Texas Four-Day School Week Campus Analysis 2022–23 School Year

OFFICE OF ANALYTICS, ASSESSMENT AND REPORTING

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TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

LIST OF ACRONYMS

Additional Days School Year (ADSY)

Five-day school week (5dsw)

Four-day school week (4dsw)

Propensity score matching (PSM)

Public Education Information Management System (PEIMS)

Reading Language Arts (RLA)

State of Texas Assessments of Academic Readiness (STAAR®)

Texas Classroom Teachers Association (TCTA)

Texas Education Agency (TEA)

SUMMARY

PURPOSE

This report presents findings of an analysis of State of Texas Assessments of Academic Readiness (STAAR®) performance in reading language arts (RLA) and mathematics comparing students from Texas public school campuses with a four-day school week (4dsw) calendar to students from Texas public school campuses with a five-day school week (5dsw) in the 2022–23 school year.

KEY FINDINGS

In 2022–23, 4dsw students had lower performance than 5dsw students in Grades 6-8 STAAR-RLA and Grades 4-6 STAAR-Mathematics. These differences were significant in a logistic regression that controlled for prior-year achievement scores.

- The percentage of students at 5dsw campuses who met the STAAR Meets Grade Level standard in RLA was 6-8 percentage points higher on average than students attending 4dsw campuses.
- The percentage of students at 5dsw campuses who met the STAAR Meets Grade Level standard in mathematics was 5-8 percentage points higher on average than students attending 4dsw campuses.

TEXAS FOUR-DAY SCHOOL WEEK IMPLEMENTATION

In Texas, the adoption of a 4dsw calendar has not been widespread until recent years. According to the Texas Classroom Teacher Association (TCTA), only one district had made this change beginning in the 2016–17 school year, followed by four others in 2019–20. Adoption has continued to grow, increasing significantly to 40 districts post-COVID through the 2022–23 school year (TCTA, 2023). For the purposes of the analysis in this report, district-reported calendar data was used to estimate the number of campuses operating a 4dsw calendar, given districts do not register their status as 4dsw or 5dsw with the Texas Education Agency (TEA). After using multiple methods to confirm 4dsw calendar status for inclusion in the analysis, the sample included 137 campuses representing 76 districts (see Appendix A). Of these campuses, 57 had been on a 4dsw calendar for 2 to 5 years. After statistically matching to students in 5dsw campuses for each grade and subject, 21,260 unique students attending 4dsw campuses and 70,673 unique students attending 5dsw campuses were included in the analysis.

RESEARCH FROM A NATIONAL PERSPECTIVE

The adoption of 4dsw calendars in the United States has grown in recent years (Thompson, 2021b) since the COVID-19 pandemic (Kraft & Novicoff, 2025). Districts that adopt 4dsw calendars often cite a variety of reasons including cost savings measures, teacher recruitment and retention factors, reducing student absences, and stakeholder satisfaction (Kilburn et al., 2021).

Recent research has shown that although there are perceived positive impacts of a 4dsw calendar and stakeholders believe it does not have detrimental effects on achievement (Kilburn et al., 2021), there are nevertheless important impacts to teacher retention and student achievement to consider from a policy perspective. Ainsworth, Penner, and Liu (2024) recently examined the impact of adopting a 4dsw on teacher retention in Oregon and found that, because teachers had chosen to work in a campus with a 5dsw calendar, adopting a 4dsw calendar increased turnover among teachers by 2.3 percentage points immediately and in the long term by 1.3 percentage point; however, non-teaching staff turnover was not impacted. Based on anecdotal evidence, the researchers reported that any benefits of a 4dsw schedule to teacher retention disappeared after nearby districts adopted a 4dsw calendar. Kilburn et al., (2021) also found weak support in their analysis related to teacher retention, cost savings, and reducing absences.

In a longitudinal study of 4dsw adoption in Oregon, Thompson (2021a) examined 15 years of student achievement data and found that implementation of a 4dsw calendar decreased reading and math achievement by a small but significant amount, and the cost savings were comparable to other interventions aimed at reducing cost savings. The reductions in student achievement were attributed to fewer hours in school which averaged out to 3 to 4 hours a week. In another study, Thompson (2021b) found that while there was a notable decrease in student achievement upon adoption of a 4dsw calendar, sustained implementation over four years led to further declines unless districts switched back to a 5dsw calendar. However, in a subsequent analysis across 12 states, Thompson and Ward (2022) concluded that when students in a 4dsw district spent more time in school by extending the school day or year, there were no significant differences in achievement between students in 4dsw districts compared to those in 5dsw districts. For 4dsw districts in the study that did not extend their school day or year, statistically negative impacts of attending a 4dsw district on achievement were seen. This suggested maintaining adequate overall time in school should be a key policy consideration for school districts adopting a 4dsw schedule.

Research conducted by RAND (Kilburn et al., 2021) found that districts adopting a 4dsw calendar typically had longer school days but fewer school days and fewer instructional hours within in a school year than districts with 5dsw calendars. Although they did not find any significant differences in achievement between students in 4dsw and 5dsw schools, student achievement did not grow at the same rate in schools with a 4dsw calendar. While student achievement was generally trending upward over time, growth for 4dsw districts was not as large as districts with a 5dsw calendar and, as Thompson (2021b) found, the difference grew more pronounced over time.

In other recent research, Morton, Thompson and Kuhfeld (2023) confirmed that an adoption of a 4dsw schedule has negative impacts on student achievement in reading and math with more significant impacts in non-rural areas, especially over a long-term implementation. It was concluded that how districts implement the 4dsw is important. The researchers suggested that creating schedules to accommodate students' academic progress was a key consideration to make when adopting a 4dsw calendar. This could include subject-specific instructional time, providing instructional opportunities on the fifth day, or considering start and end times to the school day.

In a recent review, Kraft and Novicoff (2025) examined the impacts of the different ways in which districts alter school day schedules, including the adoption of a 4dsw calendar. Overall, there was evidence in the literature that increasing the total school time through longer days or longer school years leads to growth in academic achievement and that achievement declines when districts reduce time in school by adopting a 4dsw calendar without maintaining a higher total amount of time spent in school. When districts adopt a 4dsw calendar and reduce the total time spent in schools, the average student can be exposed to 85 fewer total instructional hours per school year than students attending a 5dsw calendar, which in their findings led to a decrease in achievement.

ANALYTIC APPROACH

RESEARCH QUESTION

Do STAAR outcomes in 2022–23 differ for Texas public school students who attend 4dsw campuses compared to those who attend 5dsw campuses?

METHODS OVERVIEW

CAMPUS IDENTIFICATION

Currently in Texas, there is no standard definition or codified implementation for a 4dsw calendar. In addition, Texas school districts do not register their campuses with Texas Education Agency as 4dsw campuses. For the analysis in this report, 4dsw and 5dsw campuses were estimated using PEIMS campus calendar data, combined with media reports about 4dsw districts, and qualitative reviews of published school calendars online as supporting evidence for 4dsw.[1] See Appendix A for methodological details.

CAMPUS AND STUDENT MATCHING

Once identified, Texas public school campuses with 4dsw calendars in 2022–23 were then matched on similar campus-level characteristics to campuses with 5dsw calendars, resulting in 137 4dsw campuses in the sample. The matched 5dsw campuses were used as comparison pools for student-level matching. Statistical matching procedures were used to create comparison student samples for each grade and STAAR test subject from the students in the comparison campus pools. Students were matched based on similar student-level characteristics. After statistically matching to students in 5dsw campuses for each grade and subject, 21,260 unique students attending 4dsw campuses and 70,673 unique students attending 5dsw campuses were included in the analysis. For more detailed information about the matching, please see Appendix A.

ANALYSIS

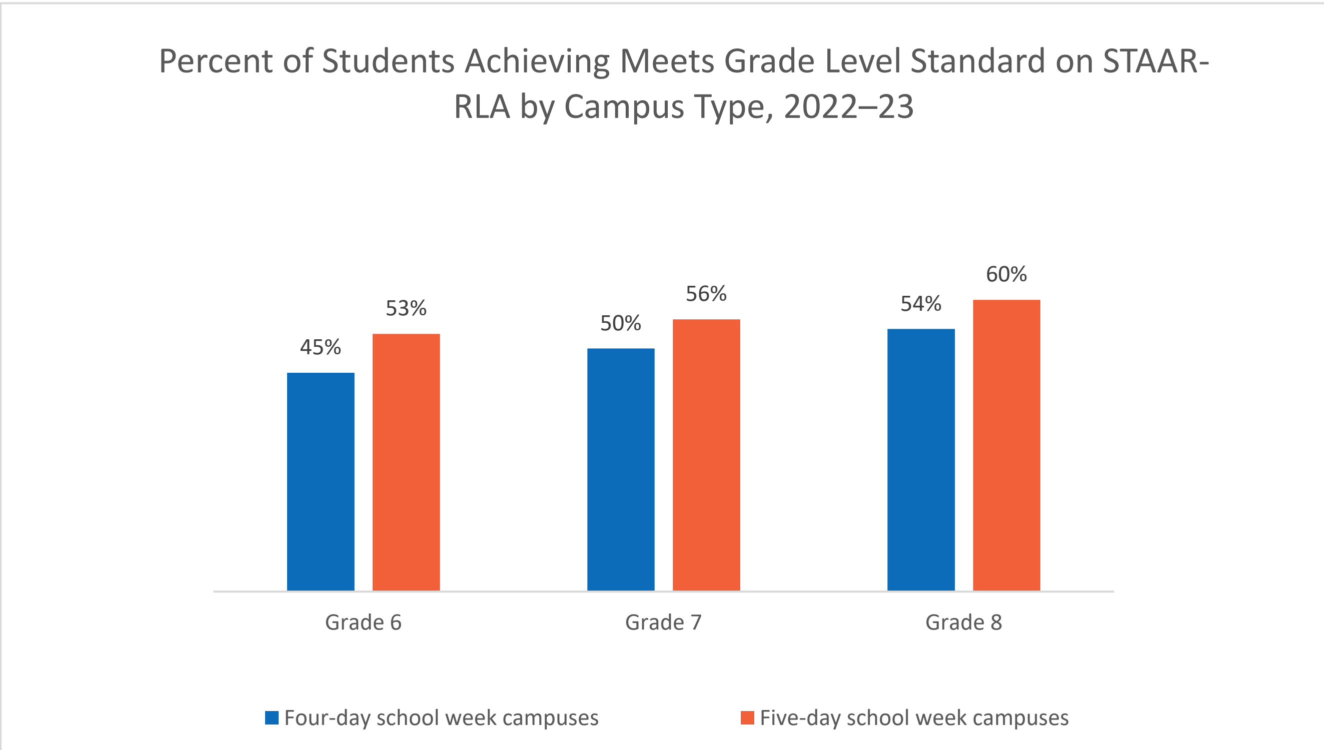
An analysis of each grade and subject area on STAAR was first done with the matched sets of 4dsw and 5dsw students and tested using chi-square. Because prior-year STAAR achievement is associated with outcomes in the analysis year, an additional statistical analysis was performed to determine whether significant differences between groups persisted once prior-year STAAR achievement was controlled for in the analysis.

[1] Decisions to adopt a 4dsw calendar for their regular instructional campuses are made at the district level, however, the PEIMS data used in this analysis was collected at the campus level.

FINDINGS

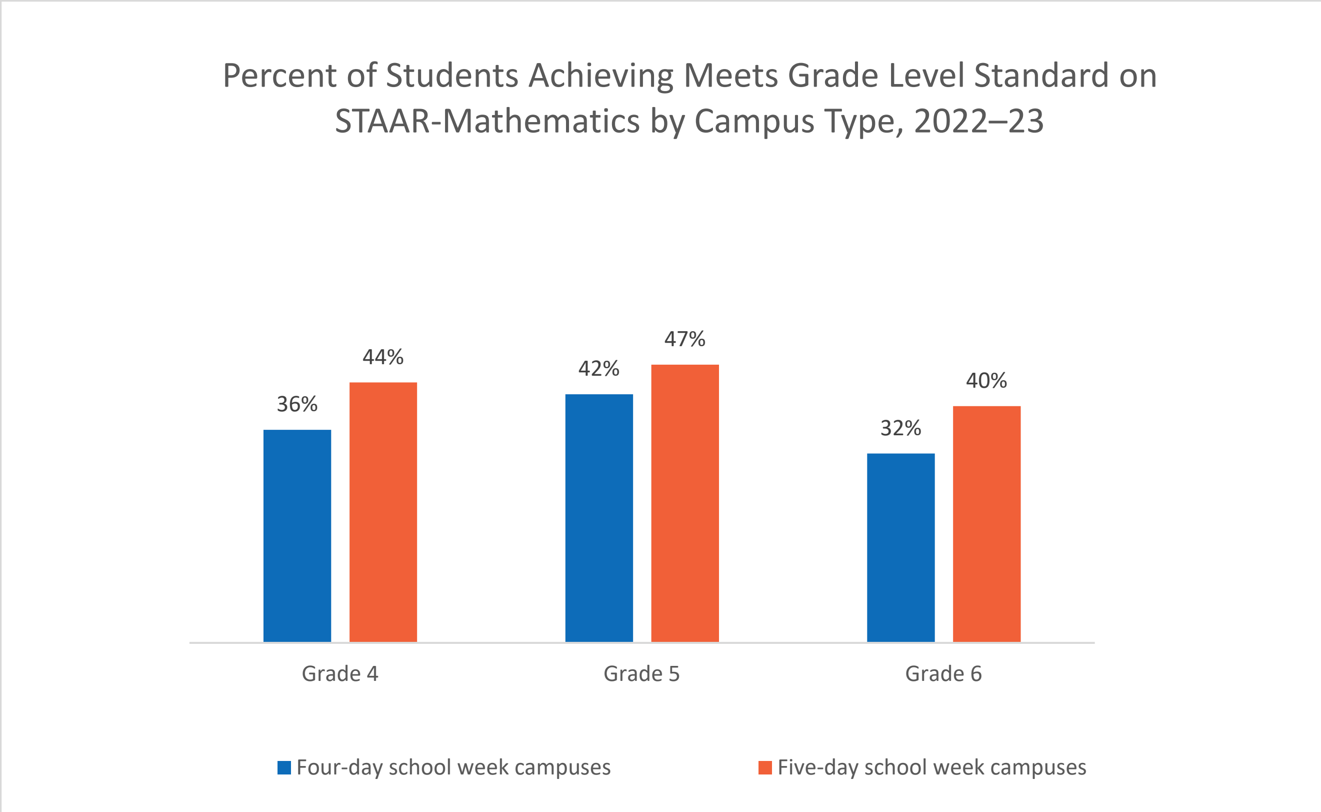
In general, 4dsw students had lower performance than 5dsw students, however, the differences were small and only in some cases statistically significant. On average, the percentage of students from 4dsw campuses who achieved the Meets Grade Level standard in 2022–23 was lower compared to students from 5dsw campuses in Grades 6-8 STAAR-RLA (Figure 1) and Grades 4-6 STAAR-Mathematic (Figure 2). These differences were statistically significant when incorporating statistical controls for prior-year achievement.

Figure 1. Difference in Meets Grade Level on STAAR-Reading Language Arts (RLA) by Campus Type, 2022–23



Source. State of Texas Assessments of Academic Readiness (STAAR), 2021–22 and 2022–23.
Note. OR – Odds ratio. χ2 – chi-squared statistic. The cohort differences, displayed above, were significant at the group level for Grade 6 (χ^2 (1, n=11,073) = 50.0, $p < .001$), Grade 7 (χ^2 (1, n=10,780) = 28.0, $p < .001$), and Grade 8 (χ^2 (1, n=11,417) = 30.5, $p < .001$). Additionally, the differences were significant in the logistic regression model for Grade 6 (OR = 0.65 $p < .001$), Grade 7 (OR = 0.78 $p < .001$), and Grade 8 (OR = 0.78 $p < .001$).

Figure 2. Difference in Meets Grade Level on STAAR-Mathematics by Campus Type, 2022–23



Source. State of Texas Assessments of Academic Readiness (STAAR), 2021–22 and 2022–23.

Note. OR – Odds ratio. $\chi 2$ – chi-squared statistic. The cohort differences, displayed above, were significant at the group level for Grade 4 ($\chi 2$ (1, n=9,881) = 48.5, $p < .001$, Grade 5 ($\chi 2$ (1, n=9,074) = 15.4, $p <.001$), and Grade 6 ($\chi 2$ (1, n=11,639) = 51.7, $p <.001$). Additionally, the differences were significant in the logistic regression model for Grade 4 (OR = 0.77 $p < .001$), Grade 5 (OR = 0.87 $p = .034$), and Grade 6 (OR = 0.62 $p < .001$).

LIMITATIONS

4DSW AND 5DSW SAMPLE POOL ESTIMATION

Campuses included in the analysis were estimated using methods described in Appendix A in this report. Although multiple methods were used to identify the campuses as 4dsw or 5dsw, it is possible that some campuses may have been misidentified for a variety of reasons and their inclusion could have resulted in different findings.

LENGTH OF TIME A CAMPUS IS 4DSW

The length of time that each campus in the sample began implementing a 4dsw calendar could not be consistently determined for this analysis. While some campuses may have implemented a 4dsw calendar for just one year, others may have been implementing 4dsw calendars for longer. Therefore, the length of exposure to a 4dsw calendar will vary for students across the sample.

Furthermore, district and campus calendars may have been atypical due to the effects of school closures related to COVID-19 in 2019–20 and 2020–21. Most districts with a 4dsw calendar in the state began implementing the calendar in the years after 2021-22, therefore there is limited data to analyze any longitudinal impacts. Relatedly, there is limited STAAR data post-COVID-19 that was available for this analysis. There were no STAAR exams in 2019–20, exam participation was below normal rates in 2020–21, and STAAR was redesigned in 2022–23, limiting analyses of student performance over time.

HOMOGENEITY IN DEMOGRAPHICS

The practice of adopting a 4dsw calendar most often occurs in rural areas of the state where there is less variation among demographics in the student population. Although statistical techniques were employed to control for the homogeneity of the student-level comparison sample, findings are not generalizable to the entire state.

UNMEASURED FACTORS

There are possible unmeasured factors that may contribute to the results. For example, campuses that have adopted a 4dsw calendar may have done so due to a lack of available qualified teachers in their area which may have had an effect on prior performance as well as a persistent effect on current performance.

APPENDIX A: SUPPORTING DOCUMENTATION

METHODOLOGICAL DETAILS

CAMPUS ESTIMATION

The following methods were used to estimate the 4dsw and 5dsw campuses:

Campuses were identified as using a 4dsw calendar if: a) at least 55% of a campus's weeks were four-day, per analysis of PEIMS calendar data; and b) the campus was identified as 4dsw in at least one media report (e.g., KXAN, Ft Worth Star-Telegram, Texas Classroom Teachers Association, as available); or c) qualitative research such as a news report or instructional calendar review found evidence of the campus using a four-day week.

Only regular instructional campuses were included. Additional Days School Year (ADSY) campuses were excluded because the TEA-derived percentage does not account for ADSY days, which look like non-instructional days in the data but are actually instructional days. Since 4dsw is a district policy, campuses were excluded when evidence showed 4dsw was the exception rather than the rule within a local education agency.

Campuses were identified as using a 5dsw calendar if: a) a lower percentage of a campus's weeks were four-day, per analysis of PEIMS calendar data, <30.2%; and b) the campus was not identified as 4dsw in any media report (e.g., KXAN, Ft Worth Star-Telegram, Texas Classroom Teachers Association, as available).[2] Only regular instructional campuses were included.

CAMPUS ESTIMATION NOTES

Currently in Texas, there is no standard definition or codified implementation for a four-day school week (4dsw) calendar. In addition, Texas school districts do not register their campuses with Texas Education Agency (TEA) as 4dsw campuses. For the analysis in this report, 4dsw and five-day school week (5dsw) campuses were estimated using Public Education Information Management System (PEIMS) campus calendar data, combined with media reports about 4dsw districts, and qualitative reviews of published school calendars online as supporting evidence for 4dsw.[3] Both quantitative and qualitative methods were used to identify campuses operating a 4dsw calendar to increase the validity of the identification. Using a cut point of 55% of a campus's weeks to estimate a 4dsw calendar identified 169 campuses representing 90 districts that were potentially operating a 4dsw calendar in 2022-23. The qualitative methods used to confirm the calendar status reduced the count to 137 campuses from 76 districts.

It is important to note that some campuses that use a five-day, traditional calendar may also have weeks with four instructional days or fewer due to holidays, in-service days, etc. Similarly, there are campuses that would call themselves a 4dsw campus that shift their schedule back to five days a week during the school year, for reasons such as STAAR testing or other locally-defined reasons.

[2] To determine the percentage cut point for 5dsw campuses, a histogram was created to show the distribution of the percentage of four-day school weeks for all campuses in the PEIMS calendar data. The histogram resembled a normal distribution, with a few outliers on the higher end. The peak percentage on the histogram was selected to approximate the average percentage in order to ensure the comparison group did not operate on a 4dsw calendar.

[3] Decisions to adopt a 4dsw calendar for their regular instructional campuses are made at the district level, however, the PEIMS data used in this analysis was collected at the campus level.

There is no threshold at which a campus calendar can reliably be considered 4dsw versus 5dsw, primarily because districts may adopt this schedule with varying configurations resulting in disparate percentages of four days of instruction per week. For example, some 4dsw campuses have every Friday off, some have a combination of four- and five-day weeks, and some adopt a "hybrid calendar," which can vary in implementation from a small percentage to a higher percentage of 4dsw. Districts also vary in how they make up minutes from days off during the week. Some districts extend the school year while some extend the school day, which may have a differential impact on student performance.

Due to the variation in calendar configurations, district calendars were qualitatively reviewed to verify 4dsw calendar status estimated by PEIMS data. If calendars could not be found and/or no other qualitative evidence of 4dsw status existed, campuses were removed from the sample, even those identified with higher percentages of 4dsw in PEIMS data. In some cases, districts may have been piloting a 4dsw calendar but not publicizing it yet. Excluding campuses that looked like 4dsw but were not verified qualitatively could have a differential impact on student performance. Additionally, since this analysis relied on an estimation to identify a 5dsw traditional campus, not all campuses that could have been operating a traditional calendar were included in the analysis and a lower threshold for inclusion as a 5dsw was determined as well.

In the qualitative review of calendars, there were some cases where districts with 4dsw calendars were implementing "flex days" which could make a 4dsw campus appear to be a 5dsw campus in PEIMS. For example, one district had "Flex Fridays" where instruction was offered to students who needed additional help and the rest of the student body was excused from attending. Those "flex days" can be recorded as instructional days in PEIMS, so these campuses would appear as a 5dsw calendar in PEIMS but are effectively operating a 4dsw calendar. These campuses could only be verified as 4dsw in this analysis if they appeared on a media list. This may have a differential impact on student performance as it is difficult to detect these types of campuses.

MATCHED SAMPLE IDENTIFICATION

CAMPUS-LEVEL MATCH

To select similar campuses to create a comparison pool, a set of 5dsw campuses was chosen for each 4dsw campus in the sample using propensity score matching (PSM) with a 1 to 10 match and resampling. Each campus was matched with at least 3 and up to 10 other campuses. The following campus characteristics were used in the matching process: campus size, percent economically disadvantaged, percent African American, percent Hispanic, percent White, prior year State of Texas Assessments of Academic Readiness (STAAR®) performance, grade grouping, geographic community type (National Center for Education Statistics locale). Table A1 includes the overall demographic characteristics of each type of campus.

In total, there were 137 4dsw campuses and 600 5dsw campuses included in the analysis for this report.

Table A1. Demographic Characteristics of Four- and Five-Day School Week Campuses, 2022–23

	4dsw	5dsw
Total number of campuses	*137*	*600*
Average enrollment	323	472
% Race/ethnicity		
African American	6.7	7.3
Asian	0.4	1.2
Hispanic	31.8	39.0
White	57.2	49.0
% Economic Status		
Economically disadvantaged	64.9	60.6
% Instructional program or special population		
Emergent bilingual students/English learners	8.1	11.9
Special education	14.4	14.0
% Locale		
Rural	80.3	67.5
Town	16.1	25.3
City	0.7	0.7
Suburban	2.9	6.5

Sources: Texas Education Agency (2023), Texas Academic Performance Report, 2022–23.
Note: 4dsw – Four-day school week; 5dsw – Five-day school week; Overall percentages presented in this table for race/ethnicity, economic status, instructional program or special population represent the average of the campus level percentages while percentages for locale represent the percentage across campuses.

STUDENT-LEVEL MATCH

From the pool created in the campus-level matching process, at least one 5dsw student was selected for each 4dsw student in the sample using PSM with a 1 to 5 match and without resampling. Each student was matched with at least 1 and up to 5 other students from comparison campus pools. Some 4dsw students could not be matched and were excluded from the analysis. The following student-level characteristics were used in the matching process: prior year STAAR performance (not used for Grade 3 PSM), gender, race/ethnicity (categorized as Black, Hispanic, White, Asian, Other), economic status, at risk status, and received special education services.

The sample size of students included in each grade and subject analysis varied. For 4dsw campuses the sample size ranged from 2,320 to 3,092, while for 5dsw campuses, it ranged from 6,754 to 12,482 for each subject and grade. A comparison of the student characteristics of the final 4dsw and 5dsw samples, after the matching process was completed, indicated that the samples were balanced on all student characteristics except for some small differences in prior year STAAR performance. These differences were subsequently controlled for in the statistical analysis.

STATISTICAL ANALYSIS

This study first compared the proportion of students achieving Meets Grade Level performance standard from 5dsw and 4dsw campuses testing the null hypothesis that the difference of proportions equals zero. Difference of proportions is zero when the outcome is independent of the group, i.e., 4dsw vs 5dsw.

Null Hypothesis (H_0): The two proportions are equal ($p_1 = p_2$).

Sample proportions are given by

$$(p\_1)\hat{} = x\_1/n\_1 \quad and \ (p\_2)\hat{} = x\_2/n\_2$$

n_1 and n_2 are sample sizes for treatment and comparison groups, x_1 and x_2 are number of successes, i.e. number of students achieving Meets Grade Level performance standard for treatment and comparison groups.

The estimated standard error is given with

$$SE = \sigma\hat{}(p\_1 - p\_2) = \surd((p\_1 \ (1 - p\_1))/n\_1 \ + (p\_2 \ (1 - p\_2))/n\_2)$$

Then the test statistic, *z*, is used to obtain the *p*-value to test H_0 using the standard normal distribution.

$$z = ((p\_1)\hat{} - (p\_2)\hat{})/SE$$

Difference of proportions test did not account for the prior student achievement therefore logistic regression was utilized to account for the prior student achievement.

Logistic regression is a statistical method used to model the relationship between a binary dependent variable (e.g., student performance level: pass/fail) and one or more independent variables (covariates).

This study utilized logistic regression model to estimate the probability that a student will achieve Meets Grade Level performance standard based on students' prior year achievement and participation in the treatment (e.g. four-day school week vs five-day school week). The logistic regression equation is given as:

$$logit(P) = \beta_0 + \beta_1 \times Prior\ Year\ Achievement + \beta_2 \times Treatment$$

Here, P is the probability of the student passing, β_0 is the intercept, and β_1 is the coefficient for the prior year achievement and β_2 is the coefficient for the treatment.

The coefficients (β) indicate the strength and direction of the relationship between the covariates and the outcome. For example, a positive β_1 would suggest that higher prior year achievement increases the likelihood of passing.

The exponentiated coefficients e^{β_2} can be interpreted as odds ratios, which reflect how the odds of passing change with being in 4dsw versus 5dsw.

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