PURPOSE

The Department of Early Childhood requested an investigation into the long-term effects of AISD half-day versus full-day prekindergarten (pre-K) participation. Austin Independent School District (AISD) currently funds a full-day pre-K program for all students who qualify. This report provides:

- Historical background of the full-day and half-day pre-K programs
- Description of the pre-K enrollment increase that resulted from the district-wide implementation of the full-day program in 2002–2003
- Reanalysis of the Peabody Picture Vocabulary Test, Third Edition (PPVT-III) and the Test de Vocabulario en Imagenes Peabody (TVIP) comparisons for half-day and full-day pre-K programs for the 2001–2002 and 2009–2010 cohorts
- Comparison of Spring 2010 7th-grade reading and mathematics (math) scores on the Texas Assessment of Knowledge and Skills (TAKS) for the 2001–2002 pre-K cohort

FINDINGS

The major findings of this report include:

- District-wide half-day pre-K programming was implemented in AISD in 1986–1987 to increase the number of students served by the AISD pre-K program, using only state and local funds; 1,516 students were served that year. In 1987–1988, the district re-implemented full-day programming to some schools relying on Chapter 1 (Title I) funds, which were used in previous years to fund full-day pre-K.

- Enrollment growth was nearly three times greater for schools transitioning from half-day to full-day pre-K in 2002–2003 than for schools that already had access to a full-day pre-K program, suggesting full-day programming contributed to higher pre-K usage rates (i.e., enrollment) in AISD.

- English language learners (ELLs) who attended full-day pre-K in 2009–2010 had greater gains in pre-literacy skills (as measured by the PPVT-III and TVIP) than did ELLs who attended the half-day pre-K program in 2001–2002, demonstrating a possible increase in academic rigor in preliteracy areas for the full-day pre-K program over the past decade.

- Eligible pre-K students entered the district with varying pre-literacy aptitudes in their native language. Compared with other elementary schools in the district, some elementary schools served more pre-K students who entered the program with receptive vocabulary ability in their native language that was more than 1 standard deviation below the national average (as measured by the PPVT-III and TVIP).

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- If schools that have *fewer* students entering pre-K who score below the national norm in receptive vocabulary need to implement a half-day pre-K rather than full-day pre-K program, then pre-K students might not experience a significant loss in pre-literacy growth, assuming the half-day program (and its wrap-around services) are similar to the 2001–2002 half-day model.

- If schools have a *greater* number of their entering pre-K students scoring below the national norm in receptive vocabulary, then implementing a half-day pre-K program might cause students to experience less growth in pre-literacy skills than with full-day pre-K, especially if there are no wrap-around services.

- Attending full-day pre-K might have contributed more to students' higher academic achievement on 7th-grade TAKS than did students attending half-day pre-K or kindergarten only.

    - Full-day pre-K students from the 2001–2002 cohort were more likely to pass the 2010 7th-grade reading TAKS than were kindergarten students from the 2002–2003 cohort who were assumed eligible for pre-K but did not attend pre-K in 2001–2002.

    - Full-day pre-K students were moderately more likely to receive a commended score on the 2010 7th-grade math TAKS than were half-day pre-K students from the same 2001–2002 cohort.

RECOMMENDATIONS

Based on the findings of this report, Department of Program Evaluation (DPE) staff provides the following recommendations for consideration:

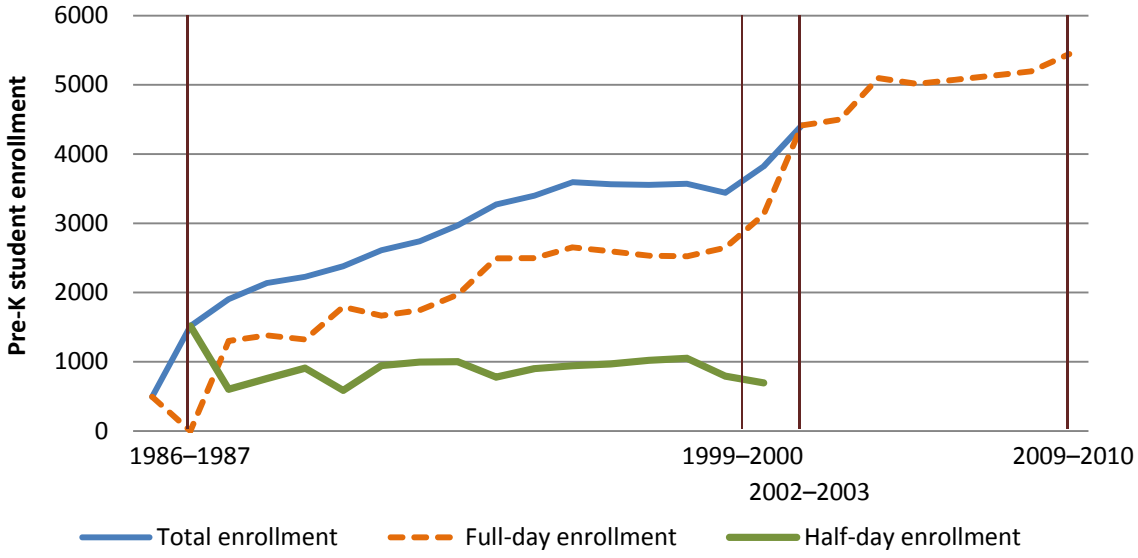
- Continue providing a full-day pre-K program in schools that have the highest concentration of students coming into the district with pre-literacy skills below the national average in their native language.
- If funding cannot be continued to provide full-day programs at all schools with a pre-K program, then phase in half-day programs at schools that have a history (a) of smaller enrollments of pre-K students and (b) of higher concentrations of students coming into the district with average or above average pre-literacy skills.
- Develop and expand partnerships with Austin-area early childhood service providers who can offer wrap-around services to supplement programs to half-day students that will equate to a full day of pre-K services, especially in the area of developing students' early math skills.
- If half-day programs are implemented, maintain an average staff-to-student ratio no greater than 1 to 29 students for the entire day (i.e., classroom sizes of 14 to 15 students for each morning or afternoon session), similar to the ratio in the half-day program in 2001–2002.
- Monitor pre-K enrollment levels at schools that have a history of a high percentage of students who also enroll in AISD for kindergarten to ensure no significant drops occur in enrollment because this drop could have a negative impact on district funds received from the state, based on average daily attendance and possible decreases in academic achievement.

Historical Background

Since the introduction of pre-K into the district in the 1970s, the only year in which AISD did not have a full-day pre-K program was 1986–1987 (Leben, 1987). In 1985, half-day pre-K became funded by the state; however, in 1985–1986, AISD continued to fund a full-day program for all pre-K classes, using primarily Title I (Chapter 1) and local funds. In 1986–1987, the district introduced a half-day program to increase the number of pre-K-eligible students served, which more than tripled from 494 pre-K students in 1985–1986 to 1,516 pre-K students in 1986–1987. During 1986–1987, AISD used only state and local funds for pre-K.

A district study looking at the effects of half-day versus full-day programming for limited English proficient (LEP) students showed significantly better performance for full-day LEP students than for half-day LEP students on the PPVT-III and TVIP (Leben, 1987). In 1987–1988, the district funded both full-day and half-day programs, relying on local and Title I (Chapter 1) funds to provide the full-day pre-K classes at some schools. In the 15 years after its original introduction, the half-day pre-K program did not exceed an enrollment of 1,100 students. From 2002–2003 to the present, all AISD pre-K programs have been full day. See Figure 1 for AISD's past 25-year pre-K enrollment history.

Figure 1. AISD Prekindergarten (pre-K) Enrollment From 1985–1986 to 2009–2010, by Half-Day and Full-Day Programs



Source. Department of Program Evaluation publications 09.43, 02.05, 95.02, 92.03, and 86.55
Note. 1986–1987 was the only year AISD did not have a full-day pre-K program. Half-day enrollment since this year did not exceed 1,100 students. 1999–2000 was the first year of the state-funded Prekindergarten Expansion Grant, which reimbursed districts for Title I funds used to provide full-day pre-K. 2002–2003 was the first year since 1985–1986 that AISD provided full-day pre-K to all elementary campuses with a pre-K program.

Title I funds continued to support full-day pre-K at 25 campuses in 1990–1991 (Christener et al., 1991) and at 33 campuses in 1998–1999 (Zyskowski et al., 1999). In 1999–2000, the state provided the

Prekindergarten Expansion Grant to reimburse districts using Title I funds to support full-day pre-K. The 2001–2002 pre-K cohort was the last in the district to either attend a half-day or full-day program, based on the school receiving additional funding provided by the state's aforementioned grant (Curry, 2002). Through the grant, 47 schools offered a full-day program. The 14 schools that did not receive state grant funds offered a half-day program that year.

In 2002–2003, AISD supported full-day pre-K for all eligible students district wide at the 61 elementary schools with a pre-K program (Curry, 2003). The Expansion Grant continued to fund only 47 schools. Local funds supported the expansion of the full-day program at the 14 other elementary schools.

In 2009, approved Texas HB 130 would have funded full-day pre-K programs; however, this bill was vetoed by the governor of Texas, who believed the funds were better spent serving a greater number of students through existing half-day programs (Dilger, 2010).

PRE-K ENROLLMENT AND USAGE RATES

The total pre-K enrollment in 2002–2003 increased by 591 students from the prior year, 45% of whom were enrolled at the 14 non-Expansion Grant campuses (*n* = 266). The remaining 325 additional students were enrolled across the 47 grant-funded schools. On average, grant-funded schools increased enrollment by 7 students per campus, while non-grant funded schools increased enrollment by 19 students per campus (i.e., a nearly three times higher growth). This finding suggests that the transition to a district-wide full-day pre-K program led to greater growth in enrollment than would have occurred if a full-day pre-K had not been implemented. In other words, full-day pre-K might have a positive influence on the usage rate[1] of the program. Figure 2 depicts the number of students served by the pre-K program in 2001–2002 and 2002–2003, based on attendance at a school funded by an Expansion Grant.

In Fall 2010, pre-K enrollment was 5,176, a 59% increase from the Fall 2001 snapshot of 3,252 students.[2] The data available to AISD for analyses cannot be used to determine the extent to which increased enrollment was due strictly to increased population[3] or increased usage rates for program-eligible participants due to the district offering a full-day program. The E3 Alliance estimated AISD's enrollment rate of pre-K-eligible children at 79%, while six neighboring districts had an average enrollment rate of 61% (Van Overschelde & Koenig, 2011). Based on this finding, the E3 Alliance suggested that AISD enrollment would decrease by 18% if the district changed to half-day programming (Van Overschelde & Koenig, 2011). The E3 Alliance study excluded students who enrolled in AISD for pre-K and attended kindergarten at another district, meaning the estimated 18% loss represents future

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[1] *Usage rate* refers to the number of students served divided by the number of people eligible for a program.

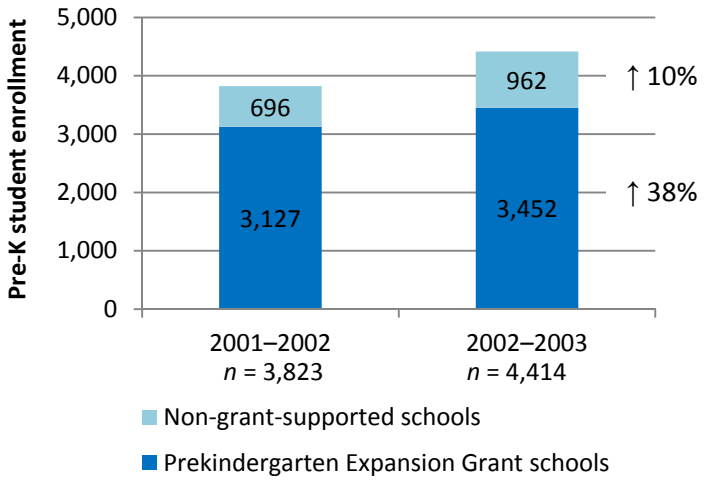
[2] Data are from AISD Public Education Information Management System (PEIMS) submissions for Fall 2010 and Fall 2002.

[3] Travis County census data from US Census Bureau, 2009 Population Estimates Program retrieved from http://factfinder.census.gov/servlet/QTTable?_bm=y&-context=qt&-qr_name=PEP_2009_EST_DP1&-ds_name=PEP_2009_EST&-CONTEXT=qt&-tree_id=809&-redoLog=true&-geo_id=05000US48453&-search_results=01000US&-format=&-_lang=en ,and Census 2000 Summary File 1 retrieved from http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&qr_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=05000US48453.
The number of people age 0–5 was 58,840 in 2000 and estimated to be 82,065 in 2009; a 39% increase. Projected growth based on English proficiency and/or family income level may be disproportionate.

AISD kindergarten students who might otherwise not attend pre-K. Furthermore, the E3 Alliance estimate assumed that schools that offered half-day programs would offer on-campus wrap-around services similar to those offered by neighboring districts. If wrap-around services are not provided to these campuses, the estimated decrease in usage rates for AISD will be higher (i.e., fewer eligible students will attend pre-K).

Furthermore, pre-K usage rates might decrease disproportionately based on the immigrant status of students. In a national report, immigrant families were less likely to use center-based care (Brandon, 2004), and Mexican immigrant families were more likely to use parental care or relative care, than to use any other form of child care (i.e., Head Start, center-based care, and preschool) (Crosnoe, 2007).

Figure 2. Prekindergarten (pre-K) Enrollment, by Year and by Schools Funded by a Prekindergarten Expansion Grant



Source. Department of Program Evaluation Publication 02.05

Note. The percentages represent the increase in students at the schools funded by the Prekindergarten Expansion Grant (i.e., full-day programs, *n* = 47) and those schools that were not funded by the aforementioned grant (i.e., half-day programs in 2001–2002, *n* = 14). In 2002–2003, all schools with a pre-K program were full day. The overall number of pre-K students served increased by 15% in 2002–2003 from the 2001–2002 academic year.

Academic Performance on the PPVT-III and TVIP

Students' early language skills lay the foundation for later reading and writing in school, and students with poorer language skills are more likely to have difficulties learning to read than are students with good language skills (Whitehurst & Lonigan, 1998). Studies have shown that students who have difficulty learning to read in the earliest years of schooling tend to continue having difficulties over time (Scarborough, 2001; Snow et al., 1998). Vocabulary recognition is a precursor to the development of reading skills.

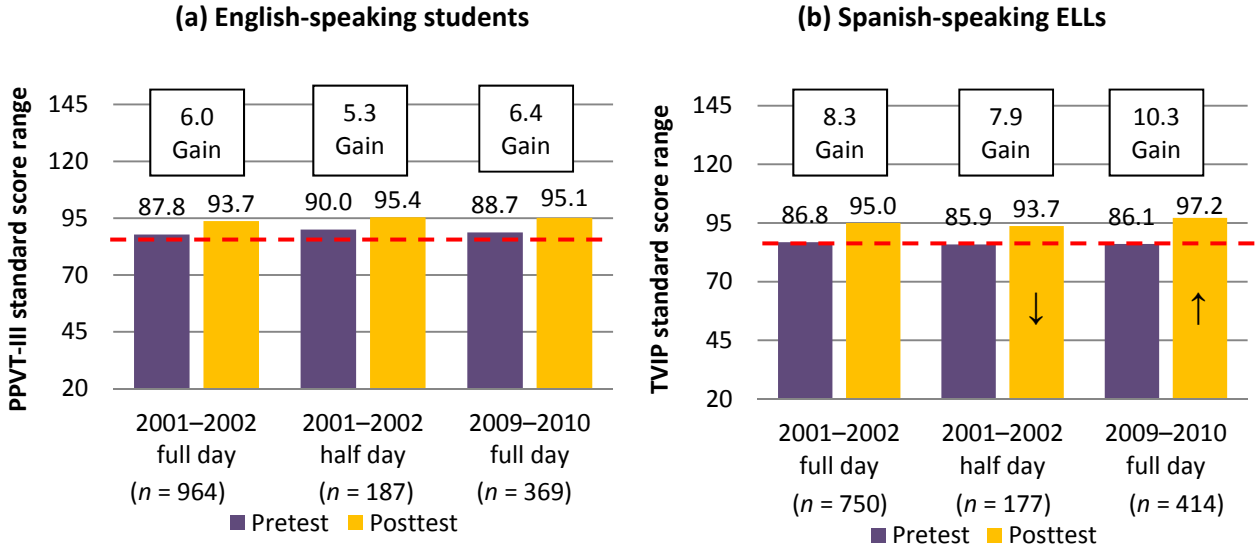
The PPVT-III and the TVIP are norm-referenced assessments that measure knowledge of receptive vocabulary in English and Spanish, respectively (Dunn & Dunn, 1997). DPE staff re-examined PPVT-III and TVIP scores for the 2001–2002 pre-K cohort to determine differences in outcomes of

students who attended half-day pre-K and the outcomes of students who attended full-day pre-K. In the reanalysis of the assessments, DPE staff discovered two errors in previously reported analysis: all students with a TVIP score were assumed to be ELL, and all students with a PPVT-III score and no TVIP score were assumed not to be ELL (Curry, 2009a). After controlling for ELL status, DPE staff found no significant difference in PPVT-III and TVIP scores between half-day and full-day students for the 2001–2002 cohort.

Since 2003–2004 AISD has participated in the state initiative to increase the rigor of pre-K through Texas Early Education Model (TEEM) professional development opportunities offered by the state Center for Improving Readiness of Children for Learning and Education (CIRCLE); TEEM was referred to as CIRCLE training in 2009–2010 (Curry, 2009b). To estimate changes in program rigor over time, comparisons between pre-K cohorts from different academic years can be made using norm-referenced assessments. DPE staff further examined PPVT-III/TVIP scores of the 2009–2010 pre-K cohort to determine whether possible improvements made in the full-day pre-K program provided students greater gains in pre-literacy skills than did the half-day program for the 2001–2002 cohort.

No significant difference was found among English-speaking pre-K students, based on cohort (Figure 3a). However, Spanish-speaking ELLs in the 2009–2010 pre-K cohort had significantly higher posttest results than did Spanish-speaking ELLs who attended the half-day program in 2001–2002 (Figure 3b). These findings are consistent with previous research that has shown that ELLs benefit more than do non-ELLs from full-day pre-K (Brunner, 2010; Leben, 1987). These findings further suggest that the full-day pre-K program has increased in rigor since 2001–2002 to demonstrate a benefit over half-day pre-K programming for Spanish-speaking ELLs.

Figure 3. Average Peabody Picture Vocabulary Test (PPVT-III) Pretest and Posttest Scores for Prekindergarten Students, 2001–2002 and 2009–2010, by Program and English Language Learner (ELL) Status



Source. AISD student records

Note. Average gains might be more or less than the difference of the posttest and pretest due to rounding. The dotted red line represents a score of 85, the minimum score to be within the normalized national average range (i.e., 85 to 115, wherein 100 represents the mean score).
Arrows ↑ and ↓ indicate significant differences ($p < .05$) based on Anova tests.

Is Full-Day Pre-K Beneficial in Schools That Have More Students Demonstrating a Need for Pre-K?

With the possibility of AISD implementing half-day pre-K district wide in the future due to budget cuts, DPE staff examined whether the pre-K program type made a difference for students with different pre-literacy ability upon entry to the program. DPE staff compared PPVT-III and TVIP results of students from the 2001–2002 and 2009–2010 pre-K cohorts, based on schools' concentration of students scoring below an 85 on the PPVT-III/TVIP in their native language (i.e., below the national norm in receptive vocabulary ability). A cut-off point of 35% of pre-K students scoring below the national average range was used in order to ensure statistical power in conducting significance tests. *Please note, the 35% cut-point does not represent a threshold in which full-day pre-K was found to be more or less beneficial than half-day pre-K.* Table 1 provides the number of schools that had more or less than 35% of their pre-K students scoring below the national norm on the PPVT-III/TVIP.

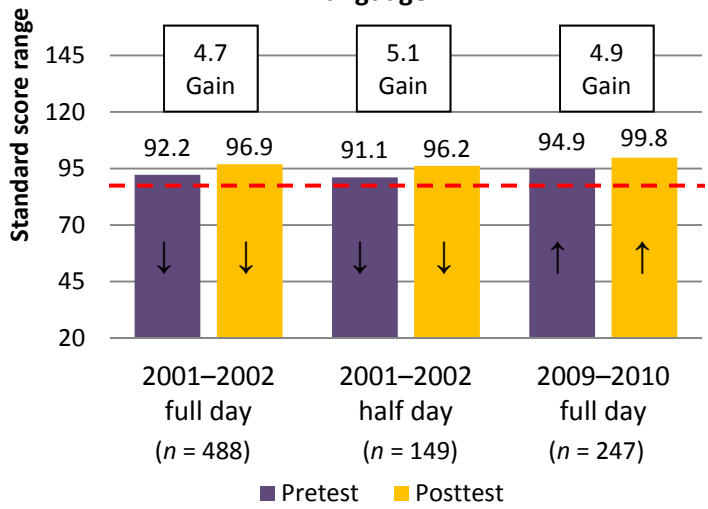
Table 1. Schools With More or Less Than 35% of Entering Prekindergarten (pre-K) Students Scoring Below the National Norm on the Peabody Picture Vocabulary Test (PPVT-III) or Test de Vocabulario en Imagenes Peabody (TVIP) in Their Native Language, by Year and Program

Year/program	Number of schools with less than 35% of entering pre-K students below national norm	Number of schools with more than 35% of entering pre-K students below national norm
2001–2002 full day	14	33
2001–2002 half day	7	7
2009–2010 full day	29	39

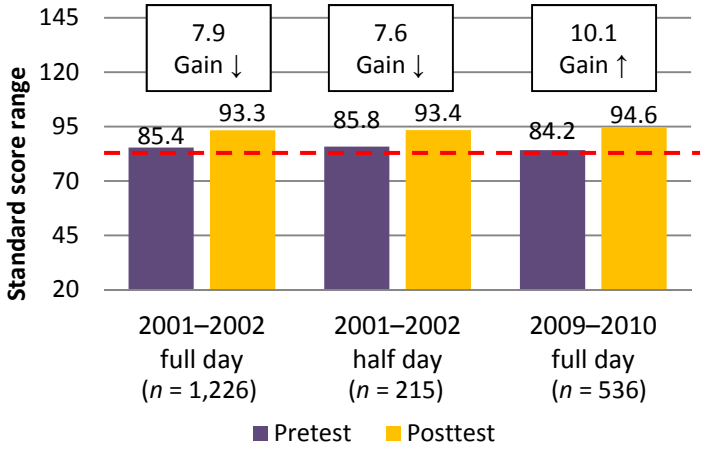
Source. AISD Department of Program Evaluation records

Figure 4. Average Peabody Picture Vocabulary Test (PPVT-III) or Test de Vocabulario en Imagenes Peabody (TVIP) PPVT-IIIPretest and Posttest Scores, 2001–2002 and 2009–2010, by Program

(a) Schools with less than 35% of entering prekindergarten cohort below national norm in their native language



(b) Schools with more than 35% entering prekindergarten cohort below national norm in their native language



Source. AISD student records

Note. Average gains might be more or less than the difference of the posttest and pretest due to rounding. The dotted red line represents a score of 85, the minimum score to be within the national norm average range (i.e., 85 to 115 wherein 100 represents the mean score).

Arrows ↑ and ↓ indicate significant differences ($p < .05$).

Although the 2009–2010 cohort had higher pretest and posttest scores than did the 2001–2002 cohort in schools that had fewer than 35% of their entering pre-K students with PPVT-III or TVIP scores below the national norm, no significant difference was found in the gains achieved by both cohorts (Figure 4a). In schools that had more than 35% of their entering pre-K students with PPVT-III or TVIP below the national norm, the 2009–2010 full-day cohort had significantly higher gains than did the 2001–2002 half-day cohort (Figure 4b).[4]

These findings suggest that pre-K students who attend schools with fewer entering students below the PPVT-III/TVIP national norm might not be as adversely affected as would be pre-K students who attend schools with more entering students below the national norm, by half-day programming if the program approximates the 2001–2002 model.[5] The staff-to-student ratio was 1:29 for half-day classes in 2001–2002 (Curry, 2002). Also, given the size of the population served by the half-day program in 2001–2002 (*n* = 696), half-day students might have benefited from other services provided to economically disadvantaged families, such as Head Start or subsidized child care. Consideration should be placed on the capacity and availability of other early childhood service providers to Austin students.

Furthermore, these findings suggest that full-day pre-K students who attend schools that have more than 35% of entering pre-K students below the PPVT-III/TVIP national norm might benefit more from a full-day program than they would in half-day programming similar to the 2001–2002 model. These findings were for all pre-K students, regardless of their ELL status.

Performance on 7th-Grade Reading and Math TAKS

DPE staff examined the long-term effect on academic performance of students attending a full-day or half-day pre-K program. Kindergarten students who (a) were assumed eligible for pre-K (i.e., were either ELL or economically disadvantaged in kindergarten) but did not attend AISD pre-K, and (b) attended kindergarten on a campus that also served pre-K students in 2002–2003 were included in the analyses. Assuming on-time grade-level promotion, the 2001–2002 pre-K cohort and 2002–2003 kindergarten cohort would have been in 7th grade in 2009–2010. Table 2 provides a description of the sample.

[4] DPE staff used both Anova and generalized linear modeling (GLM) to test differences in gain scores among 2009–2010 full-day and 2001–2002 full-day and half-day students by schools with above and schools with below 35% of entering pre-K students with PPVT-III or TVIP scores below the national norm in their native language. GLM estimated 2009–2010 full-day students gained 2.5 standard points more on the PPVT-III or TVIP than did 2001–2002 half-day students.

[5] Although the average scores for these schools were within the average range of performance (i.e., 85 to 115), some schools' average scores were below the national average of 100.

Table 2. 2001–2002 Prekindergarten (pre-K) and 2002–2003 Pre-K-Eligible Kindergarten Students Who Took 7th-Grade Texas Assessment of Knowledge and Skills (TAKS) in 2009–2010 in AISD, by Program and English-Language-Learner (ELL) Status

	# Taking reading TAKS	# Taking math TAKS
Non-ELLs		
Full-day pre-K	317	313
Half-day pre-K	58	58
Kindergarten	286	275
Total	**661**	**646**
ELLs		
Full-day pre-K	477	508
Half-day pre-K	116	135
Kindergarten	187	194
Total	**780**	**837**
All students	**1,441**	**1,483**

Source. AISD student records
Note. Students who took TAKS-ALT and TAKS-M were excluded. Students needed a 3rd-grade TAKS score to be included in the sample. Kindergarten students did not enroll in AISD for pre-K, but were assumed eligible based on their 2002–2003 ELL status or economic disadvantage indicator. Only kindergarten students who attended a campus that served pre-K students were included.

To determine whether the 2001–2002 pre-K programs (i.e., half day or full day) had any contribution to students' probability of passing or receiving commended on the 2010 reading or math TAKS, DPE staff used logistic regression, controlling for students' kindergarten ELL status and their 3rd-grade TAKS scale score in the corresponding content area.

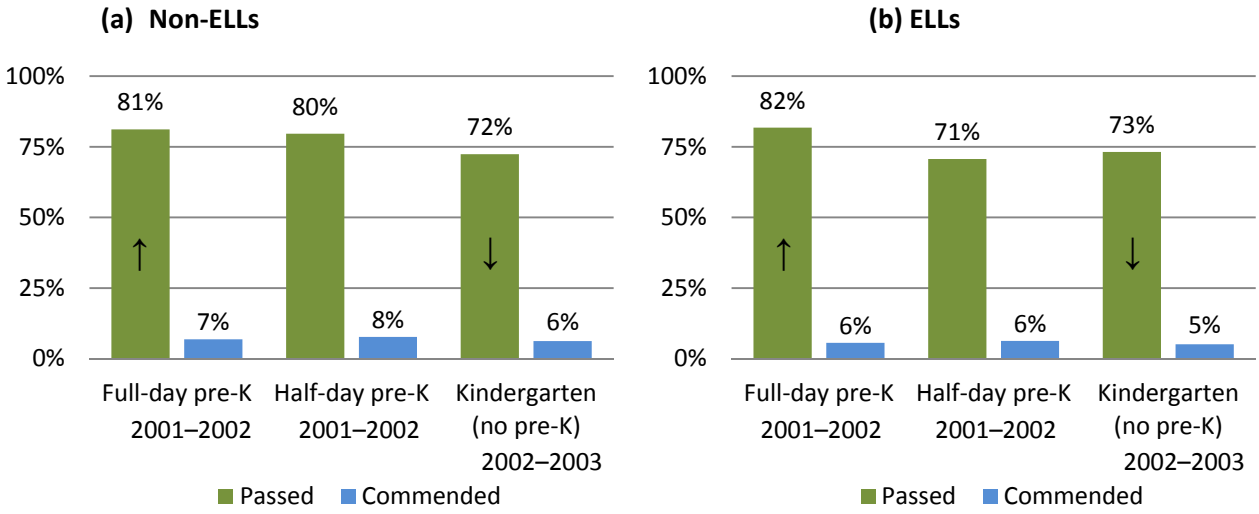
For both 7th-grade reading and math TAKS, students' 3rd-grade scale scores positively contributed to the probability of whether they passed TAKS or received a commended score in the corresponding content area. In other words, students with higher 3rd-grade TAKS scores were more likely to pass 7th-grade TAKS than were students with lower 3rd-grade TAKS scores. The question DPE staff addressed was:

> Does the half-day or full-day pre-K program have any effect on students' probability of passing or receiving commended scores on their 7th-grade TAKS for students who share the same 3rd-grade TAKS scale score?

Due to limited data availability, DPE staff relied on 3rd-grade TAKS results to control for students' different levels of ability. The PPVT-III and TVIP assessments were administered to a limited sample of pre-K students, and other early literacy assessments prior to 3rd grade were not available for the 2001–2002 cohort. Furthermore, no math assessments were provided to students prior to 3rd-grade. By comparing students with similar content area abilities in 3rd grade, variation in the probability

of passing TAKS due to previous abilities was controlled. Any student growth up to 3rd grade that might be attributed to full-day or half-day pre-K was "zeroed" out through this method. In other words, full-day pre-K students were compared with half-day and kindergarten-only pre-K students who had achieved the same level of academic performance by 3rd grade, regardless of higher or lower growth in content area ability that might be linked to half-day or full-day pre-K programming. The estimates from the logistic regression models did not take into account growth from pre-K through 2nd grade, and thus might underestimate the true difference among program effects.

Figure 5. Students' Probability of Passing and Earning Commended Status on 2010 7th-Grade Reading Texas Assessment of Knowledge and Skills (TAKS), by Program and Kindergarten English Language Learner (ELL) Status



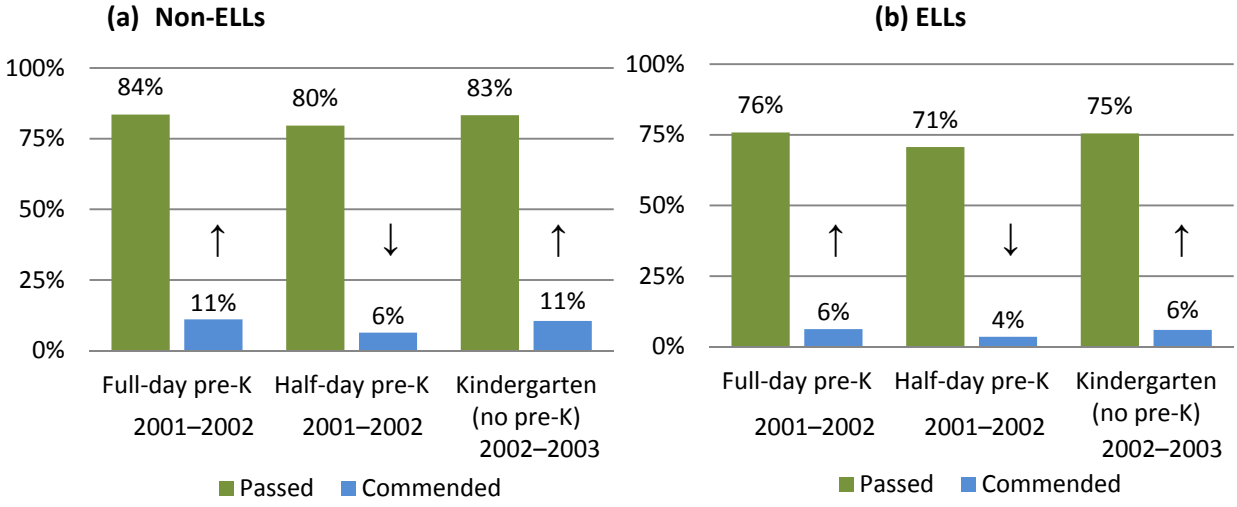
Source. AISD student records

Note. For the displayed predicted probabilities, 3rd-grade reading scale score was set to the sample's median score of 2236. For students scoring higher than the median, probabilities were higher. For students scoring lower than the median, probabilities were lower. Furthermore, the magnitude of the difference in program effect was greater for students with higher 3rd-grade reading scores than for students with lower scores.

Arrows ↑ and ↓ indicate significant differences ($p < .05$).

For 7th-grade reading TAKS, students who attended a full-day pre-K program had a significantly higher probability of passing than did kindergarten students who did not attend AISD for pre-K but were assumed eligible to attend and had the same 3rd-grade reading scale score (Figures 5a and 5b). However, AISD pre-K was not a significant contributor to receiving commended scores on 7th-grade reading TAKS. Kindergarten ELL status also did not significantly contribute to students passing or receiving commended on 7th-grade reading TAKS.

Figure 6. Students' Probability of Passing and Earning Commended Status on 2010 7th-Grade Math Texas Assessment of Knowledge and Skills (TAKS), by Program and Kindergarten English Language Learner (ELL) Status



Source. AISD student records

Note. For the displayed predicted probabilities, 3rd-grade math scale score was set to the sample's median score of 2170. For students scoring higher than the median, probabilities were higher. For students scoring lower than the median, probabilities were lower. Furthermore, the magnitude of the difference in program effect was greater for students with higher 3rd-grade math scores than for students with lower scores.

Arrows ↑ and ↓ indicate significant differences ($p < .05$); ↑ indicates moderate significance ($p < .07$).

In general, ELLs were less likely to pass or receive commended scores on 7th-grade math TAKS than were non-ELLs who shared similar 3rd-grade math TAKS scores. Overall, the pre-K program did not have a significant effect on students' probability of passing 7th-grade math TAKS. However, half-day pre-K students were significantly less likely to receive commended scores on math TAKS than were kindergarten students who did not attend AISD pre-K, and they were moderately less likely to receive commended scores than were students who attended full-day pre-K (Figures 6a and 6b). No significant difference was found between full-day pre-K students and kindergarten students; however, DPE staff did not have data to determine whether those kindergarten students attended pre-K outside of the district. The results do suggest that full-day pre-K students and kindergarten students who did not attend AISD for pre-K but were assumed eligible had a higher propensity to perform at a commended level on 7th-grade math than did the half-day students.

The full-day program had 74 additional minutes of core academic time per day, which amounted to a possibility of an additional 223 hours of core academic instruction per program year for full-day pre-K students than for half-day pre-K students (Curry, 2002). The 2001–2002 pre-K evaluation report did not include the time spent in each content area. The findings, however, suggest that half-day pre-K students did not have enough of a foundation in math necessary to obtain a commended level on math TAKS by 7th-grade, compared with other similar students. Although Figures 6a and 6b depict conditional probabilities for students based on the 3rd-grade math score set to the median score, the magnitude of

the program effect is amplified when the 3rd-grade math score is set to 2400 (i.e., commended level). Using the TAKS scale score of 2400, full-day non-ELLs had a 45% probability of receiving commended on their 7th-grade math TAKS, and half-day non-ELLs had a 31% probability of receiving commended, a 14 percentage point difference. Full-day ELLs scoring a 2400 on 3rd-grade math TAKS had a 30% probability of receiving commended on 7th-grade math TAKS, and half-day ELLs had only a 19% probability of receiving a commended score.

CONCLUSION

District-wide half-day pre-K was implemented in AISD in 1986–1987, and served a population only 28% of that in 2009–2010 (i.e., 1,512 versus 5,445 pre-K students). For 10 of the 15 years, the district had both full-day and half-day programs, and fewer than a third of students were served by the half-day program. In 2001–2002, the last cohort of pre-K students served by the half-day program represented 18% of total pre-K enrollment. The smaller number and percentage of students served by half-day pre-K in 2001–2002 meant that other early childhood service partners could possibly provide wrap-around services or serve as an alternative to AISD pre-K for those who did not attend. The findings of this report are only generalizable to half-day programs similar to the AISD model in 2001–2002. Variations in the half-day program components and/or its supporting environment means possible variation in the outcomes described in this report. DPE staff does not have data on the capacity limits of current community partners that serve pre-K students, given that the current AISD pre-K student population is much larger.

The findings of this report and other studies suggest that full-day pre-K increases the usage rate of eligible students attending AISD pre-K (including those likely to stay in the district for kindergarten). The first issue of this study showed that full-day pre-K ELLs from the 2005–2006 cohort had an advantage in literacy skills, compared with 2006–2007 kindergarten ELLs who were assumed eligible for pre-K but did not attend AISD pre-K (Brunner, 2010). Furthermore, full-day pre-K participation contributed to students' later academic performance, leading to a higher probability that those students would pass 7th-grade reading TAKS than that AISD students assumed eligible for pre-K who first entered the district as kindergarteners would do so. If the E3 Alliance's estimate is accurate, AISD kindergarten teachers might have 18% or more students who will enter kindergarten with age-appropriate pre-literacy skills below the average national norm.

Full-day pre-K was moderately associated with higher rates of receiving commended scores on 7th-grade math TAKS than was half-day pre-K; gains in math ability were "zeroed" out by 3rd grade. Although DPE staff cannot assess the growth of math ability from pre-K to 2nd grade, the findings suggest it is possible students who attended AISD half-day pre-K programs did not have the same foundation in math as did other similar students.

Without state funds to provide full-day pre-K district wide, AISD would have to use other funding sources (e.g., Title I, local funds) to maintain the full-day program. If these funds were insufficient, district decision makers could phase in half-day programs at schools where pre-K students enter with high native language pre-literacy ability, rather than implement a half-day program district wide, as in 1986–1987. Pre-K students who enter the district with pre-literacy skills already in the national average range may not be as adversely affected as would be students with weaker pre-literacy skills by half-day program implementation, in terms of their growth in pre-literacy skills. It is important

to note that although these students at some schools had higher pre-literacy abilities than did other students in the district, their skills, on average, were still below the national average.

Furthermore, DPE staff cannot make conclusions about the lesser growth rate observed in half-day students' early math skills, compared with the growth rate for full-day students' early math skills, for students entering with levels of math ability that were high already. Half-day programs would benefit from early childhood community partners providing these campuses with additional resources and services, especially in the area of improving students' early math abilities. The students who seem to have benefitted the most from the full-day pre-K program were those who entered school with low native language pre-literacy skills. The district could target full-day programs for those students who attend schools that have high concentrations of students with low pre-literacy ability.

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