



**A COST-BENEFIT
ANALYSIS OF UNIVERSALLY-
ACCESSIBLE PRE-KINDERGARTEN
EDUCATION IN TEXAS**

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EXECUTIVE SUMMARY

This study provides an analysis of the relative costs and benefits of a high-quality, universally-accessible pre-kindergarten program in Texas. The analysis identifies the costs and benefits unique to Texas' population, workforce, economy and existing educational system. It concludes that, even under very conservative assumptions, the benefits of universally-accessible, high-quality pre-kindergarten for four-year-olds in Texas greatly outweigh the costs.

The high-quality, universally-accessible pre-kindergarten program under analysis is our interpretation of some of *The Texas Plan's* policy recommendations. The Texas Early Childhood Education Coalition (TECEC) and the Texas Program for Society and Health (TPSH) at the James A. Baker III Institute for Public Policy at Rice University developed *The Texas Plan: Statewide Early Education and Development System (SEEDS)* to address the need for high-quality, universally-accessible pre-kindergarten. TECEC believes that the creation of a widely available early education program open to children of all different income levels will increase the overall quality of the Texas workforce (Tarlov et al. 2004, 15). *The Texas Plan* contains 50 policy recommendations covering three core educational areas—effective infrastructure, quality standards, and families and communities. Our analysis focuses on the costs and benefits of infrastructure and quality standards recommendations

An Important Policy Issue

High-quality pre-kindergarten is an important policy issue in Texas because economic changes make upgrading the skills of the state's labor force essential. Over the last two decades, Texas' economy has shifted from an emphasis on extractive industries, such as oil and agriculture, to an emphasis on knowledge and technology. Unfortunately, a large percentage of the Texas population is not highly skilled or educated. Furthermore, without efforts to reform the quality and educational attainment of the labor force in Texas, the situation will only get worse. The average American citizen became better educated during the 1990s, but Texans showed much less improvement than the residents of other states (Taylor 2003).

The demographic profile of Texas suggests that the need for change is urgent. The future workforce is over 57 percent non-Anglo (Murdock and Klineberg 2005). For a variety of reasons, members of minority populations are much less likely to have completed high school or attended college. Unless these patterns change, the state will be substantially "poorer and less competitive in the future" (Murdock and Klineberg 2005, 9). In fact, if the state continues on the current path, by 2040 the proportion of households living in poverty will increase by 4 percent and average annual household income will decrease by \$6,500 (Murdock and Klineberg 2004). These consequences will be accompanied by losses in tax revenue and increases in the demand for health, criminal, and social services from the state.

Upgrading our educational system is an obvious solution to labor quality problems now facing Texas, and pre-kindergarten is one of the most cost-effective educational investments. Therefore, stakeholders have proposed that the state of Texas offer a system of universally-accessible, high-quality pre-kindergarten education. Our research team was asked to evaluate the costs and benefits of such a system.

The Need for a Texas-Specific Analysis

In 2005, the RAND Corporation produced a report entitled “The Economics of Investing in Universal Preschool Education in California,” which serves as a useful model for our analysis. However, despite the obvious similarities between Texas and California, key differences between the two states and the two policy proposals prevent us from directly applying costs and benefits from one state to the other. These differences imply that a Texas-specific study must be completed in order to appropriately weigh the benefits and costs of such a program for Texas policymakers. Three primary differences also exist between the universally-accessible, prekindergarten program evaluated by the RAND Corporation for California and the Texas proposal under analysis: a public/private partnership, full-day structure, and a lower student/teacher ratio. The differences in context and programs are outlined below:

- (1) There is a substantial disparity in wages and costs of living between the two states. The wage level is much higher in California, which impacts both the costs and benefits of any educational proposal. In California, the prevailing wage for a college graduate is 9 percent higher than the national average, while in Texas the same college graduate makes roughly 2 percent above the national average. It will cost California much more to hire teachers and fund a pre-kindergarten program. On the other hand, the primary benefit of education is higher earnings, so the estimated benefits of universally-accessible, pre-kindergarten programs in high-wage states will also be larger.
- (2) California and Texas also have vastly different current participation rates in state funded and privately-owned pre-kindergarten programs. Texas currently enrolls 46 percent of eligible four-year-olds in state funded pre-kindergarten and about 58 percent of all four-year-olds are enrolled in some sort of publicly funded school program (Barnett et al. 2005). The RAND study measured gains from the differential between California’s current state funded pre-kindergarten enrollment of 9 percent of all four-year-olds and an expected participation rate of 70 percent (based on the realized participation of a similar program implemented in Oklahoma). Benefits to California, therefore, are based on a vast increase in participation that Texas will not be able to realize due to its currently high participation rate.
- (3) Although both the Texas and California proposals allow voluntary participation, the Texas proposal includes a public/private partnership system, whereas the California proposal does not. Privately owned child care providers that meet the quality standards can participate in the Texas program. Such a

public/private partnership would, therefore, minimize the harm to the current private child care industry by not taking away children and revenues. RAND presumed that enrollment in privately-owned pre-kindergarten or child care facilities would fall from 55 percent of four-year-olds to 10 percent of four-year-olds; however, RAND did not evaluate the costs such a change would impose on the private child care industry and, thus, on the parents of children younger than four.

(4) The proposed Texas program would implement full-day learning (7 hours per day for the length of the Texas public school year) instead of half-day learning as proposed for California. The primary benefit of a full-day program relates to parental labor force participation. A full-day program would allow the parents of participants to hold full-time employment, if so desired.

(5) The California program requires a student/teacher ratio of 20:2, whereas the proposed program for Texas requires a ratio of 17:2. A smaller ratio of studentsto-teachers allows participants to realize greater quality benefits associated with smaller class size and more individualized attention.

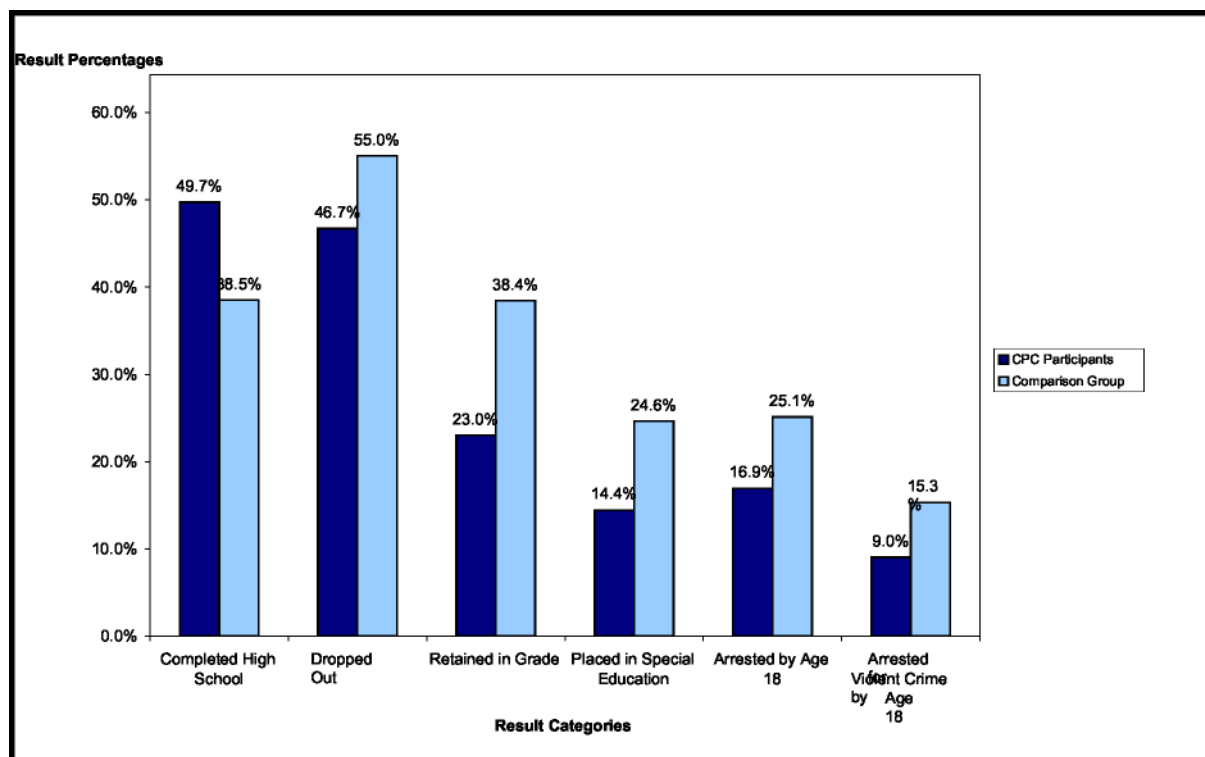
The Benefits of High-Quality Pre-kindergarten

As did RAND, we base our model pre-kindergarten program and our analysis of the benefits of high-quality, pre-kindergarten education on the Chicago Child-Parent Center (CPC) study. The CPC program was established by the Chicago Public School system using funds from the Elementary and Secondary Education Act of 1965. The CPC program provides educational and familial support services to socio-economically disadvantaged children from prekindergarten through the early elementary years. CPC provides a half-day pre-kindergarten program for children ages three and four. CPC was established for those children deemed to be living in poverty stricken neighborhoods, who have no access to federal Head Start program facilities.

The CPC program is a high-quality pre-kindergarten program. The CPC pre-kindergarten curriculum emphasizes basic skills in language arts/reading and mathematics. CPC program teachers are all required to possess a Bachelors degree and a certificate in early childhood education. Moreover, student-teacher ratios are set at 17:2. Each CPC facility is managed by a head teacher and includes a staffed parent resource room, school-community outreach activities, and health services.

Research suggests that the CPC program has statistically meaningful and positive impacts on long-term educational outcomes (see Figure S.1). The largest effects are seen in the areas of grade retention by age 15, the percentage of students that used special education programs by age 18, and the percentage of individuals that completed high school. CPC program participants were 40 percent less likely to have been retained in a grade through the eighth grade and 41 percent less likely to require special education by age 18. CPC's participants also were more likely to have completed high school and less likely to have dropped out of high school.

Figure S.1: Chicago Parent-Child Center Results by Age 20



Source: Proving the Value of Early Childhood Education in the Real World; CPC Website

The Costs and Benefits of High-Quality Pre-kindergarten Education in Texas

Our cost-benefit analysis for Texas indicates that the combined benefits to the participant, society, and the government from a statewide universally-accessible pre-kindergarten program greatly exceed the costs. We find that every \$1.00 invested in the proposed high-quality program returns \$3.50 per participant, based on the enrollment of seventy percent of all four-year-olds in the state. Because it is more expensive to establish new classrooms than to upgrade existing classrooms, the return on investment decreases to \$3.31 with ninety percent enrollment (see Table S.1).

In an effort to be conservative, all cost estimates are overestimated and benefits are underestimated. The quality standards utilized within the proposed pre-kindergarten program’s cost estimates surpass CPC quality standards in many instances. Pre-kindergarten teachers, for instance, are required to hold three years of teaching experience within the proposed program, and, therefore, the costs associated with teacher salaries are higher. Further, we estimated an increase in infrastructure costs from the *total* number of pre-kindergarten participants expected to enter the program, reflecting the higher cost associated with equipping new classrooms rather than upgrading existing classrooms. The costs of the program have been deliberately overestimated because we based our estimates on the costs of establishing new public school

classrooms for additional children rather than the more modest costs of upgrading existing classrooms. This is an overestimate because many children will enter the private child care sector instead of the public school, and the cost of upgrading those facilities will be lower than the cost of new classrooms. Similarly, we exclude benefits that cannot be adequately quantified, such as a reduction in welfare dependency and improved health conditions over participants' life spans.

Table S.1: Texas Investment Return per Child

	70% Enrollment	80% Enrollment	90% Enrollment
Program Costs	-\$5,268	-\$5,446	-\$5,585
Education Outcomes	\$1,096	\$1,096	\$1,096
Increased Earnings	\$7,280	\$7,280	\$7,280
Current Increased Income for Mothers	\$484	\$484	\$484
Increased Lifetime Earnings for Mothers	\$2,145	\$2,145	\$2,145
Juvenile Justice System Costs	\$70	\$70	\$70
Juvenile Crime Victim Costs	\$30	\$30	\$30
Adult Justice System Costs	\$550	\$550	\$550
Adult Crime Victims Costs	\$18	\$18	\$18
Child Welfare Numbers	\$48	\$48	\$48
Value of Child care	\$6,741	\$6,741	\$6,741
Total Benefits	\$18,462	\$18,462	\$18,462
Rate of Return	\$3.50	\$3.39	\$3.31

Texas vs. California

Even with fairly conservative estimates, our results far exceed the RAND study's estimate of a \$2.62 return per California participant. Three primary explanations for these differences exist:

- (1) Significant differences exist between the programs being evaluated. The RAND analysis covers a half-day pre-kindergarten program with a 20:2 pupil-teacher ratio. Our analysis covers a full-day program with a 17:2 pupil-teacher ratio. A full-day program incurs higher costs, but also higher benefits from the value of child care and the earnings of parents.
- (2) The RAND study evaluated only the marginal costs and benefits of the California program. Marginal costs and benefits are the differences to costs and benefits of upgrading the current system. Total estimates include the costs and benefits of the existing system and the improved system, but marginal costs and benefits include only the increases to the existing system. Our analysis evaluates the total costs and benefits of the program. Marginal benefit analysis requires additional and largely arbitrary assumptions about the benefits received under the existing pre-kindergarten system. For example, RAND assumed that children not otherwise expected to attend pre-kindergarten would reap the most benefit from

the policy change, children already attending public school programs would generally receive half the benefits of children not in pre-kindergarten, and children already attending private programs would not experience any gain in the quality of their pre-kindergarten experience (RAND 2005, pg. xxii). If we make similar assumptions, then the returns to pre-kindergarten would be greatly reduced.

Table S.2 presents one estimate of the marginal benefits of the study. Because Texas already has approximately 161,000 four-year-olds enrolled in state-funded pre-kindergarten at a cost of \$2,722 per pupil (Barnett et al. 2005), the state would only need to spend an additional \$3,804 per pupil when upgrading and expanding the program so that 80 percent of all four-year-olds in the state are enrolled in a high-quality public or private pre-kindergarten program.

As Table S.2 illustrates, assuming that children in private pre-kindergarten receive no benefits greatly lowers the estimate of net benefits arising from a universally-accessible high-quality pre-kindergarten program in the state. However, even under these very conservative assumptions, the benefits of universally-accessible high-quality pre-kindergarten still outweigh the program's costs.

Table S.2: Comparing Marginal Effects (80 percent enrollment)

	Texas Marginal Effects RAND Equivalent	RAND
Program Costs	\$3,804	-\$4,339
Education Outcomes	\$467	\$876
Increased Earnings	\$3,105	\$5,801
Increased Income for Mothers	\$61	
Increased Lifetime Earnings for Mothers	\$268	
Juvenile Justice System Costs	\$30	\$508
Costs to Victims of Juvenile Crime	\$13	\$711
Child Welfare Numbers	\$21	\$102
Value of Child Care	\$4,709	\$2,406
College Attendance		-\$173
Adult Crime Outcomes	\$235	\$1,143
Costs to Victims of Adult Crime	\$8	
Total Benefits	\$8,915	\$11,374
Rate of Return	\$2.34	\$2.62

- (3) Finally, significant differences in the costs of key study components exist, including labor costs, juvenile justice system costs, and the allocation of benefits to program participants' mothers. Some of the differences arise from the different cost profiles of Texas and California. However, other differences in estimated

cost arise from differences in methodology. RAND based its analysis on percentage point differences between the treatment and control groups in the CPC analysis. We based our analysis on percentage differences. For example, Reynolds (2002) found that high-quality pre-kindergarten reduced the dropout rate from 55.0 percent to 46.7 percent, a difference of 8.3 percentage points or 15 percent. RAND presumed that high-quality pre-kindergarten would lower the dropout rate by 8.3 percentage points; we presumed that it would lower the dropout rate by 15 percent. Among low-income students, the reported dropout rate in Texas for 2004-2005 was 5.9 percent. If we were to simply apply the 8.3 percentage point decrease observed in the CPC study, the dropout rate would be negative. A 15 percent reduction in the dropout rate is equivalent to a 0.9 percentage point reduction, not an 8.3 percentage point drop. Our approach is, therefore, much more conservative than RAND's approach.

Conclusions

Labor quality issues are very important within Texas. Publicly-financed, universally-accessible pre-kindergarten education is one proposed solution to the problem. Our analysis of the relative costs and benefits of a high-quality universally-accessible pre-kindergarten program suggests that even under very conservative assumptions, the benefits of such a program in Texas greatly outweigh its costs. Furthermore, our analysis suggests that many of the benefits of high-quality pre-kindergarten accrue long before participants enter the labor force. Full-day, high-quality pre-kindergarten has a significant effect on Texas' K-12 public education system, its participants, the juvenile justice system within the state, and on the labor force participation of parents.