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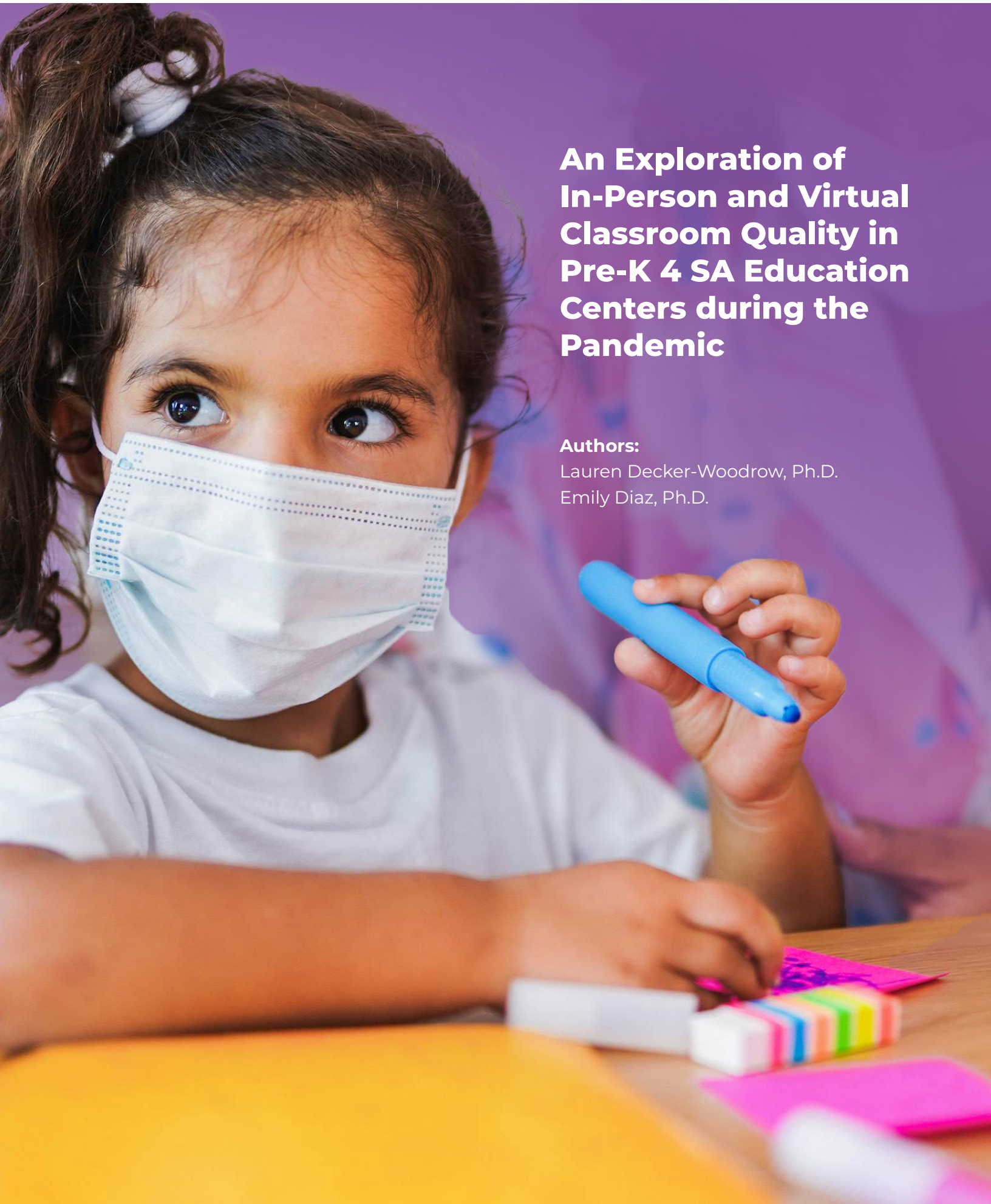

An Exploration of In-Person and Virtual Classroom Quality in Pre-K 4 SA Education Centers during the Pandemic

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Executive Summary

Pre-K 4 SA served more than 1,350 children across the four education centers during its eighth year of implementation (the 2020-21 school year). The Early Childhood Education Municipal Development Corporation contracted with Westat, a large employee-owned, global research firm, to conduct an independent evaluation of the Pre-K 4 SA program. This report, the first in a series documenting results of the Pre-K 4 SA initiative through the COVID-19 pandemic, explores attendance and observed classroom quality in the Pre-K 4 SA education centers during the 2020-21 pandemic school year.

During this pandemic school year, Pre-K 4 SA served roughly equal numbers of boys (**50.1%**) and girls (**49.9%**). The majority of Pre-K 4 SA children were Hispanic (**65.8%**), with the remaining children identified as Asian (**9.4%**), Black (**9.2%**), White (**11.7%**), and other ethnicities (**3.9%**). More than 45 percent of children attended Pre-K 4 SA for free; 37.1 percent did so on scholarship; and 17.1 percent were tuition-paying children. Of those children who attended Pre-K 4 SA for free, 70.6 percent did so based on income eligibility. The majority of children attended in-person (**60.5%**) with the remaining children attending virtually (**39.5%**).

Average attendance for Pre-K 4 SA children was 88 percent, which increased slightly to 90.4 percent when children who withdrew were excluded. Attendance was found to be significantly higher for children who attend virtually compared to in-person. Considering trends over time, attendance rates were stable over the first 6 years of implementation prior to the pandemic. Due to the initial school closures during the 2019-20 school year and the pandemic challenges of attending school during the 2020-21 school year, it is not surprising that attendance decreased from earlier stable patterns.

Westat conducted classroom observations using the Classroom Assessment Scoring System (CLASS) to assess the quality of teacher–child interactions in Pre-K 4 SA in-person and virtual classrooms. Overall, teachers were observed displaying high levels of Emotional Support, near high levels of Classroom Organization, and mid-range levels of Instructional Support. Between the fall and spring observations, significant increases were found in both Emotional Support and Classroom Organization. No significant quality differences were found between in-person and virtual classrooms. Taken together, the results suggest Pre-K 4 SA continued to provide quality learning environments to children during the pandemic.

Introduction

This report is the first in a series of reports documenting results of the Pre-K 4 SA initiative through the COVID-19 pandemic. In the current climate, discussions on the importance of early childhood education dominate policy and funding arenas at the local, state, and national levels. While some evidence suggests the importance of investing in such experiences (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Gray-Lobe, Pathak, & Walters, 2021; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010; Reynolds, Temple, White, Ou, & Robertson, 2011; Rolnick & Grunewald, 2003), other evidence suggests initial results are not sustained (Hill, Gormley, & Adelstein, 2015; Lipsey, Farran, & Durkin, 2018; Pages, Lukes, Bailey, & Duncan, 2020). Some point to the key factor of high-quality early childhood experiences as a potential differentiator in effects. Coupled with the importance of high-quality experiences is the fact that children who need such early experiences the most are often those who do not receive them. Previous research indicated that minority children, children from low-income backgrounds, and children who are English language and dual-language learners are more often exposed to lower quality instruction and learning environments (Bassok & Galdo, 2016; Chien et al., 2010; Valentino, 2018).

In the current climate, some cities are creatively supporting high-quality early childhood education. It is not surprising that local governments may look to provide programs given what is known about the benefits of early childhood education, coupled with the fact that only 16 states provide funding for full-day rather than half-day 4-year-old preschool programs, and the fact that only 31 states provide any funding for 3-year-old programs (Friedman-Krauss et al., 2021). San Antonio, Texas, is among several cities that have opted for investing in preschool education, in addition to state mandates. San Antonio is unique because the city has funded an early childhood program through a voter-approved 1/8 cent increase in local sales tax rates starting April 1, 2013 (and recently reauthorized). 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 an eighth year of implementation at the end of the 2020–21 school year.

The Early Childhood Education Municipal Development Corporation contracted with Westat, a large employee-owned, global research firm, to conduct an independent evaluation of the Pre-K 4 SA program. The purpose of the current series of reports is to present evaluation findings of the Pre-K 4 SA program during the pandemic school year (2020-2021). In particular, this report presents results of child attendance and classroom quality within the Pre-K 4 SA education centers.

Research Questions

The components of the Pre-K 4 SA evaluation that are the focus of this report include two main research questions:

1. What were the reported levels of children's attendance in Pre-K 4 SA during the 2020-21 pandemic school year?
   - **a.** How did attendance rates differ from previous pre-pandemic years?
   - **b.** Did attendance rates differ by instructional modality?

2. What was the overall teacher–child interaction quality observed in Pre-K 4 SA classrooms during the 2020-21 pandemic school year?
   - **a.** Did the interaction quality differ between fall of 2020 and spring of 2021?
   - **b.** Did the interaction quality vary by instructional modality?

Evaluation Sample and Methods

In this section, demographics characteristics for the sample are provided for children served during the 2020-21 school year as well as a brief discussion of methods used.

Sample

Data were provided for 1,359 children who attended Pre-K 4 SA education centers during the 2020-21 school year. Given the conditions of the pandemic, it is not surprising that Pre-K 4 SA served fewer children during that year compared to prior years (e.g., 2,005 children were served in 2019-20). In a recent report, the National Institute for Early Education Research (NIEER) found that pre-K enrollment rates declined by a range from 15 percent to 41 percent (Weisenfeld, 2021). Furthermore, looking more broadly among PK-12 enrollment, declines were largest among young children (National Center for Education Statistics, 2021). The enrollment decline for Pre-K 4 SA translates into 32.2 percent, which is within the range identified by NIEER.

Pre-K 4 SA served an approximately even split of boys (**50.1%**) and girls (**49.9%**). Of those more than 1,350 children, the majority who attended for free were represented within three districts: Northside Independent School District (ISD), San Antonio ISD, and North East ISD.[1] In addition, 17.1 percent of children paid tuition, and 37.1 percent received scholarships. Table 1 includes the percentage of children who attended by type of attendance as well as per partner school district for children who attended for no cost.

[1] These same three districts were also the majority representation in Years 1-7 (2013-14 to 2019-20).

Table 1 | Children who attended Pre-K 4 SA by type of attendance

District name	Number of children	Percentage (%) of total children
No-cost attendance	**623**	**45.8**
Northside	324	23.8
San Antonio	104	7.7
North East	68	5.0
Edgewood	41	3.0
East Central	23	1.7
Southwest	22	1.6
New Frontiers	15	1.1
Harlandale	14	1.0
South San	12	0.9
Scholarship attendance	**504**	**37.1**
Tuition attendance	**232**	**17.1**
Total	**1,359**	**100.0**

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

The average age of attending children on the first day of school (August 17, 2020) was 4.47 years.[2] The majority of Pre-K 4 SA children were Hispanic (**65.8%**), with the remaining children reported as Asian (**9.4%**), Black (**9.2%**), White (**11.7%**), and other ethnicities (**3.9%**). Out of all children enrolled (tuition, scholarship, and free attending), 62.7 percent were considered economically disadvantaged. For children who attended for free, this number rose to 70.6 percent. It is important to note, an additional 78 percent (**n=393**) of the 504 scholarship children also met income eligibility criteria (economic disadvantage); 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 at no cost.

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	440	70.6
English language learner	158	25.4
Foster care/Conservatorship	18	2.9
Military	81	13.0
Eligible total	**623**	**--**

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 46 percent. Children were removed from eligibility criteria counts in this table if they were identified as scholarship or tuition children. Due to potentially identifying information, it was not possible to provide descriptive information on homeless status.

[2] This average includes all children in the sample regardless of start date.

Methods

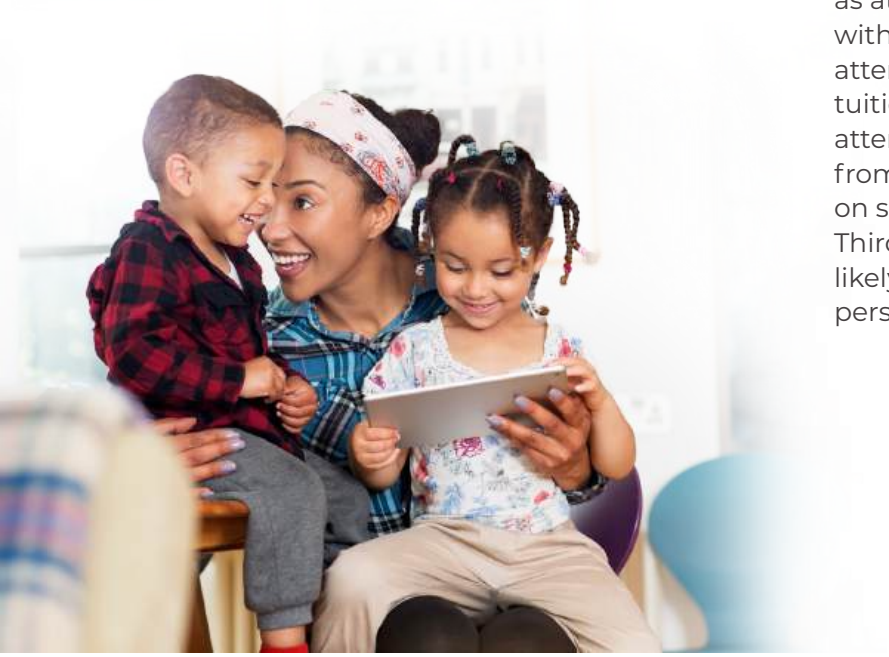
The research questions were addressed through analysis of existing Pre-K 4 SA databases and results from classroom observations. To address the descriptive question pertaining to attendance, data collected by Pre-K 4 SA were submitted to Westat and descriptively and inferentially analyzed. To address the descriptive and inferential questions pertaining to classroom quality, data were collected and analyzed from the Classroom Assessment Scoring System (CLASS) (Pianta, La Paro, & Hamre, 2008). CLASS is an observational system that assesses classroom practices in preschool by measuring the interactions between children and adults. Observations in the Year 8 evaluation consisted of five 20-minute cycles, followed by 10-minute coding periods.

Because of constraints of the pandemic, there were three additional differences in the observations as compared to previous years of the evaluation. First, rather than observations of all classrooms, in-person and virtual classrooms were randomly selected for observation. This was done to reduce burden by obtaining a representative snapshot of classrooms rather than conducting an observation in each classroom. Second, observations occurred in both the fall and spring of the school year, rather than just in the spring. This allowed for observation data to be gathered so as to better understand the level of teacher–child interactions closer to the beginning of the year (October) and toward the end of the year (April). Third, all observations were conducted remotely. To adhere to safety protocols, in-person observations were conducted via live Zoom feeds into the classroom, and virtual classes were recorded for observation coding. For more information on the observation procedures, see Appendix A.

Evaluation Results

Child Attendance in Pre-K 4 SA

Children began attending Pre-K 4 SA at different times, although the majority of children (**89.7%**) began at the start of the academic year (August 17, 2020). The last date a child began Pre-K 4 SA was April 8, 2021.[3] 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 was 1–173 days, with an average of 149 days. Average percentage attendance across all children was 88.2 percent. When considering children who stayed in membership with Pre-K 4 SA through the year (i.e., they did not withdraw), the average number of membership days rose to 168 days and the attendance percentage increased to 90.4 percent.



Over the course of the year, 230 (**16.9%**) children withdrew from Pre-K 4 SA. The earliest withdrawal occurred on August 18, 2020, with the last on May 24, 2021. Over 70 percent (**71.3%; n=164**) of the withdrawals occurred before the end of December 2020. No significant differences were found between children who did and did not withdraw in terms of gender (**t (1,357) = -1.77, p = .08**) and race/ethnicity (**F** (**4, 221.11) = 1.284, p=.28**).[4] However, significant differences were found for economic advantage status, eligibility type, and instructional modality. First, children identified as economically disadvantaged were less likely to withdraw from Pre-K 4 SA than non-disadvantaged children (**t (322.16) = 2.07, p = .04**).[5] Second, differences were also found with respect to eligibility to attend Pre K 4 SA for free, on scholarship, or tuition (**F (2, 561.90) = 35.07., p = .00**).[6] More specifically, children identified as attending on scholarship were more likely to withdraw from Pre-K 4 SA than either children attending for free or children attending on tuition. At the same time, children identified as attending for free were less likely to withdraw from Pre-K 4 SA than either children attending on scholarship or children attending on tuition. Third, children who attended virtually were more likely to withdraw then children who attended in-person (**t (952.80) = -4.99, p < .01**).[7]

[3] Although some children did not begin membership in Pre-K 4 SA until late spring, more than 97 percent of all children were in membership by the end of the 2020 calendar year.

[4] Results from Levene's test of homogeneity of variances showed equal variances could not be assumed; therefore, a Welch's analysis of variance (ANOVA) was conducted.

[5] Results from Levene's test of homogeneity of variances showed equal variances could not be assumed; therefore, the Welch Satterthwaite degrees of freedom were used.

[6] Results from Levene's test of homogeneity of variances showed equal variances could not be assumed; therefore, a Welch's ANOVA was conducted.

[7] Results from Levene's test of homogeneity of variances showed equal variances could not be assumed; therefore, the Welch Satterthwaite degrees of freedom were used.

Attendance Rates Over Time. Prior to the pandemic school year, attendance rates had remained relatively stable. On average, rates have consistently remained between 91–94 percent. Table 3 displays attendance for all children who attended the program as well as attendance for the subgroup of children who did not withdraw from the program. It not surprising that attendance dropped below 91 percent in 2020-21 given the pandemic and the fact that some children attended in-person and some virtually. An example of a similar trend is found in a recent analysis of the National Survey of Public Education's Response to COVID-19, which revealed elementary average attendance declined by 3 percent during the pandemic. More specifically, average elementary attendance prior to the pandemic was 95 percent and decreased to 92 percent during the pandemic in fall 2020 (Carminucci, Hodgman, Rickles, & Garet, 2021).

Table 3 | Pre-K 4 SA attendance over time

	Pre-COVID						COVID	
Enrollment status	**Year 1 2013-14**	**Year 2 2014-15**	**Year 3 2015-16**	**Year 4 2016-17**	**Year 5 2017-18**	**Year 6 2018-19**	**Year 7[a] 2019-20**	**Year 8 2020-21**
All enrolled children	92.3%	91.3%	92.5%	92.4%	91.0%	91.5%	91.0%	88.2%
Children who did not withdraw	93.7%	92.5%	93.6%	93.6%	92.4%	92.6%	92.2%	90.4%

[a]Attendance rates are based on data collected prior to the education centers closing in March 2020.

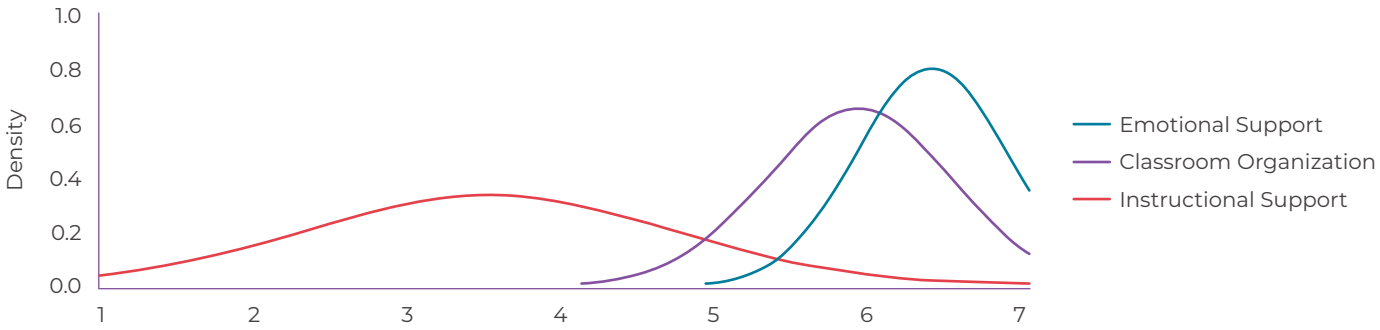
Attendance Rates by Instructional Modality. To determine how the pandemic influenced attendance in Pre-K 4 SA, a comparison of attendance rates, by instructional modality, revealed a significant difference (for more detailed information, see Appendix B Table B-1). Children who attended virtually had higher attendance (**89.4%**) compared to children who attended in-person (**87.4%**).

Pre-K 4 SA Teacher–Child Interaction Quality

Considering the ongoing pandemic and the fact that the implementation of Pre-K 4 SA was different in many ways during the 2020-21 school year, it was important to capture the level of quality teacher–child interactions that were possible within the context of the pandemic schooling of young children. The 2020-21 school year was the first time Pre-K 4 SA had conducted complex virtual classes of children from the outset. In addition, safety measures changed the in-person experience as well. With national concerns about the possible engagement and quality of experiences under the pandemic conditions, a total of 27 Pre-K 4 SA classrooms were randomly selected to be observed, both in the fall and spring, using CLASS.[8] The classrooms were distributed across the four Pre-K 4 SA education centers (ranging between five and eight classrooms per center) and instructional modalities (12 were in-person classrooms and 15 were virtual classes).

Scores for the Emotional Support domain ranged from 4.30–7.00 (on the 1 to 7 scale) across all five observation cycles, with most scores in the high range of Emotional Support (**average score of 6.42**). This score suggests effective teacher–child interactions occurred throughout most observations. Similarly, with an overall score very near the high range, Classroom Organization domain scores ranged from 4.07–6.93, which suggests that teachers proactively managed behavior and used time and materials effectively to get the most out of the time with children (**average score of 5.93**). Finally, Instructional Support domain scores ranged from 1.80–6.20, with an average score in the middle range at 3.53. This average score suggests only some observed interactions included support from teachers that extended children's thinking or that teachers asked questions encouraging children to analyze their thought processes throughout the observation period. Visual representations of each of the CLASS domain scores are provided in Figure 1 and more detail, including results by dimension, can be found in Appendix C, Table C-1.

Figure 1 | Average classroom quality scores for Pre-K 4 SA education centers



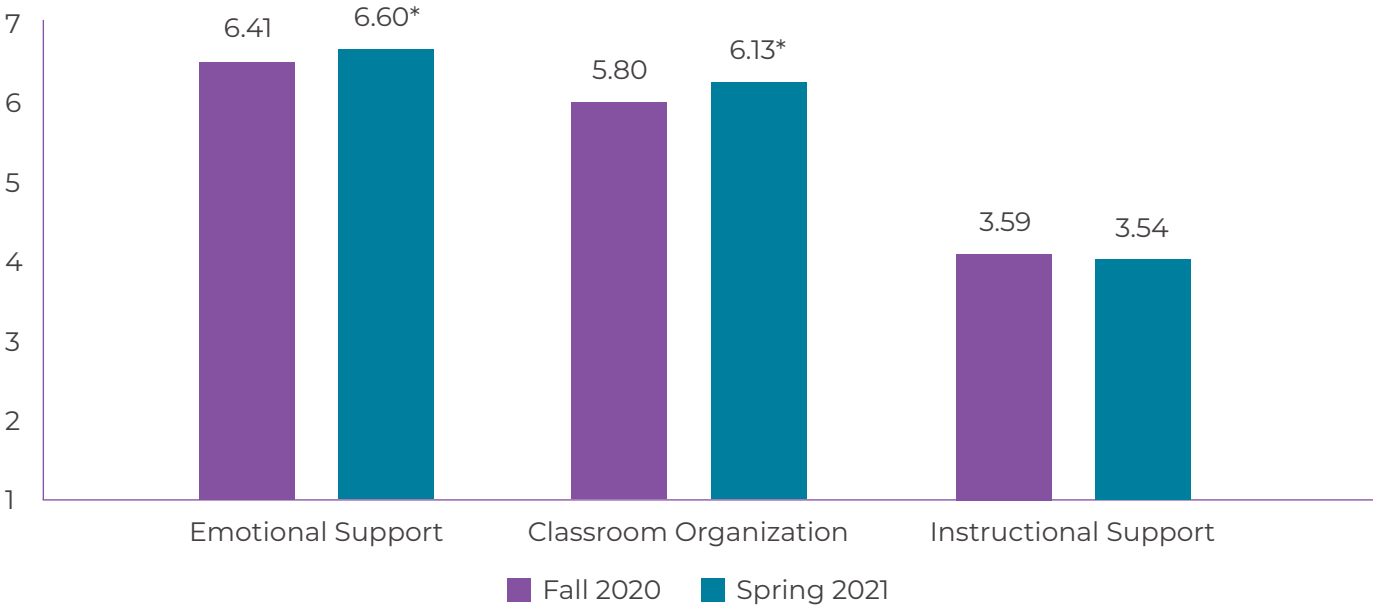
Previous research has found that children in classrooms with Emotional Support scores over 5 also have higher teacher ratings of social competence and lower ratings of behavior problems, while children from classrooms with Instructional Support ratings of 3.25 or above score higher on measures of reading, mathematics, and expressive language (Burchinal, Vandergrift, Pianta, & Mashburn, 2010).[9] From these results, it appears that despite the pandemic and changes to the classroom setting, Pre-K 4 SA teachers were able to maintain emotionally supportive interactions and provide activities that kept children interacting and understanding expectations. They were also able to provide cognitively engaging interactions for children, on average, at levels associated with positive outcomes.

[8] Twenty-two of the 27 classrooms were able to observed in both the fall and the spring. Five classrooms were observed only at one time, either due to changing assignments or lack of available video recording.

[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.

Interaction Quality by Time of Year. The three CLASS domains were analyzed to determine if there were significant differences in teacher–child interactions at the beginning and end of the 2020-21 school year. Two significant differences were found. In comparison to the fall 2020 observation results (beginning of the year), overall Emotional Support (**t=2.48, p<.05**) and Classroom Organization (**t=2.82, p<.05**) were significantly higher in the spring 2021 observation results (end of the year). No significant differences were found for Instructional Support between the same time points. These results are visually represented in Figure 2, with more detail in Appendix C, Tables C-2 and C-3.

Figure 2 | Average classroom quality scores by domain and time point

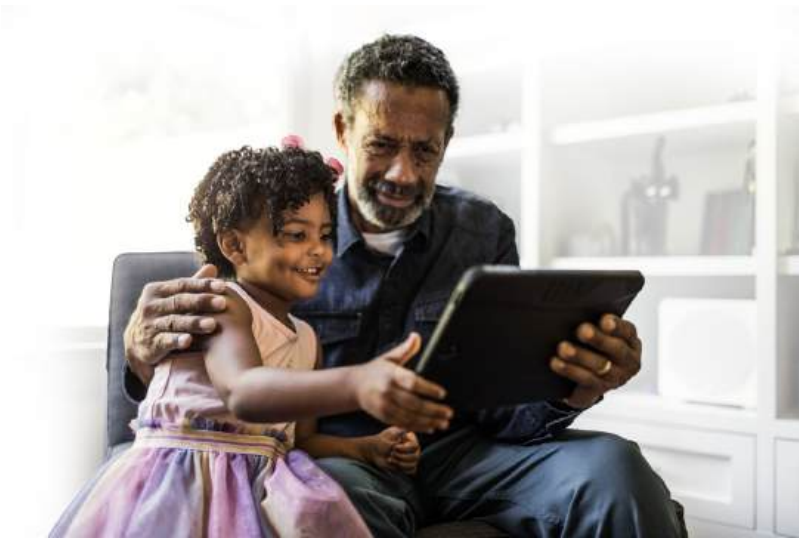


Instructional Modality. The three CLASS domains were also analyzed to determine if there were significant differences in classroom teacher–child interactions across instructional modalities (in-person and virtual classes). No significant domain level differences were found, indicating that in-person and virtually attending children were receiving similar levels of teacher-child interaction quality. One dimension level difference was found in fall 2020. Specifically, Regard for Student Perspectives was significantly higher in fall for in-person classrooms compared to virtual classes. However, by spring, this difference was no longer significant. (See Appendix C, Tables C-4, C-5, and C-6 for scores by domain and dimension.). This equality of experience, regardless of modality, was found overall and separately for each time point (fall and spring).

Conclusions and Limitations

Throughout the pandemic, teachers and students have faced many challenges. With the many unknowns and concerns with virtual learning, it has been imperative to collect information on these learning environments to understand the experiences of children in schools during this unique time. The findings reported here indicate that children's attendance, regardless of learning modality with Pre-K 4 SA, dropped off, much like it did for other children across the country (Carminucci et al., 2021). However, regardless of in-person or virtual instruction, the environments teachers were able to create were at a level of quality that research has identified as necessary for learning (Burchinal et al., 2010). Based on the randomly selected observations, Pre-K 4 SA teachers demonstrated high-quality, emotionally supportive environments as well as high-quality organizational environments by the spring. Additionally, throughout the year, teachers consistently provided mid-range instructional quality for all children regardless of instructional modality). As instructional quality has been identified as the most challenging type of interaction support for teachers across the nation pre-pandemic (Barnett & Friedman-Krauss, 2016; Vitiello, Pianta, Whittaker, & Ruzek, 2020), this finding is particularly meaningful and suggests Pre-K 4 SA teachers maintained the ability to provide opportunities for children to exercise their higher-order cognitive skills and to hear and use language.

Two important limitations of the current study require mention. First, while the current study focused on teacher–child interaction quality that is related to positive outcomes for children, direct child assessments were not included. Therefore, these findings do not directly explore learning during the pandemic. Second, no comparison classrooms outside of Pre-K 4 SA were observed. Therefore, it is not possible to compare how other classrooms, teachers, or programs may have been able to maintain pre-pandemic levels of quality interactions and place these findings in a larger context. However, these findings add to the existing literature on the learning and educational experiences of some of the nation's youngest learners during a complex and challenging school year. The findings suggest that Pre-K 4 SA teachers, despite the pandemic, continued to provide San Antonio children with nurturing, organized, and cognitively rich educational environments.



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Appendix A
Evaluation Methods

The purpose of Appendix A is: (1) to provide additional information on measures used in the 2020-21 Pre-K 4 SA pandemic year evaluation, and (2) to explain in detail the analytic approach utilized.

Measures and Procedures Classroom Assessment Scoring System (CLASS)

CLASS (Pianta, La Paro, & Hamre, 2008) is an observational system that assesses classroom quality by measuring the interactions between children and adults. Observations in the Year 8 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. Classrooms were randomly selected to participate in classroom observations and were observed at two time points: once in the fall of 2020 and again in the spring of 2021.

Because of constraints of the pandemic, there were two additional differences in the observations as compared to previous years of the evaluation. First, while observations typically occur with the observer in-person in the classroom, no observers were able to be present, "live" inside the classrooms, due to the nature of schooling during the pandemic year. Rather, in-person classrooms were observed via live Zoom feed to a remote observer. Virtual classrooms were videotaped throughout the same week that in-person classrooms were observed. These recordings were then watched and coded for virtual observation data collection. Second, in-person classrooms (as is typical) were observed during one full morning. However, children attending virtually switched between synchronous and asynchronous instructional opportunities throughout the day. Synchronous instructional time was the only time recorded and available for observation. These times were not long enough for a full observation due to the developmental appropriateness of online time for children. Therefore, multiple video recordings of virtual classrooms were required to complete a full observation on these classes. Because of the necessity to create the observation out of multiple, shorter engagements between teachers and children, these class observations spanned multiple recordings over the course of the same week that in-person observations were conducted. Taken together, these differences in observation construction suggest that caution should be taken when comparing and contrasting observation results between these types of experiences.

Interactions were measured through 10 different dimensions (see Table A-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. CLASS also measures the Classroom Organization domain through three dimensions: productivity, behavior management, and instructional learning formats. The Instructional Support domain is measured 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 A-1 | Descriptions of the 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 teachers' use of language-stimulation and language-facilitation techniques.

Analytic Approach

Research questions were addressed through analysis of study-collected data as well as existing Pre K 4 SA databases. To address the first two questions, *What were the reported levels of children's attendance in Pre-K 4 SA during the 2020-21 pandemic school year?* and *How did attendance rates differ from previous pre-pandemic years?*, data collected by Pre-K 4 SA were submitted to Westat and descriptively analyzed. To address the question *Did attendance rates differ by instructional modality?*, data were analyzed using an independent *t*-test. To address the questions *What was the overall observed teacher–child interaction quality observed in Pre-K 4 SA classrooms during the 2020-21 pandemic school year?*, *Did the interaction quality differ between fall of 2020 and spring of 2021?,* and *Did the interaction quality vary by instructional modality?*, data were analyzed from the CLASS observations both descriptively and inferentially, using independent (variation in quality by instructional modality) and dependent (interaction quality differences between fall of 2020 and spring of 2021) *t*-tests.

Appendix B
Additional Attendance Results

Table B-1 | Attendance by instructional modality results

	In-person	Virtual	Gap (In-person - Virtual)	*t*-test statistic	df	Initial p-value	Significance	Group favored[a]
Attendance rate	87.4%	89.4%	2.0%	-2.430	1,357	0.015	Significant	Virtual

[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."

Appendix C
Additional CLASS Results

Table C-1 | Descriptive statistics of Pre-K 4 SA CLASS scores across all observations

CLASS outcome	M (SD)	Total range observed
Emotional Support Domain	**6.42 (0.49)**	**4.30 – 7.00**
Positive Climate	6.68 (0.47)	4.40 – 7.00
Negative Climate[a]	6.90 (0.22)	6.00 – 7.00
Teacher Sensitivity	6.10 (0.90)	2.20 – 7.00
Regard for Student Perspectives	6.00 (0.85)	3.60 – 7.00
Classroom Organization Domain	**5.93 (0.60)**	**4.07 – 6.93**
Behavior Management	5.88 (0.88)	3.20 – 7.00
Productivity	6.22 (0.57)	5.00 – 7.00
Instructional Learning Formats	5.69 (0.81)	3.80 – 6.80
Instructional Support Domain	**3.53 (1.19)**	**1.80 – 6.20**
Concept Development	3.16 (1.15)	1.80 – 6.20
Quality of Feedback	3.63 (1.37)	1.60 – 6.60
Language Modeling	3.78 (1.18)	2.00 – 6.20

Note: All observations regardless of time point or instructional modality were used in these calculations.

M=mean; 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.

Table C-2 | Descriptive statistics of Pre-K 4 SA CLASS scores by time point

CLASS outcome	Fall 2020		Spring 2021	
	M (SD)	Total range observed	M (SD)	Total range observed
Emotional Support Domain	**6.41 (0.34)**	**(5.50 – 6.90)**	**6.60 (0.35)**	**(6.00 – 7.00)**
Positive Climate	6.65 (0.36)	(6.00 – 7.00)	6.81 (0.29)	(6.20 – 7.00)
Negative Climate[a]	6.89 (0.25)	(6.00 – 7.00)	6.92 (0.20)	(6.20 – 7.00)
Teacher Sensitivity	6.16 (0.57)	(4.20 – 6.80)	6.28 (0.71)	(4.80 – 7.00)
Regard for Student Perspectives	5.92 (0.78)	(4.20 – 6.80)	6.37 (0.52)	(5.20 – 7.00)
Classroom Organization Domain	**5.80 (0.54)**	**(4.80 – 6.93)**	**6.13 (0.52)**	**(5.20 – 6.93)**
Behavior Management	5.82 (0.77)	(4.20 – 6.80)	6.03 (0.84)	(4.20 – 7.00)
Productivity	6.01 (0.59)	(5.00 – 7.00)	6.50 (0.43)	(5.60 – 7.00)
Instructional Learning Formats	5.57 (0.77)	(4.20 – 6.80)	5.86 (0.80)	(3.80 – 6.80)
Instructional Support Domain	**3.59 (0.99)**	**(1.80 – 6.20)**	**3.54 (1.27)**	**(2.07 – 6.00)**
Concept Development	3.21 (1.06)	(1.80 – 6.20)	3.12 (1.12)	(2.00 – 5.40)
Quality of Feedback	3.66 (1.14)	(1.60 – 6.20)	3.68 (1.51)	(1.60 – 6.60)
Language Modeling	3.88 (0.95)	(2.00 – 6.20)	3.82 (1.29)	(2.00 – 6.00)

Note: Only the 22 classes with both fall and spring observations were used in these calculations.

M=mean; 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.

Table C-3 | CLASS quality by time of year results

	Spring 2021	Fall 2020	Difference (Spring - Fall)	*t*-test statistic	df	Initial p-value	Significance	Time Point Favored[a]
Emotional Support	6.60	6.41	0.19	2.48	21	0.022	Significant	Spring
Classroom Organization	6.13	5.80	0.32	2.82	21	0.010	Significant	Spring
Instructional Support	3.54	3.59	-0.05	-0.17	21	0.864	Not significant	No difference

Note: Only the 22 classes with both fall and spring observations were used in these calculations.

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

Table C-4 | Descriptive statistics of Pre-K 4 SA CLASS scores by instructional modality

CLASS outcome	In-person classrooms		Virtual classes	
	M (SD)	Total range observed	M (SD)	Total range observed
Emotional Support Domain	**6.53 (0.32)**	**6.00 – 7.00**	**6.31 (0.60)**	**4.30 – 7.00**
Positive Climate	6.64 (0.40)	6.00 – 7.00	6.71 (0.53)	4.40 – 7.00
Negative Climate[a]	6.83 (0.29)	6.00 – 7.00	6.97 (0.10)	6.60 – 7.00
Teacher Sensitivity	6.31 (0.56)	4.80 – 7.00	5.90 (1.10)	2.20 – 7.00
Regard for Student Perspectives	6.33 (0.48)	5.20 – 7.00	5.68 (1.01)	3.60 – 7.00
Classroom Organization Domain	**5.97 (0.57)**	**4.80 – 6.80**	**5.90 (0.64)**	**4.07 – 6.93**
Behavior Management	5.98 (0.79)	4.40 – 7.00	5.79 (0.96)	3.20 – 7.00
Productivity	6.22 (0.57)	5.00 – 7.00	6.23 (0.59)	5.20 – 7.00
Instructional Learning Formats	5.69 (0.84)	3.80 – 6.80	5.69 (0.80)	3.80 – 6.80
Instructional Support Domain	**3.47 (1.23)**	**1.80 – 6.20**	**3.58 (1.18)**	**2.00 – 6.20**
Concept Development	3.13 (1.20)	1.80 – 6.20	3.19 (1.12)	2.00 – 6.20
Quality of Feedback	3.48 (1.40)	1.60 – 6.60	3.77 (1.37)	2.00 – 6.40
Language Modeling	3.80 (1.21)	2.00 – 6.20	3.77 (1.18)	2.00 – 6.00

Note: Only the 22 classes with both fall and spring observations were used in these calculations.

M=mean; 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.

Table C-5 | Fall 2020 CLASS quality by instructional modality results

CLASS outcome	In-person (n=12 classrooms) Fall 2020		Virtual (n=14 classes) Fall 2020					
	M (SD)	Total range observed	M (SD)	Total range observed	Difference (in-person – virtual)	*t*-test statistic	df	p-value
Emotional Support Domain	**6.42 (0.28)**	**(6.00 – 6.90)**	**6.13 (0.70)**	**(4.30 – 6.85)**	**0.29**	**1.44**	**17.404**	**0.168**
Positive Climate	6.55 (0.44)	(6.00 – 7.00)	6.58 (0.67)	(4.40 – 7.00)	-0.03	-0.14	24	0.889
Negative Climate[a]	6.82 (0.32)	(6.00 – 7.00)	6.94 (0.13)	(6.60 – 7.00)	-0.12	-1.23	13.896	0.239
Teacher Sensitivity	6.20 (0.41)	(5.60 – 6.80)	5.67 (1.30)	(2.20 – 6.80)	0.53	1.44	15.915	0.170
Regard for Student Perspectives	6.13 (0.53)	(5.20 – 6.80)	5.33 (1.13)	(3.60 – 6.80)	0.80	2.38	19.03	0.028
Classroom Organization Domain	**5.83 (0.55)**	**(4.80 – 6.67)**	**5.68 (0.69)**	**(4.07 – 6.93)**	**0.15**	**0.61**	**24**	**0.547**
Behavior Management	5.87 (0.78)	(4.40 – 6.80)	5.61 (1.00)	(3.20 – 7.00)	0.26	0.72	24	0.478
Productivity	5.97 (0.58)	(5.00 – 6.80)	6.02 (0.62)	(5.20 – 7.00)	-0.05	-0.21	24	0.832
Instructional Learning Formats	5.65 (0.79)	(4.20 – 6.80)	5.40 (0.82)	(3.80 – 6.80)	0.25	0.79	24	0.438
Instructional Support Domain	**3.53 (1.15)**	**(1.80 – 6.20)**	**3.61 (1.15)**	**(2.13 – 6.20)**	**-0.08**	**-0.17**	**24**	**0.870**
Concept Development	3.20 (1.27)	(1.80 – 6.20)	3.29 (1.15)	(2.00 – 6.20)	-0.09	-0.19	24	0.852
Quality of Feedback	3.55 (1.28)	(1.60 – 6.20)	3.73 (1.30)	(2.00 – 6.40)	-0.18	-0.36	24	0.723
Language Modeling	3.85 (1.02)	(2.00 – 6.20)	3.80 (1.15)	(2.20 – 6.00)	0.05	0.11	24	0.915

Note: When degrees of freedom equal 24, the test of equality of variances was reasonable. When degrees of freedom do not equal 24, the test of equality of variances was not reasonable and Satterthwaite *t*-test is reported.

M=mean; SD=standard deviation; df = degrees of freedom

[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.

Table C-6 | Spring 2021 CLASS quality by instructional modality results

CLASS outcome	In-person (n=12 classrooms) Spring 2021		Virtual (n=14 classes) Spring 2021					
	M (SD)	Total range observed	M (SD)	Total range observed	Difference (in-person – virtual)	*t*-test statistic	df	p-value
Emotional Support Domain	**6.63 (0.35)**	**(6.00 – 7.00)**	**6.55 (0.35)**	**(6.00 – 7.00)**	**0.08**	**0.61**	**21**	**0.549**
Positive Climate	6.73 (0.33)	(6.20 – 7.00)	6.87 (0.21)	(6.40 – 7.00)	-0.14	-1.19	21	0.247
Negative Climate[a]	6.85 (0.26)	(6.20 – 7.00)	7.00 (0.00)	(7.00 – 7.00)	-0.15	-2.02	11	0.069
Teacher Sensitivity	6.42 (0.67)	(4.80 – 7.00)	6.18 (0.75)	(5.00 – 7.00)	0.24	0.79	21	0.438
Regard for Student Perspectives	6.53 (0.36)	(6.00 – 7.00)	6.13 (0.63)	(5.20 – 7.00)	0.40	1.93	21	0.067
Classroom Organization Domain	**6.11 (0.58)**	**(5.20 – 6.80)**	**6.19 (0.46)**	**(5.53 – 6.93)**	**-0.08**	**-0.37**	**21**	**0.713**
Behavior Management	6.10 (0.81)	(4.60 – 7.00)	6.02 (0.90)	(4.20 – 7.00)	0.08	0.23	21	0.821
Productivity	6.48 (0.44)	(5.60 – 7.00)	6.49 (0.43)	(5.80 – 7.00)	-0.01	-0.04	21	0.967
Instructional Learning Formats	5.73 (0.92)	(3.80 – 6.80)	6.06 (0.63)	(4.60 – 6.80)	-0.33	-0.97	21	0.345
Instructional Support Domain	**3.41 (1.36)**	**(2.13 – 6.00)**	**3.54 (1.26)**	**(2.00 – 5.27)**	**-0.13**	**-0.23**	**21**	**0.817**
Concept Development	3.07 (1.17)	(2.00 – 5.40)	3.07 (1.12)	(2.00 – 4.80)	0.00	-0.01	21	0.990
Quality of Feedback	3.42 (1.56)	(1.60 – 6.60)	3.82 (1.51)	(2.00 – 6.20)	-0.40	-0.63	21	0.538
Language Modeling	3.75 (1.41)	(2.60 – 6.00)	3.73 (1.27)	(2.00 – 5.40)	0.02	0.04	21	0.968

Note: When degrees of freedom equal 24 (fall) or 21 (spring), the test of equality of variances was reasonable. When degrees of freedom do not equal 24 (fall) or 21 (spring), the test of equality of variances was not reasonable and Satterthwaite *t*-test is reported. Some virtual classes were not available to be included in the spring due to teacher movement back to in-person instruction.

M=mean; SD=standard deviation; df = degrees of freedom

[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.

Appendix References

Pianta, R., LaParo, K., and Hamre, B. (2008). *Classroom assessment scoring system*. Baltimore, MD: Brookes Publishing.