MEMORANDUM January 27, 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, 2012–2013**

CONTACT: Carla Stevens, (713) 556-6700

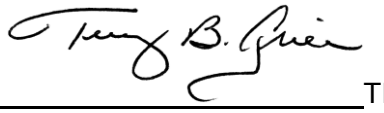
The purpose of this evaluation was to assess the impact of two HISD prekindergarten class models on students' performance on the 2012–2013 Stanford and Aprenda reading and mathematics subtests. The most notable findings of this evaluation were: a) there were no statistically significant differences in the mean NCE scores on both 2012–2013 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 2012–2013 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). However, the results show that the non-at-risk students who attended the Early Childhood Centers outperformed their school-based program peers on the Stanford mathematics subtest.

Administrative Response: Historically, students enrolled in Early Childhood Centers have always outscored the school-based program students. As a result, efforts were focused on supporting the school-based programs with their instructional delivery model. During the 2010–2011 academic year, all prekindergarten programs received a new textbook adoption/curriculum resource and all prekindergarten teachers were trained on implementation. This consistency would attribute to the increased performance for students enrolled in school-based programs. Efforts to use the four Early Childhood Centers as models of best practices in prekindergarten would also attribute to the increased student performance at school-based programs. To further support this trend, the following support will continue: coaching for leadership and teachers on campuses, textbook adoption/curriculum resource training, classroom management training, differentiation using assessment data training, Response-to-Intervention training, and utilizing the Early Childhood Centers as models of best practices in prekindergarten.

The Home Instruction Program for Preschool Youngsters (HIPPY) provides an avenue to connect children to HISD prekindergarten programs. HIPPY offers a standardized research based curriculum and resources aligned with the national math, reading and

science standards. HIPPY is aligned with Family and Community Engagement goals of building parent capacity to prepare their children for school.

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.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RESEARCH

Educational Program Report

PREKINDERGARTEN EDUCATION PROGRAM: A PERFORMANCE COMPARISON OF EARLY CHILDHOOD CENTERS AND SCHOOL-BASED PROGRAMS, 2012–2013

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PREKINDERGARTEN EDUCATION PROGRAM: A PERFORMANCE COMPARISON OF THE EARLY CHILDHOOD CENTERS AND SCHOOL-BASED PROGRAMS, 2012–2013

Executive Summary

Program Description

HISD has provided prekindergarten classes for Houston area four-year old students since the 1985–1986 academic year. The focus of the program has been beginning literacy and oral language development that support individual needs as well as the language and cultural backgrounds of children. The central feature of the program has been communication and literacy that form the basis of children's future academic success. Language and literacy accomplishments are best achieved following: cognitive development, motor development, and social and emotional development. At the same time, native language, augmentative communication, and sensory challenges must be considered for a child's development.

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 to 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 program 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:

- Be homeless
- Be unable to speak or understand English
- Be economically disadvantaged
- Be 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
- Is or 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 performance of students who attended one of the four Early Childhood Centers or the school-based prekindergarten programs in 2011–2012. The evaluation focused on the following research questions:

- The performance of prekindergarten students on the 2012–2013 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 2012–2013 kindergarten Stanford and Aprenda reading and mathematics subtests between students who attended Early Childhood Centers and their peers in school-based programs.

- The analysis showed the performance of Early Childhood Center students and school-based program students on both 2012–2013 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).

- Overall, the performance on the 2012–2013 kindergarten Stanford and Aprenda mathematics subtests were comparable between students who attended Early Childhood Centers and students who attended school-based programs.

- When compared to students in school-based programs, non-at-risk students who attended Early Childhood Centers outperformed their peers on the kindergarten Stanford mathematics subtest in 2012–2013.

Recommendations

- A cost-benefit analysis may be included in the future evaluation in order to determine which class model is more cost-effective.

- Future evaluation should explore the unique components of each class model to determine which factors are more effective for prekindergarten education for all students and for student subgroups.

- HISD should consider modifying its state database 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

Historically the Early Childhood Centers have always outscored the school-based programs. As a result, efforts were focused on supporting the school-based programs with their instructional delivery model. During the 2010-2011 academic year, all prekindergarten programs received a new textbook adoption/curriculum resource and all prekindergarten teachers were trained on implementation. This consistency would attribute to the increased student performance for the school-based programs. Efforts to use the four Early Childhood Centers as models of best practices in prekindergarten would also attribute to the increased student performance of the school-based programs. To further support this trend, the following support will continue: coaching for leadership and teachers on campuses, textbook adoption/curriculum resource training, classroom management training, differentiation using assessment data training, Response-to-Intervention training, and utilizing the Early Childhood Centers as models of best practices in prekindergarten.

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 (see 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 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). Because 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 attended prekindergarten education in 2011–2012, and entered kindergarten in 2012–2013. To ensure Early Childhood Center students and school-based prekindergarten program students have similar kindergarten educational experience, all school-based program students in this evaluation were enrolled in the same elementary schools as the Early Childhood Center students. Moreover, only students who completed their prekindergarten education, and had 2012–2013 kindergarten Stanford 10 or Aprenda 3 test scores were included in this evaluation. Consequently, the sample size was 1,054 for Early Childhood Centers and 6,279 for school-based programs.
- The reading and mathematics tests in this evaluation were the 2012–2013 Stanford 10 and Aprenda 3 reading and mathematics subtests. The 2012–2013 Stanford 10 and Aprenda 3 were referred to as 2012 Stanford and 2012 Aprenda, respectively, throughout this report.
- 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.
- A two-sample t-test was performed to determine whether there was a significant difference between Early Childhood Center and school-based program students with respect to

demographic characteristics (ethnicity, gender, economically disadvantaged, special education status, limited English proficiency (LEP), and at-risk status).

- 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 status, 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. Data by specific centers are presented in **Appendix B** tables.

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 economic status, gender, and special education placement in 2011–2012 (**Appendix A-Table 1**). Notably, 81.3% of the students in Early Childhood Centers were Hispanic, 98.5% were non-special education, 61.7% were LEP, and 89.3% were at-risk students (Appendix A-Table 1). These proportions of Hispanic, non-special education, LEP and at-risk students were lower in the sample of students who attended school-based programs.

- There were statistically significant differences in the proportion of Early Childhood Center and school-based program students who were Hispanic, non-special education, LEP, and at-risk ($p < .05$).

How did students who attended Early Childhood Centers perform on the 2012 kindergarten Stanford and Aprenda reading subtests compared with their grade-level peers who attended school-based prekindergarten programs?

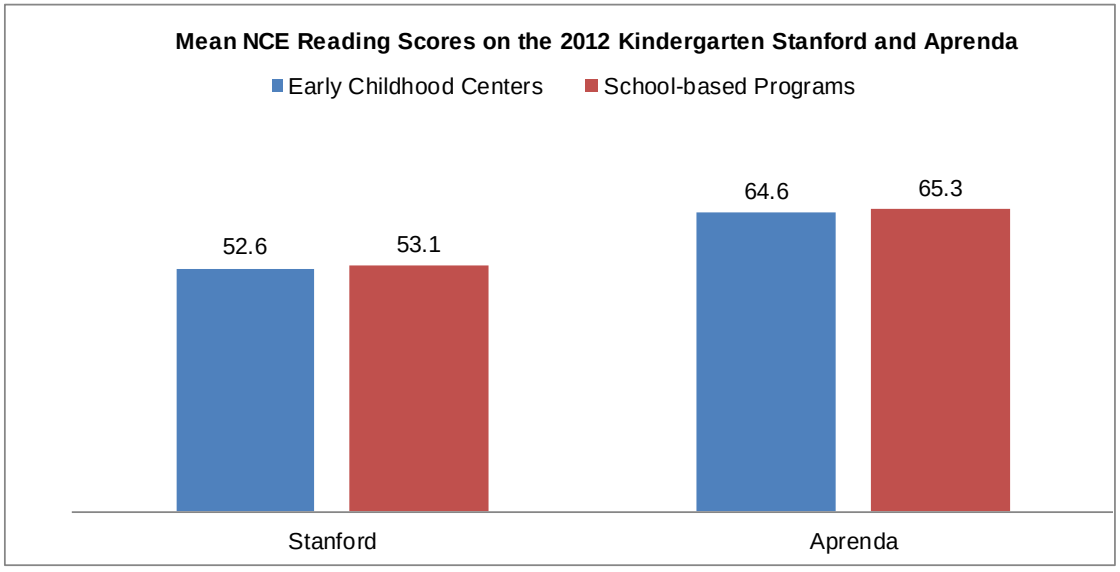
- The kindergarten reading subtest performances of Early Childhood Center students and school-based program students in 2012 were compared by using descriptive statistics and independent two-sample t-tests. The same analytic procedure was applied to the mathematics subtests data.

- The kindergarten Stanford reading performance of students who attended Early Childhood Centers (M = 52.6) was similar to their peers who attended school-based programs (M = 53.1). On the 2012 kindergarten Aprenda reading subtest, Early Childhood Center students (M = 64.6) obtained comparable mean NCE scores as their peers who attended school-based programs (M = 65.3) **(Figure 1)**.

- Independent t-test was used to examine the performance difference on the 2012 kindergarten Stanford and Aprenda reading subtest between Early Childhood Center and school-based program students. The t-test results showed that the mean NCE score differences on the 2012 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)**.

- The effect size of mean NCE score differences on both 2012 kindergarten Stanford and Aprenda reading subtests between Early Childhood Center and school-based program students were less than 0.15. The negligible effect sizes also indicated that the mean NCE score differences on the kindergarten Stanford and Aprenda reading subtests between Early Childhood Center and school-based program students were not large enough to be practically meaningful in an educational setting.

Figure 1. Mean NCE Scores on the 2012 Kindergarten Stanford and Aprenda Reading Subtests for Early Childhood Center and School-based Program Students



Note. Differences were not statistically significant.

How did students who attended Early Childhood Centers perform on the 2012 kindergarten Stanford and Aprenda mathematics subtests compared with their grade-level peers who attended school-based prekindergarten programs?

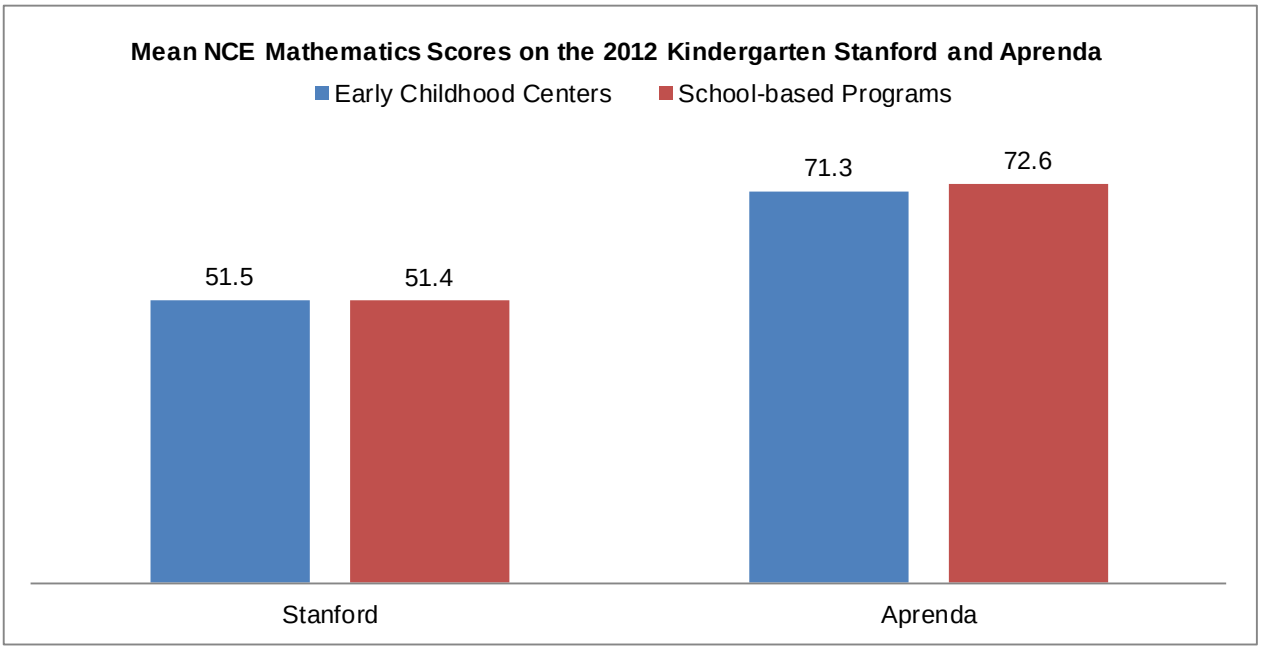
- **Figure 2** shows that the performance of students who attended Early Childhood Centers in 2011–2012 (M = 51.5) was similar to their peers who attended school-based programs (M = 51.4) on the 2012 kindergarten Stanford mathematics subtest.

- On the 2012 kindergarten Aprenda mathematics subtest, Early Childhood Center students (M = 71.3) performed similar to their counterparts who attended school-based programs (M = 72.6) (Figure 2).

- Independent t-test was used to examine the kindergarten Stanford and Aprenda mathematics performance difference between Early Childhood Center and school-based program students. **Appendix A-Table 3** shows that the mean NCE score differences on both 2012 kindergarten Stanford and Aprenda mathematics subtests between Early Childhood Center and school-based program students were not statistically significant ($p > 0.05$).

- The effect size of the mean difference on the 2012 kindergarten Stanford and Aprenda mathematics subtests between Early Childhood Center and school-based program students were less than 0.15, which is negligible.

Figure 2. Mean NCE Scores of Students on the 2012 Kindergarten Stanford and Aprenda Mathematics Subtests for Early Childhood Center Students and School-based Program Students



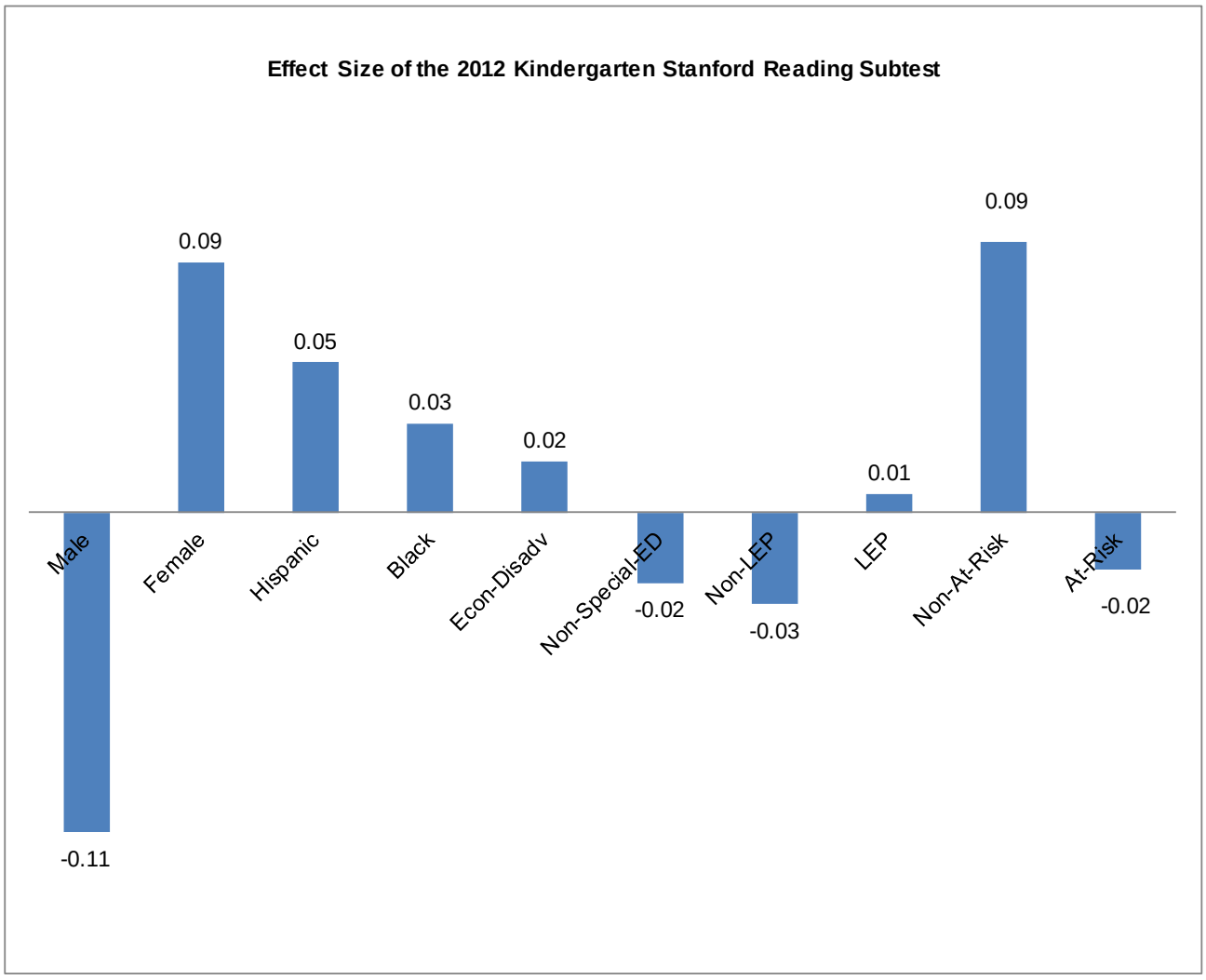
Note. Differences were not statistically significant.

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, **Appendix A-Table 4** shows that the 2012 kindergarten Stanford reading mean NCE scores of students who attended Early Childhood Centers in 2011–2012 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 2012 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 2012 Kindergarten Stanford Reading Subtest

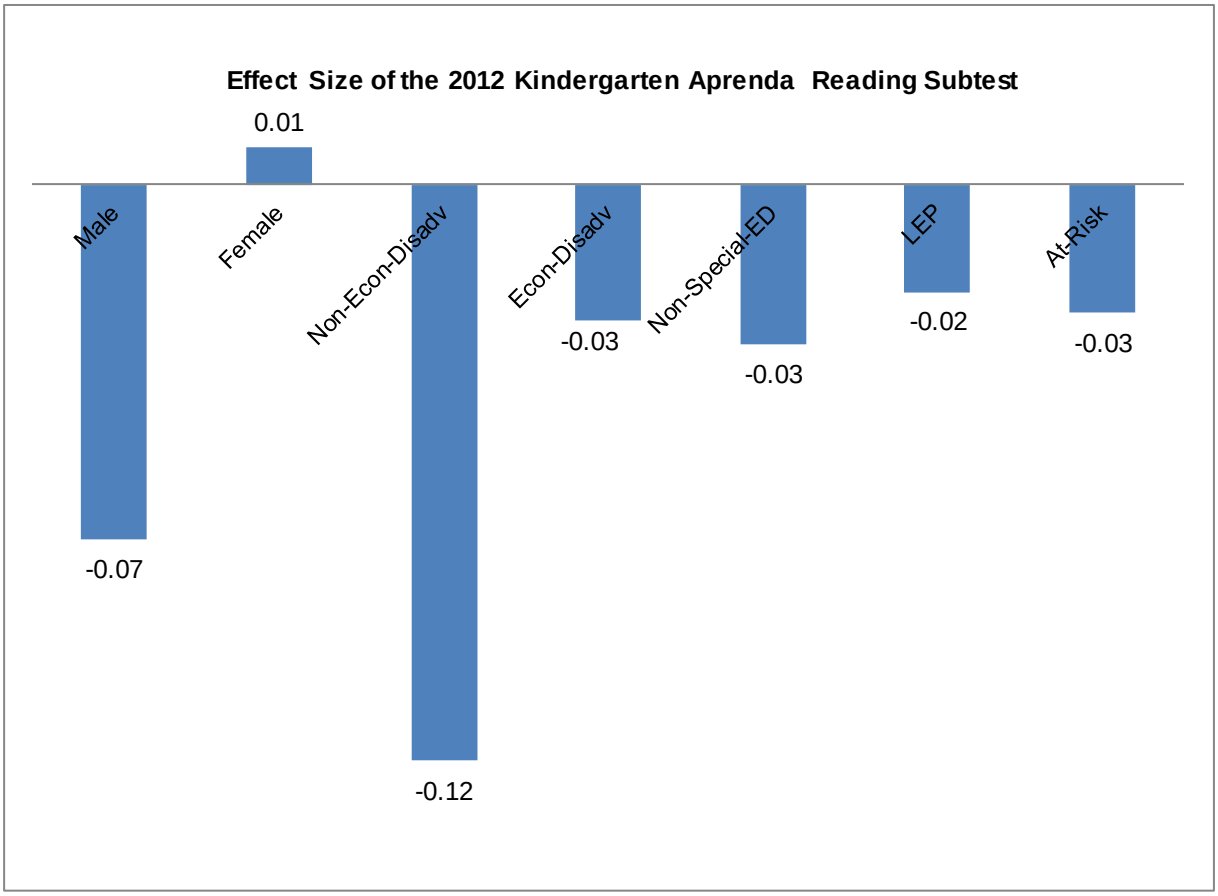


Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large.

- **Appendix A-Table 5** shows that the kindergarten Aprenda reading mean NCE scores of Early Childhood Center and school-based program students in 2012 were similar within each student group.

- **Figure 4** shows that the effect size was negligible (d < 0.15) within each student group 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 2012 Kindergarten Aprenda Reading Subtest



Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large.

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

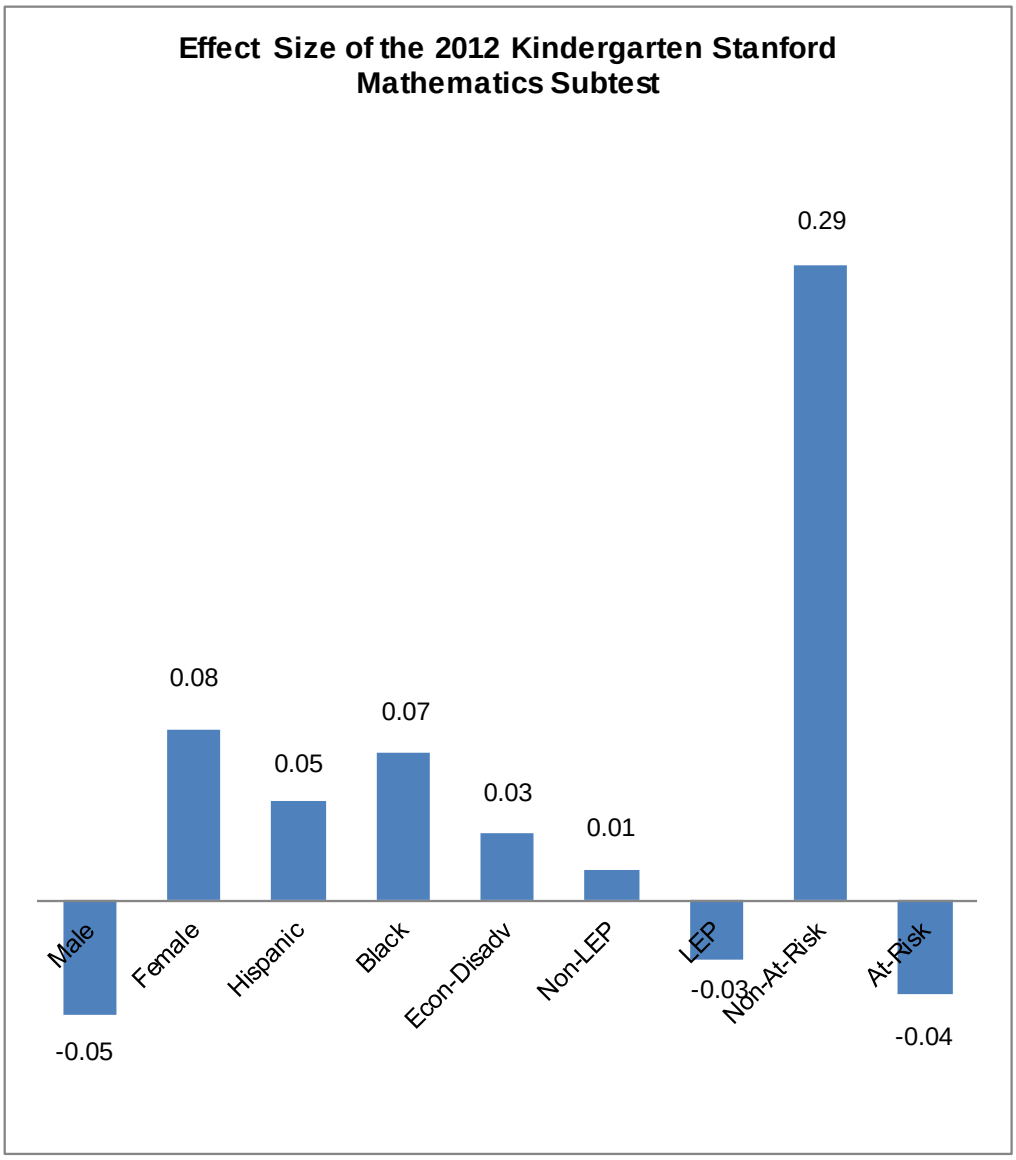
- In the student group analysis, **Appendix A-Table 6** shows that the 2012 kindergarten Stanford mathematics mean NCE scores of Early Childhood Center and school-based program students were similar within each student group, except for non-at-risk students.

- When compared with their peers in school-based programs, non-at-risk students in Early Childhood Centers (M = 63.1) outperformed their counterparts (M = 57.2) (Appendix A-Table 6)

on the 2012 kindergarten Stanford mathematics subtest (d = 0.29) **(Figure 5)**. The difference in term of effect size was large enough to be meaningful in an educational setting.

- The effect sizes for other student groups were negligible (d < 0.15), which indicated that students of these groups from these two class models performed similar on the 2012 kindergarten Stanford mathematics subtest (Figure 5).

Figure 5. Effect size of Early Childhood Center Students vs. School-based Program Students on the 2012 Kindergarten Stanford Mathematics Subtest



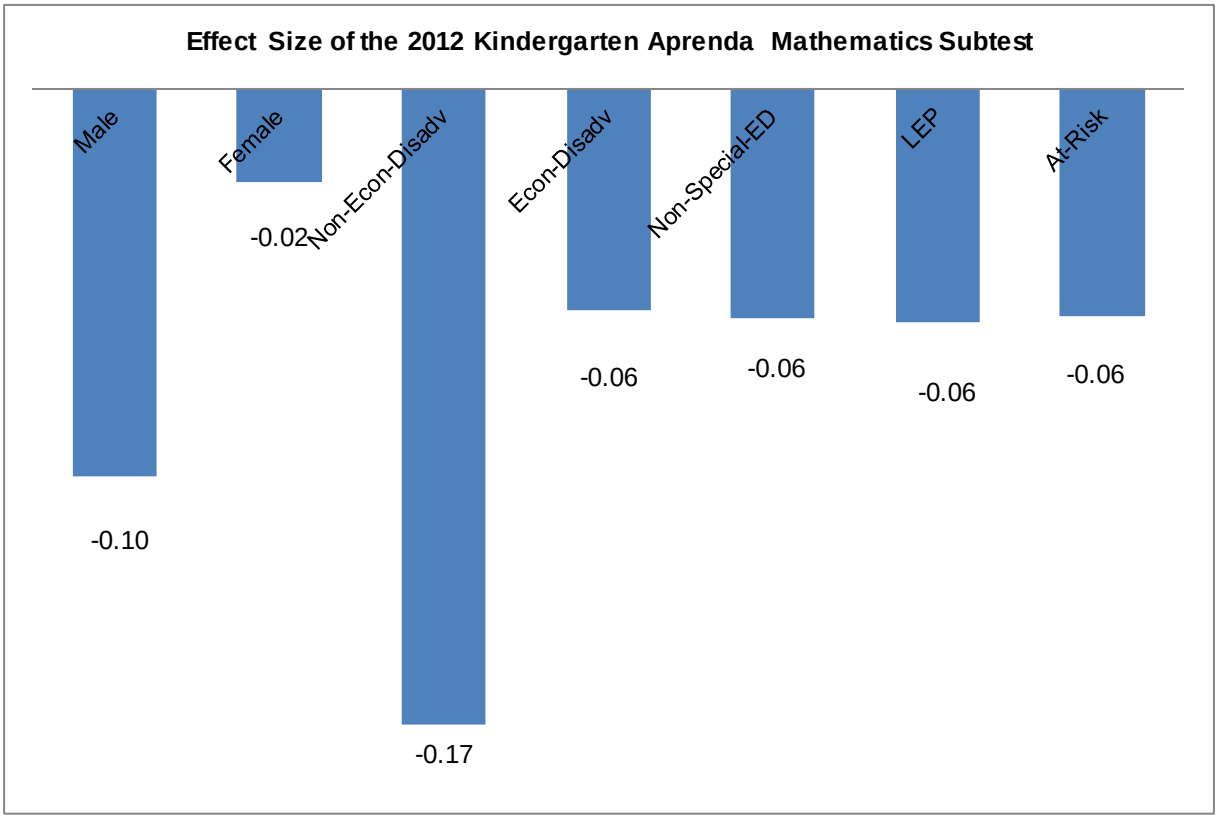
Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large.

- **Appendix A-Table 7** shows that the 2012 kindergarten Aprenda mathematics mean NCE scores of Early Childhood Center and school-based program students were similar within each student group.

- **Figure 6** shows that non-economically-disadvantaged students (d = -0.17) who attended Early Childhood Centers lagged behind their peers who attended school-based programs. However, the magnitude of the difference was small.

- The effect sizes for other student groups were negligible (d < 0.15) (Figure 6), which indicated that the performance of students from these groups who attended these two class models was comparable on the 2012 Aprenda mathematics subtests.

Figure 6. Effect size of Early Childhood Center Students vs. School-based Program Students on the 2012 Kindergarten Aprenda Mathematics Subtest



Note. Defined d = 0.15 as small-modest, d = 0.3 as modest-large, d = 0.5 as large.

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 are different in school setting, 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 2012 kindergarten Stanford and Aprenda reading and mathematics subtests was similar, unlike results from previous evaluation reports.

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 kindergarten education experience, such as teacher and classroom differences. Moreover, only student outcome data were used 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 information database 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 in this report. 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.

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Appendix A

Table 1. Demographic Characteristics of Early Childhood Center Students and School-based Program Students in 2011–2012

		Early Childhood Centers (n = 1054)		School-based Program (n = 6279)		Sig. (2-tailed)
Demographic Characteristic		**n**	**%**	**n**	**%**	
Gender	Male	527	50	3089	49.2	0.7
	Female	527	50	3190	50.8	0.7
Ethnicity	Asian	17	1.6	181	2.9	0.7
	Hispanic	857	81.3	4572	72.8	0.0
	Black	166	15.7	1240	19.7	0.2
	White	11	1	238	3.8	0.4
	Other	*	*	48	0.8	*
Economically-Disadvantaged	No	57	5.4	415	6.6	0.7
	Yes	997	94.6	5864	93.4	0.1
Special Education	No	1038	98.5	6115	97.4	0.0
	Yes	16	1.5	164	2.6	0.7
Limited English Proficient (LEP)	No	404	38.3	2893	46.1	0.0
	Yes	650	61.7	3386	53.9	0.0
At-Risk	No	113	10.7	1050	16.7	0.1
	Yes	941	89.3	5229	83.3	0.0

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 the student enrolled in prekindergarten.

Table 2. Performance of Early Childhood Center Students and School-based Program Students on the 2012–2013 Kindergarten Reading Subtests

	Early Childhood Center			School-based Program			Mean Difference	t	df	Sig. (2-tailed)	Effect Size (d)
	Mean	SD	n	Mean	SD	n					
Stanford	52.6	20.3	497	53.1	20.2	3568	-0.5	-0.5	4063	0.6	-0.02
Aprenda	64.6	22.4	557	65.3	22.5	2711	-0.7	-0.6	3266	0.5	-0.03

Table 3. Performance of Early Childhood Center Students and School-based Program Students on the 2012–2013 Kindergarten Mathematics Subtests

	Early Childhood Center			School-based Program			Mean Difference	t	df	Sig. (2-tailed)	Effect Size (d)
	Mean	SD	n	Mean	SD	n					
Stanford	51.5	19.9	497	51.4	20.9	3568	0.1	0.1	657.8	0.9	0.01
Aprenda	71.3	21.5	557	72.6	21.3	2711	-1.3	-1.3	3266	0.2	-0.06

Table 4. 2012–2013 Kindergarten Stanford Reading Performance of Early Childhood Center Students and School-based Program Students by Student Groups

		Early Childhood Centers			School-based Programs				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Male	49.4	20.3	262	51.7	20.6	1772	-2.3	-0.11
	Female	56.2	19.7	235	54.5	19.6	1796	1.7	0.09
Ethnicity	Asian	58.7	21.0	17	68.0	22.0	181	--	--
	Hispanic	51.3	20.5	302	50.3	19.0	1869	1.0	0.05
	Black	54.9	19.7	166	54.3	20.2	1238	0.6	0.03
	White	45.6	19.9	10	58.0	21.0	232	--	--
	Other	*	*	*	53.1	22.2	48	--	--
Economically Disadvantaged	No	58.5	18.8	26	63.4	22.1	359	--	--
	Yes	52.3	20.4	471	52.0	19.6	3209	0.4	0.02
Special Education	No	52.9	20.2	489	53.4	20.0	3451	-0.5	-0.02
	Yes	37.4	22.6	8	45.4	23.6	117	--	--
Limited English Proficient (LEP)	No	52.4	20.5	395	53.1	20.1	2823	-0.6	-0.03
	Yes	53.3	19.6	102	53.2	20.5	745	0.1	0.01
At-Risk	No	61.9	21.0	112	59.9	21.1	1036	2.0	0.09
	Yes	49.9	19.3	385	50.3	19.1	2532	-0.4	-0.02

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. 2012–2013 Kindergarten Aprenda Reading Performance of Early Childhood Center Students and School-based Program Students by Student Groups

		Early Childhood Centers			School-based Programs				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Male	61.3	23.4	265	62.9	22.6	1317	-1.7	-0.07
	Female	67.7	21.1	292	67.5	22.2	1394	0.2	0.01
Economically Disadvantaged	No	65.0	22.1	31	67.5	21.6	56	-2.6	-0.12
	Yes	64.6	22.5	526	65.3	22.5	2655	-0.6	-0.03
Special Education	No	64.8	22.3	549	65.5	22.4	2664	-0.7	-0.03
	Yes	54.3	27.1	8	52.4	23.1	47	--	--
Limited English Proficient (LEP)	No	48.1	22.1	9	61.1	21.4	70	--	--
	Yes	64.9	22.3	548	65.4	22.5	2641	-0.5	-0.02
At-Risk	No	*	*	*	64.5	20.8	14	--	--
	Yes	64.7	22.4	556	65.3	22.5	2697	-0.6	-0.03

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. 2012–2013 Kindergarten Stanford Mathematics Performance of Early Childhood Center Students and School-based Program Students by Student Groups

		Early Childhood Centers			School-based Programs				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Male	49.5	20.5	262	50.6	21.4	1772	-1.1	-0.05
	Female	53.7	19.0	235	52.1	20.4	1796	1.6	0.08
Ethnicity	Asian	58.0	24.9	17	62.1	19.7	181	--	--
	Hispanic	51.0	19.3	302	50.1	20.7	1869	0.9	0.05
	Black	51.6	20.0	166	50.2	21.2	1238	1.4	0.07
	White	49.8	29.0	10	58.8	17.9	232	--	--
	Other	*	*	*	54.6	22.2	48	--	--
Economically Disadvantaged	No	58.4	19.6	26	59.5	20.6	359	--	--
	Yes	51.1	19.9	471	50.5	20.8	3209	0.6	0.03
Special Education	No	51.9	19.8	489	51.8	20.7	3451	0.1	0.00
	Yes	27.9	13.9	8	39.2	23.6	1177	--	--
Limited English Proficient (LEP)	No	51.7	19.8	395	51.4	21.0	2823	0.3	0.01
	Yes	50.5	20.5	102	51.1	20.6	745	-0.6	-0.03
At-Risk	No	63.1	15.4	112	57.2	20.7	1036	5.9	0.29
	Yes	48.1	19.8	385	49.0	20.5	2532	-0.9	-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 "--".

Table 7. 2012–2013 Kindergarten Aprenda Mathematics Performance of Early Childhood Center Students and School-based Program Students by Student Groups

		Early Childhood Centers			School-based Programs				
Student Group		**Mean**	**SD**	**n**	**Mean**	**SD**	**n**	**Mean Difference**	**Effect Size (d)**
Gender	Male	69.4	23.2	265	71.6	21.8	1317	-2.2	-0.10
	Female	73.0	19.7	292	73.5	20.7	1394	-0.5	-0.02
Economically Disadvantaged	No	71.0	24.1	31	74.5	20.1	56	-3.5	-0.17
	Yes	71.3	21.3	526	72.5	21.3	2655	-1.2	-0.06
Special Education	No	71.5	21.3	549	72.8	21.2	2664	-1.3	-0.06
	Yes	54.5	28.6	8	60.8	23.8	47	--	--
Limited English Proficient (LEP)	No	61.2	26.3	9	66.5	20.6	70	--	--
	Yes	71.4	21.4	548	72.7	21.2	2641	-1.3	-0.06
At-Risk	No	*	*	*	71.9	18.8	14	--	--
	Yes	71.3	21.5	556	72.6	21.3	2697	-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 "--".

Appendix B

Table 1. Demographic Characteristics of Four Early Childhood Center Students Enrolled in 2011–2012

		Farias ECC (n = 352)		Mistral ECC (n = 272)		MLK ECC (n = 276)		Laurenzo ECC (n = 154)		Total (N = 1054)	
Student Group		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
Gender	Female	188	53.4	121	44.5	141	51.1	77	50.0	527	50.0
	Male	164	46.6	151	55.5	135	48.9	77	50.0	527	50.0
Ethnicity	Asian	*	*	17	6.3	*	*	*	*	17	1.6
	Hispanic	337	95.7	226	83.1	143	51.8	151	98.1	857	81.3
	Black	11	3.1	22	8.1	132	47.8	*	*	166	15.7
	White	*	*	6	2.2	*	*	*	*	11	1.0
	Other	*	*	*	*	*	*	*	*	*	*[+]
Economically Disadvantaged	No	6	1.7	36	13.2	0	0	15	9.7	57	5.4
	Yes	346	98.3	236	86.8	276	100.0	139	90.3	997	94.6
Special Education	No	344	97.7	270	99.3	272	98.6	152	98.7	1038	98.5
	Yes	8	2.3	*	*	*	*	*	*	16	1.5
Limited English Proficient (LEP)	No	120	34.1	44	16.2	183	66.3	57	37.0	404	38.3
	Yes	232	65.9	228	83.8	93	33.7	97	63.0	650	61.7
At-Risk	No	24	6.8	13	4.8	55	19.9	21	13.6	113	10.7
	Yes	328	93.2	259	95.2	221	80.1	133	86.4	941	89.3

Note. * denotes fewer than 5 students. + "Other" ethnicity was not calculated in total % of ethnicity.

Table 2. Performance of Early Childhood Center Students on the 2012–2013 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	58.5	23.0	205	67.2	22.1	175	69.7	20.1	90	69.5	19.9	86
Gender	Female	61.9	21.6	114	69.0	21.3	82	74.8	18.5	49	72.2	18.4	47
	Male	54.2	24.0	91	65.7	22.8	93	63.6	20.3	41	66.3	21.4	39
Economically Disadvantaged	No	*	*	*	70.0	24.2	17	*	*	*	62.0	16.9	10
	Yes	58.6	23.0	201	66.9	21.9	158	69.7	20.1	90	70.5	20.2	76
Special Education	No	58.6	22.8	201	67.2	22.1	175	70.1	19.9	87	69.8	19.7	85
	Yes	*	*	*	*	*	*	*	*	*	*	*	*
Limited English Proficient (LEP)	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	58.8	23.0	201	67.2	22.3	172	70.2	19.5	89	70.0	19.4	85
At-Risk	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	58.6	22.9	204	67.2	22.1	175	69.7	20.1	90	69.5	19.9	86

Note. * denotes fewer than 5 students.

Table 3. Performance of Early Childhood Center Students on the 2012–2013 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	65.3	23.1	204	74.8	20.4	175	76.1	16.8	90	74.9	17.9	86
Gender	Female	68.1	21.1	113	75.2	19.2	82	78.4	15.9	49	76.6	15.3	47
	Male	61.8	25.2	91	74.4	21.4	93	73.3	17.7	41	72.9	20.7	39
Economically Disadvantaged	No	*	*	*	77.4	25.3	17	*	*	*	67.7	17.9	10
	Yes	65.6	23.1	200	74.5	19.8	158	76.1	16.8	90	75.9	17.8	76
Special Education	No	65.5	23.2	201	74.8	20.4	175	76.1	16.8	87	75.1	17.9	85
	Yes	*	*	*	*	*	*	*	*	*	*	*	*
Limited English Proficient (LEP)	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	65.5	23.2	200	74.6	20.4	172	76.3	16.8	89	75.6	16.8	85
At-Risk	No	*	*	*	*	*	*	*	*	*	*	*	*
	Yes	65.4	23.2	203	74.8	20.4	175	76.1	16.8	90	74.9	17.9	86

Note. * denotes fewer than 5 students.

Table 4. Performance of Early Childhood Center Students on the 2012–2013 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	55.5	19.3	146	48.8	18.3	95	56.0	20.0	184	45.6	20.0	68
Gender	Female	58.2	18.2	74	51.3	18.8	39	58.9	19.8	91	51.3	20.9	30
	Male	52.8	20.1	72	47.0	17.9	56	53.3	19.9	93	41.1	18.3	38
Ethnicity	Asian	*	*	*	58.7	21.0	17	*	*	*	*	*	*
	Hispanic	56.3	19.5	131	47.9	16.9	50	53.7	19.8	51	45.0	20.0	66
	Black	47.5	13.7	11	45.8	16.3	22	56.9	20.1	132	*	*	*
	White	*	*	*	41.7	23.8	5	*	*	*	*	*	*
	Other	*	*	*	*	*	*	*	*	*	*	*	*
Economically Disadvantaged	No	*	*	*	59.2	19.1	19	*	*	*	52.6	21.2	5
	Yes	55.4	19.3	144	46.2	17.3	76	56.0	20.0	184	45.0	20.0	63
Special Education	No	56.2	18.8	142	49.0	18.3	93	56.2	19.9	183	45.3	20.0	67
	Yes	*	*	*	*	*	*	*	*	*	*	*	*
Limited English Proficient (LEP)	No	54.1	19.9	116	45.9	16.3	40	56.2	20.0	180	44.3	19.8	56
	Yes	61.1	15.6	30	50.9	19.5	55	*	*	*	51.6	20.5	12
At-Risk	No	60.3	20.8	23	54.8	15.5	12	68.4	20.8	55	53.5	16.3	21
	Yes	54.7	18.9	123	47.9	18.6	83	50.8	17.2	129	42.0	20.6	47

Note. * denotes fewer than 5 students.

Table 5. Performance of Four Early Childhood Center Students on the 2012–2013 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	54.2	17.8	146	46.5	20.9	97	53.2	20.3	185	48.7	19.7	68
Gender	Female	56.5	16.8	74	48.2	19.3	39	53.7	19.7	91	55.8	18.7	30
	Male	51.9	18.6	72	45.4	22.0	58	52.7	21.0	94	43.2	18.9	38
Ethnicity	Asian	*	*	*	58.0	24.9	17	*	*	*	*	*	*
	Hispanic	54.6	17.6	131	45.7	18.5	52	51.3	20.7	52	48.7	20.0	66
	Black	48.3	15.7	11	40.7	18.4	22	53.8	20.2	132	*	*	*
	White	*	*	*	43.0	32.9	5	*	*	*	*	*	*
	Other	*	*	*	*	*	*	*	*	*	*	*	*
Economically Disadvantaged	No	*	*	*	61.6	17.4	19	*	*	*	39.7	19.3	5
	Yes	53.9	17.7	144	42.9	20.1	78	53.2	20.3	185	49.4	19.7	63
Special Education	No	54.8	17.6	142	47.1	20.7	95	53.4	20.1	184	48.9	19.8	67
	Yes	*	*	*	*	*	*	*	*	*	*	*	*
Limited English Proficient (LEP)	No	53.6	18.2	116	44.6	19.6	41	53.2	20.3	181	49.1	19.4	56
	Yes	56.8	16.2	30	48.0	21.9	56	*	*	*	47.0	22.0	12
At-Risk	No	60.7	16.0	23	57.9	12.8	13	65.7	15.9	55	62.2	14.4	21
	Yes	53.0	17.9	123	44.8	21.4	84	47.9	19.7	130	42.7	18.8	47

Note. * denotes fewer than 5 students.