

## Summary of Experimental Study of the Ready to Teach *Developmental Electronic Field Trip Reader Project*

As part of the evaluation of Maryland Public Television’s Ready to Teach grant, ORC Macro designed and carried out a school-based experimental study to examine the effect that use of Electronic Field Trips (EFT) with embedded reading supports has on student reading comprehension skills and content knowledge. In this experimental study, the three EFTs (*Knowing Poe*, *Exploring Maryland’s Roots*, and *Pathways to Freedom*) were integrated into the curriculum at two middle schools in two Maryland districts at the time of the year when the content would traditionally be covered.<sup>1</sup>

All participating language arts and social studies classes were randomly assigned to treatment and control status. Teachers averaged approximately 450 minutes (the equivalent of 10 45-minute periods) on each unit for both their treatment classes (using the EFTs) and control classes (where they used traditional approaches, enriched with supplementary resources provided by the project). For each unit, a pre- and post-test was developed and externally validated. The Gates-MacGinitie Reading Test (GMRT) was administered to participating students as a baseline and a post-intervention measurement of reading comprehension.

### Results: Classroom Content Tests

**Students who used the EFTs performed better on the unit tests than the students using only traditional methods.** The table below presents the means for all three assessments, for both treatment and control groups, and shows the changes in knowledge during each unit—in terms of the change score and the percentage change that represents.

**Table 1. Overall Results for the Three Content Assessments**

	<i>Pathways to Freedom</i>		<i>Exploring Maryland’s Roots</i>		<i>Knowing Poe</i>	
	Control (N=80)	Treatment (N=270)	Control (N=105)	Treatment (N=271)	Control (N=101)	Treatment (N=252)
<b>Pretest mean</b>	9.7	9.8	7.6	8.4	3.8	3.8
<b>Posttest mean</b>	13.4	14.9	10.1	12.0	4.7	5.2
<b>Change score mean<sup>2</sup></b>	3.7	5.1	2.5	3.6	0.9	1.4
<b>Percent change</b>	38%	52%	33%	43%	24%	37%

**Targeted students—those in poverty and struggling readers—who used the EFTs performed better on the unit tests than the students using only traditional methods.** The evaluators analyzed the performance on the classroom assessments of students in poverty (i.e., those who receive free and reduced meals—FARMs) and students who scored in the lowest quartile of the baseline assessment of the GMRT and found statistically significant differences in change scores<sup>3</sup> between treatment and control groups for all three field trips for both of these groups of interest.

### Results: Standardized Reading Tests

**Students using the EFTs demonstrated an improvement in their reading comprehension skills on a standardized reading test compared to students in the control group.** Analysis of the baseline and post-intervention administration of the GMRT reveals a statistically significant improvement in reading comprehension scores (measured in NCEs—Normal Curve Equivalents<sup>4</sup>) by the treatment group compared to the control group. Figure 1 presents the data for all students taking the pre/post reading tests.

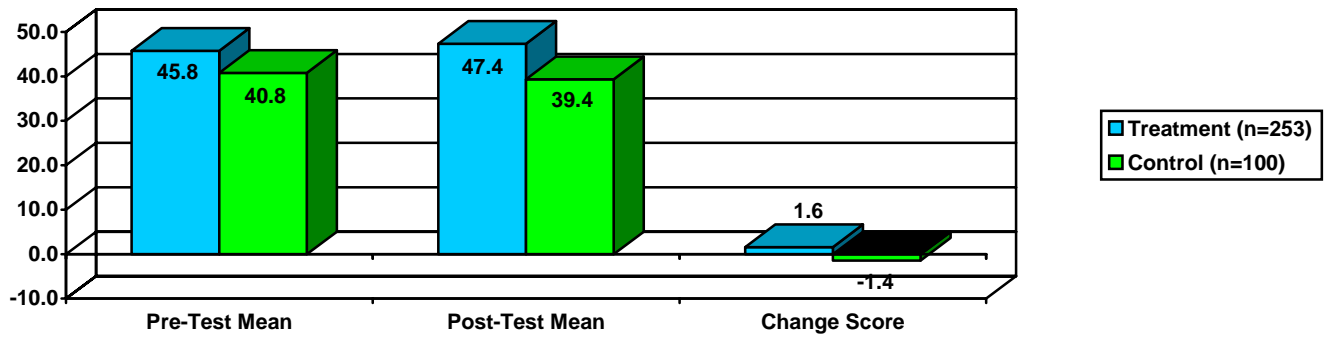
<sup>1</sup> At the rural middle school the study involved all 7<sup>th</sup> grade students and at the urban middle school the study involved all 8<sup>th</sup> grade students.

<sup>2</sup> All differences were statistically significant (*Pathways*  $p < .001$ , *Roots*  $p < .01$ , and *Poe*  $p < .05$ ) with small to moderate effect sizes. (For the *Poe* content test, only 11 items were matched pre/post; the other two tests had 20 matched items.)

<sup>3</sup> Differences for the low-income group were significant (*Pathways*  $p < .05$ , *Poe* and *Roots*  $p < .01$ ) with moderate effect sizes, and for the struggling readers they were significant (*Pathways* and *Roots*  $p < .05$ , *Poe*  $p < .001$ ) with moderate to large effect sizes.

<sup>4</sup> Normal Curve Equivalent is a statistical (normalized) transformation of percentile ranks in which the range of reading achievement is divided into 99 equal units with a mean of 50. If a student proceeds from one year to the next with his/her normed group, the score will not change.

**Figure 1. Reading Comprehension Scores on GMRT<sup>5</sup> Measured by Normal Curve Equivalent (NCE)**



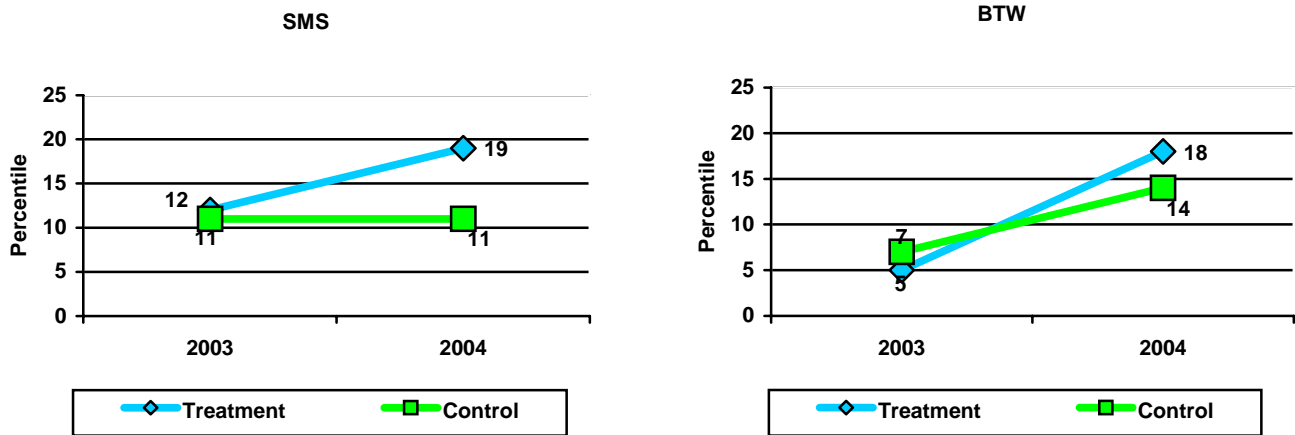
**Struggling readers in the treatment group showed the largest gains on the standardized reading test from one year to the next.** Table 2 presents the reading test data for the two testing periods. Students in the lowest quartile in the baseline measurement of the GMRT who used the EFTs gained over twice as many NCEs in their comprehension score as their counterparts in the control group.

**Table 2. Gates-MacGinitie Reading Tests: Baseline and Post-Intervention Comprehension Scores Students in the Lowest Quartile – Treatment Group vs. Control Group (NCE)**

	Lowest Quartile: Control (N=31)	Lowest Quartile: Treatment (N=54)
Baseline Mean Comprehension NCE	21.3	20.1
Post-Intervention Mean Comprehension NCE	26.4	30.5
Mean Difference in Comprehension (NCE) <sup>6</sup>	5.1	10.4

Another way to assess change among the target group (low-performing readers) is to look at how those students perform in terms of percentiles.<sup>7</sup> Figure 2 displays these results at each school.

**Figure 2. Change in Reading Comprehension Scores by the Lowest Quartile (National Percentile Rank)**



*Funding for the development of products by Maryland Public Television and evaluation conducted by ORC Macro was provided by a Ready to Teach grant (#R286b020008) from the U.S. Department of Education.*

<sup>5</sup> Change score is statistically significant ( $p=.053$ ) and effect size is small ( $d=0.2$ ).

<sup>6</sup> The change for the treatment group was statistically significant ( $p=.056$ ) and shows a moderate effect size ( $d=.4$ ).

<sup>7</sup> Percentile Rank (PR) indicates where a raw score fits within a range of scores. The PR for a particular raw score provides the percentage of students whose raw scores were lower.