Eye on Evaluation
WAKE COUNTY PUBLIC SCHOOL SYSTEM
EVALUATION AND RESEARCH DEPARTMENT

E&R Report No.11.16 July 2011

TITLE I PRESCHOOL PROGRAM IN THE WAKE COUNTY PUBLIC SCHOOL SYSTEM (WCPSS): SHORT- AND LONG-TERM OUTCOMES

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ABSTRACT

The longitudinal study of the 2005-06 preschool in WCPSS found short-term gains during the preschool year, but limited impact by kindergarten and no average impact by the end of 3rd grade on achievement, retention rates, special education placements, or attendance. Small sample sizes limit conclusions that can be drawn; a larger study with a stronger research design is recommended for next year.

The larger 2010-11 preschool program provided strong evidence of short-term gains on achievement after the preschool experience. Teachers and parents were generally satisfied with the program. Teachers suggested higher student attendance and greater parent involvement would be helpful. Teachers used Creative Curriculum materials with varying frequency; they also viewed some components of the curriculum as more effective than others.

BACKGROUND

High quality preschool programs have been found to have a long-term positive impact on student outcomes (Barnett, 1998; Li, Farkas, Duncan, Burchinal, Vandell, & Ruzek, 2011; Soriano, Duenas, & Leblanc, 2006). Barnett (1998) found model early childhood programs produced slightly larger effects on student outcomes than public school programs.

Cost-benefit analyses of eight preschool programs across the country found high quality preschools provided benefits of $4 to $7 for every $1 invested in terms of improved school readiness, better school performance, higher graduation rates, lower rates of crime and delinquency, decreased dependence on welfare, and higher incomes in adulthood (University of Pittsburgh, 2003). These benefits are seen only for low-income

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Evaluation and Research staff gratefully acknowledge the work of Amy Hawkins (contractor) in data collection, analysis, and production of this report. In addition, we appreciate the work of Linda Law (Curriculum and Instruction) in supporting data collection necessary for this study.

students and only for high quality programs (described as having educated and experienced staff, higher payrolls, favorable staff to student ratios, and low teacher turnover).

The Title I preschool program in WCPSS was developed to help academically needy preschool students be more successful upon entering kindergarten and beyond. Specific goals of the program are as follows.

- Short-term goals of the program are that WCPSS entering kindergarteners who attend a Title I preschool will need less support than similar students, as evidenced by lower special education placements and retention rates.

- The long-term goal of the program is that children who attend preschool will be more successful in 3rd grade than a comparison group of similar students and will be more likely to be on grade level as measured by the End of Grade 3rd grade test.

The preschool program is designed to present a quality preschool experience including: a developmentally appropriate environment, parent involvement, training for teachers, certified teachers and teacher assistants, and curriculum that addresses the five developmental domains. The five developmental domains include: social, emotional, cognitive, physical, and language. WCPSS has had a preschool program within Title I for many years, but there have been a small number of classrooms until recently. In 2005-06, there were eight Title I preschool classrooms. During the 2009-10 school year, the Title I preschool program underwent a sizable expansion to 39 classrooms with the use of additional Title I funds and American Recovery and Reinvestment Act (ARRA) funds. Twelve classrooms were funded through Title I and the rest through ARRA temporary funds.

Table 1 below summarizes the overall budget for 2010-11 through these two sources. Overall, $4,577,757.51 was allocated to the preschool program in 2010-11. Some of the costs were one time start-up costs (close to $1,000,000 in 2010-11) which will not be a continuing cost. The continuing cost of providing a preschool classroom is about $95,236 per year for one teacher, one teacher assistant, supplies, and miscellaneous expenses. Each classroom typically serves 15-18 children. If we use 16.5 students and $95,236 as a typical cost per year, the approximate cost per student is $5,771.88. This covers a full-day program.

Table 1
Preschool Allotments 2010-11

Fund		Purpose	Allocation
Title I	50	Salaries and Benefits	$1,292,642.77
	50	Workshop Expenses/Allowable Travel	$10,000.00
	50	Printing and Binding Fees	$10,000.00
	50	Travel Reimbursement	$12,000.00
	50	Field Trips	$14,000.00
	50	Supplies and Materials	$93,000.00
	50	Supplies and Materials	$35,855.00
	50	Furniture and Equipment	$65,000.00
	50	Computer Equipment	$76,000.00
			$1,608,497.77
ARRA	141	Salaries and Benefits	$2,367,122.46
	141	Printing and Binding Fees	$0.00
	141	Travel Reimbursement	$2,000.00
	141	Field Trips	$0.00
	141	Supplies and Materials	$160,137.28
	141	Furniture and Equipment	$140,000.00
	141	Computer Equipment	$300,000.00
			$2,969,259.74

Data Source: Oracle printouts and Title I Director

The Title I preschool sites use a curriculum that combines aspects from a number of curricula including: Opening the World of Learning (OWLS), The Creative Curriculum for Early Childhood, Second Step, and City Steps. During the 2010-11 school year, 36 of the classrooms had 18 children enrolled, two had 16 children enrolled, and one had 6 children (this class was combined with a hearing impaired preschool classroom). All of the 39 classrooms have at least one teacher's assistant in addition to the main teacher. During the 2005-06 school year each of the eight classrooms had approximately 16 children and every classroom had a teacher and teacher's assistant.

EVALUATION METHODS

The evaluation addressed both the long-term impact of preschool in WCPSS and the short-term impact of the expanded preschool program.

LONGITUDINAL STUDY

The purpose of the Title I Preschool Evaluation was to examine the effectiveness of the preschool program to students' long-term success in school. The evaluation examined whether students who attended the Title I preschool program in the 2005-06 school year made academic progress during preschool, and then compared preschool students' success in kindergarten and 3rd grade to a comparison group of students who were waitlisted for the program based on

screening measures. The 2005-06 year was chosen because prior years included only five classrooms and would not provide an adequate sample size. Students in 2005-06 would also have reached 3rd grade with normal progression by the 2009-10 school year.

As is typical in a longitudinal evaluation, some students were lost to the sample over time. Data were obtained for 62 of the 137 students who attended the preschool program during the 2005-06 school year and who were still in WCPSS at the end of their 3rd grade year (the 2009-10 school year). In addition, data were obtained for a comparison group of 31 children who were waitlisted for the program and were still in WCPSS at the end of their 3rd grade year. Children in the waitlist group were matched to those in the Title I preschool group on the educational neediness score. This neediness score was derived based on results of screening using the Brigance early childhood measure, which covers language, motor, self-help, social-emotional, and cognitive skills.

Three main measures were used to assess progress during the preschool year. The Creative Curriculum Developmental Continuum Assessment, Phonological Awareness Literacy Screening (PALS), and The Brigance Preschool Screen were all given at the beginning and end of the preschool year. However, pre and post data for each measure were not available for all eight preschool sites. Counts were reviewed, and the decision was made to use the five schools with the most complete data. These five sites included: Brentwood Elementary, Creech Road Elementary, Project Enlightenment, Smith Elementary, and Vance Elementary. Table 2 summarizes the measures and counts of scores and data available for each group at grades pre-K and K. The Brigance provided initial information to establish comparable groups and the Kindergarten Initial Assessment (KIA) provided a short-term impact measure for the WCPSS preschool. The KIA is given to all incoming kindergarten students within the first few weeks of school and covers literacy, social development, and several other areas. Other preschool measures were utilized to measure growth for preschool participants on measures most closely tied to the preschool curriculum. Data were available for End-of-Grade (EOG), attendance, special education placement, and retention rates at 3rd grade for both groups.

Table 2
Breakdown of Sample Sizes Available for Instruments, 2005-06

Grade	Preschool Measures					K
2005-06	**Brigance (pre)**	**Preschool Attendance**	**PALS**	**Creative Curriculum**	**Brigance (post)**	**KIA (post)**
Title I Preschool	62	62	37	62	61	55
Waitlist	31	--	--	--	--	30

Data Source: Data files for each instrument were provided by Title I preschool staff.

The Creative Curriculum Developmental Continuum Assessment was conducted in the fall and the spring and data were available for all 62 of the preschool students in the sample. This measure is designed to assess four main areas of development: Social/Emotional, Physical, Cognitive, and Language. This measure uses a continuum that is based on the expected developmental steps during the preschool years to assess curriculum objectives. This continuum allows for assessment of progress over time on each objective.

The Phonological Awareness Literacy Screening (PALS) was conducted in the fall and the spring and data were available for 37 of the preschool students in the sample. Tasks on the PALS are designed to be developmentally appropriate for 4 year olds and assess four main areas: Phonological Awareness, Alphabet Knowledge, Print and Word Awareness, and Name Writing. This measure has demonstrated high levels of reliability – split half reliability, $r = 1.00$; Internal consistency, alpha = 1.00; inter-rater reliability = .99. Additionally, content, construct and criterion-related validity have all been established.

The Brigance Preschool Screen was conducted in the fall and the spring and data were available for all 62 of the preschool students in the 2005-06 sample expressed as standard scores. The assessments in this section allow screening personnel to assess the basic skills of four-year-old preschool children. Additionally, only the 4 year old version was used, regardless of whether children were 4 at the time of the assessment or not. This measure has demonstrated high levels of reliability (internal consistency from .84 to .89, test-retest with *r* from .84 to .99, inter-rater reliability from .90 to .99). The Brigance Preschool Screen has also demonstrated acceptable levels of content, construct, concurrent, predictive, and discriminant validity.

In order to assess the short-term impact of preschool, children's scores on the KIA were used. The KIA is given countywide to incoming kindergarteners each fall in order to assess students' skill level. A subset of the KIA items that are most relevant to the curriculum used in the Title I preschools, will be used in this evaluation. The items selected for this evaluation included eight early literacy items (Print Concepts, Retelling, Letter ID, Letter Sound, Word ID, Concept of Spoken Word, Rhyme Recognition, Rhyme Production), four Math items (Rote Counting, One-to-One, Geometry, Patterns), five language items (Takes Care of Personal Needs, Recognizes and Responds to Name, Interacts with Adults and Peers, Responds to Adult Direction, Follows School Routines), and four Personal/Social items (Starts Conversation, Communicates Personal Experience, Asks Questions, Talks While Pretending). In addition to the KIA, children's attendance records and retention records were obtained for the 2006-07 kindergarten year.

When examining the long-term goal of the program, the 3rd grade EOG scores for math and reading were used to assess the preschool and waitlisted students' status in 3rd grade. The children who attended the Title I Preschool Program in 2005-06 should have been in 3rd grade during the 2009-10 school year. In addition to EOG scores, students' attendance records, Special Education placement, and retention records were used to examine the long-term impact of the Title I Preschool Program.

2010-11 PRESCHOOL PROGRAM

During the 2010-11 school year, additional methods were used to assess the state of the current preschool program and the progress of the current students. A survey of the 2010-11 Title I Preschool Teachers was conducted in April, 2011. This survey was designed to acquire information from teachers about their perceptions of the effectiveness of program components, implementation of the program, and satisfaction with program training, materials, and support. The survey was sent via Survey Gizmo by program staff to all 39 preschool teachers (one teacher at each preschool site) via an online survey tool, and teachers were able to complete the survey online. Twenty-nine teachers completed the survey before the deadline, which equates to a 74% response rate.

Additionally, a survey was given to parents of children who participated in the 2010-11 Title I Preschool Program. The survey was conducted at the end of the school year in May 2011 by the preschool staff. Parents were able to complete this survey either online or by completing a paper copy during a family-school partnership day at their child's preschool site. Additionally, the survey was translated into Spanish so that Spanish-speaking parents were also able to complete it. The survey was designed to acquire information from parents about the effectiveness of the program, their satisfaction with the program, and their level of participation in program events. There was approximately a 37% response rate for the parent survey. Because respondents were not asked to supply their school name, it was not possible to determine if responses reflected all sites within the program. Spanish speaking families accounted for 21% of the survey responses. While this return rate is not unusually low for a parent survey distributed online or through a mail out process, responses will be shared on a limited basis because we cannot assess the representativeness of the returns.

Finally, the Brigance Preschool Screen was used to assess progress for 2010-11 preschool students. Standard scores, percentiles, and age equivalents were available for this group of students. Additionally, for this group of students, the four-year old version was only used when children were still four years old at the time of the assessment; if the child had turned five before the assessment then the five-year old version was used. Due to the fact that different versions may have been used for pre and post assessment (because of child's age) the percentile scores and age equivalents will be used to validly assess student growth from pre- to posttest.

LIMITATIONS

A key limitation of the longitudinal part of this study is the small sample size. While we initially had 137 students in the preschool program in 2005-06, we were unfortunately only able to use data for five of the eight campuses because three campuses had incomplete data. Students were also lost to attrition over time, so by the end of 3rd grade, 62 students remained in the sample

with 30 matching comparison students from the waiting list. Therefore, this study must be considered more exploratory than conclusive.

Another limitation of the comparison group is the parents' designation of whether their child received preschool services was the only measure available for this important variable. WCPSS does not have records of children's participation in preschools across the county. Parents sometimes consider day care service to be the same as preschool, but the quality is often quite different.

Finally, data are not available on the quality of the implementation of the program in 2005-06. This can make it difficult to distinguish whether implementation levels are related to the findings. Data for 2010-11 is limited to survey self-report data; observation data would be stronger evidence of the quality of implementation.

LONGITUDINAL STUDY FINDINGS

Did Preschool Participants Show Growth After the Preschool Experience?

Available assessment measures suggest preschool students made considerable growth during preschool. However, it was not possible to compare this growth to a comparable group or to national norms.

Student assessment results before and after the preschool year were initially examined to assess student growth. The average number of days absent for the sample of preschool students from the 2005-06 school year was 16 days (out of 180). Although there is no specific comparison for this number, generally having over 10 absences can be considered problematic. A series of pre and post assessments were completed during the 2005-06 school year on the Title I preschool group. Waitlisted students had only some prescreening measures and no tests at the end of the preschool period, so comparisons were not possible. Measures that offer developmental norms provided the best measure of preschool success, because they provided a standard for whether students grew more than would normally be expected.

The first measure used to assess progress over the course of the preschool year was the Brigance Preschool Screen. A paired samples t-test showed significant growth between the pretest scores (Mean = 35.11) and posttest scores (Mean = 75.69) (t= -19.629, p=.000, n= 61).

The second measure given was the PALS. Seven subtests were included on the pre- and posttest: Name Writing, Upper Case Recognition, Lower Case Recognition, Letter Sounds, Beginning Sounds Awareness, Print/Word Awareness, and Rhyme Awareness. Paired sample t-tests revealed that posttest scores on all subtests were significantly higher than pretest scores (see Table 3). Additionally, at least 65% of students scored at or above the spring developmental range scores on all subtests (a fall developmental range was not available for comparison).

Name Writing and Beginning Sound Awareness had the strongest results, with over 86% of scores above the spring developmental range.

Table 3
PALS Results - Fall and Spring 2005-06

PALS Subtest	T score	Significance	Fall Mean Score	Spring Mean Score	% at or above Spring Developmental Range
Name Writing (n=36)	-6.454	*p* =.000	3.61	6.31	89.2%
Upper Case Recognition (n=37)	-7.795	*p* =.000	5.70	16.46	75.7%
Lower Case Recognition (n=37)	-7.327	*p* =.000	3.19	13.95	70.3%
Letter Sounds (n=37)	-6.337	*p* =.000	1.59	8.27	64.9%
Beginning Sound Awareness (n=37)	-4.751	*p* =.000	4.97	8.54	86.5%
Print/Word Awareness (n=37)	-5.897	*p* =.000	4.73	7.76	75.7%
Rhyme Awareness (n=37)	-5.280	*p* =.000	3.30	6.30	64.9%

The Creative Curriculum Assessment was the 3rd pre and post measure given during the 2005-06 preschool year. Another series of paired samples t-tests revealed that the posttest scores were significantly higher than the pretest scores for all four areas (see Table 4).

Table 4
Creative Curriculum Results, 2005-06

Creative Curriculum Subtest	T score	Significance	Fall Mean Score	Spring Mean Score
Social/Emotional	-12.215	*p* =.000	18.52	32.34
Physical	-10.834	*p* =.000	12.76	20.56
Cognitive	-15.369	*p* =.000	17.44	36.11
Language	-14.720	*p* =.000	15.90	30.95

n= 62

Thus, available measures show considerable growth in students' scores over time. However, national norms and/or a comparison group are not available to put this growth in context.

Did the 2005-06 Preschool Program Meet Its Short-Term Goals? (Kindergarten)
KIA scores were significantly higher for preschool participants on two of 21 measures. Attendance, retention, and special education placements did not vary statistically. This provides little evidence of a major short-term impact of preschool.

Title I Preschool students who attended the program during the 2005-06 school year were compared to a group of students who were on the waitlist and not admitted into the Title I program. The two groups were found to have similar characteristics.

- Initial educational neediness scores (a score that was used as criterion for admittance to the program), for the two groups were not statistically significantly different. Since the children on the waitlist had similar scores to those who were admitted to the program, it is likely that they too would have been admitted had more openings been available.

- The Title I preschool group and the waitlist group were demographically similar in terms of percentage of students on free or reduced-price lunch (FRL) and limited English proficient (LEP) students (see Table 5).

- Additionally, the two groups were similar in terms of the percentage of students of different races/ethnic groups (see Table 5).

Table 5
Characteristics of Preschool Participants and Waitlisted Students, 2005-06

	FRL	LEP	Black	Hispanic	White	Other
Title I Pre-K %	76.2%	28.6%	42.9%	36.5%	20.6%	0%
Number	48	18	27	23	13	0
Waitlist %	77.4%	29.0%	54.8%	22.6%	16.1%	6.5%
Number	24	9	17	7	5	2

Data Source: Title I data files (paper, converted to electronic Excel files).

In addition, an item on the KIA was used to examine if the two groups were significantly different in preschool experience. However, this variable may not be completely accurate for these two groups of students due to inconsistent reporting of this variable. Sometimes parents count day care as preschool, and rosters from other preschools were not available. Preschool experience is based on parent responses to a general question on the registration form. The preschool item is open to interpretation in the type, amount, and quality of pre-kindergarten or childcare that constitutes preschool experience. Approximately 15% of the preschool sample

used in this study was reported as not having attended preschool, which we know was incorrect. In an effort to have this variable accurately reflect the preschool experience of the sample, the variable was corrected to show that all children in the preschool sample had attended preschool. When run with the variable as it was reported by parents, the chi square suggested that the two groups were not significantly different (Pearson Chi Square = 6.847, p=.144). Approximately 60% of the waitlist group was reported to have had preschool experience. When run with the corrected variable the Chi square revealed that the groups were significantly different in their preschool experience (Pearson Chi Square = 24.173, p=.000). However, readers must be aware that some error likely exists in the waitlisted responses as well.

Several measures from the kindergarten year were used to examine success in meeting the short-term goals of the program (KIA scores, special education placements, retention rates, and attendance rates.

Upon entering kindergarten, children were given the KIA and therefore items from this measure are being used to compare the preschool and waitlist groups at the beginning of the kindergarten year. Of the selected KIA items, the preschool group was significantly different than the waitlist group on two items: Letter ID and Rhyme Production. Letter ID is considered a critical indicator of potential success in learning to read. For both of these items the preschool group outperformed the waitlist group. Additionally, the difference between the two groups on Rhyme Recognition was approaching significance, with the preschool group performing better than the waitlist group. For the remainder of selected KIA items, the two groups were not significantly different in their performance (see Tables 6 and 7).

Table 6
KIA Mathematics Items Chi Square Results, 2005-06

KIA Items	Chi Square	Significance
1. One-to-One	1.227	.747
2. Patterns	2.232	.328
3. Geometry	3.481	.481

n = 55 for preschool and 30 for waitlist
Data Source: E&R Data Files (Quickr)

Table 7
KIA Literacy Items T Test Results, 2005-06

KIA Items	Preschool Mean	Waitlist Mean	T-test	Significance
1. Print Concepts	6.93	5.63	1.523	.132
2. Retelling	1.75	1.80	-.289	.773
3. Letter ID	28.82	19.07	2.548	**.013***
4. Letter Sound	6.35	4.43	.671	.504
5. Word ID	.62	.83	-.356	.722
6. Concept of Spoken Word	2.38	2.27	.273	.786
7. Rhyme Recognition	3.24	2.43	1.839	.070
8. Rhyme Production	1.64	.43	2.588	**.011***
9. Starts Conversation	2.78	2.83	-.313	.755
10. Communicates Personal Experience	2.65	2.57	.510	.611
11. Asking Questions	2.44	2.43	.018	.986
12. Talks While Pretending	2.82	2.90	-.541	.590
13. Rote Counting	16.02	14.63	.704	.484
14. Recognizes and responds to name	3.05	3.07	-.102	.919
15. Takes care of personal needs	2.91	3.03	-1.192	.237
16. Interacts with adults and peers	2.85	2.93	-.537	.593
17. Responds to adult direction	2.87	2.80	.494	.623
18. Follows school routines	2.80	2.67	.899	.371

n = 55 for preschool and 30 for waitlist
* = Significant
Data Source: E&R Data Files (Quickr)

Short-term goals of the preschool program were that participants would need less support than similar students, as evidenced by lower special education placements and retention rates.

At the beginning of kindergarten the two groups were not significantly different in the number of students with special education placements (Pearson Chi Square =.544, *p*=.762). At the end of the kindergarten year the two groups were also not significantly different for attendance or retention rates.

- Attendance: the Title I preschool group (Mean = 8.40) and the waitlist group (Mean = 6.90) did not have significantly different numbers of days absent during their kindergarten year (t= 1.092, *p*=.278).

- Retention: The two groups were also not significantly different in the number of students that were retained (Pearson Chi Square = 4.053, *p*=.132). Few students were retained from either group.

Has the Title I Preschool Program met its long-term outcomes/goals?

EOG results do not support a long-term impact of the preschool program based on this small sample. Retention rates, attendance rates, and special education placements were also not different for those who attended preschool in WCPSS compared to similar students.

The long-term goal of the program was that children who attended Title I preschools would be more likely to be on grade level in 3rd grade than students not served. In order to determine the success in meeting this goal, EOG scores for the preschool and waitlist groups were compared (see Table 8).

- Approximately 27% of the Title I preschool sample was on grade level in reading and approximately 54% were on grade level in mathematics.

- However, when examining Reading EOG scores, the Title I preschool group was not significantly different from waitlist group (t= -.566, *p*=.573). Similarly, Mathematics EOG scores for the Title I preschool group were not significantly different from scores for the waitlist group (t= -.676, *p*=.501).

- Both groups had a similar breakdown of scores for both reading and mathematics. While the scores are generally lower than for WCPSS as a whole, they are similar to the FRL and LEP subgroups.

Table 8
Title I and Comparison Groups by EOG Level, 2005-06

EOG Scores	Level	Title I Pre-K	Waitlist	WCPSS	FRL	LEP
Reading	**4**	5.6%	3.4%	29.2%	8.7%	2.3%
	3	21.8%	24.1%	43.2%	38.5%	21.7%
	2	27.2%	34.5%	13.2%	21.7%	21.4%
	1	45.4%	37.9%	14.4%	31.1%	54.5%
Math	**4**	9.1%	10.3%	38.1%	13.5%	8.6%
	3	45.4%	44.9%	47.1%	55.7%	47.6%
	2	38.2%	37.9%	11.8%	23.4%	33.2%
	1	7.3%	6.9%	3.0%	7.3%	10.6%

n = 63 for preschool and 31 for waitlist

In addition to EOG scores, attendance, retention, and special education placement data were used to examine whether preschool students fared better than those students in the waitlist group. Chi square results revealed no significant differences in terms of the number of days absent during their 3rd grade year, special education placements, or retentions at any point up to and including their 3rd grade year. Table 9 shows actual values, which illustrate that differences in values can be relatively large (e.g., 7% in the case of kindergarten retention) without reaching statistical significance) with these small samples.

Table 9
Title I Outcomes Comparison, 2005-06

Outcomes	Title I Pre-K	Waitlist	WCPSS	FRL	Black	Hispanic
Attendance (mean days absent)	6.02	6.67	--	--	--	--
Special Ed. Placement	17.5% 11	9.7% 3	--	--	--	--
K-3rd Grade Retention	14.8%* 9	16.7%* 5	--	--	--	--
Kindergarten Retention	0% 0	7.4% 2	4.2% 480	0.5% 55	1.6% 180	1.3% 152
3rd Grade Retention	.2% 1	9.7% 3	1.2% 145	0.2% 26	.5% 60	.4% 42

n= 62 for preschool and 31 for waitlist group
* Percent of children retained in any grade up through 3rd grade

2010-11 PRESCHOOL PROGRAM FINDINGS

The 2010-11 preschool program provided data on implementation and short-term outcomes. Overall, 686 students were enrolled during the 2010-11 school year at 38 schools in 39 classes. The curriculum used was substantially the same as that used in 2005-06, but the number of classes was far greater. Teachers were hired from July 1, 2010 to June 30, 2011; training included topics related to curriculum and meeting the needs of individual students. Of the teachers who were hired 7.7 % were new to WCPSS, 12.8 % were new to preschool, and 100% were certified to teach preschool. Each class had 15-18 students and was staffed with a teacher and at least one teacher assistant.

Was the Preschool Program implemented as planned?

Most teachers reported they had what they needed to implement the preschool program well. Actual observation data were not available. Reported frequency of use of the Creative Curriculum varied across teachers.

Data on the observed implementation of the program in individual preschool classrooms were not available at the time of the report. However, some basic information on implementation of the program was available through teacher survey data. Creative Curriculum is the major curriculum resource for the program, and daily use is expected by central staff. Over two thirds (69%) of the teachers said they use the Creative Curriculum multiple times a day in their classrooms (31%) or daily (38%). However, 21% indicated only weekly use, 3% said they only use Creative Curriculum 2 to 3 times a week, and 7% said that they do not use it in their classrooms at all.

Also, as shown in Table 10, teachers felt well supported in implementing the program.

- In terms of support for preschool teachers, approximately 86% of teachers felt that they were supported by their Title I coordinating teacher and approximately 66% felt supported by the Title I central office team (see Table 10).

- With regard to materials, 83% of teachers felt they had the materials they needed to meet the needs of their students.

- Finally, 76% of teachers felt that the professional development that was provided was effective.

Thus, these data indicate most teachers believed they had what they needed to implement the preschool program well. Close to one third reported using Creative Curriculum materials less often than expected.

Table 10
Teacher Perceptions of Aspects of Program Implementation, 2010-11

Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have been supported by my Title 1 Coordinating Teacher.	34.5%	51.7%	13.8%	0%	0%
I have been supported by the Title 1 Central Office Team.	20.7%	44.8%	24.1%	6.9%	3.4%
I have the necessary materials to meet the needs of my students.	27.6%	55.2%	0.0%	13.8%	3.4%
The professional development provided by the Title 1 Pre-K Department was effective.	27.6%	48.3%	17.2%	6.9%	0%

n= 29
Data Source: Preschool Teacher Survey

Did students show growth on the Brigance?
Overall, preschool students did show growth on the Brigance, with gains beyond what would be expected normally after preschool service.

During the 2010-11 school year, a number of measures were completed regarding the current preschool class. At the time of this report, the data available to measure progress over the course of the year were from the 2010-11 Brigance Screen. In order to compare total progress, the Total Quotient score was used because it allows for comparison to national norms and because it is the best type of score for an aggregate comparison (see Table 11). According to national norms, the pretest mean score of 77.50 fell in the Poor range; however, the posttest mean score of 98.66 fell in the Average range. Additionally, the Academic Age Equivalent for the posttest was significantly different from the pretest (t= -36.836, *p*=.000). The Language Age Equivalent for the posttest was also significantly different from the pretest (t= -15.616, *p*=.000). Thus, these data provide stronger evidence than the 2005-06 program that students showed growth beyond what would normally occur after participating in the preschool program.

Table 11
2010-11 Brigance Results, 2010-11

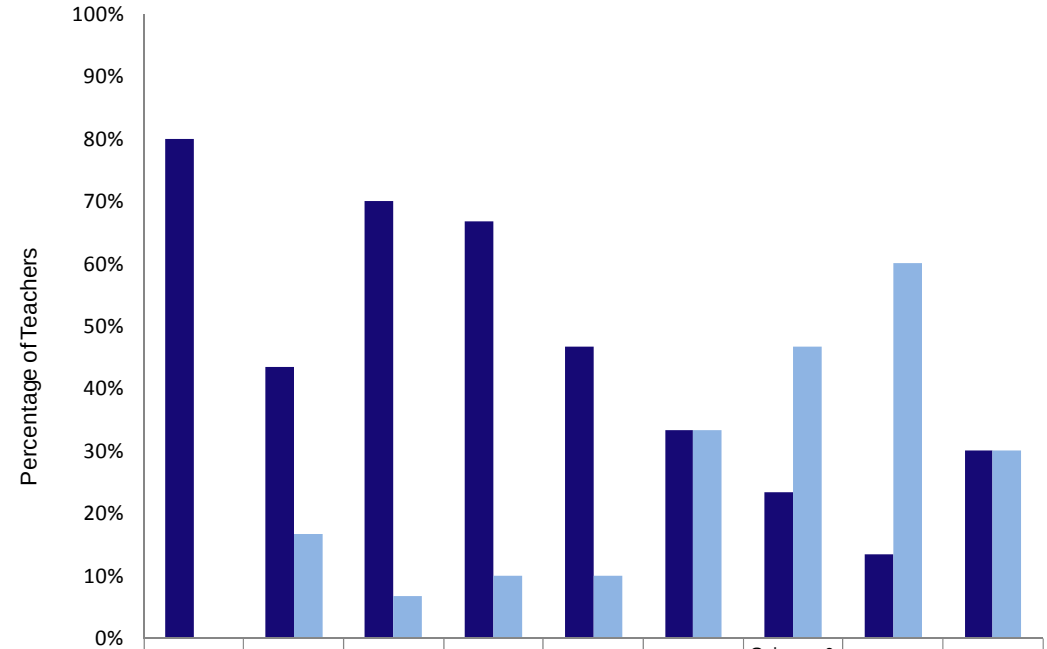
Scores	Pretest Mean	Posttest Mean	T test	Significance
Total Quotient	77.50	98.66	-22.552	.000
Academic Age Equivalent (in months)	41.57	61.50	-36.836	.000
Language Age Equivalent (in months)	39.55	55.37	-15.616	.000

n = 201

What facets of the Preschool Program are viewed as most effective and least effective?
Within the Creative Curriculum, teachers most often cited the Social/Emotional, Oral Language, and Cognitive aspects as most effective and the Social Studies and Science & Technology aspects as least effective. Teachers felt higher student attendance rates and parent participation rates would be helpful. Parents did tend to have conferences with the teachers, but participation in other ways was limited. Most parents who responded to the survey found the program helpful in preparing their children for kindergarten.

The effectiveness of the curriculum can impact student outcomes. While the program uses parts of multiple curricula, the Creative Curriculum is one major part of the program curriculum, which has multiple components within it. Teachers were asked to comment on which components of the Creative Curriculum they found most effective and which they found to be least effective. As shown in Figure 1, teachers found the Social/Emotional, Oral Language, and Cognitive aspects of Creative Curriculum to be the most effective components, while they found Social Studies and Science & Technology to be the two least effective components. Mathematics and literacy components were in the mid-range of responses; it is interesting that about the same percentage of teachers selected mathematics as the most effective and least effective aspect of the program (33%).

Figure 1
Teacher Rated Effectiveness of Creative Curriculum Areas



	Social-Emotional	Physical	Oral Language	Cognitive	Literacy	Math	Science & Tech-nology	Social Studies	The Arts
most effective	80.0%	43.3%	70.0%	66.7%	46.7%	33.3%	23.3%	13.3%	30.0%
least effective	0%	16.7%	6.7%	10.0%	10.0%	33.3%	46.7%	60.0%	30.0%

n: 29
Data Source: Preschool Teacher Survey

Student attendance can impact how effective a program is at increasing student achievement. According to teacher reports student attendance can be a problem; 28% of teachers reported that between 5 and 9 students in their classrooms had 10 or more absences. Additionally, 69% of teachers felt that attendance impacted student's achievement. A few teachers also commented that there need to be stricter attendance policies in order to increase student attendance.

Another important aspect of the program is the family-school partnership. As shown in Table 12, two-thirds of teachers felt that the family-school partnership aspect of the program is a necessary part of the program, and that it does impact student achievement in a positive way. Teachers mentioned that parents who participated learned the importance of being involved in their child's education and were able to continue to help their child learn at home. Additionally, the children of participating parents had fewer behavior problems in the classroom and did better academically. Of course, since participation is voluntary, parents who elect to participate may be more involved with their children's development overall.

Table 12
Teacher Perceptions of Family Involvement, 2010-11

Item	Yes, Definitely	Yes, Somewhat	No
Family-school Partnership Days are a necessary part of the Title 1 Pre-K program.	65.5%	31.0%	3.5%
Has family involvement impacted the achievement of students?	69.0%	24.1%	6.9%

n: 29
Data Source: Preschool Teacher Survey

Despite the importance of this aspect of the program, the Director of the preschool program reported that participation in parent sessions varied by classroom considerably, with some teachers frequently reaching 100% attendance and others with 60% for their most highly attended session. Some teachers commented that lack of participation in these family-school partnership activities was an issue. A few of the teachers commented that some of the families were not consistent with their child's attendance and did not consistently participate in family-school partnership activities. Teachers suggested that additional support from the Title I staff on these aspects of the program (e.g., through a letter sent to families from program staff) might be beneficial. Comments from some teachers suggest that family involvement is considered important by staff but participation rates by parents are lower than desired.

The program goal for parent conferences is to have at least two per family and nearly all (90%) of teachers did indicate that they usually had one to three conferences with each family throughout the year.

While the parent survey return rate was low (37%), responses were provided by 255 parents. Responses to a few key questions merit discussion. Approximately 93% of the parents who responded to the survey were extremely satisfied with the preschool program. In addition to overall satisfaction, approximately 82% of responding parents felt that the Title I preschool program helped their child very much with their social skills. Approximately 67% of responding parents felt that the Title I preschool program helped their child very much with reading skills. Finally, 65% of responding parents felt that the Title I preschool program helped their child very much with their mathematics skills (see Table 13).

Table 13
Parent Perceptions of Program Effectiveness, 2010-11

Items	Very Much	Quite A Bit	Somewhat	A Little	Not At All
How much did Title I Pre-K Program help your child with SOCIAL skills?	81.9%	16.1%	1.6%	0.4%	0%
How much did The Title I Pre-K Program help your child with READING skills?	66.5%	26.4%	6.3%	0.4%	0.4%
How much did the Title I Pre-K Program help your child with MATH skills?	65.0%	28.0%	6.3%	0%	0%

n= 255
Data Source: Preschool Parent Survey

Parents were asked what that their favorite part of the program was; common open-ended responses included:

- the teachers and their investment in the students,
- the effort to involve parents and families in the program,
- the chance for their children to learn social skills,
- the academic progress that their child showed over the course of the year, and
- the preparation of their child for kindergarten.

How could the Title I Preschool Program be improved?

The teacher survey asked teachers about their biggest challenges in implementing the preschool program. Common challenges included: meeting Early Childhood Environment Rating Scale (ECERS**)** standards, lack of support from administration at the school, difficulty in ordering supplies, lack of materials for the OWL curriculum, dealing with challenging behavior, and no duty-free lunch or planning time.

In addition, when asked about improvement on the teacher survey, teachers mentioned the following as areas of improvement:

- more consistency in school-central office expectations for classroom routines and procedures,
- more support from coordinating teachers, meaningful and relevant professional development,
- better/easier access to materials and resources for classroom, and
- changing the parent workshops and family-school partnership days so that they are better attended.

Based on responses from the parent survey, a large number of parents would not change anything about the Title I preschool program. Numerous parents commented that the program should be available to more children and be offered at more sites. Parents also commented that although the parent workshops and family-school partnership days are valuable to the program they should be more accessible to working parents, perhaps by holding one or more on a Saturday. Finally, parents commented that there could be better communication especially for Spanish speaking families.

Is the WCPSS preschool program cost effective?

Research studies such as that conducted by the University of Pittsburgh (2003) found *high-quality* preschools can be quite cost effective, returning $4-7 per dollar of investment over time. Some of these benefits can only be measured later in students' educational careers and beyond (such as graduation rates, higher average incomes, and reduced delinquency and incarceration rates). Benefits which can be seen much early in students' educational careers include school readiness for kindergarten and stronger achievement scores.

Costs for preschool programs included in the University of Pittsburgh 2003 study ranged from about six to thirteen thousand dollars per year. Most were part-time programs, with some full-day programs. The WCPSS program cost was $5,772 if one-time start-up costs are not included; all were full-time programs. While the 2003 study notes that costs are calculated in differing ways across studies, the WCPSS program clearly appears to be at the low end of the cost range.

In our WCPSS study, positive short-term benefits in terms of preschool learning were observed, with limited advantages in terms of kindergarten readiness. However, by 3rd grade, positive impacts on achievement, on the average, were not evident. Barnett (1998) found that achievement effects appear to fade out in studies without strong study designs and with considerable selective attrition, but do not fade out in experimental or quasi-experimental studies with few methodological constraints. Unfortunately, in this post-hoc study, it was impossible to avoid some methodological issues--it was not possible to create an experimental or quasi-experimental design, some of the comparison students were served in different preschool

programs, the impact of attrition on the remaining sample is unknown, and the small sample size reduces the statistical power to detect effects.

Whether some of the long-term benefits will become evident over time is impossible to tell at this point. Based on evidence available at present, we cannot demonstrate long-term cost effectiveness based on higher achievement, lower retention rates, or lower special education referral rates as of 3rd grade.

CONCLUSIONS

The findings indicate that preschool participants do show academic growth beyond what would be normally seen during the preschool year and to a limited extent at the start of kindergarten. However, 3rd grade data on End of Grade, retention, Special Education placements, and attendance do not show that preschool participants are any more successful than similar students not served in the Title I preschool program.

The teacher survey results indicate that teachers are fairly satisfied with working in the Title I preschool program; however, there is still room for improvement in areas such as student attendance, parent participation, and consistent implementation of the Creative Curriculum. Additionally, the parent survey results suggest that the majority of parents are satisfied with the program and feel that it helps their children in multiple areas.

RECOMMENDATIONS

WCPSS needs to know more about the benefits received from its investment of federal dollars in preschool. While national and experimental studies have found lasting effects of preschool experience on student achievement (Barnett, 1998; Soriano et al. 2006), our current data do not support that view for the WCPSS program. The WCPSS finding is not unique among studies without experimental designs and with small sample sizes. At a 2010-11 cost of $4.5 million, we need to have a better sense of whether our preschool efforts are cost beneficial as structured. If not, the preschool method currently used for low-income students might need to be enhanced or replaced with a stronger model.

Examine aspects of model preschools and modify our program to match them more closely if appropriate. This small longitudinal study did not discern significant impact of our current program on students' success through 3rd grade. However, the small numbers of participants and comparison students is a very real limitation of this study, and we must consider it primarily exploratory. At this point, we recommend staff review model preschool programs with positive research results to determine practices, materials, or conditions we do not use and incorporate them as feasible. Title I central staff members are also encouraged to ask other districts or Title I staff at the state or federal level for ideas on how to promote parent involvement and student attendance. Preschool teachers within WCPSS might also be asked to brainstorm possibilities,

and perhaps try two different methods in an experimental way to check impact. One idea revealed in the survey results was to change the timing of the parent sessions to promote higher attendance. Teachers who have high attendance at parent sessions may have some valuable ideas to share as well.

Start a quality long-term study of preschool in WCPSS with next year's cohort. Preschool programs can meet an important need, in helping to "level the playing field" for students from low income backgrounds whose families cannot afford quality preschool programs. The Curriculum Management Audit and Board Policy 5600 both cite the importance of evaluating our efforts. In the case of preschool, millions of dollars are being spent on our preschool program, yet its effectiveness here in WCPSS has not yet been demonstrated. When students are screened for next year, a comparison group should be established which can be followed over time through a contracted evaluation. Two options are a comparison group of those just below the cut (waitlisted) if the selection criteria are strictly adhered to or a group that receives a different pre-school model. The use of nationally normed preschool measures (such as the Brigance) is imperative to allow developmental comparisons over time. The evaluation contractor should be hired soon, before screening, to support the establishment of a solid research design. Data should be collected for students on the waitlist in terms of preschool participation; spring posttest scores on the Brigance should be obtained if possible. Student attendance and fall and spring testing data should be recorded consistently as part of the study. Measures used to monitor progress should include norms that match the program goals and which provide developmental norms to assess relative progress. Only one such measure was available for the longitudinal study, and the correct version of the pretest was not given to all 2005-06 participants.

Improve data collection mechanisms. In addition to establishing a quality long-term student design in advance, having high quality data readily available will enhance the ability to complete a quality study in a timely manner. Title I staff are encouraged to put a high priority on changing over from paper data collection to an electronic system for preschool in the coming year. Collecting data efficiently will make it easier for program staff to use data in an ongoing way as well. In the case of this study, data were not readily available and were incomplete when located; this cost valuable time for program and evaluation staff and slowed completion of this study.

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