

Research Brief

Background. The state of Texas mandates that districts with at least 15 or more eligible 4-year-old students provide a half-day prekindergarten (pre-K) program to prepare students developmentally for the rigors of kindergarten and beyond. In 2011–2012, Austin Independent School District (AISD) provided eligible students with full-day pre-K across 69 elementary campuses and the Lucy Read Prekindergarten Demonstration School. This report evaluates students' achievement in the mandatory AISD pre-K program during the 2011–2012 school year, based on Peabody Picture Vocabulary Test-IV (PPVT) and Test de Vocabulario en Imagenes Peabody (TVIP) results.

Pre-literacy skills. The first 5 years of a child's life are influential in his or her later school and life success (National Research Council, 2001). Decades of research indicate that early exposure to high-quality educational opportunities benefits young children by preparing them to enter school. 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, Burns, & Griffin, 1998). Vocabulary recognition is a precursor to the development of reading skills.

The PPVT and the TVIP measure knowledge of receptive vocabulary in English and Spanish, respectively (Dunn & Dunn, 2007). Receptive (i.e., hearing) vocabulary is one domain of language development. PPVT and TVIP pre- and post-assessments were administered by Department of Research and Evaluation (DRE) staff to a random sample of pre-K students in the fall and spring of the 2011–2012 academic year. DRE staff used a stratified cluster design to select 20 elementary campuses to test English-proficient pre-K students and 20 elementary campuses to test bilingual Spanish pre-K students. Approximately 15 to 18 students were randomly selected from each campus in Fall 2011. A total of 474 mandatory pre-K students were tested in both semesters, representing 9% of all students enrolled in the mandatory pre-K program in Fall 2011. Of the pre-K students tested, 47% were English speakers ($n = 223$); 53% were Spanish-speaking English language learners (ELLs, $n = 251$). All students in



Program description. AISD

provides a full-day pre-K program for all children who are 4-years-old on or before September 1st of the current school year and who meet one of the following eligibility criteria:

- Qualifies for free or reduced-price lunch program
- English language learner
- Homeless
- Child of an active-duty military member or a military member who was injured or killed in service
- Resides or has ever resided in foster care

(TEC §29.153, [b])

The AISD pre-K program is designed to provide instructional activities to meet the individual needs of young children and stimulate learning in all areas of physical, social, emotional, and cognitive development.

The district's pre-K curriculum is closely tied to the guidelines issued by the state to prepare students for success in kindergarten.

PPVT-IV and TVIP Interpretation

The standard scores for the PPVT and TVIP are based on age norms from samples of native speakers in English and Spanish, respectively. The tests are best interpreted in the native language of the student.

To make group comparisons and estimates of students’ gains and losses, standardized scale scores were converted into normal curve equivalent (NCE) scores. NCE scores have a mean of 50 and a standard deviation of 21.06 points (i.e., the national normal distribution of scores). For the national samples on which the scores are based, the majority of students (68%) scored between 29 and 71 NCEs.

Interpretation of Normal Curve Equivalent (NCE) Scores

Range of performance	NCE scores	National percentile
Very low	1–4	1–11
Low	25–35	12–25
Low average	36–44	26–39
Average	45–55	40–60
High average	56–64	61–74
High	65–75	75–88
Very high	76–99	89–99

When interpreting NCE average gain (or loss), note that a zero shows that the students’ growth did not differ from the national average expected growth; a zero does not indicate no growth. Because these tests are age normed, a student must have a raw score about 8 to 10 points higher in the spring to receive the same standard score as in the fall.

Deviations of ± 4 NCE represent a significant growth (or loss), compared with national expected growth, and deviations of ± 11 represent a very high significant gain (or loss).

the sample were tested in English (PPVT), and Spanish-speaking ELLs were tested in Spanish (TVIP), as well.

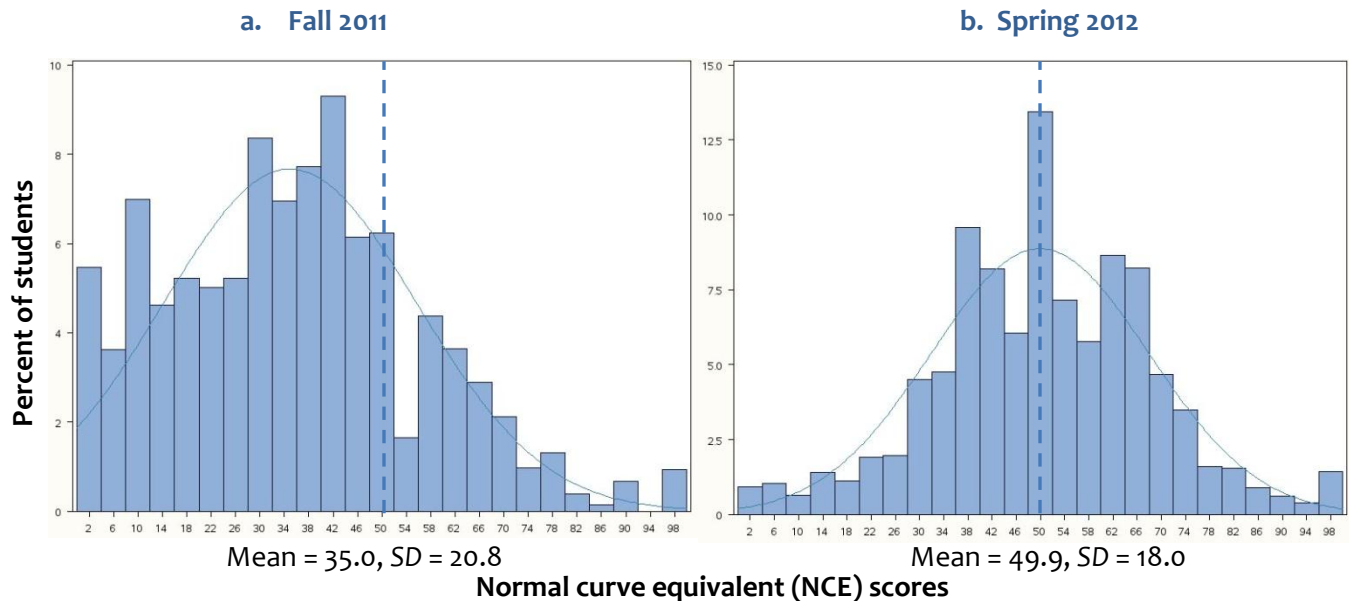
AISD pre-K advances students to the national average in receptive vocabulary. Pre-K programs are designed to prepare students for kindergarten who might otherwise not have access to early educational programs. A quality pre-K program contributes to the reduction of the achievement gap in school performance that students face due to socioeconomic and language barriers. The goal of AISD pre-K is to raise students’ academic performance to the average range of their peers. The assumption is that students who advance to at least the average range in the test of their language of instruction will be ready for future literacy learning in kindergarten.

PPVT and TVIP scores are best interpreted in the students’ native language. For the PPVT, students are compared with a national sample of native English speakers. For the TVIP, students are compared with a national sample of native Spanish speakers.

In Fall 2011, AISD pre-K students in the mandatory program, on average, had a NCE score of 35.0 in their native language (Figure 1a). An estimated 77% of entering AISD pre-K students in the mandatory program (rather than an expected 50%) had scores below the national mean score; 40% were one standard deviation below average. The median equivalent age (3 years, 9 months) of mandatory pre-K students’ native language receptive vocabulary ability was 10 months below the median actual age (4 years, 7 months).

In Spring 2012, pre-K students’ distribution of PPVT and TVIP scores more closely approximated the national distribution than it did in Fall 2011 (Figure 1b); an estimated 46% of pre-K students had scores below the national mean in their native language, and 10% were one standard deviation below average. The median age-equivalent score was 1 month below the median actual age (5 years, 2 months).

Figure 1. Mandatory Prekindergarten (pre-K) Students’ Peabody Picture Vocabulary Test (PPVT- IV) and Test de Vocabulario en Imagenes Peabody (TVIP) Performance Scores in Native Language, by Semester, 2011–2012



Source. AISD student records, Department of Research and Evaluation

Note. Results were based on a weighted sample to reflect the pre-K Fall enrollment. Original sample, $n = 474$. The dotted line represents the national mean NCE score.

PPVT and TVIP, according to ELL status. The average PPVT-IV NCE score for English-speaking students in Fall 2011 was 40.4, while the average TVIP NCE score for Spanish-speaking ELLs was 31.2. In Spring 2012, the average NCE score for English-speaking pre-K students was 49.7, with an average gain of 9.3 points. For Spanish-speaking ELLs, the post-test scores averaged 50.3, with an average gain of 19.1 points.

Approximately 84% of students were expected to be in the average range or higher in the standard normal distribution in which the scores were based. However, an estimated 92% of English-speaking students scored in the average range or higher, and 88% of Spanish-speaking students scored in the average range or higher (Figure 2).

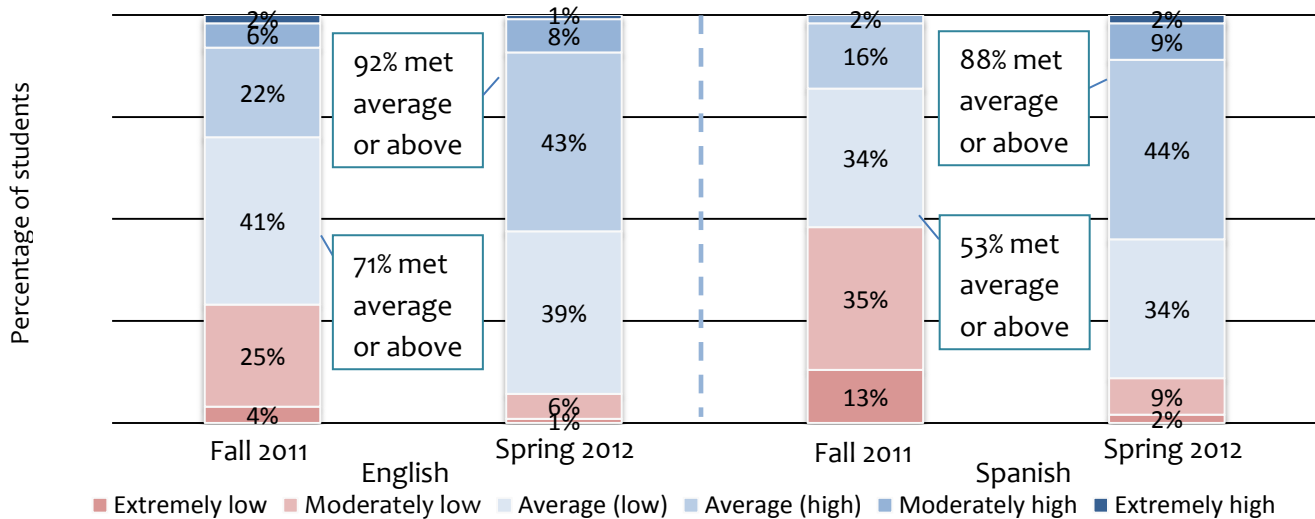
From pretest to posttest, 21% of English-speaking students and 35% of Spanish-speaking students advanced to the average range or higher on the PPVT and TVIP, respectively. Furthermore, more than half of sampled native English-speaking students (53%) and Spanish-speaking students (54%) scored *average-high* or above on the PPVT/TVIP in Spring 2012.



The AISD pre-K program advanced nearly one-third of students to above the national average in receptive vocabulary ability in their native language by the end of the school year.

In Spring 2012, more than 50% of students scored above the national average on the PPVT and TVIP.

Figure 2. Mandatory Prekindergarten Students’ Peabody Picture Vocabulary Test (PPVT-IV) and Test de Vocabulario en Imágenes Peabody (TVIP) Performance, by Native Language and Semester, 2011–2012



Source. AISD student records, Department of Program Evaluation

Note. Results were based on a weighted sample. Original sample: English, n = 223; Spanish, n = 251.

ELL status, continued. In general, the AISD mandatory pre-K program accelerated pre-K students’ growth in receptive vocabulary to twice that of the national average expected growth (i.e., approximately 15 months in age equivalency in a 7-month period). On average, Spanish-speaking students gained an estimated 18 months of growth in equivalent age in a 7-month period. An estimated 84% of Spanish-speaking students improved their age-equivalency score by more than 7 months (i.e., faster than the expected growth rate) in receptive vocabulary.

English-speaking students gained 12 months of age-equivalent growth. Approximately 69% of English-speaking students improved their age-equivalency score by more than 7 months.



In a 7-month period, pre-K students gained the equivalent of 12 to 18 months of growth in receptive vocabulary, on average.

Conclusion. The AISD mandatory pre-K program continued to achieve its goal of raising the majority of pre-K students to grade-level expectations by the end of the year, preparing them for success in kindergarten. On average, the pre-K program helped students progress an average of 15 months in age-equivalent ability in receptive vocabulary. At the end of the year, an estimated 10% of pre-K students scored below the average range, down from 40% in the fall. (In a normal distribution, 16% of students are expected to be below the average range.) AISD should continue to support funding of a full-day program for students to ensure that students continue to enter kindergarten ready to learn on grade level.

References.

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