



Third Grader, Broward County Public Schools

Pilot Overview

In the summer of 2006, Broward County Public Schools (BCPS) in conjunction with Learning Today, Inc (LT) and the Institute for Community Empowerment (ICE) piloted a tri-dimensional, cross-curricular approach in its summer reading camp for potential third grade retainees. The purpose of the project was to examine whether this approach would improve upon the promotion rate of previous summer camps and determine if Learning Today's web-based differentiated explicit instruction program would serve "at-risk" students better than systems currently used in the county.

Students in the following 13 schools participated in the pilot program:

- Bayview Elementary
- Bennett Elementary
- Croissant Park Elementary
- Dillard Elementary
- Harbordale Elementary
- Lauderdale Manor Elementary
- Thurgood Marshall Elementary
- North Fork Elementary
- North Side Elementary
- Rock Island Elementary
- Sunland Park Elementary
- Walker Elementary
- Wilton Manors Elementary

Program Highlights

- **Four-week (13 school days) intensive reading instruction program conducted during summer break**
- **162 students identified as potential third grade retainees participated in the program**
- **Students engaged in daily 60-minute instruction sessions for an average of 10 hours per student.**
- **Instructional Focus on Phonemic Awareness, Phonics, Sight Words, Vocabulary, and Comprehension**
- **Post-test scores for students that improved indicated the following average grade level gains:**
 - **Phonemic Awareness/Phonics = 1.52**
 - **Sight Words = 1.07**
 - **Vocabulary = 1.40**
 - **Comprehension = 1.38**



During the 3.5 hours of daily sessions, students rotated through the following three programs:

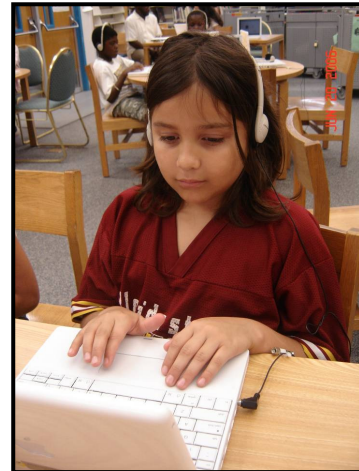
- **Learning Today** - supplemental, computer-assisted reading instruction
- **ICE** - hands-on science / math projects combined with motivational activities
- **Voyager** - book-based, teacher-directed instruction

Smart Tutor Program Overview

A total of 162 students participated in daily 60-minute instructional sessions on Smart Tutor, a computer-based reading program, over a 4 week period (approximately 13 school days). Students exhibited gains that ranged from 1.07 to 1.52 grade levels in phonemic awareness/phonics, sight words, vocabulary and comprehension.

Smart Tutor Program Implementation

- A total of 291 students were administered a diagnostic/formative skills assessment (pre-test) in May 2006 in each of their schools. Of those students, 162 students completed the Smart Tutor summer program during the four-week program period.
- Students utilized Smart Tutor in 60-minute daily instructional sessions for a period of approximately four weeks (13 school days). Typically, the Smart Tutor program runs throughout the entire school year. Each student uses Smart Tutor for 60 minutes per week, but given the short duration of the summer program, it was necessary to maximize instructional time.
- Students were able to accomplish a mean time on task of 10 instructional hours in 13 days.



Smart Tutor Results

- **The majority of students exhibited increases in their reading skill levels.**
- **Significant academic gains were achieved in phonemic awareness/phonics, sight words, vocabulary and comprehension.**
- **Mean time on task = 10 instruction hours**
- **Teacher surveys indicated students were engaged and motivated even though the program was conducted during the summer.**

- Lessons emphasized instruction in key reading sub skills, including phonemic awareness, phonics, sight words, vocabulary and comprehension strategies.
- Surveys were also conducted at the end of the program to elicit teacher opinions of the instructional content, the overall program effectiveness and student reactions.



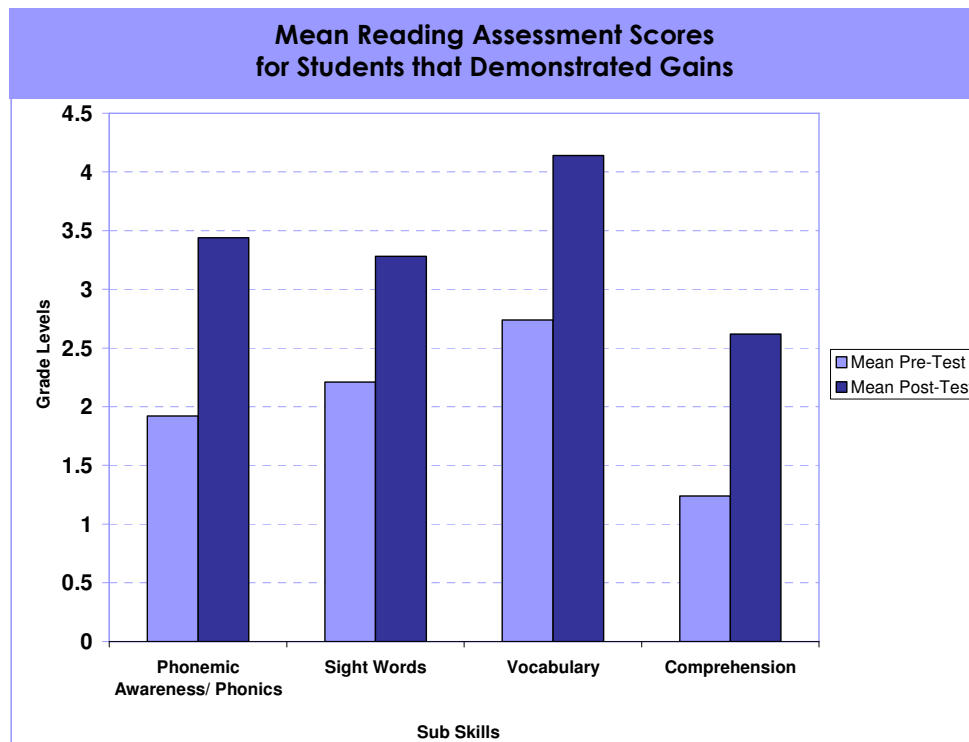
Smart Tutor Results

Analysis of Students with Academic Gains

Students' skill levels in phonemic awareness / phonics, sight words, vocabulary and comprehension were measured via Learning Today's Diagnostic/Formative Reading Assessment. Pre- and post-tests were administered to all students before and after utilizing the Smart Tutor instruction program. According to analysis, the majority of students exhibited significant increases in their reading skill levels.

Mean Reading Assessment Scores for Students that Demonstrated Gains				
	Phonemic Awareness/ Phonics	Sight Words	Vocabulary	Comprehension
Mean Pre-Test	1.92	2.21	2.74	1.24
Mean Post-Test	3.44	3.28	4.14	2.62
Mean Grade Level Gain	1.52	1.07	1.40	1.38

**Table 1 – Mean Reading Assessment Scores and Grade Level Gains
for Students that Demonstrated Academic Gain**



**Illustration 1 – Mean Reading Assessment Scores & Grade Level Gains
for Students that Demonstrated Academic Gain**

Students excluded in the illustration and table above include:

- students that scored at a mastery level in the pre-test in sight words (grade level of 3.83 or high 3rd), and/or those that scored at a mastery level in the pre-test in phonics (grade level of 4.83 or high 4th)
- students whose scores remained stable from pre-test to post-test
- students whose scores showed a decrease from pre-test to post-test

Analysis of All Students' Scores

While the majority of the students scored higher on the post test, some students' scores remained stable and others demonstrated a decrease (see Table 2). When the results of students who demonstrated a decrease and those that remained stable were included in the analysis, significant gains were still observed. See Appendix A for detailed statistical analysis.

	Patterns of Response			
	Phonics/ Phonemic Awareness	Sight Words	Vocabulary	Comprehension
# that increased	98	74	68	102
# that stayed stable	33	32	53	37
# that decreased	21	25	41	23
Total # of Students	152**	131*	162	162

Table 2 – Reading Assessment Patterns of Response for All Students in Pilot Program

*Students that scored at a mastery level in the pre-test in sight words (grade level of 3.83 or high 3rd) were excluded.
**Students that scored at a mastery level in the pre-test in phonics (grade level of 4.83 or high 4th) were excluded.

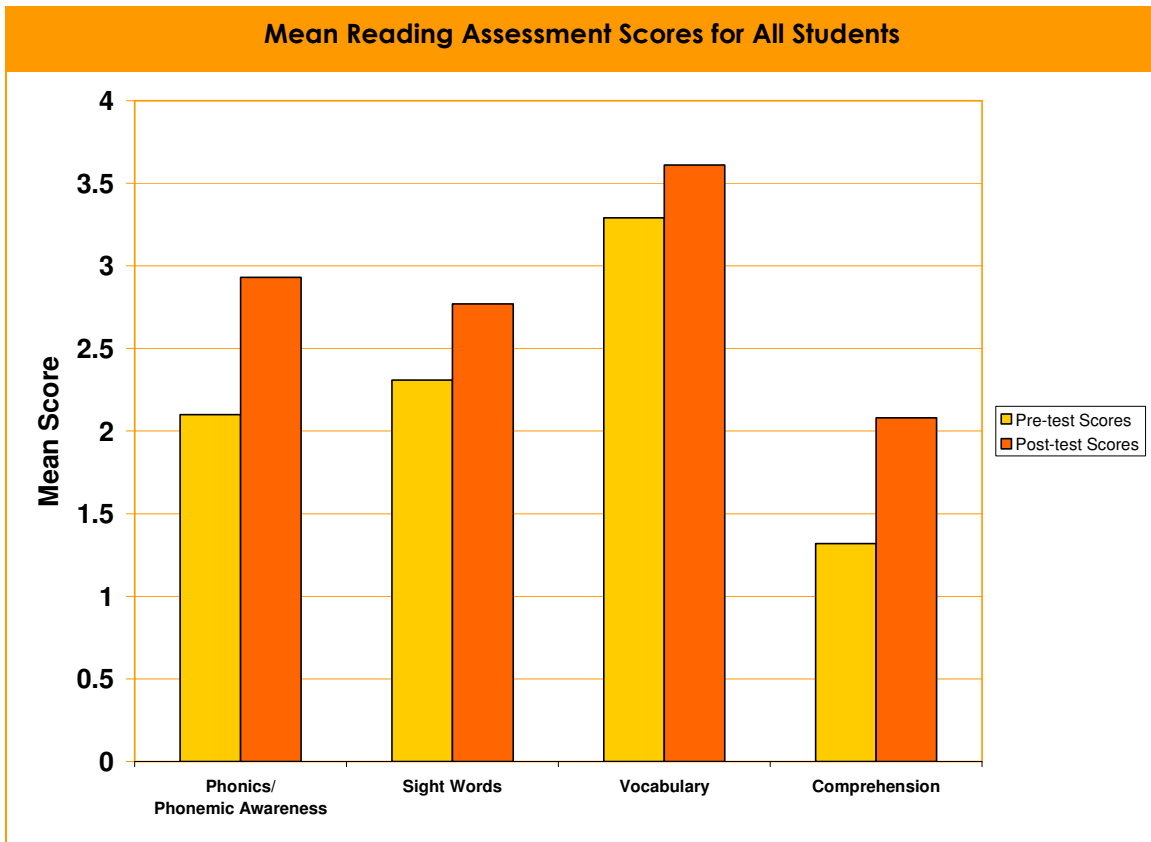


Illustration 2 – Mean Reading Assessment Scores for All Students

Mean Reading Assessment Scores for All Students				
	Phonics/ Phonemic Awareness	Sight Words	Vocabulary	Comprehension
Mean Pre-Test	2.1	2.31	3.29	1.32
Mean Post-Test	2.93	2.77	3.61	2.08
Mean Grade Level Gain	0.83	0.46	0.32	0.76

Table 3 – Mean Reading Assessment Scores & Grade Level Gains for All Students

Effects of Gender, ESE, LEP and Free & Reduced Lunch Status

Student results were also analyzed to examine whether there was an effect based on ESE, LEP, eligibility for the Free & Reduced Lunch program and Gender. Results were mixed depending on the specific variable being analyzed and the sub skill score. In general, the following effects were observed:

- Non-ESE students (N=90) performed significantly better on both the pre-test and post-test Sight Words assessment than ESE students (N=41). See Table 4.
- Non-LEP students (N=104) performed significantly better on both the pre-test and post-test Sight Words assessment than LEP students (N=27). See Table 5.
- Non-ESE students (N=114) performed significantly better on both the pre-test and post-test Phonics assessment than ESE students (N=48). See Table 6.

See Appendix A for a more detailed statistical analysis.

Table 4: Sight Words x ESE Assessment Summary Results

		Non-ESE			ESE		
		N	Mean	SD	N	Mean	SD
Sight Words (HF)	Pre	90	2.44	.92	41	2.05	.91
	Post	90	2.90	.90	41	2.50	.98

Table 5: Sight Words x LEP Assessment Summary Results

		Non-LEP			LEP		
		N	Mean	SD	N	Mean	SD
Sight Words (HF)	Pre	104	2.43	.92	27	2.05	.91
	Post	104	2.90	.90	27	2.50	.98

Table 6: Comprehension x ESE Assessment Summary Results

		Non-ESE			ESE		
		N	Mean	SD	N	Mean	SD
Comprehension (SR)	Pre	114	1.40	.88	48	1.16	.76
	Post	114	2.21	1.31	48	1.77	1.16

Teacher Reactions

All twelve teachers responded to the teacher survey. The survey instrument consisted of a Likert-type scale with a series of statements and open-ended questions designed to elicit teachers' perceptions of the instructional materials, system performance, student usage, the teacher application, progress reporting, system training and support. All of the teachers responded favorably to all aspects of the program (See Tab 4 of Binder – "Learning Today Pilot Program Evaluation" for summary of responses).

Sample Teacher Comments

- "It was an excellent summer camp; the best I have ever worked."
- "Compared to Odyssey/CCC, it is the best."
- "...from the expression on the students' faces and their anxiousness to go to the Reading Lab, I could tell they enjoy the program. Even the struggling readers try to achieve."
- "One of the best compared to CCC, AR, STAR!"
- "The program is everything that is necessary to deal with the different levels and work with the concentrated areas."
- "What I liked best about the program was the direct-explicit instructions and the formats of the reports."

Student Reactions

A total of 166 students responded to the online student survey. The survey instrument consisted of 11 multiple choice and yes/no questions that were delivered in the final week prior to students taking the post-assessment. The majority of the students responded positively to using Smart Tutor in school and at home. To the surprise of program staff some students mentioned that they had actually been using the program at home, another indication that students found the program engaging. Students also indicated that they believed Smart Tutor helped them with their reading (See Tab 4 of Binder – "Student Results Summary" for summary of responses).

Sample Statements	Percentage that Agreed
I would like to use Smart Tutor in my school.	87%
Smart Tutor helped me with my reading.	93%
I had fun using Smart Tutor.	95%
I would like to use Smart Tutor at home.	84%

Table 7 – Summary of Sample Responses



BCPS 3rd Grade Summer Reading Camp Smart Tutor™ Pilot Study Results

June 2006

Observations

Data Fluctuations

The increase in scores for the majority of the students is significant due to the following factors:

- the short duration of the pilot study (13 school days)
- the demographics of the students, which included:
 - ESE
 - LEP

It must also be added that increases and decreases pre- to post-testing may be an artifact referred to as “regression effect” (Dallal, 2005). This effect typically causes the tails of any distribution to “regress” or move toward the mean in pre- to post-assessment situations. This phenomenon has been observed in regular school assessments of children in compensatory programs. Implementation of the program over a full school year with a pre-, mid- and post-test would better determine the long-term effects of the score changes.

Duration of Pilot Study

This pilot study was conducted over a four-week period with the total time of instruction amounting to approximately 13 days. Students used the system for approximately 60 minutes per day for 13 consecutive school days and accomplished a mean time on task of 10 instruction hours. Some students received less instruction due to delays in pre-testing. Despite the short duration of the pilot study, a majority of the students demonstrated significant gains in phonics/phonemic awareness, sight words, vocabulary and comprehension skills. These results indicate that the Smart Tutor instruction program can be utilized to help improve the skill levels of low-performing students in a short period of time. It is expected that a greater number of students would be able to make even higher gains if the program were to be implemented over a full school year.

Instructional Emphasis

Due to the short duration of the program, instructional emphasis was placed on 2nd and 3rd grade level skills. In a typical full school year, implementation students would receive the full benefit of individualized instruction, which would most likely result in even greater gains for this population of students.

Teacher & Administrator Perceptions

All teachers surveyed indicated positive reactions to all aspects of the program. Many felt that the students enjoyed the materials and found the system easy to use. Under typical circumstances, students use the program for three 20-minute sessions or two 30-minute sessions per week, thus allowing Smart Tutor to be used in conjunction with other computer-assisted instruction.

Conclusion

Challenges:

- demographics of the students
 - ESE
 - LEP
- short duration of time (13 school days)

Outcomes:

- The majority of the students in the pilot demonstrated academic gains.
- The mean reading grade level gains for students that demonstrated academic gain were as follows:
 - Phonics/Phonemic Awareness = 1.52
 - Sight Words = 1.07
 - Vocabulary = 1.40
 - Comprehension = 1.38
- The mean reading grade level gains for all students (including those that remained stable or demonstrated a decrease in scores) were as follows:
 - Phonics = 0.83
 - Sight Words = 0.46
 - Vocabulary = 0.32
 - Comprehension = 0.76
- Teachers indicated that the students were motivated to learn and were engaged in the program.

Learning Today was pleased to help this group of students improve their academic skills. We look forward to working with more Broward County elementary schools in the 2006/2007 school year.



Appendix A

Detailed Statistical Analysis

The following analysis includes the results of all students, including those that demonstrated an increase, those whose scores remained stable and those whose scores demonstrated a decrease.

Sight Words (HF)

Learning Today's High Frequency Words (HF) assessment was used to measure each participant's sight words skill level. The pre-test HF assessment was administered prior to children engaging in related Learning Today lessons. The post-test HF assessment was administered between two weeks and eight weeks later, following the administration of a series of related Learning Today lessons.

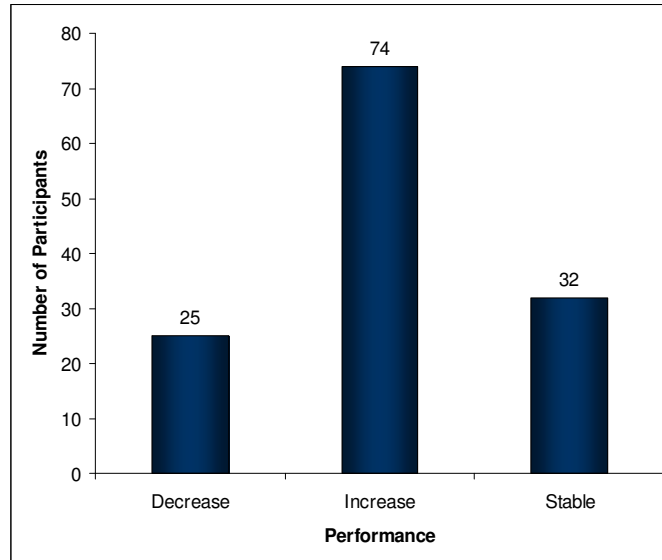
Table 1: Sight Words Assessment Summary Results

		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Sight Words (HF)	Pre	131	2.31	.93	0.5	3.50
	Post	131	2.77	.94	0.5	3.83

As can be seen in Table 1, children's scores ranged from .5 to 3.50 points in the pre-test and .5 to 3.83 in the post-test, with a mean of 2.31 points for the pre-test and 2.77 points for the post-test. This is an increase of .46 points from the pre- to post-test sessions, which is equivalent to approximately one half of a grade level.

Children's patterns of response were analyzed using a Wilcoxon Signed Ranks Test. To ensure validity of the results, children whose pre-test scores were at ceiling were omitted from these analyses. Results indicated that of those children whose performance varied, there was a significant increase in children's sight words skills ($z=-4.91, p<.01$). As is illustrated in Figure 1, 74 children increased their sight words skills, and 32 maintained a stable skill level. Twenty-five children exhibited a decrease in their skill level. For these children, this decrease may reflect fatigue and distraction during the assessment administration as all four assessments were administered at the same time. To confirm a significant increase in children's site words abilities, a paired t-test was performed on the pre- and post-test scores. Results found that there was a significant increase in test scores ($t(161)=-5.24, p<.01$), indicating a significant increase in children's sight words skills.

Figure 1: Sight Words Assessment Patterns of Response (N=131)



Children’s patterns of response were further analyzed by gender, ESE status, LEP status and whether children receive free or reduced lunches. There were no significant differences found by gender or free or reduced lunch status. A 2 (Sight Words) x 2 (ESE status) ANOVA found a main effect of ESE status ($F(1, 129) = 7.43, p < .01$). Findings indicate that non-ESE students (N=90) performed significantly better on both the pre-test and post-test Sight Words assessment than ESE students (N=41). Means can be found in Table 2.

Table 2: Sight Words x ESE Assessment Summary Results

		<i>Non-ESE</i>			<i>ESE</i>		
		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
<i>Sight Words (HF)</i>	Pre	90	2.44	.92	41	2.05	.91
	Post	90	2.90	.90	41	2.50	.98

A 2 (Sight Words) x 2 (LEP status) ANOVA found a main effect of LEP status ($F(1, 129) = 7.43, p < .01$). Findings indicate that non-LEP students (N=104) performed significantly better on both the pre-test and post-test Sight Words assessment than LEP students (N=27). Means can be found in Table 3.

Table 3: Sight Words x LEP Assessment Summary Results

		<i>Non-LEP</i>			<i>LEP</i>		
		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
<i>Sight Words (HF)</i>	Pre	104	2.43	.92	27	2.05	.91
	Post	104	2.90	.90	27	2.50	.98

Phonics

Learning Today's Word Analysis (WA) assessment was used to measure each participant's phonics skill level. The pre-test WA assessment was administered prior to children engaging in related Learning Today lessons. The post-test WA assessment was administered between two and eight weeks later, following the administration of a series of related Learning Today lessons.

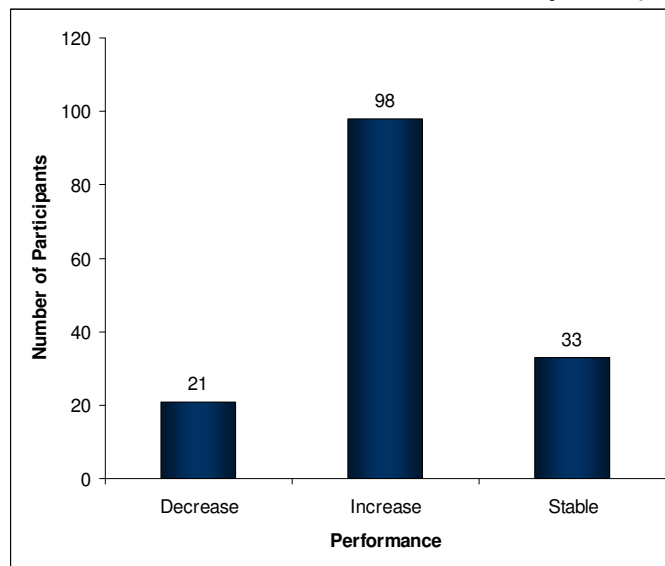
Table 4: Phonics Assessment Summary Results

		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Phonics (WA)	Pre	152	2.10	1.44	0	4.50
	Post	152	2.93	1.54	0	4.83

As can be seen in Table 4, children's scores ranged from 0 to 4.50 points in the pre-test and 0 to 3.83 points in the post-test, with a mean of 2.10 points for the pre-test and 2.93 points for the post-test. This is an increase of .83 points from the pre- to post-test trials, which is equivalent to approximately a little over two-thirds of a grade level.

Children's patterns of response were analyzed using a Wilcoxon Signed Ranks Test. To ensure validity of the results, children whose pre-test scores were at ceiling were omitted from these analyses. Results indicated that, of those children whose performance varied, there was a significant increase in children's phonics skills ($z=-6.75, p<.01$). As is illustrated in Figure 2, 98 children increased their phonics skills, and 33 maintained a stable skill level. Twenty-one children exhibited a decrease in their skill level. For these children, this decrease may reflect fatigue and distraction during the assessment administration as all four assessments were administered at the same time. To confirm a significant increase in children's phonics abilities, a paired t-test was performed on the pre- and post-test scores. Results found that there was a significant increase in test scores ($t(151)=-7.56, p<.01$), indicating a significant increase in children's phonics skills.

Figure 2: Phonics Assessment Patterns of Response (N=152)



Children's patterns of response were further analyzed by gender, ESE status, LEP status and whether children receive free or reduced lunches. There were no significant differences found by gender, ESE status, LEP status or free or reduced lunch status.

Vocabulary

Learning Today's Word Analysis (WM) assessment was used to measure each participant's vocabulary skill level. The pre-test WM assessment was administered prior to children engaging in related Learning Today lessons. The post-test WM assessment was administered between two and eight weeks later, following the administration of a series of related Learning Today lessons.

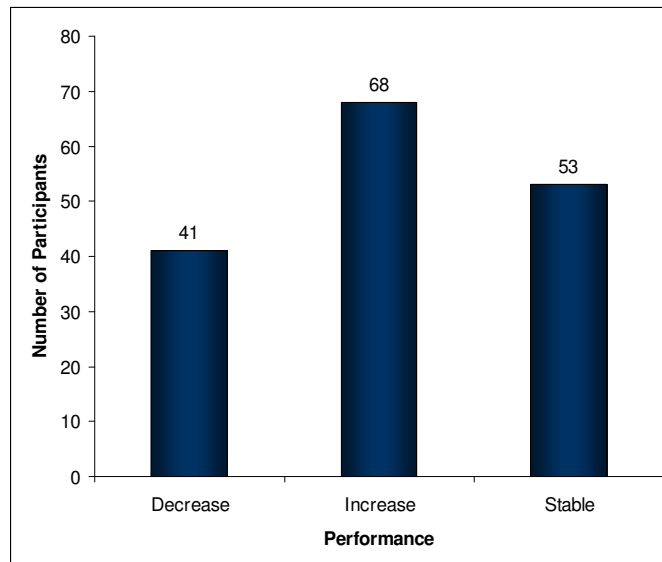
Table 5: Vocabulary Assessment Summary Results

		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Vocabulary (WM)	Pre	162	3.29	1.25	0.5	7.83
	Post	162	3.61	1.21	0.5	7.17

As can be seen in Table 5, children's scores ranged from .5 to 7.83 points, with a mean of 3.29 points for the pre-test and 3.61 points for the post-test. This is an increase of .32 points from the pre- to post-test trials, which is equivalent to approximately one third of a grade level.

Children's patterns of response were analyzed using a Wilcoxon Signed Ranks Test. Results indicated that, of those children whose performance varied, there was a significant increase in children's vocabulary skills ($z=-3.33, p<.01$). As is illustrated in Figure 3, 68 children increased their vocabulary skills, and 53 maintained a stable skill level. Forty-one children exhibited a decrease in their skill level. For these children, this decrease may reflect fatigue and distraction during the assessment administration as all four assessments were administered at the same time. To confirm a significant increase in children's vocabulary abilities, a paired t-test was performed on the pre- and post-test scores. Results found that there was a significant increase in test scores ($t(161)=-3.43, p<.01$), indicating a significant increase in children's vocabulary skills.

Figure 3: Vocabulary Assessment Patterns of Response (N=162)



Children's patterns of response were further analyzed by gender, ESE status, LEP status and whether children receive free or reduced lunches. There were no significant differences found by gender, ESE status, LEP status or free or reduced lunch status.

Comprehension

Learning Today's Silent Reading (SR) assessment was used to measure each participant's comprehension skill level. The pre-test SR assessment was administered prior to children engaging in related Learning Today lessons. The post-test SR assessment was administered between two and eight weeks later, following the administration of a series of related Learning Today lessons.

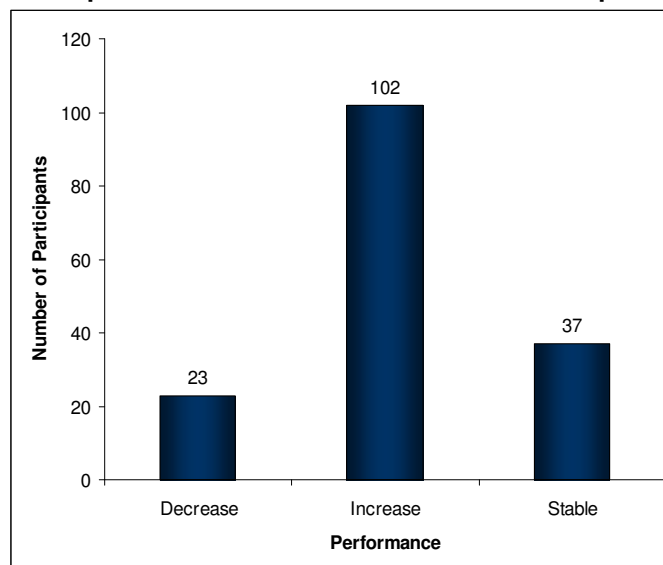
Table 6: Comprehension Assessment Summary Results

		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Comprehension (SR)	Pre	162	1.32	.86	0.5	4.17
	Post	162	2.08	1.28	0.5	6.50

As can be seen in Table 6, children's scores ranged from .5 to 4.17 points in the pre-test and from .5 to 6.50 points in the post-test, with a mean of 1.32 points for the pre-test and 2.08 points for the post-test. This is an increase of .76 points from the pre- to post-test trials, which is equivalent to almost two-thirds of a grade level.

Children's patterns of response were analyzed using a Wilcoxon Signed Ranks Test. Results indicated that, of those children whose performance varied, there was a significant increase in children's vocabulary skills ($z=-7.40, p<.01$). As is illustrated in Figure 4, 102 children increased their vocabulary skills, and 37 maintained a stable skill level. Twenty-three children exhibited a decrease in their skill level. For these children, this decrease may reflect fatigue and distraction during the assessment administration as all four assessments were administered at the same time. To confirm a significant increase in children's comprehension abilities, a paired t-test was performed on the pre- and post-test scores. Results found that there was a significant increase in test scores ($t(161)=-8.85, p<.01$), indicating a significant increase in children's comprehension skills.

Figure 4: Comprehension Assessment Patterns of Response (N=162)





BCPS 3rd Grade Summer Reading Camp Smart Tutor™ Pilot Study Results June 2006

Children's patterns of response were further analyzed by gender, ESE status, LEP status and whether children receive free or reduced lunches. There were no significant differences found by gender, LEP status or free or reduced lunch status. A 2 (Phonics) x 2 (ESE status) ANOVA found a main effect of ESE status ($F(1, 160) = 4.34, p < .05$). Findings indicate that non-ESE students ($N=114$) performed significantly better on both the pre-test and post-test Phonics assessment than ESE students ($N=48$). Means can be found in Table 7.

Table 7: Comprehension x ESE Assessment Summary Results

		<i>Non-ESE</i>			<i>ESE</i>		
		<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
<i>Comprehension (SR)</i>	Pre	114	1.40	.88	48	1.16	.76
	Post	114	2.21	1.31	48	1.77	1.16