

Abstract Title Page
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Title:

An Experimental Study Evaluating a State Funded Pre-Kindergarten Program: Bringing Together Subsidized Childcare, Public School, and Head Start

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Abstract Body

Limit 5 pages single spaced.

Background/context:

Understanding how to provide young children with an early foundation in school readiness skills is becoming a primary goal of many states in order to decrease the high incidence of school failure and drop-out, particularly by children from low income homes (Bowman, Donovan, & Burns, 2001; NAEP, 2003). For young children, a quality education includes teachers being skilled in the use of instructional approaches that are sensitive to the child's developmental needs and expose them to experiences with language, emergent literacy, and math within a responsive environment that supports social-emotional development (Bowman et al, 2001, Duncan et al., 2007, National Early Literacy Panel, 2008). Thus, in finding solutions to better preparing children for school, attention needs to be given to training teachers in instructional practices that support children's learning of these cognitive skills (Howes et al., 1992; Kontos et al., 1997). However, access to effective professional development has not kept up with the increased acknowledgement of its significance.

Purpose/objective/research question/focus of study:

This study was designed to enhance early childhood teachers' efforts to prepare young children for school. Thus, the first objective was to determine if teachers receiving comprehensive professional development (i.e., PD) would show gains in language and literacy instructional practices than teachers randomized to the control condition. Objective 2 was to determine if teachers in the second year of the intervention showed greater gains in their instructional practices than teachers receiving the program for one year and whether gains in child outcomes were greater if they had teachers with 2 years versus 1 year of the program. Finally, as the study design had Year 1 control teachers becoming intervention teachers in Year 2, objective 3 was to determine if across the same randomly selected teachers with and without the intervention there were greater gains in both teacher practices and child outcomes in year 2. Professional development included an on-line PD course with mentoring, the use of a technology-driven progress monitoring tool, and a research based curriculum.

Setting:

A request for applications was opened for all communities across Texas interested in participating. Applicants had to meet the following criteria: 1) bring together a leadership committee that crossed three early childhood programs (i.e., HS, childcare, school district), 2) identify a lead agency to coordinate offices for program staff, and 3) agree to random assignment of 20 classrooms to "business as usual" vs. participation in the program with stratification across the three program classrooms. In addition, the community partnership had to agree to: 1) use a research-based curriculum, 2) use the PD model including the progress monitoring system, a facilitated on-line course, and in-classroom mentoring, & 3) participate in all required trainings to ensure effective implementation. Of 17 communities that applied, 11 met the above criteria and were accepted into the program. See Appendix for list of communities (Table 1).

Population/Participants/Subjects:

Classrooms. In Year 1, the 11 sites recruited 20 classrooms for random assignment to control or intervention conditions. To avoid condition bias, only one classroom per building site was allowed and a request was that the 20 classrooms had representation from the three service delivery agencies. Participation across the entire study was seen for 213 classrooms; public schools ($n = 90$), childcare center ($n = 64$), and Head Start ($n = 59$). The evaluation sample was

composed of a large proportion of children from minority backgrounds; 67% Hispanic American, 19% African American, 12% Caucasian, 1% Asian American, 1% other ethnicity.

Intervention/Program/Practice:

The online professional development program included eight program courses that covered language and early literacy instructional areas (see Table 2 for list of course titles). The online course included (a) small-group interactive learning facilitated by a trainer with and independent review, (b) extensive videotaped modeling and expert commentaries, (c) active engagement of learning with online assessments of knowledge, (d) opportunities for practicing specific skills within the small group coursework, and (e) teachers' posting of experience with specific instructional activities in their own classroom with trainer review and feedback.

In-classroom teacher mentoring. Mentoring included planning for 3 hours of daily cognitive readiness activities in planful, purposeful, but playful ways, classroom demonstration of how to implement activities effectively, and side by side coaching.

The child progress monitoring system was implemented with the use of Personal Digital Assistant (PDA) technology. The system included evaluation of vocabulary and letter knowledge using a 60 second fluency method. The system also included individual child assessment of phonological awareness by asking the child to demonstrate knowledge of rhyming words, words in sentence segmentation, and onset rhyme. All classrooms in the intervention had a curriculum off the state approved list of pre-kindergarten curricula. See Table 3 for list of curricula.

Research Design:

As this was a state funded initiative, there were constraints on the design including the requirement that by the end of the second year all teachers involved in the program would have received the PD program. Additionally, due to funding delays, the first year of intervention was abbreviated. The first objective was to examine teacher change in instructional practices for control versus target teachers across 4.5 months. To address the first objective, teachers in each of the 11 communities ($n = 20$ classes per community) were randomly assigned to the TEEM intervention (i.e., Texas Early Education Model) condition versus a control condition. The second objective was to determine if increased exposure to PD resulted in greater change in teacher practices as well as child language and literacy skills. This was possible as in the second year, previously trained teachers received another year of the program and the previous control teachers were entered into their first year of the program. Thus, for year 2, the randomly assigned TEEM condition teachers received a second year of the intervention and the control teachers received TEEM for the first time. Finally, a third objective was to examine differences in instructional practices and child outcomes within a small group of the same randomly selected teachers without the program (Year 1) and with program participation (Year 2).

Data Collection and Analysis:

Evaluation of teacher outcomes. Assessment of change in instructional practices was based on classroom observations of 84 teachers divided between the control and target classrooms in Year 1 (Objective 1). This same process was repeated in Year 2 with a re-randomization of teachers selected for observation (Objective 2). Because the random selection for observations was repeated each year, a smaller number of teachers ($n = 14$) had observations when they were control classrooms in Year 1 and in Year 2 when they received their first year of the program (Objective 3). The Teacher Behavior Rating Scale (TBRS, Landry, Crawford, Swank, & Gunnewig, 2002) was used to evaluate teaching practices. The TBRS subscales include: 1) responsive teaching, 2) centers, 3) lesson plans, 4) oral language, 5) book reading, 6) print & letter knowledge, 7) written expression, 8) phonological awareness, and 9) math.

Evaluation of child outcomes. To evaluate child outcomes, we randomly selected seven consented children for testing per class (Year 1, $n = 717$ controls and $n = 710$ from intervention classrooms). In Year 2, $n = 802$ children had first year teachers and $n = 528$ children with second year teachers. For bilingual classrooms, the teacher was interviewed using a systematic set of questions to determine language of assessment. Assessments of child outcomes included the Expressive One Word Picture Vocabulary Test (EOWPVT; Brownell, 2000); the Preschool Language Scale – 4th Ed. (PLS-4; Zimmerman, Steiner, & Pond, 2002) to assess complex receptive language development, The Developing Skills Checklist (DSC; CTB/ McGraw Hill, 1990) Auditory subscale to examine phonological awareness development; The Preschool Comprehensive Test of Phonological and Print Processing (Pre-CTOPPP; Lonigan, Wagner, Torgesen, & Rashotte, 2003) to assess print awareness and letter knowledge.

Analysis of covariance (i.e., ANCOVA) examined differences between 84 teachers randomly selected between control and target teachers on post-test TBRS scores, controlling for pre-test TBRS scores (Objective 1). ANCOVAs examined the extent to which more experience with TEEM made a difference in teaching behaviors between teachers ($n = 84$) who were in their first year vs. those in their second year, controlling for pre-test TBRS scores (Objective 2). Analysis of variance (i.e., ANOVA) examined post-test differences between teachers who were randomly selected in Year 1 for measurement with the TBRS as control teachers to those same teachers who were also randomly selected for observation as program teachers in Year 2 ($n = 14$) (Objective 3).

Child skills. Child testing occurred during winter and spring of Year 1 and fall and spring of Year 2. The children in Year 1 vs. Year 2 classrooms were different and thus, the student observations were independent across years and nested within classrooms. Although we did not expect differences for child outcomes in Year 1 given the short time period, analyses confirmed these expectations (Objective 1). For Objective 2, ANCOVAs examined post-test child scores with the pretest, age at pre-test, and time between assessments used as covariates. Interactions among covariates and treatment conditions were retained if significant. Treatment condition (first vs. second year of program participation) was the independent variable. For Objective 3, the ANOVA analyses were conducted using posttest data only and control vs. program year was the independent variable. In addition to the independent variable in each analysis, language of testing and child's age at posttest were included in models. To evaluate the significance of the results, effects sizes are reported as Cohen's d (Cohen, 1988).

Findings/Results:

Objective 1: Effect of Program on Teaching Behaviors Significant differences on most of the TBRS subscales were found in favor of target teachers relative to control teachers. The results are summarized in Table 3 and illustrated in Figure 1. With just 4 months of the program, target teachers were observed to show greater gains in their use of language building activities and emergent literacy instructional practices including phonological processing and print knowledge activities with large effect sizes. In addition, teachers who received the PD program showed more responsive teaching practices, organization of their centers, and the use of lesson plans as well as early math instruction (effects were moderate to large).

Objective 2: Effect of Length of Program Participation on Teaching Behaviors and Child Skills In Year 2, teachers who were in the control condition during year one moved into the program (first year program teachers) while teachers who were in the program during year one continued to receive more training (second year program teachers). No statistically significant differences on the TBRS subscales were observed between teachers in their second year of

program exposure versus teachers in their first year. However, obtained effect sizes would be considered small to moderate.

Child language. The model for children's vocabulary skills revealed a significant effect of the length of their teachers' program participation that depended upon age at pretest, $F(1, 1061) = 4.73$; $p < .03$, effect size = .16. In addition, the program effect was dependent upon the child's language of testing, $F(1, 1061) = 4.29$; $p < .04$; effect size = .35. Children of teachers in their second program year scored higher on vocabulary at the post and this was especially true for those who were younger at the pretest (Figure 2). In addition, children tested in Spanish with teachers in their second year had higher posttest vocabulary scores.

A significant program effect was found for children's complex language, $F(1, 1107) = 14.44$, $p = .0002$. However, this depended on the pretest score and age at pretest, $F(1, 1107) = 19.49$; $p < .0001$, as well as the language of testing, $F(1, 1107) = 11.41$, $p = .0008$ (Figure 2). Children tested in English had higher post-test scores regardless of the amount of teacher training but those tested in Spanish had higher posttest scores if their teachers were in the second year of training, effect size = .34. In addition, the program effect for a second year of teacher training was greater for younger children when they started out with higher scores at pretest, effect size = .24, but greater for older children when they started out with lower scores, effect size = .20.

Comparison of child letter knowledge and print awareness. Significant differences were found for the print knowledge total score but this was dependent on their pretest score, $F(1, 1118) = 9.29$, $p < .003$, effect size = .34 (Figure 3a). This included differences on knowledge of letter sounds, letter names, and print discrimination. The finding indicated that the posttest scores were significantly higher for children with teachers in their second program year, but this was particularly true for those children who showed lower scores at the pretest.

Child phonological awareness. On the Developing Skills Checklist Auditory subtest (i.e., PA) there was a significant group by age by language of testing interaction, $F(1, 1116) = 6.13$; $p < .02$ (Figure 3). Children tested in Spanish, particularly those who were older at the beginning of the year, had higher posttest scores if their teacher was in their second year of training, effect size = .50. Conversely, children of second year teachers who were tested in English seemed to do better if they were younger at the beginning of the year, effect size = .26 (Figure 3b).

Objective 3: Comparison of the Same Teachers without and with the Program Across the two years, these teachers had two sets of children that could be compared (control classroom, $n = 423$; first year of program classroom, $n = 467$). Differences were compared on post-test TBRS data and post-test child data. Thus, while the TBRS analyses were based on 14 randomly selected teachers with data across both years, the child outcomes were based on all children tested in control classrooms for Year 1 and first year program classroom in Year 2.

Comparison of teaching behaviors. The comparison of teaching behaviors for the same teachers as control vs. target teachers showed similar, but stronger effects than the teaching results for Objective 1 (Table 4, Figure 4). Very large effect sizes were found for language building, book reading, and emergent literacy activities. Teachers who participated in the PD program demonstrated more responsive teaching, and best practices, for which there was a very large effect size.

Comparison of child vocabulary. Results based on the EOWPVT indicated that the scores for the children who were taught by teachers after they participated in the program were significantly higher than scores for the children under the control condition, $F(1, 904) = 17.90$; $p < .0001$, and that this depended upon the age of the child, $F(1, 904) = 5.63$; $p < .02$, effect size = .26 (Figure 5). The greatest differences between the groups were found for older children. The

relation of test language to the scores on the EOWPVT also depended on the age of the child, $F(1, 904) = 4.92$; $p < .03$ with the greatest difference found for children tested in English as compared to Spanish, but only for older children.

Comparison of child letter knowledge and print awareness. The final model for the total score on Print Awareness included the child's age, $F(1, 918) = 89.07$; $p < .0001$, and program vs. control years, $F(1, 918) = 4.93$; $p < .03$, effect size .11, Figure 5. The results indicated that the children tested while their teachers were in the control condition scored significantly lower than those tested when their teachers were participating in the program. The program effects were larger for naming letters, $F(1, 916) = 14.31$; $p = .0002$; effect size = .20.

Conclusions:

Results show evidence that these components are effective in promoting greater change in the teachers' practices when compared to the control teachers (Objective 1). Greater gains with moderate to large effect sizes were found for the program teachers in the initial 4-month training period across most TBRs subscales. Some of the greatest gains were found in school readiness instructional activities. Although the amount of time a teacher participated in the program was expected to result in differences in instructional practices, no differences were found.

Differences in the teachers' exposure to the program were apparent when examining the children's development of language and early literacy skills. While a positive effect of additional teacher participation was seen for all skills, at times these were dependent upon the child's age and language of assessment. For example, there were stronger gains in language skills for children whose teachers were in their second year of the program. However, these were apparent for children who were younger at the beginning of the year. Language skill differences also were stronger for those children evaluated in Spanish. As children tested in Spanish would be learning English, they might be considered as children who needed the most support from teachers.

The two aspects of emergent literacy that have been found to be unique predictors of reading from the recently released National Institute for Literacy report (2008), also showed greater increases if children's teachers were in their second year of the program. For letter-sound correspondence this finding was strongest for children who were younger while print discrimination skills were strongest for children learning English. The effect of amount of teacher participation also was seen for phonological awareness skills. However, unlike the other outcomes, those children who were older at the beginning of school and their teachers had more experienced with the program showed the greatest gains. This may occur because of the complexity of phonological awareness, such that a more experienced teacher is better able to implement these types of activities.

Finally, the design of this evaluation allowed for comparison of a small group of control teachers in year 1 and again as year 2 program teachers. The differences in these teachers' instructional practices before and after the program were found in almost all areas of teaching and the improvements were strong. The different groups of children in these teachers' classrooms also showed differences in their language and emergent literacy gains across the school year. As the 11 community partnerships all had Head Start, public school, and child care classrooms, this study demonstrates that comprehensive professional development, mentoring, progress monitoring, and collaborative relationships between educators can result in benefits for at-risk children. The results can inform state education policy by demonstrating the need for a comprehensive approach to preparing teachers in early childhood classrooms in order for children from low income homes to show growth in language and early literacy skills.

Appendixes
Not included in page count.

Appendix A. References

- Abrams & Co. (2003). *Let's begin with the letter people*. Waterbury, CT: Abrams & Co., Pub.
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Appendix B. Tables and Figures*Not included in page count.*

Table 1.

Community Partnerships at the Completion of the First Year

Community Partnership	Independent School District <i>n</i> = 90	Head Start <i>n</i> = 59	Child Care <i>n</i> = 64
Amarillo	14	2	4
Austin	10	3	6
Brownsville	9	5	5
Dallas	4	3	13
El Paso	6	6	8
Ft. Worth	8	8	4
Houston	7	8	5
Laredo	8	7	5
Raymondville	9	6	3
San Antonio	6	8	4
Wichita Falls	9	3	7

Table 2.

Approve Early Childhood Curricula.

Curriculum Name	Publisher
Building Language and Literacy	Scholastic Inc., 2003
Let's Begin with the Letter People	Abrams & Co., 2003
DLM Childhood Express	SRA/ McGraw-Hill, 2003
Doors to Discovery	Wright Group/McGraw-Hill, 2002
Pebble Soup	Rigby/Harcourt, 2002
We Can!	Sopris West, 2003

Note: Each classroom was provided with a set of materials to organize the classroom and a School Readiness kit.

Table 3.

On-line Professional Development Course List

- Classroom Management
- Setting the Stage for Children's Talk
- Reading Aloud
- Phonological Awareness
- Letter Knowledge
- Mathematics
- Written Expression
- Language Development

Table 4.

Summary of Teacher Behavior Change for Objective 1 and 3.

	Objective 1				Objective 3 ¹		
	<i>d.f.</i>	<i>F</i>	<i>p</i>	<i>d</i>	<i>F</i>	<i>p</i>	<i>d</i>
Teaching Behaviors							
Total	1, 82	19.74	.0001	.84	32.60	.0001	1.71
Language							
Book reading	1, 79	9.27	.003	.57	39.56	.0001	2.27
Oral language	1, 82	5.89	.017	.40	57.61	.0001	2.04
Emergent Literacy							
Phonolog Awareness	1,82	9.10	.003	.66	27.98	.0001	2.45
Print Use	1,82	25.16	.0001	1.03	25.50	.0002	1.98
Written Expression	1, 81	3.36	.071	.39	3.61	.0793	.55
Math							
Total	1, 81	8.63	.004	.65		Ns	
Best Practices							
Total	1, 82	9.78	.002	.56	40.32	.0001	2.21

Classroom Organization

Centers	1, 81	8.48	.005	.63	19.18	.0007	1.22
Lesson plans	1, 79	6.15	.015	.59	19.36	.0007	1.45

¹All *d.f.* = 1, 13

Figure Captions

Figure 1. Comparison after 4.6 months of program implementation of teaching behaviors for control versus program teachers - Year 1.

Figure 2. Effects on children's expressive vocabulary (top) and receptive language (bottom) skills.

Figure 3. Effects on children's on print awareness (top) and phonological awareness (bottom) skills.

Figure 4. Comparison of teaching behaviors for the same group of teachers when in control classrooms (Year 1) versus first year of program (Year 2).

Figure 5. Effects on vocabulary skills (top) and print awareness (bottom) for children with teachers in control classrooms (Year 1) versus in the first year of program (Year 2).











