MEMORANDUM September 30, 2014

TO: Board Members

FROM: Terry B. Grier, Ed.D.
Superintendent of Schools

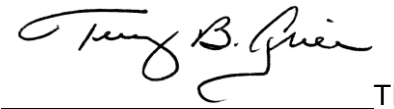
SUBJECT: **PREKINDERGARTEN EDUCATION PROGRAM: A PERFORMANCE COMPARISON OF EARLY CHILDHOOD CENTERS AND SCHOOL-BASED PROGRAMS, 2013–2014**

CONTACT: Carla Stevens, (713) 556-6700

The purpose of this evaluation was to assess the impact of two HISD prekindergarten class models on students' performance on the 2013–2014 Stanford and Aprenda reading and mathematics subtests. The most notable findings of this evaluation were: a) there were no statistically significant differences in the mean NCE scores on both 2013–2014 kindergarten Stanford and Aprenda reading and mathematics subtests between students who attended Early Childhood Centers and their peers in school-based programs; b) at the student group level, the results show that the performance of Early Childhood Center students and school-based program students on both 2013–2014 kindergarten Stanford and Aprenda reading subtests were comparable in all student groups (ethnicity, gender, economically disadvantaged, special education status, limited English proficiency (LEP), and at-risk).

Administrative Response: Past student assessment results reflect that Early Childhood Centers normally outscore school-based programs. To reduce this performance gap, the Early Childhood department directed its efforts toward providing academic assistance and improvement of classroom practices for school-based programs particularly with their instructional delivery model. Professional development offerings included coaching for school leaders and teachers, textbook adoption and curriculum resource training, classroom management training, assessment data training, and literacy and math workshops in the early childhood classroom. In addition, the department capitalized on four Early Childhood Centers as exemplars for best practices in prekindergarten. School-based programs were encouraged to visit these centers as a means to enrich teacher efficacy and serve as dynamic classroom models that enable students to take charge of their learning. Increased student performance for school-based programs may be attributed to the aforementioned factors. As a result, students' gains for this school year provided no significant difference between the academic performance of Early Childhood Centers and school-based programs.

Should you have any questions or require any further information, please contact me or Carla Stevens in the Department of Research and Accountability, at 713-556-6700.


TBG

TBG/CS:lp

cc: Superintendent's Direct Reports
Chief School Officers
School Support Officers
Lance Menster
Rachele Vincent
Janice Dingayan

HOUSTON INDEPENDENT SCHOOL DISTRICT

RESEARCH

Educational Program Report

PREKINDERGARTEN EDUCATION PROGRAM: A PERFORMANCE COMPARISON OF THE EARLY CHILDHOOD CENTERS AND SCHOOL-BASED PROGRAMS, 2013-2014

HISD | Research and Accountability

ANALYZING DATA, MEASURING PERFORMANCE.

2014 BOARD OF EDUCATION

Juliet Stipeche
President

Rhonda Skillern-Jones
First Vice President

Manuel Rodriguez, Jr.
Second Vice President

Anna Eastman
Secretary

Wanda Adams
Assistant Secretary

Michael L. Lunceford
Paula Harris
Greg Meyers
Harvin C. Moore

Terry B. Grier, Ed.D.
Superintendent of Schools

Carla Stevens
Assistant Superintendent
Department of Research and Accountability

Lai Pei , Ph.D.
Research Specialist

Venita Holmes, Dr.P.H.
Research Manager

Houston Independent School District
Hattie Mae White Educational Support Center
4400 West 18th StreetHouston, Texas 77092-8501

www.HoustonISD.org

PREKINDERGARTEN EDUCATION PROGRAM: A PERFORMANCE COMPARISON OF THE EARLY CHILDHOOD CENTERS AND SCHOOL-BASED PROGRAMS, 2013–2014

Executive Summary

Program Description

Houston Independent School District (HISD) has provided prekindergarten classes for Houston area four-year old students since the 1985–1986 academic year. The focus of the program is on lifelong learning to enhance the physical, emotional, and social wellbeing of the whole child and provide the foundational skills required for career and college readiness.

There are two main HISD prekindergarten program models: Early Childhood Centers and school-based programs. The vision of the HISD Early Childhood Centers initiative is to serve as a model for the district by providing a comprehensive state-of-the-art preschool program. The primary focus of the program is to develop academic readiness and to meet the developmental needs of preschool-age children. The district's Rebuild HISD Construction and Renovation Program included plans for a number of Early Childhood Centers that would become beacons for the community schools. Currently, there are four Early Childhood Centers, which only provide prekindergarten education to students: Armandina Farias, Gabriela Mistral, Martin Luther King, Jr. (MLK), and Ninfa Laurenzo.

The HISD school-based prekindergarten programs were initiated in 1984 (T.E.C 29.1532) when House Bill 72 established the Texas prekindergarten program requiring school districts to provide half-day education-based programs to four-year-old children. The purpose of this initiative was to develop skills necessary for success in the regular public school curriculum, including language, mathematics, and social skills (Texas Education Code 29.1532). Currently, HISD offers full-day school-based prekindergarten programs to all students within the attendance boundaries. To be eligible for participation in the non-tuition program, students should be: a) four years old on or before September 1 of the school year; b) live in the HISD attendance boundary; and meet at least one of the following criteria:

- Homeless;
- unable to speak or understand English;
- economically-disadvantaged;
- the child of an active-duty member of the U.S. military or one who has been killed, injured, or missing in action while on active duty;
- ever has been in the conservatorship of the Department of Family and Protective Services following an adversary hearing held as provided by Section 262.201, Family code;
- meet any eligibility criteria for Head Start, not only those who meet the low-income eligibility criteria for Head Start.

The purpose of this evaluation is to compare the academic performance of students who attended one of the four Early Childhood Centers with students who attended the school-based prekindergarten programs in 2012–2013. The evaluation focused on the following research questions:

- The performance of prekindergarten students on the 2013–2014 kindergarten Stanford 10 and Aprenda 3 reading and mathematics subtests;
- The effects of Early Childhood Centers and school-based programs on students' reading performance by student subgroups; and
- The effects of Early Childhood Centers and school-based programs on students' mathematics performance by student subgroups.

Highlights

- Analyses indicated that there were no statistically significant differences in the mean NCE scores on both 2013–2014 kindergarten Stanford and Aprenda reading and mathematics subtests between students who attended Early Childhood Centers and a comparable group of students who attended school-based programs.

- The analysis showed that the performance of Early Childhood Center students and school-based program students on both 2013–2014 kindergarten Stanford and Aprenda reading and mathematics subtests were comparable in all student groups (ethnicity, gender, economically-disadvantaged, special education status, limited English proficiency (LEP), and at-risk).

Recommendations

- Given findings suggesting that there were no significant difference in the academic performance of Early Childhood Center students and school-based program students, a cost-benefit analysis may be included in future evaluations in order to determine which class model is more cost-effective.

- Future evaluations should explore the unique components of each class model to determine which factors are more effective for prekindergarten education for students.

- HISD should consider modifying its student enrollment forms to collect all HISD kindergarteners' prekindergarten experience when they were enrolled into the HISD system. This will enable district and researchers to compare the full impact of HISD prekindergarten education with other non-HISD prekindergarten class models or students who did not attend prekindergarten. Moreover, the prekindergarten education experience information may be very useful to help preschoolers to have a smooth transition from prekindergarten to kindergarten.

Administrative Response

Past student assessment results reflect that Early Childhood Centers normally outscore school-based programs. To reduce this performance gap, the Early Childhood department directed its efforts toward providing academic assistance and improvement of classroom practices for school-based programs particularly with their instructional delivery model. Professional development offerings included coaching for school leaders and teachers, textbook adoption and curriculum resource training, classroom management training, assessment data training, and literacy and math workshops in the early childhood classroom. In addition, the department capitalized on four Early Childhood Centers as exemplars for best practices in prekindergarten. School-based programs were encouraged to visit these centers as a means

to enrich teacher efficacy and serve as dynamic classroom models that enable students to take charge of their learning. Increased student performance for school-based programs may be attributed to the aforementioned factors. As a result, students' gains for this school year provided no significant difference between the academic performance of Early Childhood Centers and school-based programs.

Introduction

Research studies have found that high quality early childhood centers promote students' school-readiness, enhance students' cognitive development, and reduce the risk of students' having reading difficulties as they progress through school (Butin & Woolums, 2009). Students from economically-disadvantaged backgrounds in particular gain the most benefits from these programs (Brooks-Gunn, 2003; Currie, 2001; Gormley, Gayer, Phillips, Dawson, 2005; Magnuson, Rhum, and Waldfogel, 2007).

Early childhood centers (ECCs) have increasingly become necessary in the lives of American parents given the growth of women in the workforce and the increase in amount of hours that parents spend at work (see Butin & Woolums, 2009). Another contributing factor of why the number of early childhood centers has risen is brain research highlighting the integral role that early childhood education can have in promoting the healthy development of children (Center on the Developing Child at Harvard University, 2010). Educators understand that early childhood centers play an important role in a child's school-readiness, early childhood centers within schools, also known as school-based programs, are also a growing trend. Currently, in the Texas Gulf Coast region, over a third of children between the ages of zero to five attend either an early childhood center or some other form of regulated early childhood education (Collaborative for Children, 2012).

Methods

Data Collection and Analysis

- The sample in this evaluation is kindergarten students who completed prekindergarten education in 2012–2013 in the Houston Independent School District (HISD), and entered kindergarten in 2013–2014 in HISD. To ensure Early Childhood Center students and school-based prekindergarten program students have similar kindergarten educational experience, school-based program students and Early Childhood Center students in this evaluation were enrolled in the same elementary schools in the kindergarten year. Moreover, only students who completed their prekindergarten education, and had 2013–2014 kindergarten Stanford 10 or Aprenda 3 test scores were included in this evaluation. Consequently, the sample size was 968 students from HISD Early Childhood Centers, and 6,151 students from HISD school-based programs.
- The reading and mathematics tests in this evaluation were the 2013–2014 Stanford 10 and Aprenda 3 reading and mathematics subtests.
- Both Stanford and Aprenda are norm-referenced assessments, and were administered in December of students' kindergarten year. In order to compare scores from different administrations and from different instruments, the Normal Curve Equivalents (NCEs) were used for all subtests in this evaluation.
- Effect size was used to quantify the size of the performance difference between Early Childhood Center and school-based program students. Borman and D'Agostino (1996) suggested that the average effect size associated with Title I programs is d = 0.15. Kulik, Kulik, and Bangert (1984), suggested that the average effect size in achievement test score is 0.32. Therefore, we used d = 0.15 as small-modest, d = 0.3 as modest-large, and d = 0.5 as large in this report.

- In this evaluation, analyses were conducted to examine the achievement differences on reading and mathematics subtests between student groups. The following characteristics were explored in determining which student demographics were related to their reading and mathematics performance. These student characteristics included ethnicity, gender, economically-disadvantaged, special education placement, limited English proficiency (LEP), and at-risk status.
- Data aggregated across the Early Childhood Centers are presented in this report and in **Appendix A** tables (p. 15-20). Data by specific centers are presented in **Appendix B** tables (p. 21-25), and for more details please refer to the data report titled "Stanford and Aprenda Student Performance of Early Childhood Centers, 2013–2014".

Data Limitations

- The Early Childhood Center and school-based program students were nonequivalent groups due to differences in kindergarten education experiences because only school effect was controlled in this evaluation, rather than other factors, such as teacher effect and classroom effect.

- Only student outcome data were used to assess the impact of the two class models on student academic performance, thus, the nature and the quality of the models were not considered in the analysis. Therefore, the results of this evaluation may not be generalized to indicate overall effectiveness of the models.

Results

What were the demographic characteristics of Early Childhood Center students and school-based prekindergarten program students?

- The demographic characteristics of students who attended Early Childhood Centers and those who attended school-based programs were similar with respect to gender and special education placement in 2013–2014 (**Appendix A-Table 1,** p. 15). Notably, 81.5% of the students in Early Childhood Centers were Hispanic, 91.1% were economically-disadvantaged, 59.6% were LEP, and 86.6% were at-risk students. These proportions of Hispanic, economically-disadvantaged, LEP, and at-risk students were lower in the sample of students who attended school-based programs (Appendix A-Table 1, p. 15).

How did students who attended Early Childhood Centers perform on the 2013–2014 kindergarten Stanford and Aprenda reading subtests compared with their grade-level peers who attended school-based prekindergarten programs?

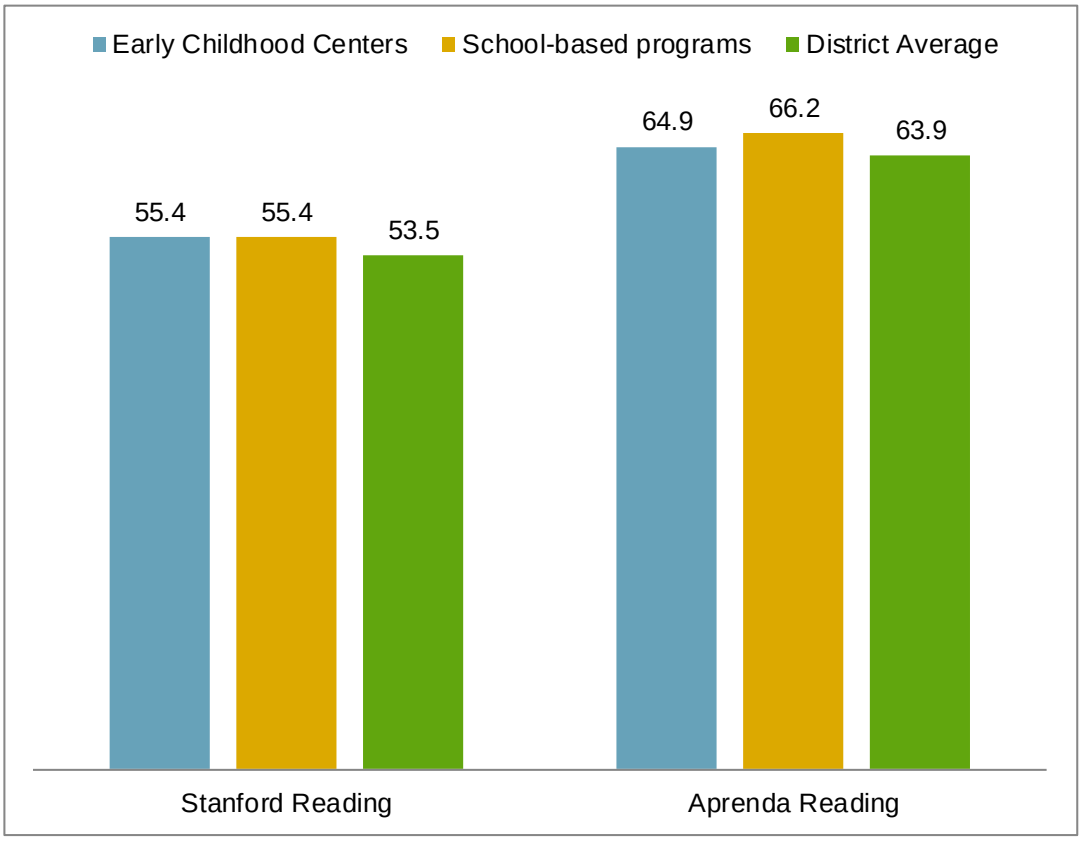
- The kindergarten reading subtest performances of Early Childhood Center students and school-based program students in 2013–2014 were compared by using descriptive statistics and independent two-sample t-tests. Similar analytic procedures were applied to the mathematics subtests data.

- The kindergarten Stanford reading performance of students who attended Early Childhood Centers was the same as their peers who attended school-based programs (M = 55.4). On the

2013–2014 kindergarten Aprenda reading subtest, Early Childhood Center students (M = 64.9) obtained lower mean NCE scores than their peers who attended school-based programs (M = 66.2) **(Figure 1,** p. 6**)**.

- Independent two-sample t-test was used to examine the performance difference on the 2013–2014 kindergarten Stanford and Aprenda reading subtests between Early Childhood Center and school-based program students. The t-test results showed that the mean NCE score differences on the 2013–2014 kindergarten Stanford and Aprenda reading subtests between Early Childhood Center and school-based program students were not statistically significant (p > 0.05) **(Appendix A-Table 2,** page 16**)**.

Figure 1. Mean NCE Scores on the 2013–2014 Kindergarten Stanford and Aprenda Reading Subtests for Early Childhood Center and School-based Program Students



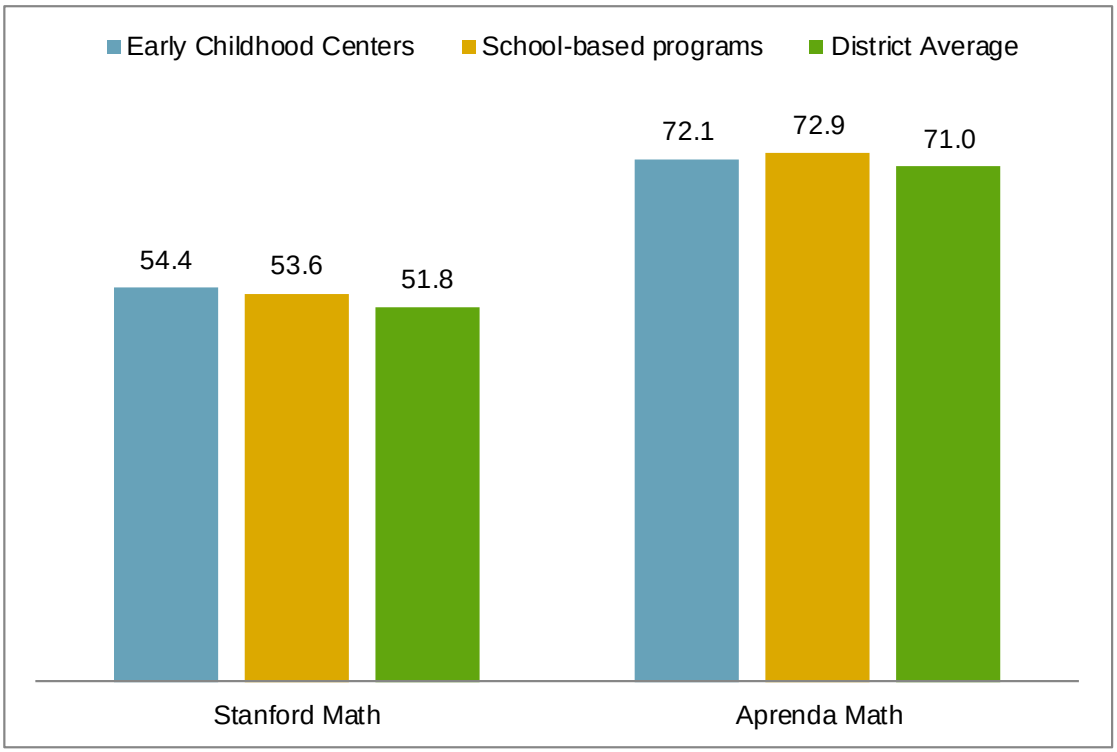
How did students who attended Early Childhood Centers perform on the 2013–2014 kindergarten Stanford and Aprenda mathematics subtests compared with their grade-level peers who attended school-based prekindergarten programs?

- **Figure 2** (p. 7) shows that the performance of students who attended Early Childhood Centers (M = 54.4) was similar to their peers who attended school-based programs (M = 53.6) on the 2013–2014 kindergarten Stanford mathematics subtest.

- On the 2013–2014 kindergarten Aprenda mathematics subtest, Early Childhood Center students (M = 72.1) performed similar to their counterparts who attended school-based programs (M = 72.9) (Figure 2).

- Independent t-test results showed that the mean NCE score differences on the 2013–2014 kindergarten Stanford and Aprenda mathematics subtests between Early Childhood Center and school-based program students were not statistically significant ($p > 0.05$) **(Appendix A-Table 3,** page 16**)**.

Figure 2. Mean NCE Scores of Students on the 2013–2014 Kindergarten Stanford and Aprenda Mathematics Subtests for Early Childhood Center Students and School-based Program Students

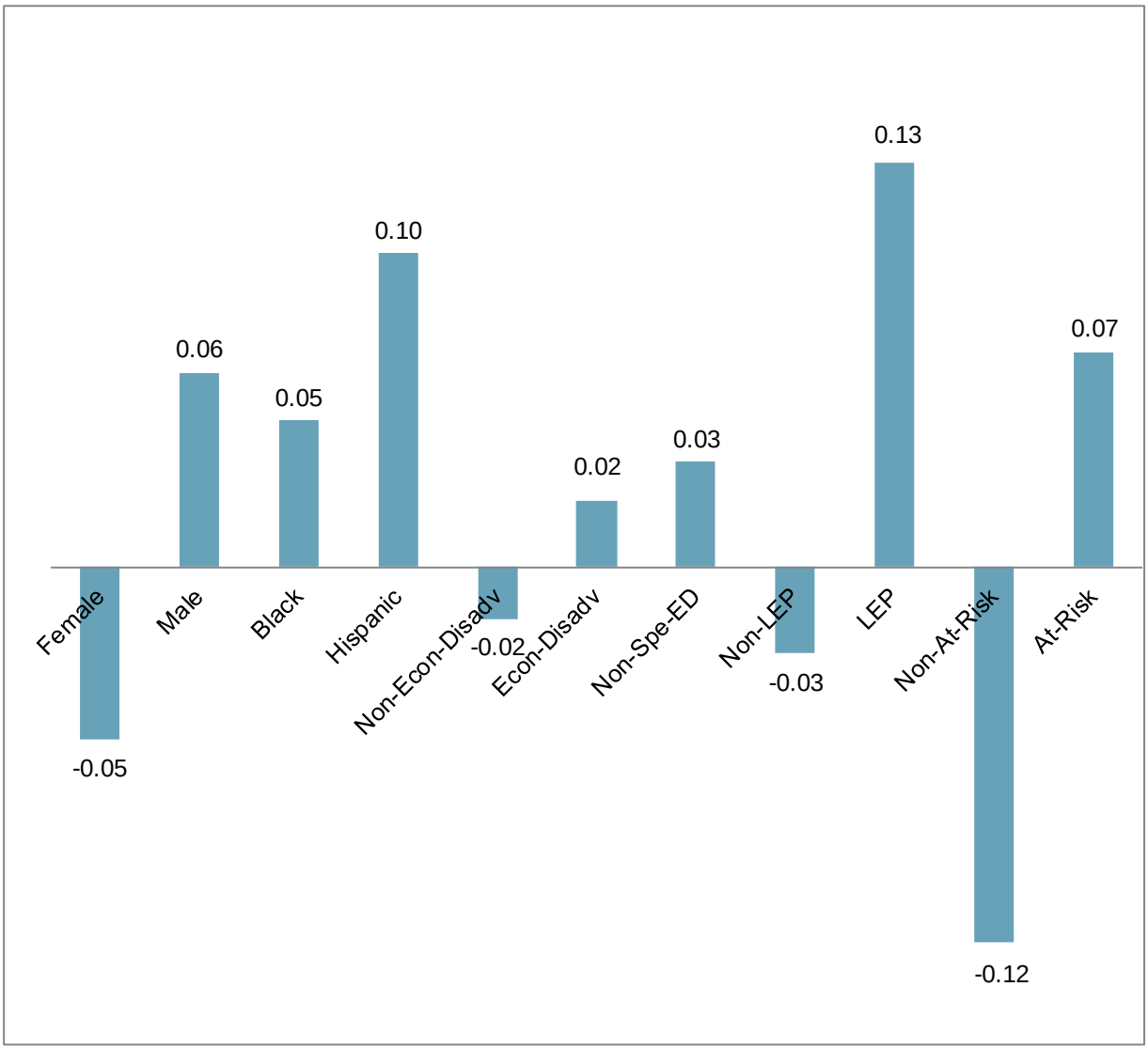


Did the effects of Early Childhood Centers and school-based prekindergarten programs in students' kindergarten reading performance vary by student groups?

- At the student group level analysis, **Appendix A-Table 4** (p. 17) shows that the 2013–2014 kindergarten Stanford reading mean NCE scores of students who attended Early Childhood Centers is similar to their peers within each student group.

- The effect size for each student group was negligible (d < 0.15), which indicated that students who attended Early Childhood Centers and school-based programs performed comparably on the 2013–2014 kindergarten Stanford reading subtest at the student group level **(Figure 3)**.

Figure 3. Effect Size of Early Childhood Center Students vs. School-based Program Students on the 2013–2014 Kindergarten Stanford Reading Subtest



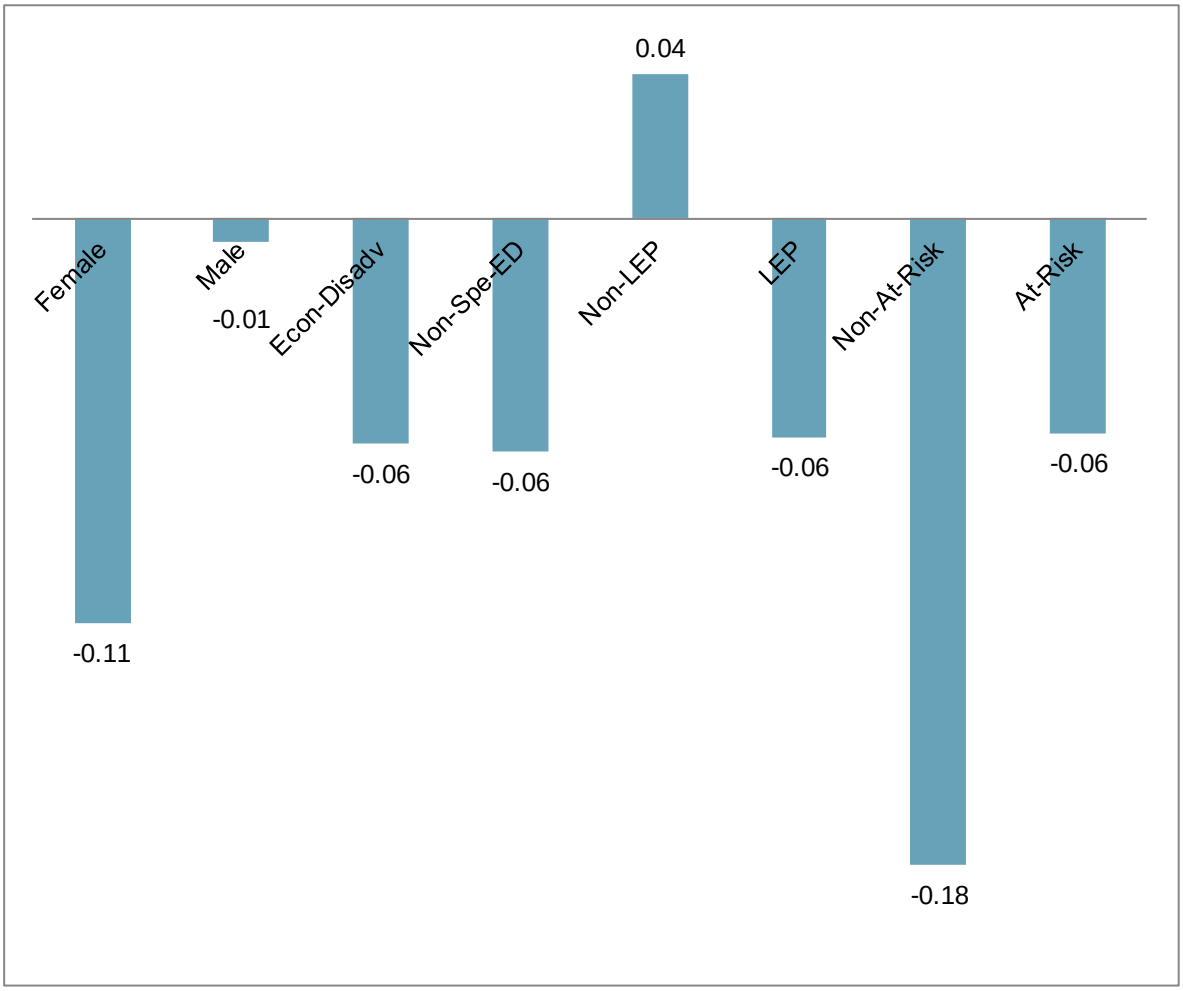
Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large. Positive numbers are to the advantage of the ECCs; negative numbers are to the advantage of the school-based programs.

- **Appendix A-Table 5** (p. 18) shows that the 2013–2014 kindergarten Aprenda reading mean NCE scores of Early Childhood Center and school-based program students were similar within each student group, except for non-at-risk group.

- When compared with their peers in school-based programs, non-at-risk students in Early Childhood Centers (M = 64.9) scored lower than their counterparts (M = 68.7) on the 2013–2014 kindergarten Aprenda reading subtest (Appendix A-Table 5, p. 18). The corresponding effect size for the mean score difference between school-based students and Early Childhood Center non-at-risk students was -0.18. The effect size indicated that the magnitude of the mean score difference was small (**Figure 4**).

- The effect sizes for other student groups were negligible (d < 0.15) when Early Childhood Center students were compared with students who attended school-based programs.

Figure 4. Effect Size of Early Childhood Center Students vs. School-based Program Students on the 2013–2014 Kindergarten Aprenda Reading Subtest



Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large. Positive numbers are to the advantage of the ECCs; negative numbers are to the advantage of the school-based programs.

Did the effects of Early Childhood Centers and school-based prekindergarten programs in students' kindergarten mathematics performance vary by student groups?

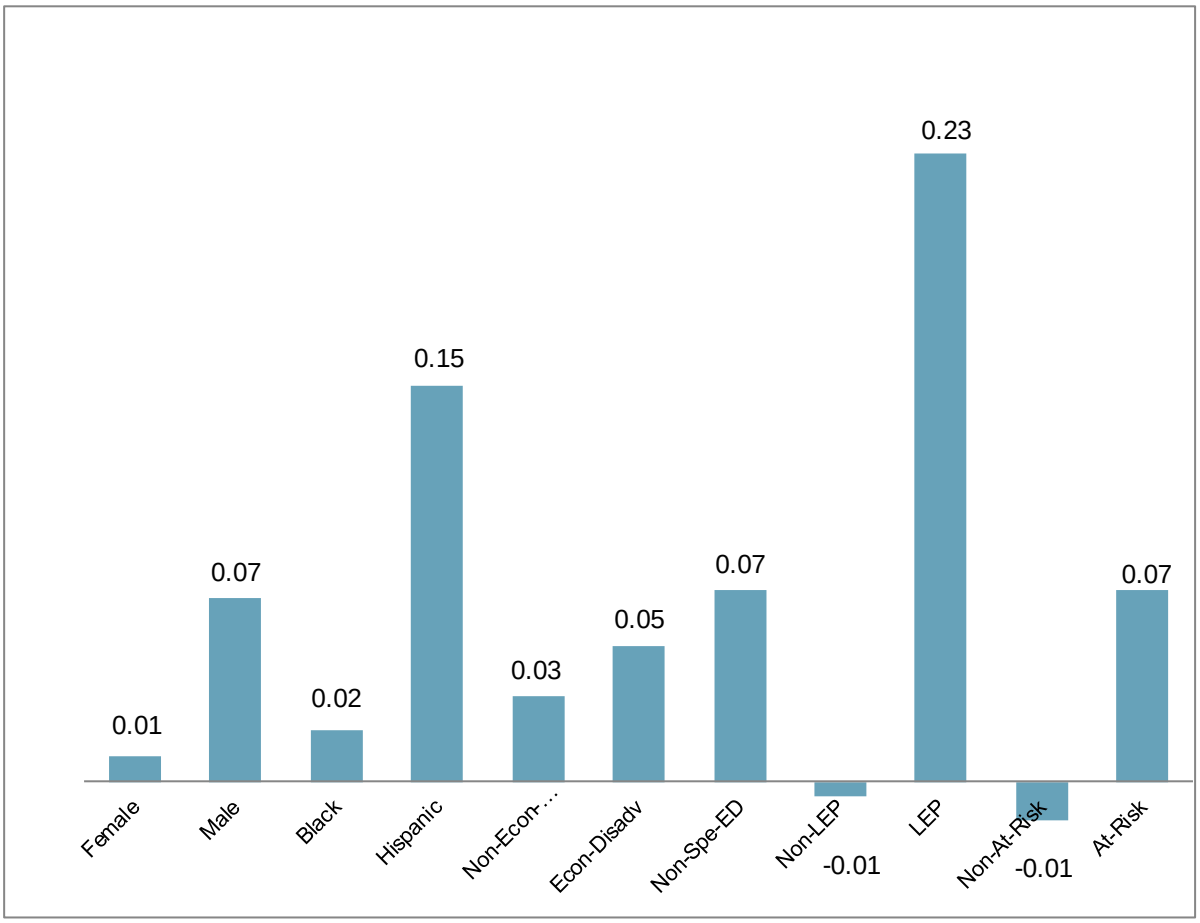
- In the student group analysis, **Appendix A-Table 6** (p. 19) shows that the 2013–2014 kindergarten Stanford mathematics mean NCE scores of Early Childhood Center and school-based program students were similar within each student group, except for LEP and Hispanic students.

- When compared with their peers in school-based programs, LEP students in Early Childhood Centers (M = 57.0) outperformed their counterparts (M = 52.3) on the 2013–2014 kindergarten Stanford mathematics subtest (Appendix A-Table 6, p. 19). The corresponding effect size for the mean score difference between school-based students and Early childhood Center LEP students was 0.23. The effect size indicated that the magnitude of the mean difference was small.

- When compared with their peers in school-based programs, Hispanic students in Early Childhood Centers (M = 55.2) obtained higher NCE mean scores than their peers in school-based programs (M = 52.3) on the 2013–2014 kindergarten Stanford mathematics subtest (Appendix A-Table 6, p. 19). The corresponding effect size for the mean score difference between school-based students and Early childhood Center Hispanic students was 0.15. The effect size indicated that the magnitude of the mean difference was small.

- The effect sizes for other student groups were negligible ($d < 0.15$), which indicated that students of these student groups from these two class models performed similar on the 2013–2014 kindergarten Stanford mathematics subtest (**Figure 5**, p. 11).

Figure 5. Effect Size of Early Childhood Center Students vs. School-based Program Students on the 2013–2014 Kindergarten Stanford Mathematics Subtest

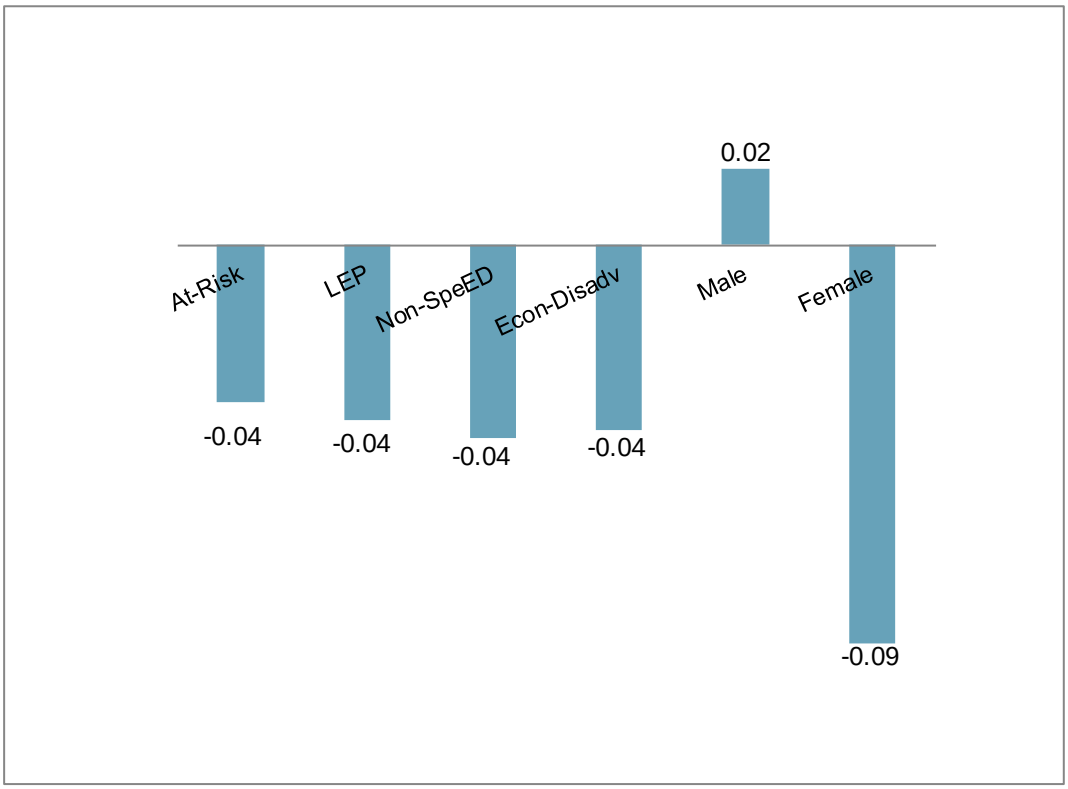


Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large. Positive numbers are to the advantage of the ECCs; negative numbers are to the advantage of the school-based programs.

Appendix A-Table 7 (p. 20) shows that the 2013–2014 kindergarten Aprenda mathematics mean NCE scores of Early Childhood Center and school-based program students were similar within each student group.

- **Figure 6** (p. 12) shows that the effect size within each student group was negligible (d < 0.15) when Early Childhood Center students were compared with their school-based program peers on the 2013–2014 Aprenda mathematics subtests.

Figure 6. Effect Size of Early Childhood Center Students vs. School-based Program Students on the 2013–2014 Kindergarten Aprenda Mathematics Subtest



Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large. Positive numbers are to the advantage of the ECCs; negative numbers are to the advantage of the school-based programs.

Discussion

The focus of both Early Childhood Center and school-based programs is to develop academic readiness and to meet the developmental needs of preschool-aged children. Although Early Childhood Centers and school-based prekindergarten programs have different school settings, these two class models use the same curriculum. The results of this evaluation showed that the impact of these two prekindergarten class models on students' performance on the 2013–2014 kindergarten Stanford and Aprenda reading and mathematics subtests was similar, like results from the 2012–2013 evaluation report.

There were several limitations in this evaluation. First, it is important to note that students' kindergarten outcome data were used to evaluate the impact of these two class models considering their prekindergarten experience. Although analysis was conducted to control for school differences in their kindergarten education experience, the Early Childhood Center and school-based program students were still nonequivalent groups due to the difference in other aspects of prekindergarten education experience, such as teacher and classroom differences. Moreover, only student outcome data were available to assess the impact of these two class models on students' academic performance, and data on the nature and the quality of these two models were not considered in the analysis. Therefore, the results of this

evaluation may not be generalized to overall effectiveness of Early Childhood Center and school-based programs.

Based on evaluation findings, there are four recommendations. First, it may be beneficial to the district to conduct cost-benefit analysis in future evaluations in order to determine which class model is more cost-effective. Second, future evaluations should explore the unique components of each class model to determine which factors are most effective in prekindergarten education for all student groups. Third, HISD may consider modifying its student enrollment forms to collect prekindergarten educational placement at students' enrollment in HISD. This will enable district administrators and researchers to determine the full impact of HISD prekindergarten education with other non-HISD prekindergarten class models or with students who did not attend prekindergarten. Finally, the kindergarten academic performance was the only outcome variable to evaluate the effect of these two class models. HISD may consider collecting HISD prekindergarten students' cognitive, social and emotional skills data during their prekindergarten academic years because these skills are foundational to children's learning and are informative for ensuring students have a smooth transition from prekindergarten to kindergarten.

References

Borman, G.D., & D'Agostino, J.V. (1996). Title I and student achievement: A meta-analysis of federal evaluation results. *Educational Evaluation and Policy Analysis*, 18, 309–326.

Brooks-Gunn, J. (2003). Do you believe in magic? What we can expect from early childhood intervention programs? *SRCD Social Policy Report, 17*, 3-14.

Butin, D. & Woolums, J. (2009) Early Childhood Centers. National Clearinghouse for Educational Facilities. http://www.ncef.org/pubs/earlychild.pdf.

Center on the Developing Child at Harvard University (2010). The Foundations of Lifelong Health Are Built in Early Childhood. http://www.developingchild.harvard.edu.

Collaborative for Children (2012). Importance of Developing an Early Childhood Education "System" in the Houston Region. Powerpoint lecture presented at Houston Independent School District SPERS Conference, Houston, TX.

Gormley, W. T., Gayer, T., Phillips, D., & Dawson, B. (2005). The Effects of Universal Pre-K on Cognitive Development. *Developmental Psychology, 41*(6), 872-884.

Currie, J. (2001). Early childhood intervention programs: What do we know? *Journal of Economic Perspectives, 15*, 213-238.

Kulik, J.A., Kulik, C.C. and Bangert, R.L. (1984) 'Effects of practice on aptitude and achievement test scores.' American Education

Magnuson, K. A., Ruhm, C., & Waldfogel, J. (2007). Does prekindergarten improve school preparation and performance?. *Economics of Education Review, 26*(1), 33-51.

Apendix A

Table 1. Demographic Characteristics of Early Childhood Center Students and School-based Program Students in 2013–2014

		Early Childhood Centers (n = 968)		School-based Program (n = 6,151)	
Demographic Characteristic		**n**	**%**	**n**	**%**
Gender	Female	469	48.5	3,081	50.1
	Male	499	51.5	3,070	49.9
Ethnicity	Asian	8	0.8	170	2.8
	African-American	162	16.7	1,301	21.2
	Hispanic	789	81.5	4,403	71.6
	White	8	0.8	214	3.5
	Other	*	*	63	1
Economically-Disadvantaged	No	86	8.9	664	10.8
	Yes	882	91.1	5,487	89.2
Special Education	No	930	96.1	5,969	97
	Yes	38	3.9	182	3
Limited English Proficient (LEP)	No	391	40.4	2,891	47
	Yes	577	59.6	3,260	53
At-Risk	No	130	13.4	1,070	17.4
	Yes	838	86.6	5,081	82.6

Note. 1. * denotes fewer than 5 students, and were not reported. 2. School-based program students were enrolled in the same elementary schools as the Early Childhood Center students. 3. The demographic information used in this evaluation was based on student information at the time that the student enrolled in kindergarten.

Table 2. Performance of Early Childhood Center Students and School-based Program Students on the 2013–2014 Kindergarten Reading Subtests

	Early Childhood Center			School-based Program			Mean Difference	t	df	Sig. (2-tailed)
	Mean	SD	n	Mean	SD	n				
Stanford	55.4	18.7	459	55.4	20.2	3,575	0	.03	604	.98
Aprenda	64.9	22.2	500	66.2	23.0	2,522	-1.3	-1.2	3,020	.229

Table 3. Performance of Early Childhood Center Students and School-based Program Students on the 2013–2014 Kindergarten Mathematics Subtests

	Early Childhood Center			School-based Program			Mean Difference	t	df	Sig. (2-tailed)
	Mean	SD	n	Mean	SD	n				
Stanford	54.4	18.4	464	53.6	20.34	3,595	0.8	.82	618.0	.42
Aprenda	72.1	21.2	499	72.9	21.8	2,509	-0.8	-.74	3,020	.46

Table 4. Performance of Early Childhood Center Students and School-based Program Students on the 2013–2014 Kindergarten Stanford Reading Subtests by Student Groups

		Early Childhood Center			School-based Program				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Female	56.8	18.6	219	57.9	19.9	1,776	-1.1	-0.05
	Male	54.1	18.8	240	52.9	20.2	1,799	1.2	0.06
Ethnicity	Asian	65.9	12.0	8	70.8	20.2	168	--	--
	African-American	56.8	20.0	159	55.9	20.1	1,276	0.9	0.05
	Hispanic	54.5	18.1	285	52.6	19.4	1,874	1.9	0.10
	White	48.0	12.9	7	62.1	20.1	198	--	--
	Other	*	*	*	65.4	21.5	59	--	--
Economically-disadvantaged	No	63.4	17.8	63	63.8	20.5	588	-0.4	-0.02
	Yes	54.1	18.6	396	53.7	19.8	2,987	0.4	0.02
Special Education	No	56.4	18.3	438	55.8	20.1	3,472	0.6	0.03
	Yes	34.1	14.6	21	42.0	18.3	103	--	--
Limited English Proficient (LEP)	No	55.1	19.0	382	55.6	20.0	2,832	-0.5	-0.03
	Yes	57.2	17.2	77	54.6	21.1	743	2.6	0.13
At-Risk	No	66.0	17.5	127	68.1	18.2	1,046	-2.1	-0.12
	Yes	51.4	17.6	332	50.1	18.6	2,529	1.3	0.07

Note. 1.) * denotes fewer than 5 students; 2.) Effect size and mean difference were not reported when n<30, and were denoted by "--".

Table 5. Performance of Early Childhood Center Students and School-based Program Students on the 2013–2014 Kindergarten Aprenda Reading Subtests by Student Groups

		Early Childhood Center			School-based Program				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Female	65.9	22.0	246	68.4	22.3	1,281	-2.5	-0.11
	Male	63.9	22.3	254	64.0	23.4	1,241	-0.1	-0.01
Economically-disadvantaged	No	67.4	16.1	21	68.1	22.7	70	--	--
	Yes	64.8	22.4	479	66.2	23.0	2,452	-1.4	-0.06
Special Education	No	65.4	22.2	483	66.8	22.8	2,445	-1.4	-0.06
	Yes	51.1	16.2	17	47.8	20.4	77	--	--
Limited English Proficient (LEP)	No	*	*	*	64.6	21.1	22	--	--
	Yes	64.9	22.1	498	66.2	23.0	2,500	-1.3	-0.06
At-Risk	No	64.9	22.2	500	68.7	18.1	14	-3.8	-0.18
	Yes	64.9	22.2	500	66.2	23.0	2,508	-1.3	-0.06

Note. 1.) * denotes fewer than 5 students; 2.) Effect size and mean difference were not reported when n<30, and were denoted by "--".

Table 6. Performance of Early Childhood Center Students and School-based Program Students on the 2013–2014 Kindergarten Stanford Mathematics Subtests by Student Groups

		Early Childhood Center			School-based Program				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Female	55.5	18.8	221	55.3	19.6	1,787	0.2	0.01
	Male	53.4	18.1	243	52.0	20.9	1,808	1.4	0.07
Ethnicity	Asian	61.3	12.8	8	65.5	17.2	168	--	--
	African-American	52.6	19.1	161	52.2	20.7	1,292	0.4	0.02
	Hispanic	55.2	18.3	286	52.3	19.8	1,876	2.9	0.15
	White	54.7	13.4	8	62.6	19.1	199	--	--
	Other	*	*	*	62.4	19.6	60	--	--
Economically-disadvantaged	No	61.6	15.4	65	61.0	18.7	588	0.6	0.03
	Yes	53.2	18.6	399	52.2	20.3	3,007	1.0	0.05
Special Education	No	55.5	17.6	443	54.1	20.1	3,490	1.4	0.07
	Yes	30.9	19.6	21	38.6	21.8	105	--	--
Limited English Proficient (LEP)	No	53.9	18.6	386	54.0	20.3	2,851	-0.1	-0.01
	Yes	57.0	17.5	78	52.3	20.3	744	4.7	0.23
At-Risk	No	64.3	14.5	130	64.6	17.0	1,052	-0.3	-0.01
	Yes	50.5	18.3	334	49.1	19.9	2,543	1.4	0.07

Note. 1.) * denotes fewer than 5 students; 2.) Effect size and mean difference were not reported when n<30, and were denoted by "--".

Table 7. Performance of Early Childhood Center Students and School-based Program Students on the 2013–2014 Kindergarten Aprenda Mathematics Subtests by Student Groups

		Early Childhood Center			School-based Program				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Female	72.5	21.2	245	74.4	21.3	1,281	-1.9	-0.09
	Male	71.8	21.3	254	71.5	22.2	1,242	0.3	0.02
Economically-disadvantaged	No	74.3	15.4	21	72.2	21.8	70	--	--
	Yes	72.0	21.5	478	73.0	21.8	2,453	-1.0	-0.04
Special Education	No	72.4	21.2	482	73.4	21.5	2,447	-1.0	-0.04
	Yes	63.9	22.5	17	58.8	25.2	76	--	--
Limited English Proficient (LEP)	No	*	*	*	75.5	22.8	22	--	--
	Yes	72.1	21.2	497	72.9	21.8	2,501	-0.8	-0.04
At-Risk	No	*	*	*	77.3	18.1	14	--	--
	Yes	72.1	21.2	499	72.9	21.8	2,509	-0.8	-0.04

Note. 1.) * denotes fewer than 5 students; 2.) Effect size and mean difference were not reported when n<30, and were denoted by "--".

Appendix B

Table 1. Demographic Characteristics of Four Early Childhood Center Students Enrolled in 2012–2013

		Farias ECC (n = 337)		Mistral ECC (n = 233)		MLK ECC (n = 261)		Laurenzo ECC (n = 137)		Total (N = 968)	
Student Group		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
Gender	Female	175	51.9	115	49.4	118	45.2	61	44.5	469	48.5
	Male	162	48.1	118	50.6	143	54.8	76	55.5	499	51.5
Ethnicity	Asian	*	*	7	3	*	*	*	*	8	0.8
	African-American	9	2.7	18	7.7	134	51.3	*	*	162	16.7
	Hispanic	326	96.7	201	86.3	127	48.7	135	98.5	789	81.5
	White	*	*	6	2.6	*	*	*	*	8	0.8
	Other	*	*	*	*	*	*	*	*	*	*+
Economically-Disadvantaged	No	16	4.7	21	9.0	39	14.9	10	7.3	86	8.9
	Yes	321	95.3	212	91	222	85.1	127	92.7	882	91.1
Special Education	No	317	94.1	228	97.9	252	96.6	133	97.1	930	96.1
	Yes	20	5.9	5	2.1	9	3.4	*	*	38	3.9
Limited English Proficient (LEP)	No	116	34.4	35	15.0	182	69.7	58	42.3	391	40.4
	Yes	221	65.6	198	85.0	79	30.3	79	57.7	577	59.6
At-Risk	No	20	5.9	9	3.9	84	32.2	17	12.4	130	13.4
	Yes	317	94.1	224	96.1	177	67.8	120	87.6	838	86.6

Note. 1.) * denotes fewer than 5 students. 2.) + “Other” ethnicity was not calculated in total % of ethnicity.

Table 2. Performance of Early Childhood Center Students on the 2013–2014 Kindergarten Aprenda Reading Subtest

		Farias ECC			Mistral ECC			MLK ECC			Laurenzo ECC		
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**
	Total	59.9	22.2	193	67.0	23.0	156	70.7	19.2	78	67.2	20.9	73
Gender	Female	60.6	21.3	96	66.7	21.7	78	72.5	19.8	39	71.5	24.0	33
	Male	59.2	23.2	97	67.2	24.3	78	69.0	18.7	39	63.7	17.3	40
Economically-Disadvantaged	No	61.9	15.9	7	71.4	16.8	8	*	*	*	*	*	*
	Yes	59.9	22.5	186	66.7	23.3	148	70.8	19.3	76	67.1	21.2	69
Special Education	No	60.6	22.3	185	67.1	22.9	153	71.3	19.3	75	67.8	20.9	70
	Yes	44.3	12.0	8	*	*	*	*	*	*	*	*	*
Limited English Proficient (LEP)	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	60.0	22.2	192	67.0	23.0	156	70.7	19.2	78	66.9	20.8	72
At-Risk	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	59.9	22.2	193	67.0	23.0	156	70.7	19.2	78	67.2	20.9	73

Note. * denotes fewer than 5 students.

Table 3. Performance of Early Childhood Center Students on the 2013–2014 Kindergarten Aprenda Mathematics Subtest

		Farias ECC			Mistral ECC			MLK ECC			Laurenzo ECC		
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**
	Total	67.3	22.2	193	74.4	21.3	156	78.5	16.6	78	73.3	20.4	72
Gender	Female	66.1	21.1	96	75.2	21.7	78	81.5	14.4	39	73.6	22.4	32
	Male	68.5	23.4	97	73.5	21.1	78	75.6	18.3	39	73.0	18.9	40
Economically-Disadvantaged	No	72.8	14.3	7	79.4	13.3	8	*	*	*	*	*	*
	Yes	67.1	22.5	186	74.1	21.7	148	78.7	16.8	76	73.6	20.3	68
Special Education	No	68.1	22.2	185	74.4	21.3	153	78.4	16.8	75	73.3	20.4	69
	Yes	50.5	18.0	8	*	*	*	*	*	*	*	*	*
Limited English Proficient (LEP)	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	67.2	22.2	192	74.4	21.3	156	78.5	16.6	78	73.0	20.4	71
At-Risk	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	67.3	22.2	193	74.4	21.3	156	78.5	16.6	78	73.3	20.4	72

Note. * denotes fewer than 5 students.

Table 4. Performance of Early Childhood Center Students on the 2013–2014 Kindergarten Stanford Reading Subtest

		Farias ECC			Mistral ECC			MLK ECC			Laurenzo ECC		
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**
	Total	54.4	17.4	143	49.5	18.6	73	58.4	19.4	181	56.1	18.3	62
Gender	Female	53.9	16.9	78	51.3	21.0	36	62.6	18.6	78	56.1	16.3	27
	Male	55.0	18.2	65	47.8	16.1	37	55.2	19.4	103	56.1	20.0	35
Ethnicity	Asian	*	*	*	62.9	9.1	7	*	*	*	*	*	*
	African American	42.4	17.9	9	47.0	18.5	17	59.0	19.7	132	*	*	*
	Hispanic	55.4	17.0	132	48.3	20.1	44	56.9	18.4	49	55.4	18.1	60
	White	*	*	*	50.3	4.6	5	*	*	*	*	*	*
	Other	*	*	*	*	*	*	*	*	*	*	*	*
Economically-Disadvantaged	No	58.0	16.0	9	57.9	13.8	12	65.3	19.5	36	71.5	14.0	6
	Yes	54.1	17.5	134	47.9	19.1	61	56.7	19.0	145	54.5	18.0	56
Special Education	No	56.3	16.6	131	50.2	18.3	71	59.0	19.1	175	56.6	18.0	61
	Yes	33.3	11.7	12	*	*	*	41.1	20.6	6	*	*	*
Limited English Proficient (LEP)	No	52.3	17.4	114	47.3	20.8	32	58.4	19.4	180	54.4	18.0	56
	Yes	62.4	15.3	29	51.2	16.7	41	*	*	*	72.1	14.4	6
At-Risk	No	60.8	12.3	20	63.8	18.1	7	67.8	18.2	83	64.0	18.7	17
	Yes	53.3	17.9	123	48.0	18.1	66	50.5	16.6	98	53.1	17.5	45

Note. * denotes fewer than 5 students.

Table 5. Performance of Four Early Childhood Center Students on the 2013–2014 Kindergarten Stanford Mathematics Subtest

		Farias ECC			Mistral ECC			MLK ECC			Laurenzo ECC		
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean**	**SD**	**n**
	Total	55.6	19.0	143	49.3	17.7	77	56.4	18.2	182	51.8	17.6	62
Gender	Female	54.9	17.8	78	51.1	19.3	37	60.2	19.1	79	49.4	17.1	27
	Male	56.5	20.3	65	47.7	16.1	40	53.6	17.0	103	53.7	17.9	35
Ethnicity	Asian	*	*	*	64.3	10.6	7	*	*	*	*	*	*
	African American	35.9	25.0	9	42.8	19.0	18	55.2	17.8	133	*	*	*
	Hispanic	57.2	17.8	132	48.4	17.6	45	59.8	19.0	49	52.2	17.7	60
	White	*	*	*	58.1	8.7	6	*	*	*	*	*	*
	Other	*	*	*	*	*	*	*	*	*	*	*	*
Economically-Disadvantaged	No	62.7	22.2	9	62.3	12.4	13	61.4	15.3	37	59.6	13.8	6
	Yes	55.2	18.7	134	46.7	17.5	64	55.2	18.7	145	51.0	17.8	56
Special Education	No	57.8	17.4	131	50.5	16.4	75	57.1	18.0	176	52.2	17.3	61
	Yes	31.9	20.1	12	*	*	*	38.4	17.4	6	*	*	*
Limited English Proficient (LEP)	No	53.3	19.1	114	46.9	18.9	35	56.5	18.2	181	50.8	17.1	56
	Yes	64.8	15.5	29	51.3	16.5	42	*	*	*	61.1	20.5	6
At-Risk	No	64.1	9.6	20	56.9	16.5	9	65.5	15.2	84	62.5	14.7	17
	Yes	54.3	19.8	123	48.3	17.7	68	48.7	17.0	98	47.7	17.0	45

Note. * denotes fewer than 5 students.