority representation in Years 1 and 2 (2013-14 and 2014-15).
[2] This average includes all children in the sample regardless of start date.

Table 2. Children who attended Pre-K 4 SA for free by Eligibility Criteria

Eligibility criteria	*Number of children*	*Percentage (%) of total eligible children*
Economic disadvantage	1,188	90.6
English language learner	237	18.1
Foster care	20	1.5
Homeless	20	1.5
Military	113	8.6
Eligible total	1,311	100.0

Note. The eligible total is not a sum because children could qualify in more than one category. The percentage of children who attended Pre-K 4 SA for free was 73.5%. Children were removed from eligibility criteria counts in this table if they were identified as scholarship or tuition children. Scholarship children would likely have qualified but were not associated with partner districts.

Methods

Descriptive research questions were addressed through analysis of existing Pre-K 4 SA databases and results from classroom observations. To address the descriptive questions pertaining to attendance and family engagement, data collected by Pre-K 4 SA were submitted to Edvance (a wholly owned subsidiary of Westat) and descriptively analyzed. Weights were assigned to various types of family engagement. To address the final descriptive questions, pertaining to classroom quality, data were analyzed from the Classroom Assessment Scoring System (CLASS).

The implementation research question was addressed through survey and observational data. Expectations were established by Pre-K 4 SA obtained through the Pre-K 4 SA Educational Philosophy and Framework documentation.[3]

Inferential tests of differences were conducted between the Pre-K 4 SA children and a nationally representative normed sample of children on the GOLD assessment outcomes. In addition, inferential tests were conducted to investigate potential differences in GOLD results by center, and whether differences in family engagement participation (amount/weight of types of engagement) were related to greater gains in GOLD outcomes for children. Refer to Appendix B for more detailed information on the Year 3 evaluation methodology, including detailed information pertaining to measures used.

Structure of Year 3 Evaluation

The Year 3 evaluation contained three study categories, descriptive, implementation, and outcome, to follow the three types of research questions addressed. These study categories and

[3] Information pertaining to the sample of teachers who completed the instructional survey is provided in Appendix A. The Pre-K 4 SA Educational Philosophy and Framework document received was still in draft form. Therefore, expectations may continue to change and become finalized beyond what was provided.

all Year 3 research questions were guided by the Pre-K 4 SA theory of change and logic model developed in Year 1 and updated by Pre-K 4 SA in Year 2.

EVALUATION RESULTS

Descriptive Study Results

Child Attendance in Pre-K 4 SA

Children began attendance in Pre-K 4 SA at different times. The majority of children (95.5%) began at the start of the academic year (August 24, 2015). The last date children began Pre-K 4 SA was April 15, 2016.[4] Because of these varied dates, some children had the opportunity to attend more days than other children. In fact, the range of possible membership days ranged from 1–177 days, with an average of 166.2 days. Average percentage attendance across all children was 92.5%. When considering children who stayed in membership with Pre-K 4 SA through the year (did not withdraw), the attendance percentage increases slightly to 93.6%.

One-hundred ninety-four children withdrew from Pre-K 4 SA over the course of the year. The earliest withdrawal occurred August 25, 2015, with the last on June 1, 2016. Forty-five percent of withdrawals occurred before the end of December. No significant differences were found between children who did and did not withdraw in terms of gender (t (1,1,781)=-0.80, p=.42); eligibility to attend Pre-K 4 SA for free, on scholarship or tuition (F (2, 1,782) =1.54, p=.21), economic disadvantage (t (1,1,781)=-0.52, p=.60) or between racial categories (F (3, 254.2)=2.70, p=.05)[5].

Attendance rates over time

Attendance rates have remained fairly stable over the first 3 years of Pre-K 4 SA implementation. On average, rates have consistently remained between 91–94%. Table 3 displays attendance for all children who attended the program as well as attendance for the subsection of children who did not withdraw from the program.

Table 3. Pre-K 4 SA attendance over time

Enrollment status	*Year 1 2013–14*	*Year 2 2014–15*	*Year 3 2015–16*
All enrolled children	92.3%	91.3%	92.5%
Children who did not withdraw	93.7%	92.5%	93.6%

[4] Although some children did not begin membership in Pre-K 4 SA until late spring, more than 99.4% of all children were in membership by the end of the 2015 calendar year.
[5] Results from Levene's test of homogeneity of variances showed equal variances could not be assumed; therefore, a Welch's ANOVA was conducted. The obtained Welch's adjusted F ratio was (2.70), which was on the threshold of significance at the .05 alpha level (p=.05).

Family Engagement

Year 3 family engagement data were provided in connection with 1,774 children (99.5%)[6]; meaning that 99.5% of children who attended Pre-K 4 SA during Year 3 had at least one family member participate in at least one type of engagement over the course of the pre-K year. In addition, analysis of the family engagement data suggested that more than 6,000 unique individuals participated in at least one type of engagement (*n*=6,085)[7] with more than 24,000 engagements documented across those individuals (*n*=24,287).

Of the more than 24,000 engagements, the majority were attended by mothers (15,609; 64%) followed by fathers (4,475; 18%). This is not surprising given that previous research has often focused on involvement and engagement of mothers due to a variety of factors (e.g., Van Voorhis, Maier, Epstein, Lloyd, & Leung, 2013). Table 4 displays the breakdown of engagement by relationship to the Pre-K 4 SA child.

Table 4. Number of family engagement occurrences by relationship

Relationship to Pre-K 4 SA child	*Number of engagement occurrences*	*Percentage (%) of total engagement occurrences*
Mother	15,609	64.27
Father	4,475	18.43
Grandmother	2,306	9.49
Grandfather	769	3.17
Aunt	433	1.78
Non-relative[a]	122	0.50
Uncle	110	0.45
Sister	104	0.43
Brother	79	0.33
Relative (not specified)	81	0.33
Friend	70	0.29
Cousin	41	0.17
Guardian	7	0.03
Case Worker	3	0.01
Unknown	78	0.32

[a] Pre-K 4 SA included step-family members such as step-parents in the non-relative category.

[6] Initial submission of family engagement data appeared to contain more information; however, after data cleaning and removal of children who were actually recognized as Year 4 incoming children, unique children were reduced from 1,796 to 1,783.

[7] As no identification variables were available to link to individuals, the process to identify unique individuals required matching on names; therefore, it is possible that the total number of unique individuals is inflated due to multiple spellings or data entry issues with name entry.

As many different types of engagement and events were available during the course of the year, Edvance, in consultation with Pre-K 4 SA, developed a weighted system of engagement that contains four levels of intensity. Those four levels are defined as follows, in descending order:

- Level 3 includes the most intense or direct one-on-one interactions with families, such as individual conferences and service referrals.
- Level 2 includes family events in groups where events have a particular educational focus for the attending family members, such as events focused on finances, literacy, parenting, or nutrition and health.
- Level 1 includes Center celebrations, which do not include direct training components for family members, such as volunteer opportunities in the classroom, parades, ceremonies, and celebrations.
- Level 0 includes cursory and abbreviated contact with family members that is focused on updates, scheduling, or enrollment tasks. (Not considered active engagement; largely administrative.)

Level 1 engagement occurred most often for family members (*n*=11,197 instances of Level 1 engagement by family members; 46.10%) and also included at least one family member connected to each of more than 1,600 Pre-K 4 SA children. Level 0 administrative engagement occurred least often (*n*=127 instances) and was related to the smallest number of Pre-K 4 SA children out of the four types of family engagement (*n*=95). See Table 5 for participation across all four levels.

Table 5. Number of children and family engagement occurrences by engagement level

Level of engagement	*Number of Pre-K 4 SA children represented in family engagement*	*Number of engagement occurrences*	*Number of engagement occurrences (%)*
Level 3	1,765	7,244	29.83
Level 2	1,146	5,719	23.55
Level 1	1,684	11,197	46.10
Level 0	95	127	0.52
Total	--	24,287	100.00

Note. A total number of Pre-K 4 SA children is not provided as the numbers representing each level of family engagement were not mutually exclusive as children could be represented in multiple levels.

Pre-K 4 SA also used the family engagement database to capture other actions and efforts taken by family engagement specialists that did not directly involve family members. Such records included efforts pertaining to more than 200 Year 3 children (*n*=204). Such documentation included attempted family contacts on the part of family engagement specialists that did not lead to actual contact with a family member, direct services to children, or observations of specific children in the classroom (no family member present).[8]

[8] These data were not included in analyses as they do not pertain to the questions of interest.

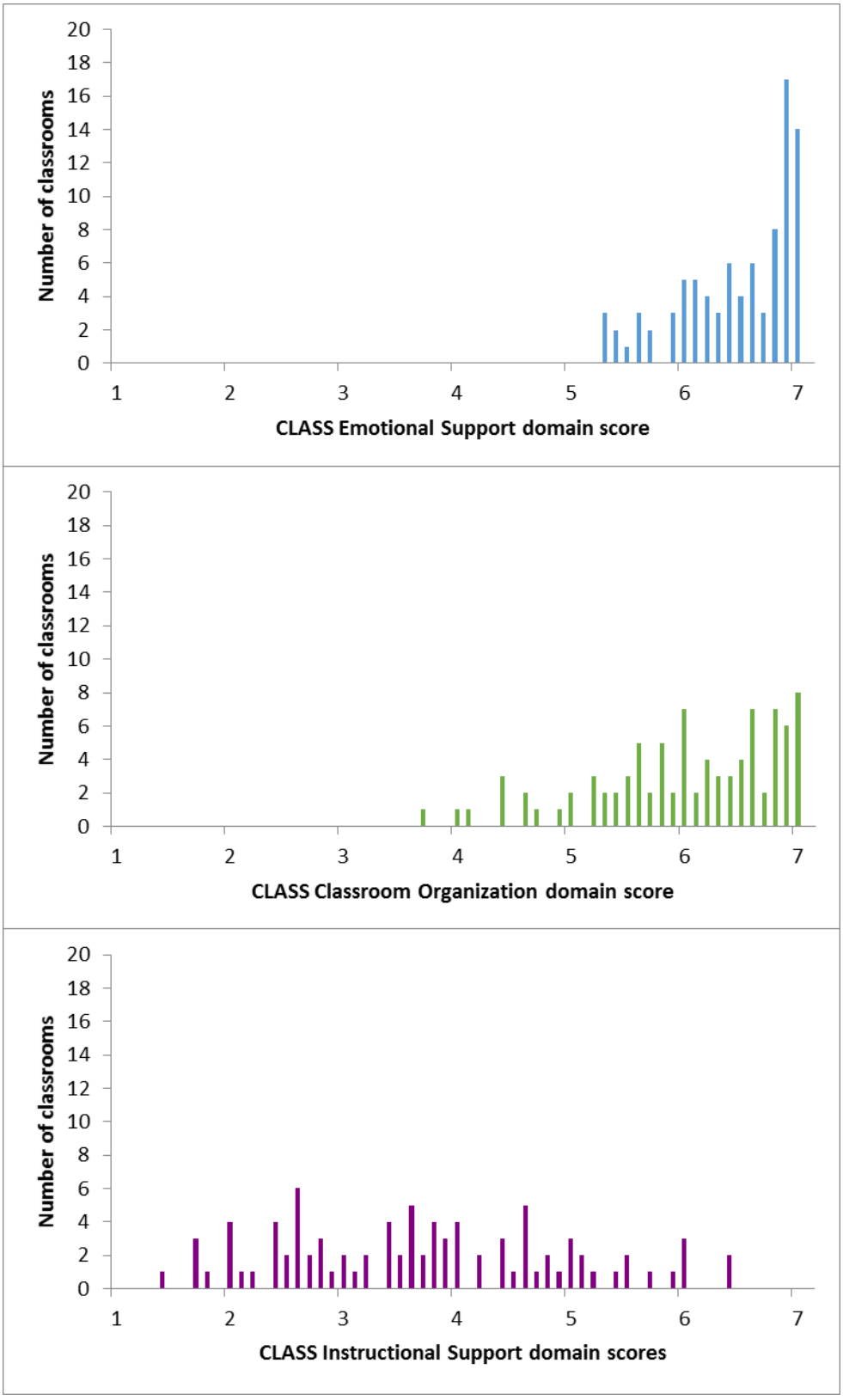
Classroom Observations

All 89 Pre-K 4 SA classrooms were observed during Year 3 using both CLASS and the *Pre-K 4 SA Classroom Observation Measure* (P-COM). Of the 89 classrooms observed, 20 were located at the East center, 25 at the North center, 22 at the South center, and 22 at the West center.

Classroom Assessment Scoring System

Scores for the Emotional Support domain ranged from 5.21–7.00 (on the 1 to 7 scale) across all five observation cycles, with most scores in the high range of Emotional Support (average score of 6.44), suggesting effective teacher-child interactions were observed most often during the observation period. Slightly lower, yet with an overall score bordering on the upper range, Classroom Organization domain scores ranged from 3.67–7.00, which suggests classrooms showed a mix of effective interactions with periods when interactions were not as effective with regard to classroom organization (average score of 5.98). Finally, Instructional Support domain scores ranged from 1.33–6.76, with an average score at the low end of the middle range at 3.67, which suggests only some observed interactions included support from teachers that extended children's thinking or asked questions that encouraged children to analyze and reason throughout the observation period. Visual representations of each of the Year 3 CLASS domain observed scores are provided in Figure 1.

Figure 1. Average classroom quality scores for Pre-K 4 SA Year 3



Note. *n*=89 classrooms

Looking further into the average Emotional Support domain scores, only 16.9% of classrooms (*n*=15) were observed in the middle range, while 83.1% of classrooms observed provided high levels of Emotional Support in the classroom (*n*=74). Approximately 44% of classrooms (43.8%; *n*=39) were observed providing middle range Classroom Organization quality, while the remaining 56.2% (*n*=50) were observed providing high levels of Classroom Organization. Finally, 33.7% of the classrooms (*n*=30) were observed providing low levels of Instructional Support, approximately 62% (61.8%; *n*=55) were observed providing moderate levels of Instructional Support, and 4.5% (*n*=4) were observed providing high levels of Instructional Support. Table 6 provides average scores by each of the 10 dimensions and three domains.

Table 6. Average Year 3 Pre-K 4 SA CLASS scores

CLASS outcome	*Average*	*Total range observed*	*Standard deviation (SD)*
Emotional Support Domain	6.44	5.21—7.00	0.51
Positive Climate	6.56	4.60—7.00	0.57
Negative Climate[a]	6.88	6.00—7.00	0.26
Teacher Sensitivity	6.22	3.80—7.00	0.79
Regard for Student Perspectives	6.11	3.75—7.00	0.79
Classroom Organization Domain	5.98	3.67—7.00	0.81
Behavior Management	6.08	3.20—7.00	0.89
Productivity	6.17	3.60—7.00	0.84
Instructional Learning Formats	5.69	2.60—7.00	1.06
Instructional Support Domain	3.67	1.33—6.40	1.23
Concept Development	3.56	1.40—6.60	1.28
Quality of Feedback	3.74	1.40—6.60	1.33
Language Modeling	3.71	1.20—6.40	1.18

SD=standard deviation

[a] Negative Climate is initially scored with lower values representing no or low negative climate. These scores are then reverse-coded to reflect the same direction (higher values are positive) as the other dimensions.

Past research using the CLASS has often noted the low scores that are commonly seen with respect to the Instructional Support domain (La Paro, Pianta, & Shuhlman, 2004; Locasale-Crouch et al., 2007; Mashburn et al., 2008). Additionally, the average grantee-level CLASS scores for Head Start grantees across the country in FY2015 revealed average scores of 6.03, 5.80, and 2.88 for Emotional Support, Classroom Organization, and Instructional Support respectively (Office of Head Start, 2015; see Figure 2). Previous research has found that children in classrooms with Emotional Support scores over 5 also have higher teacher ratings of social competence and lower ratings of behavior problems, while children from classrooms with Instructional Quality ratings of 3.25 or above score higher on measures of reading, mathematics, and expressive language (Burchinal, Vandergrift, Pianta, & Mashburn, 2010).[9]

[9] During the time the study data were collected, the CLASS was broken into two rather than three domains—Emotional Support and Instructional Quality. Direct comparisons of Burchinal et al. 2010 study findings to those presented in the current report should not be made as the dimensions within each domain are not consistent.

Figure 2. Pre-K 4 SA and Head Start average classroom quality scores

Note. This visual representation is for descriptive purposes only; no statistical tests have been conducted between Pre-K 4 SA and Head Start classrooms for this evaluation.
Source of Head Start averages (Office of Head Start, 2015).

Interaction quality by center

The three CLASS domains were analyzed to determine if there were significant differences in classroom teacher-child interactions across Pre-K 4 SA centers. At least one statistically significant comparison result was found for each domain (see Table 7). All significant findings were in favor of either the North and South centers in comparison to the East center. No significant differences between centers were found pertaining to the West center. (See Appendix C for additional information on mean differences across centers for the 10 dimensions within the three CLASS domains.)

Table 7. Average Year 3 CLASS Scores by center

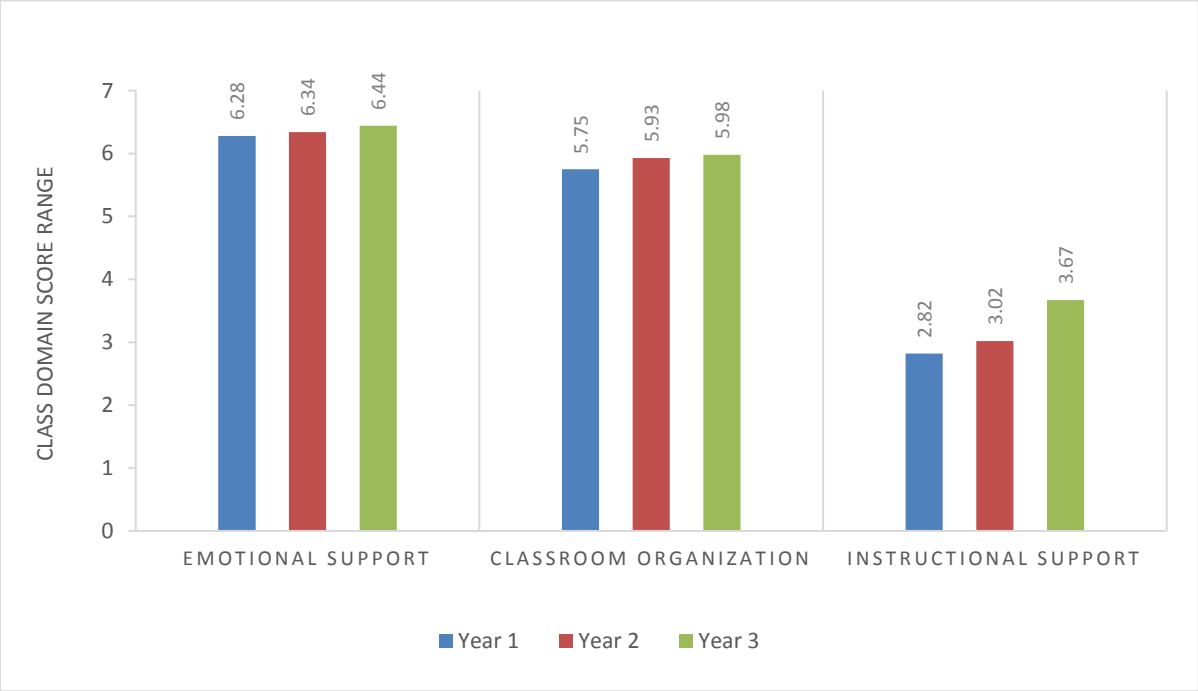
Class domain	*East center group mean*	*North center group mean*	*South center group mean*	*West center group mean*	*F statistic*	df	p-*value*	*Significant center differences*	*Effect size*
Emotional Support	6.17	6.53	6.70	6.33	5.08	85	0.003	East lower than South	1.18
Classroom Organization	5.52	6.07	6.41	5.87	4.98	85	0.003	East lower than South	1.22
Instructional Support	2.97	4.00	4.24	3.35	5.61	85	0.002	East lower than South East lower than North	1.24 0.85

Note. Effect sizes are Hedges' g.

Interaction quality over time

During the first 3 years of implementation, 100% of Pre-K 4 SA classrooms were observed. As seen in Figure 3, the overall Emotional Support and Classroom Organization scores have been relatively stable and increased slightly overtime (0.16 and 0.23, respectively). A greater increase has been seen in the Instructional Support domain (0.85), specifically between Years 2 and 3 90.65). It is important to note that Pre-K 4 SA staff focused on growth in Instructional Support during Year 3. When compared to Year 1, all Year 3 CLASS domain scores were significantly different. Emotional support was found to be significantly higher in Year 3 (z=2.57, p=.010 as well as Classroom Organization (z=2.12, p=.034) and Instructional Support (t=4.46, p<.001).[10] Figure 2 depicts the change in average interaction quality for the program over time.

Figure 3. Average CLASS domain scores by Program Year



[10] Instructional Support scores in Year 1 and Year 3 were normally distributed; therefore, an independent samples *t*-test was conducted. However, scores were not normally distributed in a least one year, for both Emotional Support and Classroom Organization. Therefore, the Wilcoxon Mann-Whiney test was conducted for each of these domains.

Implementation Study Results

Information on program implementation conveys whether the intended program components were in place and, in turn, whether results found in an evaluation can be attributed to the actual intended program. The Year 3 implementation study included data collected through the Pre-K 4 SA Instructional Staff Survey (PK-ISS) and the Pre-K 4 SA Classroom Observation Measure (P-COM).[11] Implementation fidelity expectations were taken from Pre-K 4 SA's Educational Philosophy and Framework documentation. The philosophy and framework includes expectations pertaining to program standards around curriculum, the learning environment, activity types and settings, use of technology and other key program components.

Pre-K 4 SA's documentation included five principles[12] pertaining to curricular decisions and serve as the base of the implementation study within the Pre-K 4 SA evaluation:

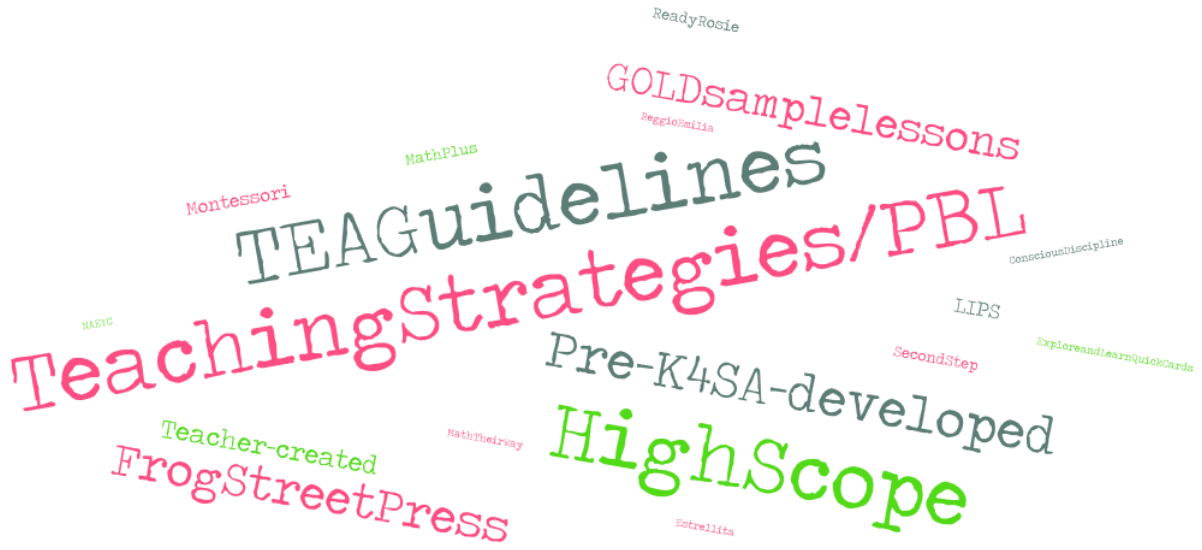
- **Integrated curriculum** with interrelated content areas of instruction
- Student engagement in **active learning**
- Incorporating learning opportunities through **varied group settings** daily
- Consideration of **children's different culture** and family experiences
- Purposeful instruction pertaining to **executive function** skills

Integrated Curriculum

The Pre-K 4 SA curriculum approach is based on an emergent and integrated approach. No one curriculum is mandated, and teachers should create activities based on supporting active learning and building on children's interests that align to the Texas Pre-Kindergarten Guidelines. To this end, teacher would be expected to use several curricula, which, in fact, was the case according to survey respondents. The most frequently mentioned curricula used was Teaching Strategies/ Project-Based Learning (82.1%; *n*=115). Figure 4 displays responses of reported curricula used by Pre-K 4 SA teachers by magnitude.

[11] All 89 classrooms received a classroom observation. The PK-ISS was completed voluntarily by 140 classroom teachers. More information about the sample of teachers who completed the survey is provided in Appendix A.
[12] During fidelity data collection planning for Year 3, the Pre-K 4 SA educational Philosophy and Framework document was in a draft stage. The five principles stated here may not be, as presented here, in the final version.

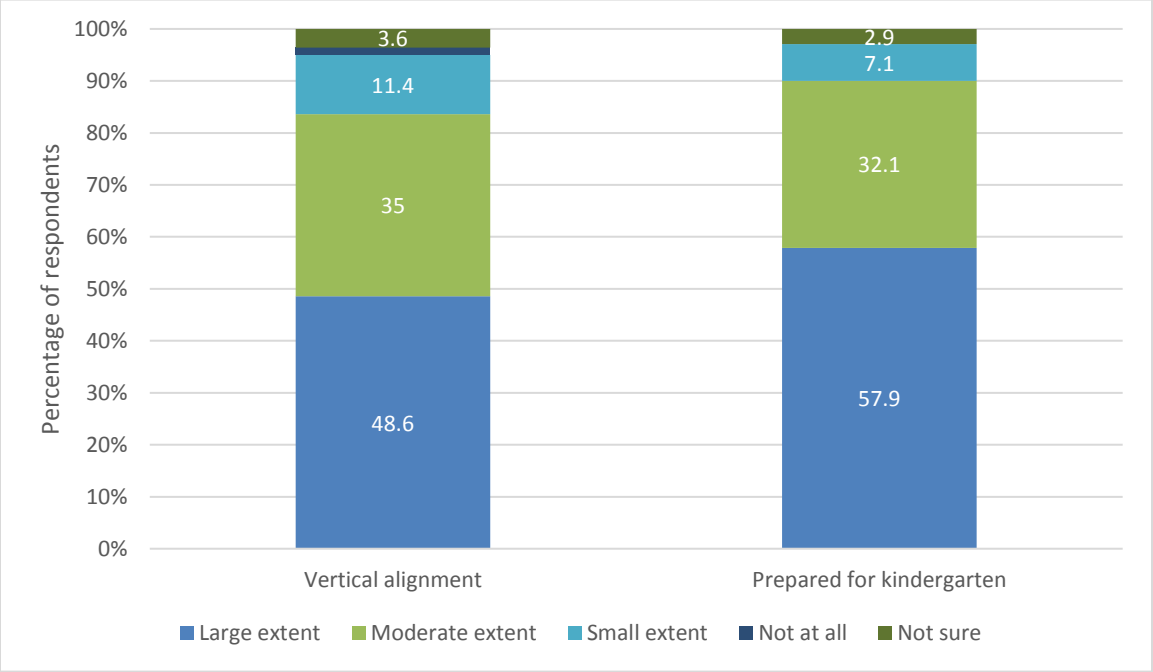
Figure 4. Word cloud of survey responses on curriculum use by magnitude frequency



Note. PBL stands for project-based learning. The exact amount of reported curricula use is provided in Appendix D, Table D-1.

With regard to alignment, teachers were asked whether they believed the curriculum in Pre-K 4 SA aligned vertically with kindergarten and later grades as well as whether Pre-K 4 SA prepared children for kindergarten. More than 80% (83.6%; *n*=117) of respondents believe the Pre-K 4 SA curriculum is vertically aligned to a moderate or large extent. More specifically, nearly half of all respondents (48.6%; *n*=68) indicated they believed Pre-K 4 SA was vertically aligned with kindergarten and beyond to a *large extent*. An additional 35% (*n*=39) indicated they believed Pre-K 4 SA was vertically aligned to a *moderate extent*. Additionally, 90% of respondents believed Pre-K 4 SA prepares children for kindergarten to a moderate or large extent. Specifically, 57.9% (*n*=81) of respondents indicated they believed children were prepared to a *large extent* for kindergarten while an additional 32% (32.1%; *n*=45) indicated they believed children were prepared to a *moderate extent* (see Figure 5).

Figure 5. Percentage of respondents indicating beliefs of vertical alignment and kindergarten preparation



Active Learning

Intentions of active learning indicate children have opportunities for creation and critical thinking through hands-on activities, a key opportunity of which occurs during play. In fact, 97.8% of survey respondents (*n*=137) reported implementing interest area time for children in classrooms at least every day with 47.1% (*n*=66) reporting offering this time more than once per day. To facilitate active learning, it is also important that teachers plan activities that are of interest and engaging to children. Eighty-three percent of survey respondents (83.4%; *n*=116) indicated planning around student interests at least daily. Related to the Active Learning intention, teachers were asked to report on the frequency with which they provided active learning opportunities to children in their classroom. As can be seen in Table 8 more than 80% of survey respondents (in many cases more than 90%) indicated providing an active learning environment and active learning opportunities every day. For example, nearly 100% of respondents indicated they provided children the opportunity to make choices at least daily.

Table 8. Frequency of provided active learning opportunities

Provided opportunity for children to…	*2-3 times per month or less*	*Once a week – less than daily*	*Daily or more*	*Don't know/NA*
Make choices	0 (0.0%)	3 (2.2%)	135 (97.2%)	1 (0.7%)
Lead the group	6 (4.3%)	10 (7.2%)	121 (87.1%)	2 (1.4%)
Plan for interest area time in a small group setting	1 (0.7%)	3 (2.2%)	134 (95.7%)	2 (1.4%)
Engage in…	*2-3 times per month or less*	*Once a week – less than daily*	*Daily or more*	*Don't know or NA*
Conversation to extend and elaborate child's plan	2 (1.4%)	8 (5.7%)	129 (92.1%)	1 (0.7%)
Organic opportunities to participate, support, and extend children's engagement	4 (2.8%)	6 (4.3%)	127 (90.7%)	3 (2.2%)
Conversation with children to extend and elaborate child's recall of interest area time	4 (2.8%)	15 (10.7%)	118 (84.3%)	3 (2.2%)

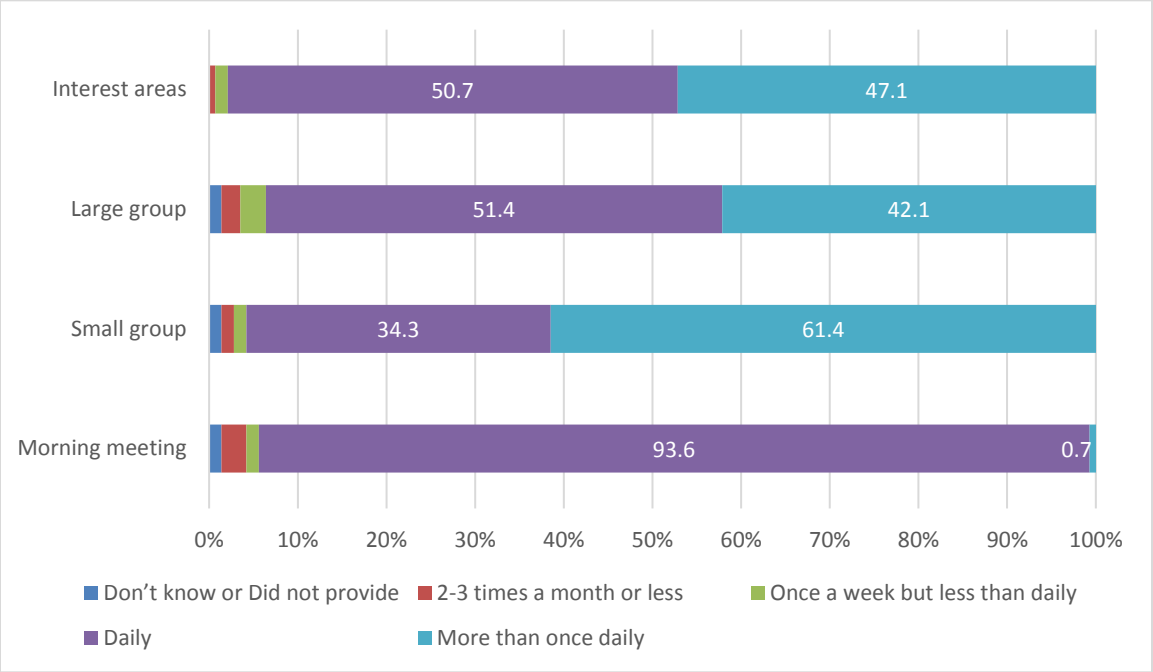
Active learning opportunities are also achieved through maximizing learning time through routines such as clean up, transition, and meal times. P-COM results indicated that of the 85 observations (98.8%) that included such routines, 55.8% (*n*=48) *always* embedded such learning opportunities within routine time, and an additional 37.2% (*n*=32) included such opportunities *some of the time*.

Finally, items on the P-COM also included information as to whether the classroom was conducive to active learning in the set-up of the room, whether areas were clearly labeled for children to engage, and whether materials for such engagement were readily available for children. Nearly 90% of classrooms (88.6%; *n*=78) had all areas clearly labeled, while an additional five classrooms' areas were sometimes clearly labeled for children. All 89 classrooms provided a variety of accessible materials for active engagement in learning.

Varied Group Settings

Teachers were asked to indicate how often they incorporated various components into their classrooms. With regard to structure, teachers reported using multiple types of learning settings multiple times a day. Figure 6 depicts how often different learning settings are used in classrooms.

Figure 6. Frequency of teacher reported use of learning settings



Pre-K 4 SA has also stated intentions for technology in the learning environment with a Hatch or Smart board as well as iPads available in every classroom. As collected through the P-COM during classroom observations, all 89 classrooms were observed to include a Hatch or Smart board, and iPads were clearly visible in 93% (*n*=81).

Appreciation of Varied Cultures

During observations, observers collected information regarding evidence of children's varied cultures and family experiences within the classroom. An example of such evidence would be pictures around the classroom of children and their families participating in various cultural holidays. Across all 89 observations, such evidence was observed in 93.3% of classrooms (*n*=83).

Executive Function

Part of providing children the opportunity to develop executive function skills is to provide opportunities for children to participate in planning and recall activities. Overlapping with teacher survey items discussed in the active learning section of the implementation study above, the majority of respondents reported providing such planning opportunities for children daily (see Table 8). In addition to those planning items, survey respondents were also asked about the frequency with which they provided recall opportunities to children. As shown in Table 9, nearly 85% of respondents reported providing such opportunities daily or multiple times per day.

Table 9. Frequency of provided recall opportunities and support

Provided opportunity for children to…	*2-3 times per month or less*	*Once a week – less than daily*	*Daily or more*	*Don't know/NA*
Engage in recall of interest area time	6 (4.3%)	12 (8.6%)	118 (84.9%)	3 (2.1%)
Engage in conversation with children to extend and elaborate the child's recall of interest area time	4 (2.8%)	15 (10.7%)	118 (84.3%)	3 (2.1%)

Teacher Preparedness, Support, Satisfaction and Challenges

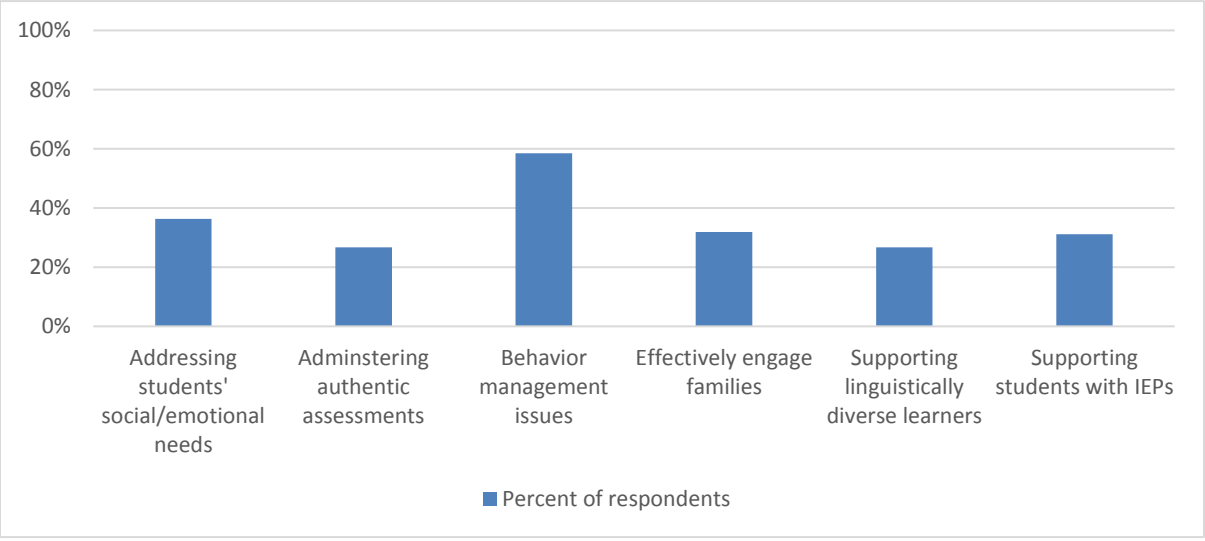
Effective and appropriate implementation of the Pre-K 4 SA program rests on whether teachers feel prepared and supported in their delivery of the program. It is also useful to understand whether teachers are satisfied with the support and materials they are provided as well as whether they are experiencing challenges in implementation.

Teacher preparedness and support

Survey respondents were asked how prepared they were to administer the primary outcome, the GOLD assessment. The majority of respondents (52.9%; *n*=74) indicated they were either very well or well prepared, while an additional 24.3% (*n*=34) indicated they were fairly well prepared to administer the GOLD.

Survey respondents were also asked what additional supports they would like to receive across a variety of areas. The most commonly selected areas for additional support needs was in *dealing with behavior management issues,* which was selected by more than half (58.5%; *n*=79) of the respondents. Several other areas were mentioned as areas of need and are presented in Figure 7.

Figure 7. Percentage of respondents requesting support types



Teacher satisfaction

Eighty-eight percent (*n*=123) of survey respondents indicated they were *satisfied* or *very satisfied* with their job at Pre-K 4 SA, and 98% (*n*=137) plan to return for the 2016–17 school year.

Additionally, survey respondents were asked whether they had the resources they needed to support students in several learning categories. Across all areas of inquiry, respondents indicated affirmatively (see Table 10).

Table 10. Resource need survey responses

Learning area (Promoting or addressing…)	*No*	*Yes*	*Not Applicable*
Positive approaches to learning among students (creativity, imagination, persistence)	4 (2.9%)	132 (96.4%)	1 (0.7%)
Students' needs in the area of physical development and health	9 (6.5%)	128 (92.8%)	1 (0.7%)
Students' needs in the area of social and emotional development	4 (2.9%)	133 (96.4%)	1 (0.7%)
Students' needs in the area of communication, language, and literacy	7 (5.1%)	129 (93.5%)	2 (1.4%)
Students' needs in the area of cognition and knowledge of the world (STEM, arts, technology)	7 (5.1%)	130 (94.2%)	1 (0.7%)
Needs of linguistically diverse learners (students with a home language other than English)	15 (10.9%)	93 (67.4%)	30 (21.7%)
Needs of students with individualized education plans (IEPs)	17 (12.4%)	79 (57.7%)	41 (29.9%)

Note. The last two learning categories (linguistically diverse learners and students with IEPs appear to have affirmative responses that are drastically lower than other areas because these areas were not applicable to 30 and 41 respondents, respectively. When considering responses from those for whom the learning category was relevant, the percentage of respondents who felt they had the resources they needed to server these children increased to 86% and 82%, respectively.

Teacher challenges

Survey respondents were asked whether they experienced challenges conducting a range of activities with students, families, and administration. Of the activities asked, respondents reported having the least challenge with communicating with families; reporting only a slight challenge on average (1.63 on a scale of 1 to 5). Dealing with behavioral management issues was reported as moderately challenging on average (3.04). No activities were rated, on average, as greater than moderately challenging by respondents. Figure 11 contains the results for all activities.

Table 11. Average challenge in order of greatest to least challenge

Activity	*Sample size*	*Average*	*Standard deviation (SD)*
Dealing with behavioral management issues	140	3.04	1.27
Working with families to address academic or behavioral issues you identify in the family's child	133	2.41	1.25
Administering authentic assessment to measure student progress	131	2.31	1.10
Providing supports to address students' social-emotional needs	140	2.27	1.23
Encouraging families to conduct extended learning activities at home	132	2.23	1.18
Having families attend program events, including parent teacher conferences	130	2.21	1.14
Providing supports for students with IEPs	85	2.20	1.17
Receiving meaningful feedback on your teaching from program administrators	136	2.13	1.30
Using data to engage families	125	2.12	1.06
Incorporating extended learning activities into your planning	131	2.08	1.09
Using data to make instructional decisions	128	1.98	1.02
Providing supports for linguistically diverse learners	83	1.94	1.04
Communicating specifically with families of linguistically diverse learners	90	1.91	1.15
Communicating with families	139	1.63	1.03

SD=standard deviation

Respondents were also given the opportunity to add other areas in which they experienced challenges that had not been directly asked. Sixty-four respondents (45.7%) provided more information.[13] Of the 64 responses, 18 mentioned issues with staff members regarding attitudes or communication. The next most mentioned issues were behavioral issues and lack of time/materials, which were each mentioned by 11 respondents. Figure 8 displays responses of reported challenges by magnitude.

[13] A response to this item was actually captured for 112 respondents; however, 48 of those responses indicated there were no other challenges.

Figure 8. Word cloud of survey responses on additional challenges by magnitude frequency

Note. The exact amount of reported challenge areas is provided in Appendix D, Table D-2.

Outcome Study Results

Kindergarten Readiness

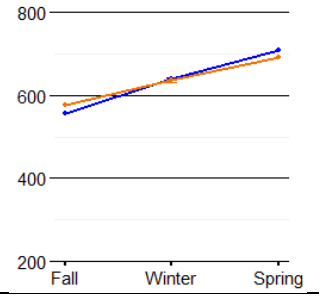
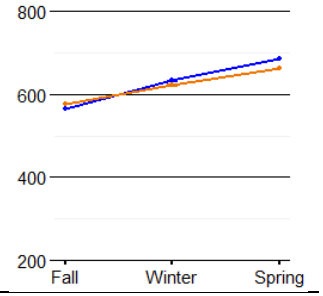
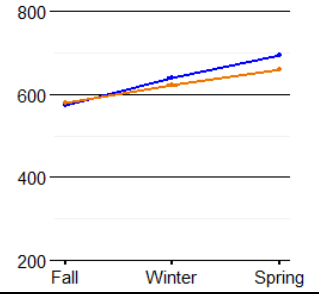
Pre-K 4 SA used the GOLD assessment to collect information on children at three time points throughout the academic year: fall, winter, and spring. Children (89.96%; n=1,604) were included in analyses if they had outcome data for all three time points in at least one of the following six outcomes: cognitive, language, literacy, mathematics, physical, and social-emotional. No significant differences were found between children included and not included in analyses for gender ($X^2(1)$ =0.907, p=.341), free lunch status ($X^2(1)$=1.695, p=.193), or tuition status ($X^2(1)$=0.925, p=.336); however, differences were found for race (p=.031). Children who were included in at least one outcome analysis were less likely to be two or more races compared to any other racial category (Z=-3.26, p=.001).

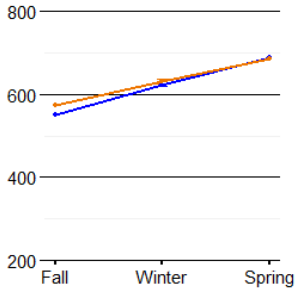
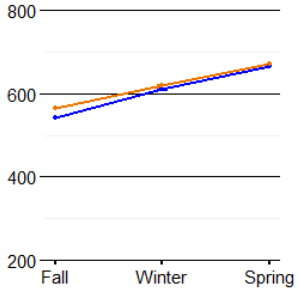
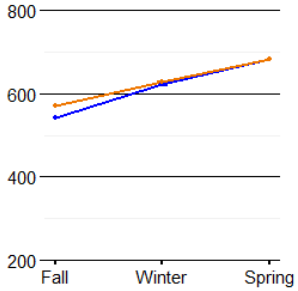
As data were not collected on a comparison or control group, comparisons were conducted using the nationally representative normed data for the GOLD assessment (Lambert, Kim, & Burts, 2013). When starting Pre-K 4 SA, children began the fall significantly below the normed sample on all six GOLD outcomes. By spring, this gap was overcome in three outcome domains, meaning the Pre-K 4 SA children scored statistically significantly (p<.001) higher than the normed sample on three outcomes (cognitive, literacy, and mathematics). In fact, the gap was completely closed by the winter time point in each of these three outcomes, with Pre-K 4 SA children already significantly exceeding the normed group in literacy and mathematics by the winter time point. Effect sizes (Hedges' g) for the significant results ranged from small (0.30 for cognitive) to medium (0.44 literacy and 0.65 for mathematics). Over the course of the pre-K

year, Pre-K 4 SA children gained an additional 37.48 scale score points (32.6% more) in cognitive, 33.97 points in literacy, and 39.71 points in mathematics than the normative group of children.

Spring results for the oral language and social-emotional outcomes indicated the initial gap between Pre-K 4 SA children and the normed sample was eliminated; by spring, no significant difference was found between Pre-K 4 SA children and the normed sample for oral language or social-emotional. Although a gap still remained for the physical outcome, it was reduced by 74% at spring (a reduction from an initial gap of more than 23 scale score points to approximately 6 scale score points). See Table 12.

Table 12. Pre-K 4 SA and Normed Sample comparison results for six GOLD outcomes across time

Outcome	*Time point*	*Pre-K 4 SA mean*	*Normed mean*	*Gap (Pre-K – Normed)*	t-*test statistic*	df	*Initial* p-*value*	*Adjusted significance*	*Group favored*[a]	*Graphic depiction of finding* (Blue line=Pre-K 4 SA; Orange line=normed sample)
Cognitive	Fall	556.14	575.72	-19.58	-7.763	1422.32	0.000	Significant	Normed	
	Winter	639.13	636.00	3.13	1.296	1376.21	0.195	Non-Significant	No difference	
	Spring	708.61	690.71	17.90	6.778	1474.90	0.000	Significant	Pre-K	
Literacy	Fall	564.60	576.00	-11.40	-5.712	1457.94	0.000	Significant	Normed	
	Winter	632.11	623.10	9.01	4.507	1623.82	0.000	Significant	Pre-K	
	Spring	684.22	661.65	22.57	9.914	1624.97	0.000	Significant	Pre-K	
Mathematics	Fall	572.90	578.93	-6.03	-3.094	1513.04	0.002	Significant	Normed	
	Winter	640.60	622.33	18.27	9.642	1680.92	0.000	Significant	Pre-K	
	Spring	693.59	659.91	33.68	15.405	1748.30	0.000	Significant	Pre-K	

Outcome	*Time point*	*Pre-K 4 SA mean*	*Normed mean*	*Gap (Pre-K – Normed)*	*t-test statistic*	df	*Initial* p-*value*	*Adjusted significance*	*Group favored*[a]	*Graphic depiction of finding* (Blue line=Pre-K 4 SA; Orange line=normed sample)
Oral Language	Fall	550.02	574.43	-24.41	-8.999	1347.51	0.000	Significant	Normed	
	Winter	622.91	630.80	-7.89	-2.838	1342.24	0.005	Significant	Normed	
	Spring	687.61	686.17	1.44	0.479	1428.60	0.632	Non-Significant	No difference	
Physical	Fall	541.75	564.82	-23.07	-9.489	1331.44	0.000	Significant	Normed	
	Winter	609.39	618.47	-9.08	-4.171	1283.55	0.000	Significant	Normed	
	Spring	665.21	671.27	-6.06	-2.375	1336.37	0.018	Significant	Normed	
Social-Emotional	Fall	543.05	570.67	-27.62	-10.469	1541.85	0.000	Significant	Normed	
	Winter	621.12	628.05	-6.93	-2.881	1433.07	0.004	Significant	Normed	
	Spring	682.56	682.47	0.09	0.031	1378.96	0.975	Non-Significant	No difference	

df=degrees of freedom

Note: Group mean information is presented in scaled scores. The Adjusted Significance column indicates significance levels (*p*-values) after adjustment to correct for multiple hypothesis testing using the Benjamini-Hochberg technique (1995).

[a] If a statically significant difference was found, the group whose score was greater (the 'favored' group) is listed in this column. If there was no statistically significant difference, this column states that there was 'no difference.'

Differences in Readiness Outcomes

Analyses were also conducted within the Pre-K 4 SA sample to explore potential differences related to GOLD outcomes for children. These analyses were conducted between centers and to explore the variance in GOLD outcomes accounted for by the amount of Pre-K 4 SA family engagement.

Pre-K 4 SA center

Analyses were conducted to determine if there were differences in GOLD growth from fall to spring across centers. A multilevel modeling approach was used as individual child observations were clustered within classrooms and centers (Raudenbush & Bryk, 2002). A three-level model was used, with children at level 1, classrooms at level 2, and centers at level 3. Results showed there was significant variation in growth across centers for all GOLD outcomes except physical; meaning the average growth was not the same for children in all four centers (see Table 13). The average gains by center and overall are provided in Table 14. As seen in Table 14, the greatest gains, on average, across all six outcomes were observed for children in the North center. (The results of the full unconditional model with random intercepts for all six GOLD outcomes are presented in Appendix E, Table E-1.)

Table 13. Center analysis results of teaching strategies GOLD outcomes

Outcome	*Variance component*	X^2	*df*	*p-value*
Cognitive	200.00	11.12	3	0.011
Literacy	77.53	9.54	3	0.022
Mathematics	108.51	10.81	3	0.013
Oral Language	219.56	14.00	3	0.003
Physical	34.40	5.03	3	0.168
Social-Emotional	230.38	11.19	3	0.011

df=degrees of freedom

Table 14. Average gain scores of teaching strategies GOLD by center

Outcome	East		North		South		West		Overall	
	Average (SD)	Sample size	Average (SD)	Sample size	Average (SD)	Sample size	Average (SD)	Sample size	Average (SD)	Sample size
Cognitive	144.20 (58.58)	371	179.82 (65.02)	450	148.96 (66.75)	400	131.84 (48.86)	382	152.44 (63.13)	1603
Literacy	106.70 (45.35)	353	138.10 (46.00)	413	119.15 (39.00)	350	111.49 (35.61)	349	119.67 (43.66)	1465
Mathematics	111.85 (45.91)	366	140.87 (47.88)	430	122.45 (48.67)	385	103.90 (40.3)	363	120.71 (48.02)	1544
Oral Language	127.96 (54.65)	369	163.15 (60.13)	453	137.10 (57.99)	369	115.64 (49.12)	365	137.48 (58.68)	1556
Physical	109.31 (61.52)	371	142.65 (51.23)	454	122.49 (63.01)	382	115.65 (52.74)	382	123.53 (58.46)	1589
Social-Emotional	126.58 (61.33)	371	167.05 (64.33)	454	142.64 (66.11)	400	116.13 (55.47)	383	139.51 (65.08)	1608

SD=standard deviation

Amount of family engagement

Total sum scores were calculated from the family engagement data, weighted by level of engagement (for more information concerning the various levels of family engagement, refer to the family engagement section beginning on page 7 of this report). Across all six GOLD outcomes, results for the amount of family engagement were nonsignificant after taking into account child demographic information. This indicates that the amount of family engagement over the course of the pre-K year was not related to child outcomes on the GOLD assessment, after taking into account demographic characteristics of the children, including children's initial GOLD scores in the fall.

LIMITATIONS AND RECOMMENDATIONS

Three important limitations of the Year 3 evaluation require mention. First, the current evaluation ultimately rests on a primary outcome that is a teacher report rather than a direct child measure conducted by unbiased data collectors. Because a teacher-report measure is the primary outcome of interest, variance in the results related to teacher bias or other teacher factors cannot be excluded. A recommendation related to this limitation is the consideration of adding at least one brief, developmentally appropriate, directly assessed outcome measure to be conducted.

Second, due to resource constraints, Edvance was not able to collect information on a control or comparison group of children with which to compare the Pre-K 4 SA children with respect to kindergarten readiness outcomes. This is important because the normed sample that was used for comparison purposes is most likely very different from the Pre-K 4 SA children. When a comparison or control group can be formed with children who are most like the Pre-K 4 SA children, more confidence can be had with respect to resulting differences on outcomes, meaning there can be more confidence that differences are the result of the program in question and not a result of other factors.[14] This is particularly true when using a control group formed from random assignment into the program. A recommendation related to this limitation is the consideration of additional funding to form a control group of children based from the lottery selection process for admittance to Pre-K 4 SA, Data can be collected from this group and compared between children who attend Pre-K 4 SA and children who do not.

Third, classroom observation data continue to be based on one observation of each classroom during the spring. As such, no inferences can be made about changes in classroom quality over time. Although this was primarily due to resource and time constraints, it is recommended that consideration be given to conducting multiple observations across a year (in a random selection of classrooms) to begin to understand potential changes or consistencies in classroom interactional quality.

[14] One way to form such a group of children, similar in nature to Pre-K 4 SA children, would be to work with Teaching Strategies to create a matched comparison group from the normed sample of children in the future.

REFERENCES

Barnett, W. S. (2011). Four reasons the United States should offer every child a preschool education. In E. Zigler, W. Gilliam, & W. S. Barnett (Eds.), *The pre-K debates: Current controversies and issues* (pp. 34–39). Baltimore: Brookes Publishing.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society Series B Methodological*, *57*(1), 289–300.

Burchinal, M., Vandergrift, N., Pianta, R., & Mashburn, A. (2010). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly*, *25*(2), 166–176.

Campbell, F. A., Ramey, C. T., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science*, *6*, 42–57.

Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P. A., & Yavitz, A. (2010). The rate of return to the HighScope Perry Preschool Program. *Journal of Public Economics*, *94*, 114–128.

La Paro, K. M., Pianta, R. C., & Shuhlman, M. (2004). Classroom Assessment Scoring System (CLASS): Findings from the pre-k year. *Elementary School Journal*, *104*(5), 409–426.

Lambert, R., Kim, D., & Burts, D. (2013). *Technical manual for the teaching strategies GOLD assessment system* (CEMETR-2013-05). University of North Carolina Charlotte, Center for Educational Measurement and Evaluation. Retrieved from https://education.uncc.edu/ceme/ceme-technical-reports

Locasale-Crouch, J., Konold, T., Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2007). Observed classroom quality profiles in state-funded pre-kindergarten programs and associations with teacher, program, and classroom characteristics. *Early Childhood Research Quarterly*, *22*(1), 3–17.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., Burchinal, M., Early, D. M., & Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, *79*(3), 732–749.

National League of Cities. (2012). *Educational alignment for young children.* Washington, DC: Institute for Youth, Education and Families. Available from http://www.nlc.org/documents/Find%20City%20Solutions/IYEF/Early%20Childhood/educational-alignment-for-young-chldren-case-studies-april-2012.pdf

Office of Head Start. (2015). *Use of Classroom Assessment Scoring System (CLASS) in Head Start*. Retrieved from http://eclkc.ohs.acf.hhs.gov/hslc/sr/quality/class/docs/use-of-class.pdf

Pianta, R., La Paro, K., & Hamre, B. (2008). *Classroom assessment scoring system*. Baltimore, MD: Brooks Publishing Company.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Newbury Park, CA: Sage.

Reynolds, A. J., Temple, J. A., White, B., Ou, S., & Robertson, D. L. (2011). Age-26 cost benefit analysis of the Child-Parent Center Early Education Program. *Child Development, 82*, 379–404.

Rolnick, A., & Grunewald, R. (2003). Early childhood development: Economic development with a high public return. *The Region, 17*(4), 6–12.

Van Voorhis, F., Maier, M., Epstein, J., Lloyd, C. & Leung, T. (2013). *The impact of family involvement on the education of children ages 3 to 8. Focus on literacy and math achievement outcomes and social-emotional skills*. New York: MDRC.

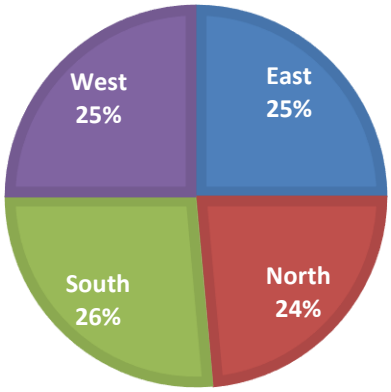
West, B. T., Welch, K. B., & Galecki, A. T. (2007). *Linear mixed models: A practical guide using statistical software*. Boca Raton, FL: CRC Press.

APPENDIX A. PK-ISS SAMPLE DESCRIPTION

More than 180 teachers (*n*=182) began, and 140 (77%) completed, the Pre-K 4 SA Instructional Staff Survey (PK-ISS). Of those 140 who completed the survey,58.6% (*n*=82) identified as a lead teacher and 37.9% (*n*=53) as a teacher assistant.[15] Responding teachers reported an average of 7 years of teaching experience within a pre-K classroom (ranging from 1–28 years) and nearly 12 years, on average, of teaching experience regardless of grade level (ranging from 1–39 years with children younger than 3 through high school grades).

More than 60% of all respondents (63.6%; *n*=89) held a Texas Early Childhood certification with an additional 22.1% (*n*=31) indicating they were currently pursuing the certification. When considering only respondents who identified as lead teachers, the certificated rate increases to 96.3% (*n*=79). Respondents represented all four Pre-K 4 SA centers (see Figure A-1).

Figure A-1. Percentage of survey respondents by center



Nearly a quarter (24.3%) of responding teachers were in their first year of teaching with Pre-K 4 SA with prior experiences including public and private teaching positions as well as childcare positions, students, and early childhood specialists.

[15] Five responses were also received from individuals who identified as Co-Master Teachers (*n*=4) or Flex Extended (*n*=1), respectively.

APPENDIX B. EVALUATION METHODS

This appendix provides more information on measures used in the Year 3 evaluation, as well as more detail on the analytic approach to analyses reported.

Measures

Classroom Assessment Scoring System (CLASS)

The CLASS (Pianta, LaParo & Hamre, 2008) is an observational system that assesses classroom practices in preschool by measuring the interactions between students and adults. Observations in the Year 2 evaluation consisted of five, 20-minute cycles, followed by 10-minute coding periods. Scores were assigned during various classroom activities, and then averaged across all cycles for an overall quality score.

Interactions were measured through 10 different dimensions (see Table B-1 for descriptions of each CLASS dimension) that are divided into three larger domains. The *Emotional Support* domain is measured through the use of four dimensions: Positive Climate, Negative Climate, Teacher Sensitivity, and Regard for Student Perspectives. The CLASS also measures *Classroom Organization* through three dimensions: Productivity, Behavior Management, and Instructional Learning Formats and *Instructional Support* through three dimensions: Concept Development, Quality of Feedback, and Language Modeling.

The CLASS uses a 7-point Likert-type scale, for which a score of 1 or 2 indicates low-range quality and a score of 6 or 7 indicates high-range quality. Each dimension and domain is assigned a score during each 20-minute cycle (or, observation period). The number of children and adults in the classroom was also recorded during each 20-minute cycle.

Table B–1. Descriptions of CLASS dimensions

Domain	*Dimension*	*Description*
Emotional Support	Positive Climate	Reflects the emotional connection between teachers and children and among children, and the warmth, respect, and enjoyment communicated by verbal and nonverbal interactions.
	Negative Climate	Reflects the overall level of expressed negativity in the classroom. The frequency, quality, and intensity of teacher and peer negativity are key to this dimension
	Teacher Sensitivity	Encompasses the teacher's awareness of and responsiveness to students' academic and emotional needs.
	Regard for Student Perspectives	Captures the degree to which the teacher's interactions with students and classroom activities emphasize students' interests, motivations, and points of view and encourage student responsibility and autonomy.
Classroom Organization	Behavior Management	Encompasses the teacher's ability to provide clear behavior expectations and use effective methods to prevent and redirect misbehavior.
	Productivity	Considers how well the teacher manages instructional time and routines and provides activities for students so that they have the opportunity to be involved in learning activities.
	Instructional Learning Formats	Focuses on the ways in which teachers maximize students' interest, engagement, and abilities to learn from lessons and activities.
Instructional Support	Concept Development	Measures the teacher's use of instructional discussions and activities to promote students' higher-order thinking skills and cognition and the teacher's focus on understanding rather than on rote instruction.
	Quality of Feedback	Assesses the degree to which the teacher provides feedback that expands learning and understanding and encourages continued participation.
	Language Modeling	Captures the effectiveness and amount of teacher's use of language-stimulation and language-facilitation techniques.

Pre-K 4 SA Instructional Staff Survey (PK-ISS)

The PK-ISS is a self-report survey for instructional staff regarding their classroom practices, knowledge and abilities, perceived challenges and needs for support, and satisfaction. Teachers are asked to reflect on several aspects of the curriculum and classroom practices, including instructional components, curriculum, and family engagement. The survey averages between 25 and 30 minutes to complete (26 minute average time within the Year 3 sample).

Pre-K 4 SA Classroom Observation Measure (P-COM)

The P-COM is an observation checklist that was developed and piloted for use in Year 2 and revised for use in Year 3. The P-COM is based on the Pre-K 4 SA logic model (completed in Year 1 of the program) and the Pre-K 4 SA Educational Philosophy and Framework. The measure captures, primarily, structural components of fidelity to the Pre-K 4 SA model such as expected teacher practices and beliefs about curriculum, etc. The measure consists of 34 items in five categories: activity settings, learning environment, routines, technology, and conflict resolution strategies. One checklist is conducted throughout the classroom observation over the course of a morning.

Teaching Strategies Gold (GOLD)

The GOLD is a teacher-report measure selected and used by Pre-K 4 SA that collects information on children's progress in 36 objectives across six main categories: cognitive, literacy, oral language, mathematics, physical, and social emotional. (Other categories are available to be tailored to specific programs.) The GOLD assessment is conducted at three time points throughout the year: fall, winter, and spring.

Analytic Approach

Descriptive research questions were addressed through analysis of existing Pre-K 4 SA databases and the CLASS. To address the first two descriptive questions pertaining to attendance and family engagement, data collected by Pre-K 4 SA were submitted to Edvance and descriptively analyzed. Weights were also assigned to various types of family engagement. To address the final descriptive questions, *What was the overall observed teacher-child interaction quality in Pre-K 4 SA classrooms in Year 3?* and *Did the Year 3 interaction quality vary by Center?*, data were analyzed from the CLASS both descriptively and inferentially using analysis of variance (ANOVA) with Hedges' *g* calculations of effect sizes for significant pairwise comparisons. To assess whether *improvement had been observed in interaction quality since the inception of the program (Year 1)?* Both *t*-tests and the Wilcoxon Mann-Whiney test were conducted by domain. A *t*-test was conducted in regard to Instructional Support, as scores were normally distributed; however, the Wilcoxon Mann-Whiney test was conducted for both Emotional Support and Classroom Organization, as scores were not normally distributed within these two domains.

The implementation study question *Was the Pre-K 4 SA program implemented with fidelity to program standards?* was addressed through descriptive analysis of survey (PK-ISS) and observation (P-COM) data in comparison to the Pre-K 4 SA Educational Philosophy and Framework.

The primary outcome research question was addressed through independent samples *t*-tests between the Pre-K 4 SA children and a nationally representative normed sample of children on the GOLD assessment outcomes. In addition, inferential tests were conducted to investigate potential differences in GOLD results by center and whether differences in family engagement participation (amount/weight of types of engagement) were related to higher GOLD outcomes

for students. More specifically, ANOVA was used to investigate center differences, and six two-level multi-level models were used to investigate relationships between family engagement and GOLD outcomes. A multilevel modeling approach was used as individual child observations were clustered within classrooms and centers (Raudenbush & Bryk, 2002). A three-level model was used with children at level 1, classrooms at level 2, and centers at level 3.

The full model for GOLD growth is denoted as:

$$GOLD_{ijk} = \gamma_{000} + r_{0jk} + u_{00k} + e_{ijk}$$

where $GOLD_{ijk}$ is the individual growth for child *i* in classroom *j* in center *k*, γ_{000} is the overall grand mean growth score, r_{0jk} is the deviation of teacher *j* in center *k*, and u_{00k} is the deviation of center *k*, and e_{ijk} is the deviation of child *i* in classroom *j* in center *k*. No covariates were added to the model for two reasons. There was a small sample size of four centers at level 3 and because the available child covariates were dichotomous. The combination of these reasons would likely result in the model failing to converge (West, Welch, & Galecki, 2007).

APPENDIX C: YEAR 3 CLASS RESULTS BY CENTER

Table C-1. Average Year 3 CLASS scores by center

	East		North		South		West	
CLASS outcome	*M (SD)*	*Total range observed*	*M (SD)*	*Total range observed*	*M (SD)*	*Total range observed*	*M (SD)*	*Total range observed*
Emotional Support Domain	6.17 (0.55)	(5.25—6.89)	6.53 (0.49)	(5.45—7.00)	6.70 (0.33)	(6.00—7.00)	6.33 (0.50)	(5.21—7.00)
Positive Climate	6.41 (0.52)	(5.40—7.00)	6.63 (0.61)	(5.00—7.00)	6.73 (0.39)	(6.00—7.00)	6.43 (0.68)	(4.60—7.00)
Negative Climate[a]	6.76 (0.34)	(6.00—7.00)	6.97 (0.10)	(6.60—7.00)	6.93 (0.19)	(6.20—7.00)	6.85 (0.31)	(6.00—7.00)
Teacher Sensitivity	5.95 (0.72)	(4.40—7.00)	6.23 (0.83)	(4.20—7.00)	6.60 (0.47)	(5.40—7.00)	6.06 (0.93)	(3.80—7.00)
Regard for Student Perspectives	5.57 (0.96)	(3.75—6.80)	6.29 (0.71)	(4.40—7.00)	6.55 (0.48)	(5.60—7.00)	5.97 (0.64)	(4.60—7.00)
Classroom Organization Domain	5.52 (0.90)	(3.67—6.93)	6.07 (0.80)	(4.33—7.00)	6.41 (0.53)	(5.40—7.00)	5.87 (0.77)	(4.07—7.00)
Behavior Management	5.64 (0.97)	(3.20—7.00)	6.19 (0.89)	(4.00—7.00)	6.54 (0.51)	(5.40—7.00)	5.89 (0.91)	(4.00—7.00)
Productivity	5.62 (0.95)	(3.60—7.00)	6.35 (0.79)	(4.60—7.00)	6.51 (0.60)	(5.20—7.00)	6.14 (0.80)	(4.60—7.00)
Instructional Learning Formats	5.31 (1.06)	(2.60—7.00)	5.65 (1.04)	(3.20—7.00)	6.17 (0.62)	(4.40—7.00)	5.59 (0.89)	(3.40—7.00)
Instructional Support Domain	2.97 (1.06)	(1.33—5.33)	4.00 (1.35)	(1.67—6.40)	4.24 (1.00)	(2.07—6.00)	3.35 (1.10)	(1.67—5.93)
Concept Development	2.82 (1.08)	(1.40—5.60)	3.90 (1.39)	(1.40—6.60)	4.12 (1.06)	(1.80—5.60)	3.28 (1.19)	(1.60—5.60)
Quality of Feedback	3.02 (1.23)	(1.40—5.40)	4.08 (1.43)	(1.80—6.60)	4.36 (1.07)	(2.20—6.40)	3.38 (1.17)	(1.80—6.20)
Language Modeling	3.07 (1.02)	(1.20—5.00)	4.03 (1.30)	(1.60—6.40)	4.25 (0.99)	(2.20—6.00)	3.38 (1.02)	(1.60—6.00)

M=mean
SD=standard deviation

APPENDIX D: IMPLEMENTATION STUDY WORD CLOUD DETAIL

Two word clouds were used to present survey information as part of the implementation study. Table D-1 provides more detail for the word cloud displayed in Figure 4 and Table D-2 provides more detail for the word cloud displayed in Figure 8.

Table 15. Teacher-reported curricula use by number of reports

Curriculum	*Number of reports by survey respondents*
Teaching Strategies/project-based Learning	115
High Scope	113
TEA Guidelines	110
Locally developed	108
Frog Street Press	89
GOLD sample lessons	79
Teacher created	6
LIPS	4
Montessori	3
Math Plus	2
Ready Rosie	2
Second Step	2
Conscious Discipline	1
Estrellita	1
Explore and Learn Quick Cards	1
Math Their Way	1
NAEYC	1
Reggio Emilia	1

Note. Teaching Strategies, High Scope, TEA Guidelines, Locally developed, Frog Street Press, and GOLD sample lessons were listed as options for teachers to select. Teachers were able to add additional curriculum resources, which resulted in the remaining categories.

Table D-2. Teacher-reported challenges by number of reports

Curriculum	*Number of reports by survey respondents*
Staff	18
Behavioral issues	11
Time /materials	11
Lack of information/training	7
Family engagement	5
Authentic art	3
Administrative responsibilities or support	2
Other	2
Differentiation	1
Facilities	1
General	1
Integrated classroom	1
Integration of program standards	1
Personal	1
Process	1
Student evaluation	1
Technology	1

Note. Actual comments provided through the survey were qualitatively analyzed using an emergent coding process to arrive at the categories listed here.

APPENDIX E: FULL UNCONDITIONAL MODEL WITH RANDOM INTERCEPTS FOR SIX GOLD OUTCOMES

Table E-1. Center analysis hierarchical linear modeling results of Teaching Strategies GOLD outcomes

	GOLD Outcome					
	Cognitive	***Literacy***	***Mathematics***	***Oral language***	***Physical***	***Social-emotional***
Fixed-Effect Parameter	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***
γ_{000} (intercept)	151.56 (8.86)	119.54 (5.78)	120.2 (6.58)	136.24 (8.82)	123.72 (6.14)	139.09 (9.49)
Random-Effect Parameter	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***	***Estimate (SE)***
$\sigma^2_{int:\,center}$	200.00 (224.09)	77.53 (95.46)	108.51 (123.16)	219.56 (221.12)	34.4 (108.02)	230.38 (256.55)
$\sigma^2_{int:\,classroom\,(center)}$	2502.89 (394.47)	1122.51 (186.26)	1365.21 (219.24)	1906.71 (309.03)	2541.62 (397.21)	2850.19 (446.87)
$\sigma^2_{int:\,child\,(classroom)}$	1225.34 (44.54)	692.89 (26.35)	807.11 (29.90)	1289.87 (47.58)	799.70 (29.20)	1128.85 (40.96)
Model Information Criteria						
Deviance	16274.835	14020.844	15018.024	15850.534	15491.060	16211.459
Sample Size						
N (Level 1)	1603	1465	1544	1556	1589	1608
N (Level 2)	89	82	87	86	89	89
N (Level 3)	4	4	4	4	4	4

SE= standard error, *N*=sample size