



# Effectiveness with ELL and Special Education Students

July 2013

**Whitehall City Schools  
2012-2013 School Year**

Principal Investigators

**Edina Torlaković, Ph.D. (ABD)**  
*Senior Research Scientist*  
EPS Literacy and Intervention

**Geoffrey Barnum, M.A.**  
*Research Assistant*

## EXECUTIVE SUMMARY

*S.P.I.R.E.*® is a small group or one-on-one reading intervention program that can be used by a wide range of struggling readers in Tier II and Tier III for instruction. *S.P.I.R.E.* is a comprehensive, intensive, and multisensory reading intervention that integrates phonological awareness, phonics, spelling, fluency, vocabulary, comprehension, and handwriting.

*S.P.I.R.E.* is based on the well-established Orton-Gillingham approach to reading instruction. The program is designed to incorporate the Orton-Gillingham approach, which involves systematic, explicit, sequential, multisensory, phonics-based, and emotionally sound instruction. *S.P.I.R.E.* comprises eight levels that consist of increasingly complex content. The *S.P.I.R.E. Initial Placement Assessment (IPA)* places students at the appropriate level of *S.P.I.R.E.*, and they receive the instruction they need to improve their reading ability.

*S.P.I.R.E.* is an intensive reading intervention that is designed to bring nonreaders and struggling readers to full literacy upon completion of Level 8. Best results are obtained when instruction occurs for 60 minutes a day, 5 days per week. Lessons maybe split in half for schools with 30 minute blocks but note that this will slow students' progress through the program.

EPS Literacy and Intervention strives to develop programs that are proven to be effective in building students' foundational reading skills. The following describes a *S.P.I.R.E.* effectiveness study.

### Design and Method

The goal of this study was to evaluate the effectiveness of *S.P.I.R.E.* for Special Education students and English Language Learners (ELL) who were identified as being struggling readers, based on standardized test results. The findings are based on a sample of 75 Special Education and ELL students in grades 2-10 who used *S.P.I.R.E.* as a pull-out intervention. Five schools from the Whitehall City School District, an enclave of Columbus, Ohio, participated in the study.

Four primary assessments and several secondary assessments of students' reading ability were administered during the study. In addition, several assessments administered by the district were included as measures for the study. Primary assessments were most closely related to the skills taught in *S.P.I.R.E.* and were administered directly before and after instruction was delivered. In contrast, secondary assessments evaluated students' reading ability but were not as closely aligned with the skills taught in *S.P.I.R.E.* Several of the secondary assessments were administered well before instruction began or before *S.P.I.R.E.* instruction had ended.

The primary assessments evaluated in this report are:

- ***S.P.I.R.E.* Initial Placement Assessment (IPA):** A proprietary test used to evaluate the *S.P.I.R.E.* level a student should start in and to collect data on the skills they have mastered. Data collected can also be used to update or change instruction based on students' needs.
- **Gates-MacGinitie Reading Test (GMRT):** A standardized and norm-referenced assessment of general vocabulary, comprehension, and overall reading ability.
- **Test of Word Reading Efficiency; 2<sup>nd</sup> Edition (TOWRE):** A standardized and norm-referenced assessment of students' sight word efficiency, phoneme decoding efficiency, and total word reading efficiency.
- **Test of Silent Word Reading Fluency (TOSWRF):** A standardized and norm-referenced assessment of students' ability to fluently identify printed words.

The secondary assessments evaluated in this report are:

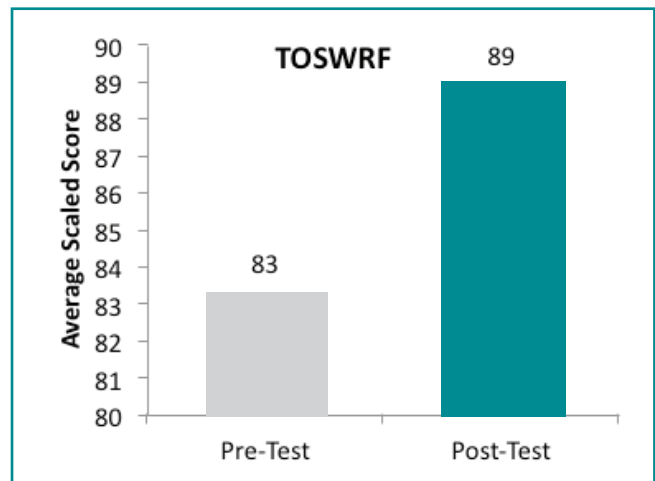
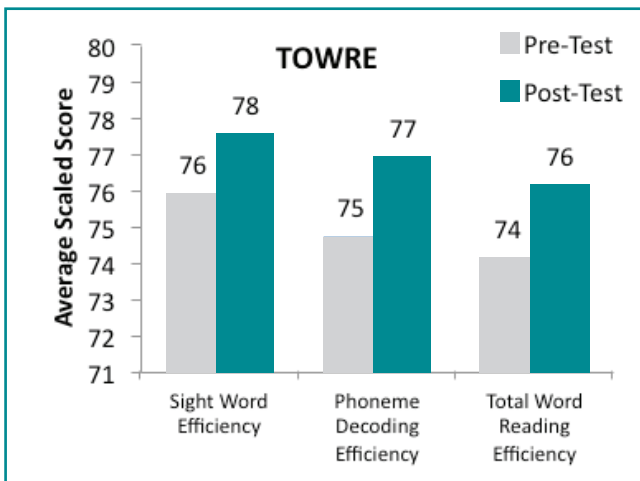
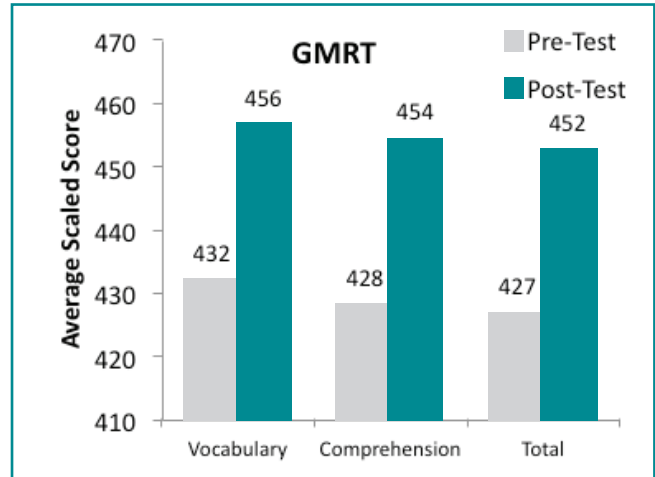
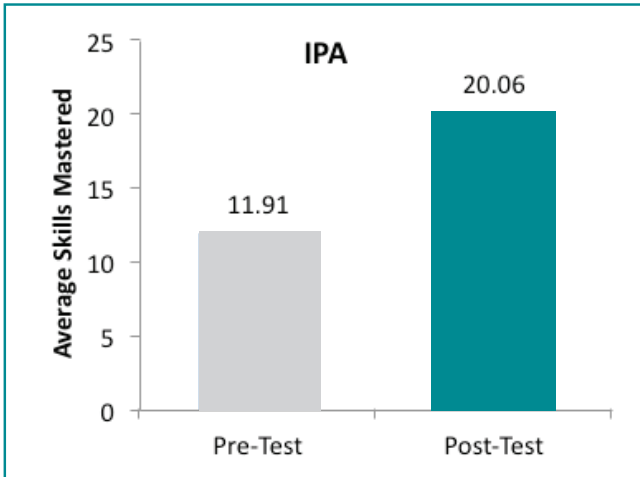
- ***Academy of READING*® Placement Test:** A proprietary computer-based maze test that evaluates students' general reading ability.
- **Oral Reading Fluency (ORF) Assessment from *Path Driver for Reading*™:** A proprietary computer-based oral reading fluency assessment that is part of *Path Driver for Reading*. This assessment evaluates students' general reading ability.
- **TerraNova® (Reading & Language):** A standardized and norm-referenced assessment of reading and language ability administered to students in grades 2-8 by the Whitehall City School District.
- **Ohio Test of English Language Acquisition (Reading; OTELA):** A standardized assessment of reading ability administered to all ELL students in Ohio.
- **Ohio Achievement Assessment (Reading; OAA):** A standardized assessment of reading ability administered to all grades 3-8 students in Ohio.

All students identified as ELL or Special Education by the district were considered for *S.P.I.R.E.* instruction. Students with OAA, OTELA, or TerraNova data that indicated they were non-proficient readers were evaluated for instruction using *S.P.I.R.E.* For grades where no test data was available, all ELL and Special Education students were tested with the GMRT. Those who scored at or below the 30<sup>th</sup> national percentile on this measure were evaluated for *S.P.I.R.E.* instruction. Students who scored at levels 1-4 on the IPA received pull-out *S.P.I.R.E.* instruction during the 2012/2013 school year. At the end of the school year, students were administered all of the primary and secondary outcome measures again in order to evaluate the gains they had achieved.

## STUDENT PERFORMANCE RESULTS

ELL and Special Education students in grades 2-10 who received *S.P.I.R.E.* instruction achieved significant reading gains on all primary outcome measures.

The gains are summarized in the charts that follow.



Average gains on the primary outcome measures are summarized in the table below.

<b>MEASURE</b>	<b>Average Gain</b>	<b>Significant Increase?</b>
<b>S.P.I.R.E.® IPA (Skills Mastered)</b>	8.15	Yes
<b>Gates-MacGinitie Reading Test (Scaled Scores)</b>		
Vocabulary	24.44	Yes
Comprehension	26.33	Yes
<b>Total</b>	<b>25.68</b>	<b>Yes</b>
<b>TOWRE (Scaled Scores)</b>		
Sight Word Efficiency	1.61	No
Phoneme Decoding Efficiency	2.15	Yes
Total Word Reading Efficiency Index	1.97	Yes
<b>TOSWRF (Scaled Score)</b>	5.60	Yes

Average gains on the secondary outcome measures are summarized in the table below.

<b>MEASURE</b>	<b>Average Gain</b>	<b>Significant Increase?</b>
<b>Academy of READING® Placement Test (GLE)</b>	1.18	Yes
<b>Path Driver for Reading™ Oral Reading Fluency Assessment (WCPM)</b>	21.89	Yes
<b>TerraNova® (Scaled Score)</b>		
Reading	16.07	Yes
Language	9.20	No
<b>OTELA Reading (Scaled Score)</b>	109.03	Yes
<b>OAA Reading (Scaled Score)</b>	4.49	No

## Conclusion

The results of this study indicated that *S.P.I.R.E.* is an effective reading intervention for ELL and Special Education students identified as struggling readers. On almost all outcome measures examined in this report, students achieved significant gains in their reading ability.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	2
<b>INTRODUCTION</b> .....	8
<i>S.P.I.R.E.</i> ® Reading Intervention Program .....	8
<b>METHODS</b> .....	9
Outcome Measures.....	9
Procedures.....	13
Participants .....	15
<b>STUDENT PERFORMANCE RESULTS</b> .....	19
<b>SECTION A:</b> Performance Improvements on the <i>S.P.I.R.E.</i> Initial Placement Assessment (IPA) .....	19
<b>SECTION B:</b> Performance Improvements on the Gates-MacGinitie Reading Test (GMRT).....	20
<b>SECTION C:</b> Performance Improvements on the Test of Word Reading Efficiency (TOWRE) .....	21
<b>SECTION D:</b> Performance Improvements on the Test of Silent Word Reading Fluency (TOSWRF).....	23
Summary Student of Performance Results on Primary Outcomes .....	24
<b>SECTION E:</b> Performance Improvements on the <i>Academy of READING</i> ® Placement Test .....	25
<b>SECTION F:</b> Performance Improvements on <i>Path Driver for Reading</i> ® Oral Reading Fluency Assessment (ORF) .....	26
<b>SECTION G:</b> Performance Improvement on TerraNova® .....	27
<b>SECTION H:</b> Performance Improvements on the Ohio Test of English Language Acquisition (OTELA) .....	28
<b>SECTION I:</b> Performance Improvements on the Ohio Achievement Assessment (OAA) .....	29
Summary Student Performance Results on Secondary Outcomes.....	30
<b>STUDENT ATTITUDES TOWARDS READING</b> .....	31
<b>TEACHERS SURVEY RESULTS</b> .....	31
<b>CONCLUSION</b> .....	33
<b>REFERENCES</b> .....	35
<b>APPENDIX A:</b> Assignment of IPA Skills Mastered .....	36
<b>APPENDIX B:</b> Student Performance Results by School .....	38

## LIST OF TABLES

Table 1: Timeline of study and data collection activities.....	13
Table 2: Summary of fidelity questionnaire ratings .....	14
Table 3: Characteristics of Whitehall City School District for 2012 fiscal year .....	15
Table 4: Distribution of <i>S.P.I.R.E.</i> students by grade .....	17
Table 5: Distribution of <i>S.P.I.R.E.</i> students by ELL and Special Education status .....	18
Table 6: Distribution of <i>S.P.I.R.E.</i> students by School.....	18
Table 7: Average skills mastered gains on the IPA.....	19
Table 8: Average scaled score gains on the GMRT.....	20
Table 9: Average scaled score gains on the TOWRE.....	21
Table 10: Average scaled score gains on the TOSWRF.....	23
Table 11: Average Grade Level Equivalent (GLE) gains on the <i>Academy of READING</i> Placement Test .....	25
Table 12: Average WCPM gains on the <i>Path Driver for Reading</i> Oral Reading Fluency Assessment .....	26
Table 13: Average scaled score gains on the TerraNova assessment.....	27
Table 14: Average scaled score gains on the OTELA reading component.....	28
Table 15: Average scaled score gains on the OAA reading component.....	29
Table 16: Average reading attitude ratings from student reading attitude survey .....	31
Table 17: Average S.P.I.R.E. teacher endorsement of student reading gains sorted from most strongly to least strongly endorsed .....	32
Table 18: Average homeroom teacher endorsement of student reading gains sorted from most strongly to least strongly endorsed ...	33

## LIST OF FIGURES

Figure 1: Overview of <i>S.P.I.R.E.</i> instruction selection process.....	16
Figure 2: Average pre-test and post-test skills mastered on the <i>S.P.I.R.E.</i> IPA .....	19
Figure 3: Average pre-test and post-test scaled scores on the GMRT .....	20
Figure 4: Average pre-test and post-test GLE on GMRT components .....	21
Figure 5: Average pre-test and post-test scaled scores on the TOWRE .....	22
Figure 6: Average pre-test and post-test GLE on TOWRE components .....	22
Figure 7: Average pre-test and post-test scaled score on the TOSWRF .....	23
Figure 8: Average pre-test and post-test GLE on TOSWRF.....	24
Figure 9: Average pre-test and post-test grade-level equivalent (GLE) scores on the <i>Academy of READING</i> Placement Test.....	25
Figure 10: Average pre-test and post-test WCPM on the <i>Path Driver for Reading</i> ORF assessment .....	26
Figure 11: Average pre-test and post-test scaled scores on TerraNova .....	27
Figure 12: Average pre-test and post-test scaled scores on the OTELA reading component.....	28
Figure 13: Average pre-test and post-test OAA reading scaled score.....	29

## INTRODUCTION

EPS provides a wide variety of reading intervention programs that are designed to address the specific needs of students who struggle with reading. The goal of this report is to examine the effectiveness of the *Specialized Program Individualizing Reading Excellence*, or *S.P.I.R.E.*® with English Language Learners (ELL) and Special Education students.

All students identified as ELL or Special Education by the district were considered for inclusion in the study. Those who were identified as being non-proficient readers, based on state-administered standardized tests, were assigned *S.P.I.R.E.* instruction. For those students without standardized test data, the Gates-MacGinitie Reading Test (See page 3 for a description of this test.) was administered to determine whether they were non-proficient readers. Those identified as non-proficient readers were evaluated for *S.P.I.R.E.* instruction.

Seventy-five ELL and Special Education students were selected and received *S.P.I.R.E.* instruction throughout the 2012/2013 school year. ELL and Special Education students in elementary, middle, and high school in the Whitehall City School District, located in Whitehall, OH, received *S.P.I.R.E.* instruction during the 2012/2013 school year.

At the start of the year, students were assessed with several standardized and proprietary tests that evaluated various aspects of reading proficiency. Students were assessed again at the end of the year to examine their gains.

### ***S.P.I.R.E.* Reading Intervention Program**

*S.P.I.R.E.* is a comprehensive, intensive, and multisensory reading intervention program that integrates instruction in phonological awareness, phonics, spelling, fluency, vocabulary, comprehension, and handwriting. The program was authored by Sheila Clark-Edmands, M.S.Ed., an Orton-Gillingham Fellow. *S.P.I.R.E.* is published by EPS, and is currently in its third edition.

*S.P.I.R.E.* is based on the Orton-Gillingham approach to reading instruction. This approach has several key features, including the following:

- **Systematic and Explicit Instruction:** Students are given explicit instruction in phonology, phonological awareness, sound-symbol correspondence, syllables, morphology, syntax, and semantics. Students are taught these concepts until they have achieved mastery.
- **A Sequential Scope and Sequence:** Instruction follows a logical sequence from basic single sound concepts to integration of these sounds into words, phrases, and sentences.
- **Multisensory Techniques:** Instruction is provided using visual, auditory, and kinesthetic pathways.
- **Phonics-based Instruction:** The Orton-Gillingham approach uses phonics-based instruction as the foundation on which students become successful readers.
- **Emotionally Sound Pedagogy:** Teaching is directed toward providing the experience of success, leading to increased self-confidence and motivation.



The *S.P.I.R.E.* methodology is characterized by one-on-one or small-group instruction that incorporates the most recent research in best practices for reading and language arts instruction (Clark-Edmands, 2012). *S.P.I.R.E.* is systematically structured and follows a 10-Step Lesson plan that ensures students will experience continuous and visible success. The eight levels of *S.P.I.R.E.* focus on increasingly complex reading skills.

## METHODS

This section describes how data was collected to create this effectiveness report. Specifically, it describes the outcome measures, procedures, fidelity of implementation, and the students who participated.

### Outcome Measures

Four primary outcome measures were administered to evaluate the effectiveness of *S.P.I.R.E.* Each measure is described in detail in this section and summarized under the Student Performance Results section. In addition to the four primary outcome measures, students were also administered several secondary outcome measures to evaluate the effectiveness of *S.P.I.R.E.* Primary outcome measures were those that were administered right before and shortly after *S.P.I.R.E.* instruction. Secondary outcome measures were administered well before and prior to the completion of the study.

### Primary Outcome Measures

Students were administered four primary outcome measures that evaluated the target skills taught in *S.P.I.R.E.*, as well as students' overall reading ability. All measures were administered just before and just after *S.P.I.R.E.* instruction. These tests are reviewed in detail in this section.

### Initial Placement Assessment (IPA)

The IPA is a proprietary test that is included with *S.P.I.R.E.* It should be administered prior to any instruction to determine what skills students have already mastered and where there are skill gaps. This will show which level of *S.P.I.R.E.* students should start in (Clark-Edmands, 2012). The IPA consists of five tests that teachers can administer one-on-one to assess students.

EPS recommends that teachers administer Test 3 and Test 4 to determine students' placement in *S.P.I.R.E.* (Clark-Edmands, 2012). For Test 3, students are shown increasingly complex phonogram cards and must produce the sound that is shown on that card. Teachers stop testing if a student misses all five short vowels (*a, e, i, o, u*) or makes four or more mistakes with eight sequential phonograms. This test evaluates students' knowledge of sounds and letter patterns. For Test 4, students read increasingly complex decodable words and nonsense words to evaluate their knowledge of sounds and letter patterns. Results on Tests 3 and 4 should be compared for accurate placement. Both of these tests were administered in the current study to place students in the appropriate *S.P.I.R.E.* level, and to evaluate their gains after the study.

The scoring methodology used for this study is explained in detail in Appendix A. The test produces two types of scores. The first score assigns students to a specific level of *S.P.I.R.E.* The second score indicates the specific skills students have mastered. Thus, one can evaluate students by looking at whether their *S.P.I.R.E.* level changed from fall to spring. However this type of analysis does not take into consideration the more detailed data about skills. For example, Level 1 of *S.P.I.R.E.* has 11 skills that students must master before they move on to Level 2. If a student masters all but one skill by spring and their IPA level is examined in

isolation, it will appear that the student has made no gains when, in fact, they have. Therefore, to avoid this issue, the number of skills students have mastered in the fall and spring have been calculated for each student, to provide a more accurate picture of student growth over the course of the study.

### Gates-MacGinitie Reading Test (GMRT)

The GMRT, published by Riverside Publishing, is a norm-referenced, group-administered reading test that can be administered to students in kindergarten through grade 12 (MacGinitie, MacGinitie, Maria, & Dreyer, 2002). For grades 3 and up, the GMRT consists of two sections, vocabulary and comprehension, the scores of which are compiled to form a total reading score. At grade 2, the test consists of three components: word decoding, word knowledge, and comprehension. Students' scores on these three tests are also compiled to form a total reading score. The GMRT is widely used and well recognized.

There are two versions of the paper-and-pencil test that are of equal length and difficulty (MacGinitie et al., 2002). By administering different versions of the test in the fall and spring, changes in performance over the course of the year are made apparent. Students' raw scores are converted into a variety of additional scores: normal curve equivalents, national percentile rank, stanines, grade level equivalents, and extended scale scores. These norm-referenced scores were derived from a stratified standardization sample of almost 60,000 students from around the United States in 2005/2006. As extended scale scores are equal-interval measures that can be averaged, they were used for all analyses in this current report.

### Test of Word Reading Efficiency (TOWRE; 2<sup>nd</sup> Edition)

The TOWRE is a norm-referenced, individually-administered test that measures the ability to pronounce printed words accurately and fluently (Torgesen, Wagner, & Rashotte, 2012). The test, published by ProEd, has been validated for use with individuals between the ages of 6 years, 0 months and 24 years, 11 months. There are two subtests that make up the TOWRE:

- 1) **Sight Word Efficiency (SWE):** A 45-second test, during which a list of increasingly complex words is presented to students to evaluate their reading rate and accuracy. Students are asked to read the words as fast as they can without making errors.
- 2) **Phoneme Decoding Efficiency (PDE):** A 45-second test, during which a list of increasingly complex, phonemically regular nonwords are presented to students to evaluate their ability to apply graphophonemic knowledge to decode them. This test evaluates "word attack" skills.

Two forms of the test, equated for difficulty, were administered to students in the study (Torgesen et al., 2012). Raw scores are the total number of words (SWE) and nonwords (PDE) produced correctly. These scores are converted, taking students' chronological age into consideration, into a variety of additional scores: age equivalent, grade equivalent, percentile rank, and scaled scores. The scaled scores from the two subtests are combined and converted into a scaled score that reflects students' Total Word Reading Efficiency. As scaled scores are equal-interval measures that can be averaged, they were used for all analyses in this report.

### Test of Silent Word Reading Fluency (TOSWRF)

The TOSWRF is a norm-referenced, individual or group-administered test that measures students' ability to recognize printed words accurately and efficiently (Mather, Hammill, Allen, & Roberts, 2004). The test, published by ProEd, has been validated for use with individuals between the ages of 6 years, 6 months and 17 years, 11 months. It measures students' word identification and rate by presenting them with

rows of connected letters that form words of increasing complexity. Students are given three minutes to separate the letters to form words.

Two forms of the test, equated for difficulty, were administered to students in the fall and spring to evaluate the impact of *S.P.I.R.E.* instruction on students' word identification fluency (Mather et al., 2004). Raw scores were calculated by determining the total number of words correctly separated. These scores were then converted, taking students' chronological age into consideration, into a variety of scores: scaled score, age equivalent, grade equivalent, and percentile. As scaled scores are equal-interval measures that can be averaged, they were used for all analyses in this report.

## Secondary Outcome Measures

The outcome measures described in the section above most closely evaluate the skills that students learn during *S.P.I.R.E.* instruction (i.e., IPA, TOWRE, and TOSWRF) and students' general reading ability (i.e., GMRT). These outcome measures were administered shortly before and after *S.P.I.R.E.* instruction. Data from several other secondary outcome measures was also analyzed in this report. However, some of these outcome measures were administered before the study began (i.e., TerraNova, OAA, and OTELA), or were proprietary tests of general reading ability (i.e., *Academy of READING*® Placement Test and *Path Driver for Reading*™ Oral Reading Fluency Assessment). Thus, results on all of these measures were considered secondary to outcome measures previously described.

### *Academy of READING* Placement Test

The *Academy of READING* Placement Test is a proprietary online assessment of general reading ability that is published by EPS, 2010®. It is a maze test, where students are presented with a paragraph of text with certain words removed and a list of potential words with which to fill each blank. From this list, students must try to select the correct word: the one which makes most sense in the context of the surrounding sentences. Students are assigned a grade-level equivalent (GLE) score based on their performance.

In previous research studies, scores on the *Academy of READING* Placement Test have correlated strongly and significantly with the Gates-MacGinities Reading Test (Torlaković, 2011). These results indicate that the *Academy of READING* Placement Test is a good indicator of students' general reading ability.

### *Path Driver for Reading* Oral Reading Fluency Assessment (ORF)

The *Path Driver for Reading* Oral Reading Fluency Assessment is a proprietary online universal screener that monitor online was published by EPS in 2013®. During this test students read three grade-appropriate passages aloud for one minute each. The computer records students reading the passages, and teachers then score each recording to determine the number of words students read correctly (WCPM). The median number of WCPM across the three trials is reported as student's overall oral reading fluency score.

### TerraNova (3<sup>rd</sup> Edition) Complete Battery (TerraNova)

The TerraNova Complete Battery is a norm-referenced, group-administered, paper-and-pencil test of general academic ability (CTB McGraw-Hill, 2008). It evaluates different subjects, depending on a student's grade level (i.e., Reading, Language, Mathematics, Science, and Social Studies). The test has been designed to evaluate students' understanding and skills in these areas. The TerraNova consists of a series of multiple-choice test items. As the focus of *S.P.I.R.E.* is on reading and language abilities, only data from those two parts of the test were considered.

Students in grades two through eight are tested with TerraNova every year in the Whitehall City School District. The data included in the current study is from the spring 2012 and spring 2013 administration.

The TerraNova management system generates a variety of scores, based on student performance: scaled scores, national percentiles, national stanines, grade equivalents, and performance levels (CTB McGraw-Hill, 2008). As scaled scores are equal-interval and can be averaged, they were used in subsequent analyses in this report.

### Ohio Achievement Assessment (OAA)

In accordance with the No Child Left Behind Act, students in Ohio enrolled in grades three through eight are administered the OAA annually (Ohio Department of Education, 2013a). The OAA is a standardized test of reading and mathematics. The test content and question types vary by grade, but they generally include a variety of multiple-choice, short-answer, and long-answer questions. Students are assigned a scaled score that reflects their overall proficiency with any given topic. Since *S.P.I.R.E.* is a reading program, only reading data was considered.

The data from the spring 2012 and spring 2013 administrations were made available to the researchers. Because the test is only administered to students in grades three through eight, a large proportion of students did not have pre-test or post-test data to include in the analysis.

### Ohio Test of English Language Acquisition (OTELA)

In accordance with state and federal law, Ohio requires that all ELL students have their English language proficiency assessed annually (Ohio Department of Education, 2013b). Four primary components of the English language are assessed with OTELA: listening, reading, speaking, and writing. Where *S.P.I.R.E.* is designed to most significantly improve reading abilities in these early levels, results from this component of OTELA are considered. The OTELA for grades 1 and 2 consist of inventories that teachers complete over the course of the winter, evaluating students' abilities. In contrast, students in grades 3 and higher complete a combination of multiple-choice and short answer questions that evaluate their reading ability. All students are assigned a scaled score that reflects their general reading ability.

The data from the 2012 and 2013 winter administrations of OTELA was made available to the researchers. Only ELL students had OTELA data, so the results of this analysis will not include the Special Education students who are included in all other analysis.

### Student Reading Attitude Survey

A brief, ten-question survey that evaluates students' attitudes towards reading was administered at the end of the study. Five questions from the Recreational Reading and five questions from the Academic Reading components of McKenna and Kear's (1990) norm-referenced and standardized measure of reading attitude were randomly chosen. This modified survey was used because researchers felt the original survey was too long for younger participants.

Teachers read each question aloud to students, and students indicated how they felt about each statement. This was accomplished by using a 4-point Likert-like visual scale with cartoon faces that ranged from "Hate It" (1 point) to "Love It" (4 points). Scores from the five questions relating to

recreational reading (e.g., How do you feel about reading for fun at home?) and the five academic reading questions (e.g., How do you feel when you read out loud in class?) were combined to form an index of students' overall attitude toward those two activities, as well as their overall attitude toward reading.

### *S.P.I.R.E.* Teacher and Homeroom Teacher Surveys

Two short surveys were created by the researchers to examine the perceptions and opinions of *S.P.I.R.E.* teachers and homeroom teachers about the gains students achieved. Responses were primarily binary (i.e., yes/no), 5-point Likert, and open-text responses. Some of the questions from the two surveys were not relevant to the current study (e.g., satisfaction with professional development) so were excluded from this report.

## PROCEDURES

This section of the report describes the study timeline, implementation guidelines, and fidelity of implementation.

### Study Timeline

Table 1 displays information about teacher training, data collection, and student instruction. Initial teacher training began in July 2012 and continued into September. In addition to the initial training, teachers received regular visits by members of the EPS Professional Development team who provided assistance with the implementation of *S.P.I.R.E.* throughout the year. These classroom-support visits included observation, discussions with reading teachers, modeling of intervention strategies, and additional staff training. In late September and early October 2012, students were administered all pre-test measures. Students then began *S.P.I.R.E.* instruction from October 2012 until early May 2013. In the middle of May 2013, post-test measures were administered, and the study concluded.

**Table 1:** Timeline of study and data collection activities

TASK AND ACTIVITY	July	August	September	October	November	December	January	February	March	April	May
Study Orientation	√										
Initial Teacher Training		√	√								
Administration of Pre-Test Measures			√								
Student Instruction				√	√	√	√	√	√	√	√
Administration of Post-Test Measures											√
Conclusion of Study											√

## Implementation Guidelines

*S.P.I.R.E.* is an intensive, multisensory reading intervention. Ideal implementation involves one-on-one or small-group instruction for five days a week, 45–60 minutes a day. The pacing requirements for *S.P.I.R.E.* are flexible, to accommodate the scheduling needs of schools. For the purposes of consistency across *S.P.I.R.E.* groups, teachers were instructed to provide instruction five days a week for 45 minutes a day. *S.P.I.R.E.* provides teachers with clear and specific instructions about how to organize instruction around 10 consistent steps. Based on the best implementation model, teachers should attempt to cover all 10 steps, in order, within a single 45 – 60 minute teaching period.

## Fidelity of Implementation

The fidelity of an intervention refers to how well teachers implemented the program during the study. Because one-hundred percent fidelity is unrealistic, the National Center on Intensive Intervention (NCII) stipulates that all measures of fidelity should, at minimum, exceed 75%.

The fidelity of this *S.P.I.R.E.* implementation was evaluated in two ways. First, teachers submitted weekly logs that allowed the researcher to examine student attendance. Second, the majority of classes were observed three times over the course of the study by a *S.P.I.R.E.* specialist who is also a member of the EPS Professional Development team. During these class visits, the specialist completed a questionnaire that evaluated the quality of the classroom setup, the lesson, and the steps the teachers followed.

The total number of possible days a student could have attended *S.P.I.R.E.* sessions was calculated based on attendance sheets. School holidays, inclement weather days, and state-mandated testing days were not included in this total. Based on the attendance sheets submitted, it was then possible to calculate how many days each student attended *S.P.I.R.E.* class. On average, students attended 85% of all possible *S.P.I.R.E.* lessons. This level of attendance exceeds the 75% requirement stipulated by the NCII.

**Table 2:** Summary of fidelity questionnaire ratings

QUESTION	Average Rating (1-5)	Percent of Maximum
<b>Classroom Environment</b>		
How would you rate the readiness and accessibility of student materials?	4.30	86
How would you rate the readiness and accessibility of teacher materials?	4.33	87
How would you rate the physical set-up of the classroom?	4.17	83
<b>Quality of Lessons</b>		
Students are engaged and attentive with continuous teacher-student interaction.	4.46	89
Students are involved in a variety of visual, auditory, kinesthetic, and tactile activities.	4.30	86
Lesson is organized and materials accessible.	4.57	91
Teacher checks for understanding and monitors student progress.	4.47	89
How would you rate the overall quality of the lesson?	4.02	80

An EPS specialist also completed a questionnaire that evaluated the quality of the classroom environment and the lessons that were delivered. All questions were evaluated using a 5-point Likert scale. For questions related to the classroom environment, the scale ranged from 1 (Poor) to 5 (Excellent). For questions related to the quality of lessons, the scale ranged from 1 (Strongly Disagree) to 5 (Strongly Agree).

The results of these evaluations are summarized in Table 2.

All fidelity indicators from the classroom observation checklist exceeded the NCII 75% criterion (Table 2). The last component of the classroom observation checklist that was evaluated at each visit was the number of steps the teacher completed correctly. A complete *S.P.I.R.E.* lesson consists of 10 steps, though not all teachers who participated in this study were able to cover all 10 steps in the 45-minute instructional period. The implementation guidelines for *S.P.I.R.E.* state that a teacher should be able to complete, *at the very least*, 5 steps per lesson. This involves splitting the lesson in half to accommodate a 30 minute block. On average, teachers completed 4.20 steps per class. Therefore, on average teachers completed 84% of the steps they could ideally complete in a 30 minute block.

Overall, the results of the fidelity analyses are clear, *S.P.I.R.E.* was properly implemented over the course of the school year.

## PARTICIPANTS

This section of the report briefly describes the school district that participated, and how students were selected for inclusion in the study.

### Setting

All students included in this study were attending school in the Whitehall City School District during the 2012/2013 school year. The district is located in Whitehall, OH, which is a small city and enclave of Columbus, OH. The enrollment data is based on the 2012 fiscal year District Profile Report (Ohio Department of Education, 2013c). Past performance on state-wide assessments is based on the 2011/2012 school year district report card, which is published by the same organization (Ohio Department of Education, 2012).

**Table 3:** Characteristics of Whitehall City School District for the 2012 Fiscal Year

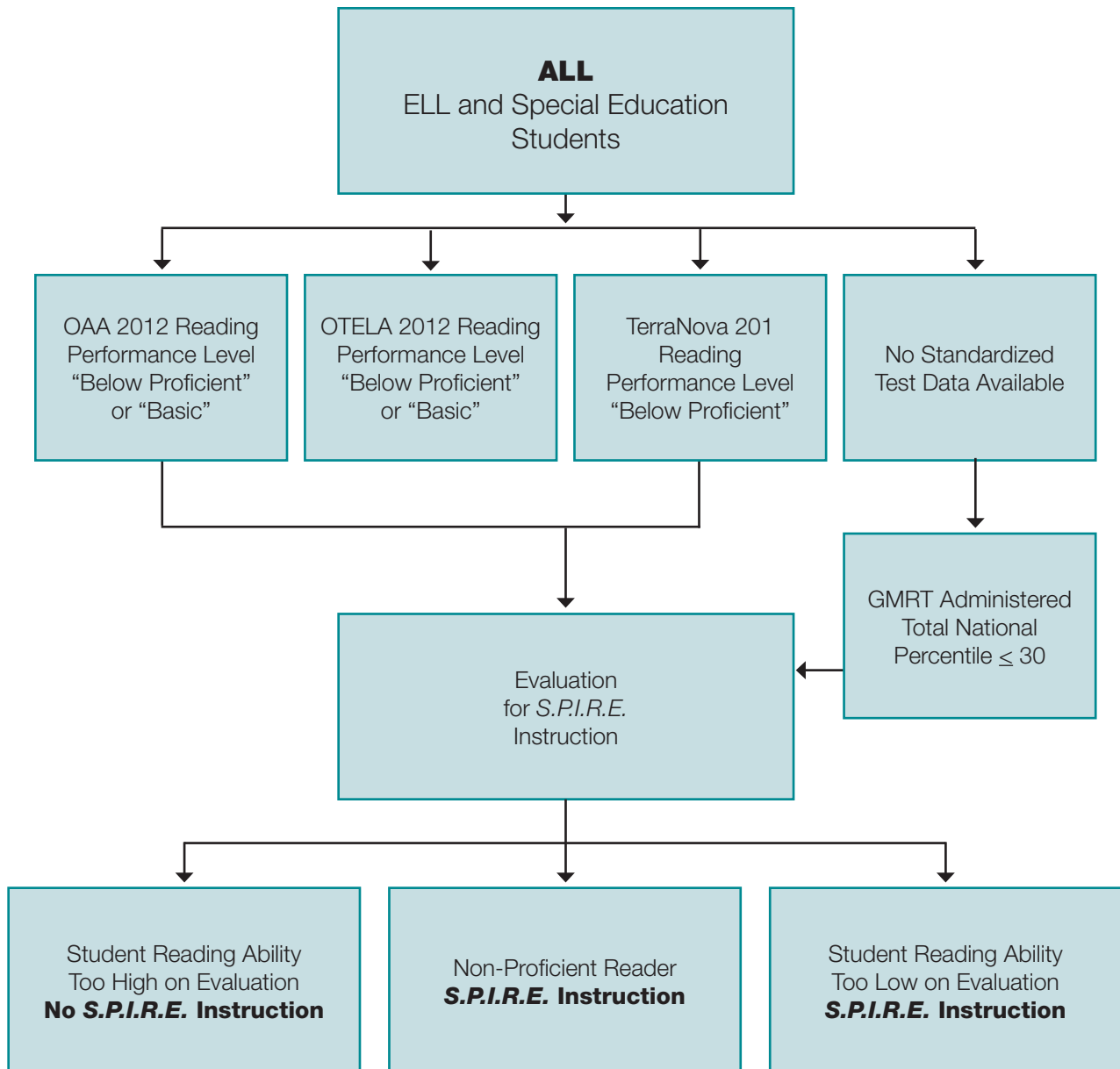
<b>DISTRICT CHARACTERISTICS</b>	
<b>Total Student Enrollment</b>	<b>2,828</b>
Percent Qualifying as Low Income (Free/Reduced Lunch)	79%
Ethnic Breakdown	
Asian	1.2%
African American	32.6%
Hispanic	15.7%
American Indian/Alaskan Native	0.2%
Multiracial	7.3%
Caucasian	43.0%
Past Performance on State-Wide Assessment	Effective

As shown in Table 3, the district is relatively small and has a high percentage of students who qualify as low income.

### Student Inclusion Criteria

Five schools were involved in the study. A multi-step process was used to determine whether a student would receive *S.P.I.R.E.* instruction.

**Figure 1:** Overview of *S.P.I.R.E.* instruction selection process





All students identified as ELL or Special Education by the district were considered for inclusion in the study. Students' proficiency on standardized tests administered by the district prior to the study was also considered; students identified as non-proficient on OAA, OTELA, or TerraNova were selected to participate. For grade levels where standardized test information was not available, GMRT was administered, and non-proficient students were identified by using the following criteria:

1. Students who had completed the reading component of the OAA in spring 2012 and scored 'basic' or 'below proficient' were selected for evaluation. Those with no OAA data were moved to the next step.
2. Students' spring 2012 OTELA data was examined, if available. If students scored 'pre-functional' or 'beginning' on the reading component of this test, they were selected for evaluation. Those without OAA or OTELA data were moved to the next step.
3. Students' spring 2012 TerraNova data was examined, if available. If students scored 'below proficient' on the reading component, they were selected for evaluation.
4. Students without OAA, OTELA, or TerraNova scores took the GMRT. If students scored at or below the 30th percentile on the GMRT, they were identified as non-proficient readers. The next step was determining whether or not these students qualified for *S.P.I.R.E.* instruction.
5. The IPA data for all students up to this point was examined. If students scored below Level 4 on the IPA, they were placed in a *S.P.I.R.E.* group and received instruction. If they scored at Level 0 on the IPA, they received instruction using *Sounds Sensible*®. *Sounds Sensible* is the Pre-Level 1 component of *S.P.I.R.E.* and provides hands-on, multisensory instruction in phonemic awareness, alphabet knowledge, letter-sound relationships, and handwriting. Students using *Sounds Sensible* were not included in the current report.

These criteria resulted in the selection of 83 students for *S.P.I.R.E.* instruction.

### Characteristics of Final Analytic Sample

A total of 75 students completed *S.P.I.R.E.* instruction, with a relatively low attrition rate of eight students (9.6%). This section briefly describes the characteristics of these participants.

Table 4 summarizes the distribution of students who received *S.P.I.R.E.* instruction. The majority of students included in the current report were enrolled in grade five or below.

**Table 4:** Distribution of *S.P.I.R.E.* students by grade

GRADE	Number of Students	Percentage of Students
2	11	15
3	13	17
4	15	20
5	12	16
6	6	8
7	5	7
8	5	7
9	6	8
10	2	3
<b>Total</b>	<b>75</b>	<b>100</b>

The distribution of students by ELL and Special Education status is summarized in Table 5, below. A slightly larger number of students were identified as Special Education than as ELL. Only three students in the current study were identified as both ELL and Special Education.

**Table 5:** Distribution of S.P.I.R.E. students by ELL and Special Education status

STATUS	Number of Students	Percentage of Students
ELL	33	44
Special Education	39	52
Both ELL and Special Education	3	4
<b>Total</b>	<b>75</b>	<b>100</b>

The distribution of students by school in the Whitehall City School District included in the study is summarized in Table 6, below.

**Table 6:** Distribution of S.P.I.R.E. students by school

SCHOOL	Number of Students	Percentage of Students
Beechwood ES	8	11
Etna Road ES	26	35
Kae Avenue ES	17	23
Rosemore MS	16	21
Whitehall-Yearling HS	8	11

*Note.* Percentages may not add up to 100 due to rounding.

## STUDENT PERFORMANCE RESULTS

This section of the report presents the gains achieved by students who received *S.P.I.R.E.* instruction. It is divided into separate sections for each of the measures that students completed. Results are presented in terms of gains. The first four sections of the report present the results from the primary student outcomes used in the current study. Student gains are reported by school in Appendix B.

### SECTION A: Performance Improvements on Initial Placement Assessment (IPA)

#### Introduction

This section examines the influence of *S.P.I.R.E.* instruction on IPA scores. Briefly, the IPA is a proprietary test that is part of *S.P.I.R.E.* It assesses the skills that are taught in the program, evaluating the total number of skills students have mastered. The IPA is used to place students appropriately in *S.P.I.R.E.* and can be used to assess student gains after instruction.

#### Student Performance

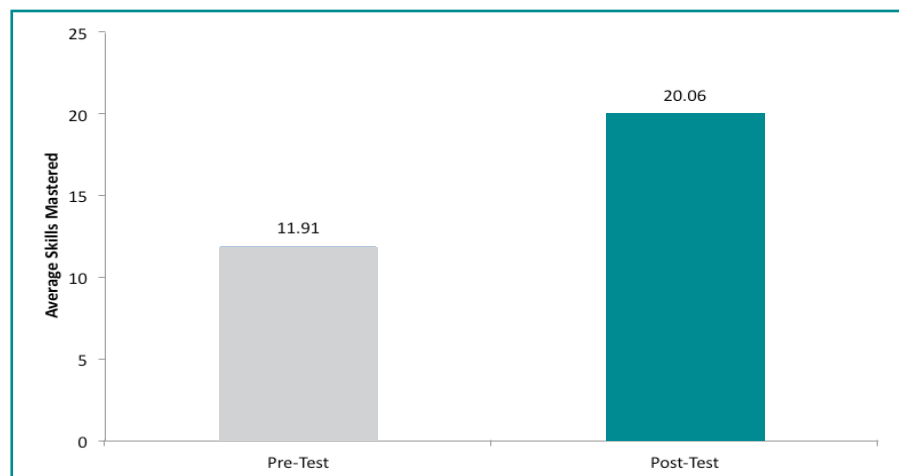
The data from all available IPA tests was included in this analysis. Note, the number of students included in the analysis differs from the final analytic sample, as some students were missing their post-test data.

**Table 7:** Gains in average skills mastered on the IPA

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
IPA (Skills Mastered)	8.15	1.40	5.81	68	<.001

Students who received *S.P.I.R.E.* instruction mastered, on average, eight skills over the course of the study (Table 7). These gains were statistically significant. Average number of skills students' demonstrated mastery of on the pre-test and post-test are summarized in Figure 2.

**Figure 2:** Average Number of Skills Students Demonstrated Mastery of on the IPA



The data displayed in Figure 2 clearly illustrates that students' who received *S.P.I.R.E.* instruction achieved significant gains in the number of skills they mastered over the school year.

## SECTION B: Performance Improvements on the Gates-MacGinitie Reading Test (GMRT)

### Introduction

This section examines the influence of *S.P.I.R.E.* instruction on the performance of students on the GMRT. The GMRT is a standardized assessment of general reading ability. For students who are enrolled in grades three and above, the test consists of a vocabulary and comprehension subtest. Student performance data from these two GMRT subtests is combined to provide an overall index of student performance. Note that grade two students do not complete a vocabulary section of the GMRT, so there is no vocabulary data reported for them.

### Student Performance

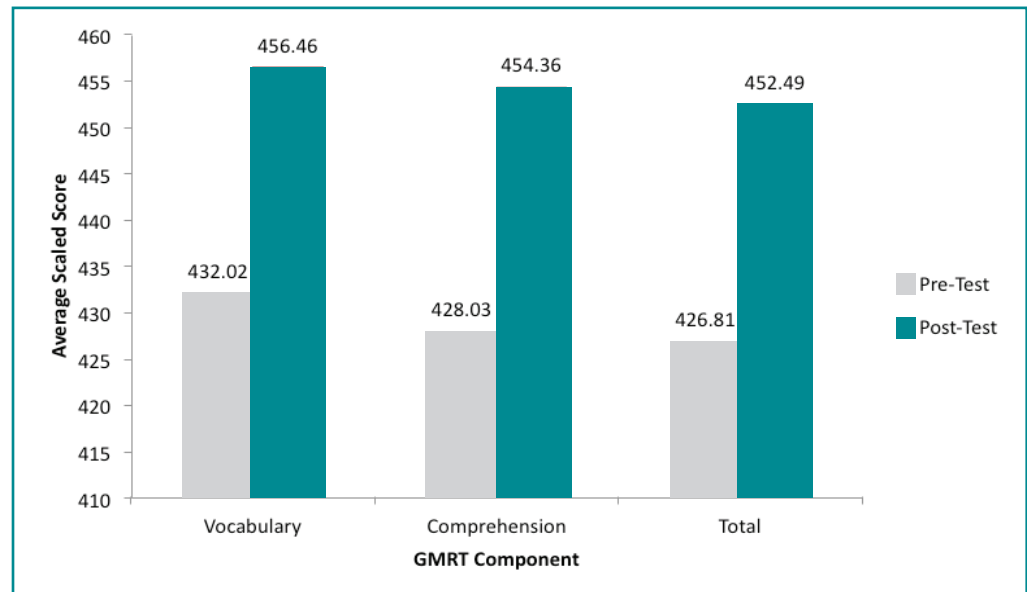
The data from all available GMRT subtests is included in this section. Table 8 summarizes the results of these analyses. All data is presented as scaled scores.

**Table 8:** Average scaled-score gains on the GMRT

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
GMRT Vocabulary	24.44	3.48	7.03	60	<.001
GMRT Comprehension	26.33	3.88	6.79	71	<.001
GMRT Total	25.68	2.82	9.12	71	<.001

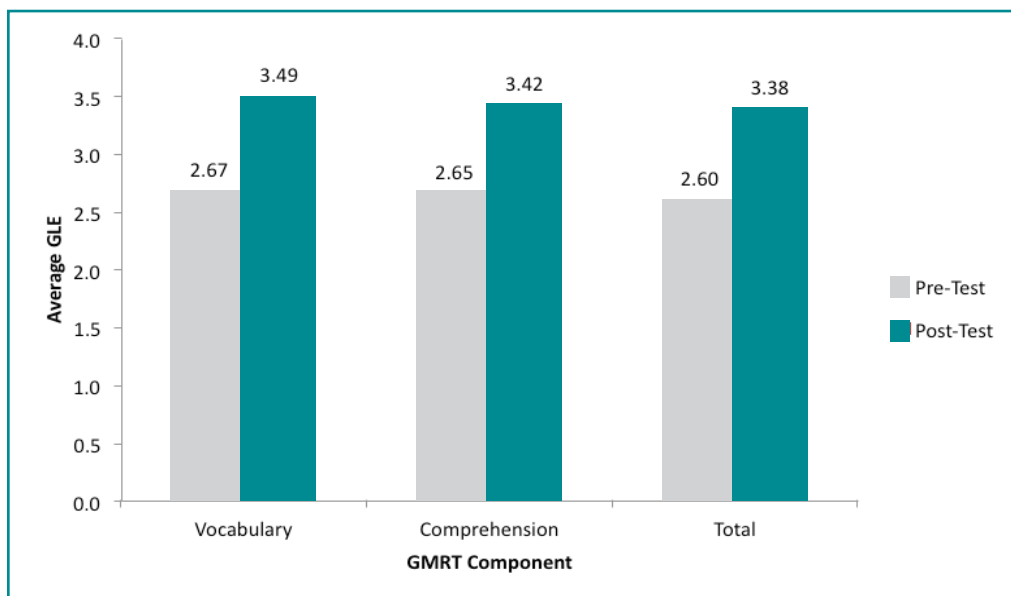
Students who received *S.P.I.R.E.* instruction achieved significant scaled-score gains (Table 8) on both GMRT subtests (both  $p < .001$ ) and on the overall evaluation of reading ability ( $p < .001$ ).

**Figure 3:** Average pre- and post-test scaled scores on the GMRT



The data summarized in Figure 3 indicates that students who received *S.P.I.R.E.* instruction started the school year with compatible vocabulary and comprehension abilities. On average, these students achieved significant scaled score gains on all components of the GMRT. These results indicate that *S.P.I.R.E.* instruction improved students reading abilities as indexed by a standardized and well-regarded test of reading ability.

**Figure 4:** Average pre- and post-test GLE on GMRT components



The data in Figure 4 clearly illustrates the average level of reading ability of students in the study before and after *S.P.I.R.E.* instruction.

## SECTION C:

### Performance Improvements on the Test of Word Reading Efficiency (TOWRE)

#### Introduction

This section examines the influence of *S.P.I.R.E.* instruction on students' performance on the TOWRE. The TOWRE is a test of students' word reading efficiency. It consists of two subtests, Sight Word Efficiency and Phoneme Decoding Efficiency. Students' performance on both of these subtests was combined to provide a Total Word Reading Efficiency Index.

#### Student Performance

All available data from the TOWRE test for students who received *S.P.I.R.E.* instruction was examined in this section.<sup>1</sup> Note that the number of students included in each component of the TOWRE test may differ, due to students not completing specific components of the test at the beginning or end of the study. Total Word Reading Efficiency scores were not calculated if students were missing data on one of the two subtests. See Table 9, below, for average scaled-score gains on the TOWRE.

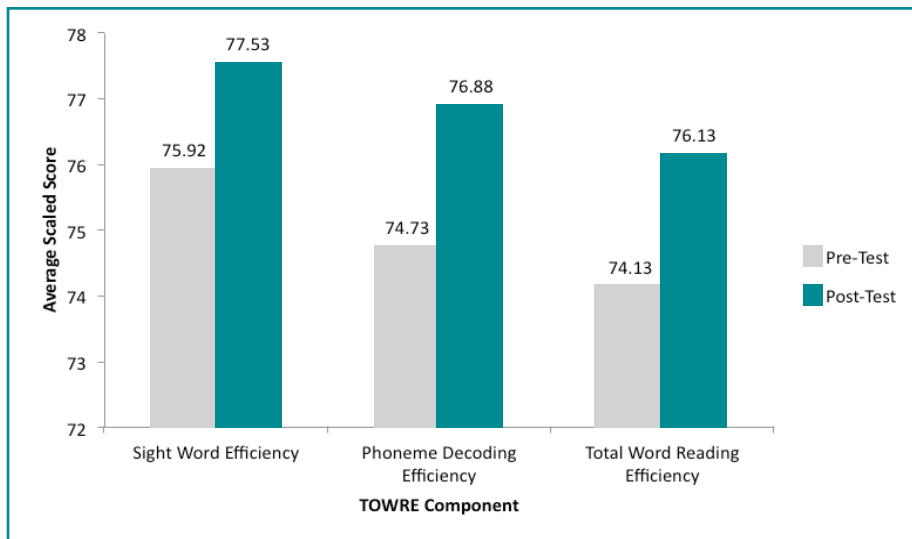
**Table 9:** Average scaled-score gains on the TOWRE

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
TOWRE Sight Word Efficiency	1.61	0.87	1.85	71	0.07
TOWRE Phoneme Decoding Efficiency	2.15	0.94	2.29	72	0.03
TOWRE Total Word Reading Efficiency Index	1.97	0.79	2.50	70	0.02

<sup>1</sup> One extreme outlier was omitted from the Total Word Reading Efficiency Index results.

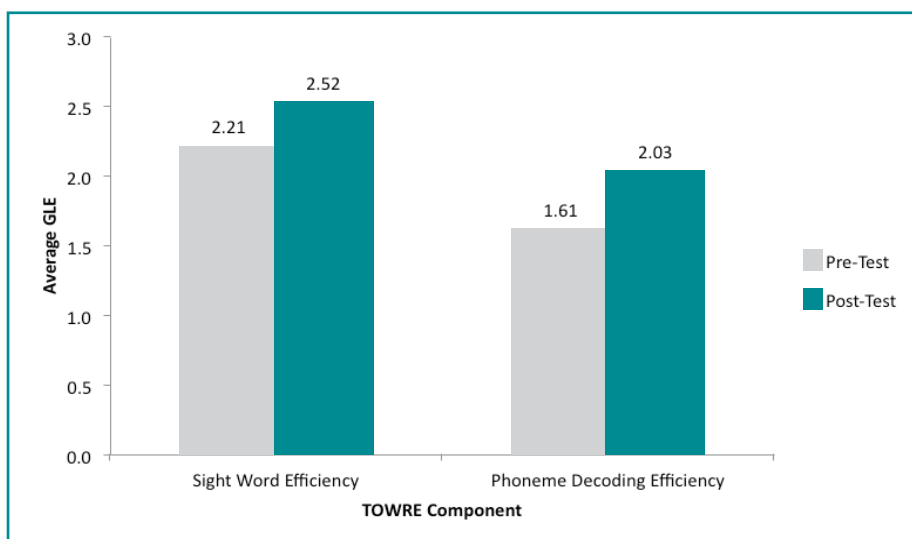
Students who received *S.P.I.R.E.* instruction achieved significant average scaled-score gains on the Phoneme Decoding Efficiency Component and Total Word Reading Efficiency Index (Table 9). Phonological processes are one of the main areas of instruction in *S.P.I.R.E.*, and thus significant gains in this area would be expected. As the Total Word Reading Efficiency Index is a sum of the two subtests, gains on the PDE subtest drove the overall effect. In contrast, students achieved average scaled-score gains on Sight Word Efficiency, but these gains were just below the benchmark for being classified as statistically significant. Therefore, while there is a trend indicating that students improved on this subtest, the gains were not dramatic enough to achieve the traditional threshold of statistical significance.

**Figure 5:** Average pre- and post-test scaled scores on TOWRE



As illustrated in Figure 5, there were some minor variations in average pre-test scaled scores, but the same pattern of growth was observed on both subtests of the TOWRE. Although these gains failed to achieve traditional levels of statistical significance for Sight Word Efficiency, these results indicate that *S.P.I.R.E.* instruction had a positive effect on students’ sight word reading abilities.

**Figure 6:** Average pre- and post-test GLE on TOWRE components



To illustrate the reading performance of students in this study, students’ average performance in terms of grade-level equivalent (GLE) is presented in Figure 6. (The TOWRE for Total Word Reading Efficiency index does not produce a GLE score.)

## SECTION D: Performance Improvements on the Test of Silent Word Reading Fluency (TOSWRF)

### Introduction

This section examines the gains achieved on the TOSWRF by students who received *S.P.I.R.E.* instruction. The TOSWRF examines students' ability to quickly and accurately identify words by having students separate lines of connected letters into individual words.

### Student Performance

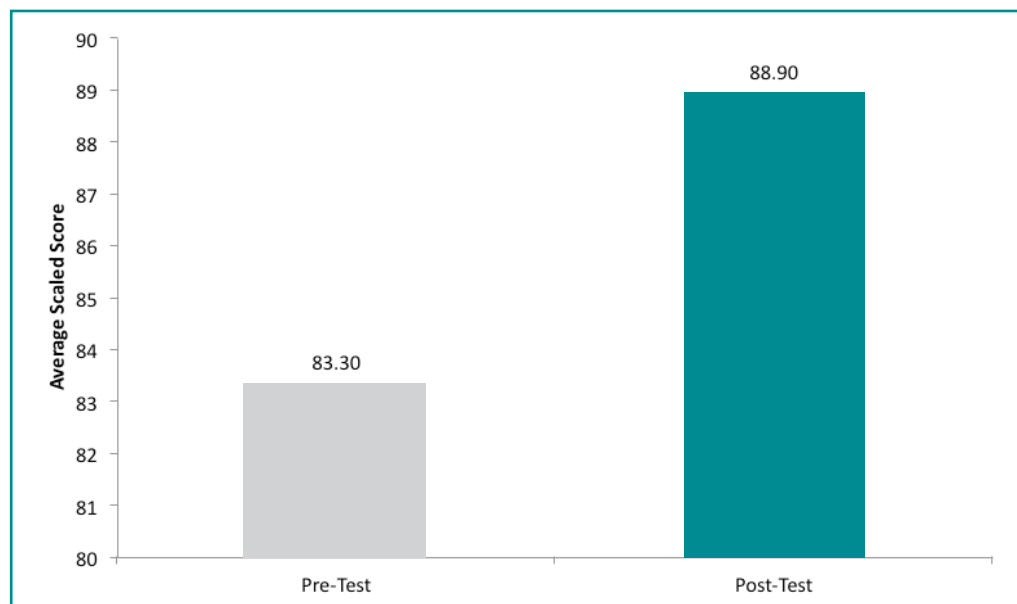
All available data from the TOSWRF was submitted for analysis. Scaled scores were used, not raw scores, because they are equal-interval measures that can be averaged.

**Table 10:** Average scaled-score gains on the TOSWRF

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
TOSWRF	5.60	0.85	6.60	72	<.001

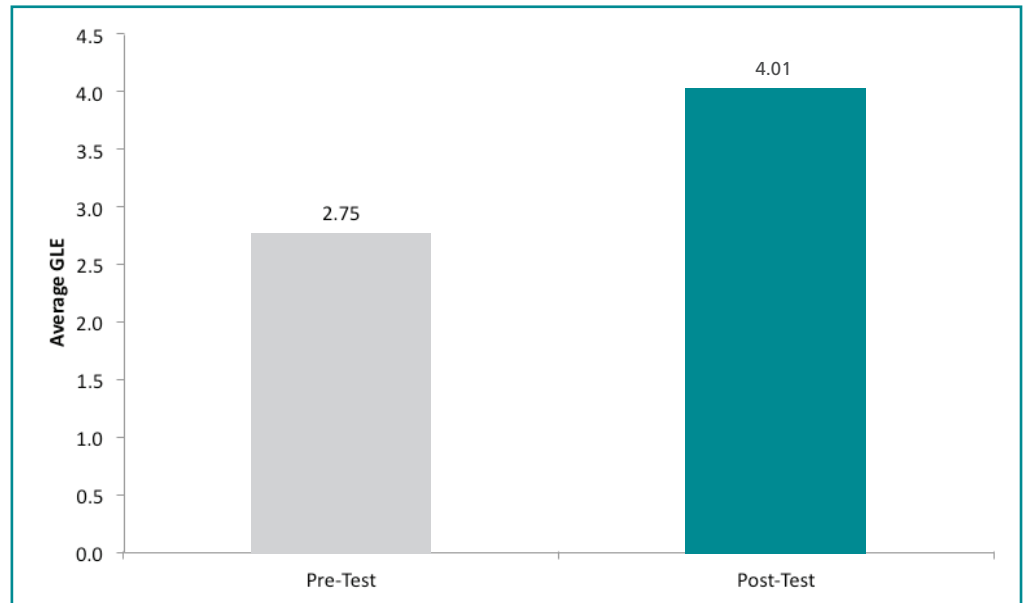
On average, students who received *S.P.I.R.E.* instruction achieved statistically significant scaled- score gains on the TOSWRF (see Table 10). Average pre- and post-test scaled scores are summarized in Figure 7.

**Figure 7:** Average pre- and post-test scaled score on the TOSWRF



Students who received *S.P.I.R.E.* instruction achieved significant gains of approximately six scaled points in their ability to fluently identify words (Figure 7). This finding was expected, given the variety of words that students are exposed to during *S.P.I.R.E.* instruction.

**Figure 8:** Average pre- and post-test GLE on TOSWRF



The GLE data, summarized for reference purposes in Figure 8, indicates that, on average, students achieved gains of over a full grade level after receiving *S.P.I.R.E.* instruction. If *S.P.I.R.E.* had been implemented in 45-60 minute blocks, allowing all 10 steps to be completed every day, we would expect to see gains of two or more grade levels.

### Summary Student Performance Results on Primary Outcomes

The results from this section of this report are clear. Students who received *S.P.I.R.E.* instruction achieved significant gains on almost all of the primary outcome measures. First, students mastered a significant number of skills after using *S.P.I.R.E.* Second, these same students achieved significant vocabulary, comprehension, and overall reading gains; as indexed by the GMRT. Third, students achieved significant decoding efficiency gains on the TOWRE. Finally, the students achieved significant improvements in word recognition, as indexed by the TOSWRF.

The following sections examine student gains on the secondary outcome measures that were used. While the secondary outcome measures also probe different aspects of reading ability, they are not as closely aligned to the skills that are taught in *S.P.I.R.E.*, or, they were administered months before the study had begun and again before the study had finished.



## SECTION E: Performance Improvements on the *Academy of READING* Placement Test

### Introduction

This section of the report examines the gains students achieved on the *Academy of READING* Placement Test, which is published by EPS. This is a maze test that all students enrolled in the *Academy of READING* program must complete at the beginning and end of instruction and practice in that program. The maze test is a curriculum-based measure that provides an index of students' general reading ability. Scores on this test are reported as grade-level equivalents (GLE).

### Student Performance

The majority of students involved in the current study completed the *Academy of READING* Placement Test before and after the study. Due to unforeseen circumstances, a number of students at Rosemore Middle School ( $n = 12$ ) and Etna Road Elementary School ( $n = 6$ ) did not complete either the pre-test or post-test. Therefore, the analysis in this section should be interpreted cautiously, as it is only based on a subset of the students who received *S.P.I.R.E.* instruction.

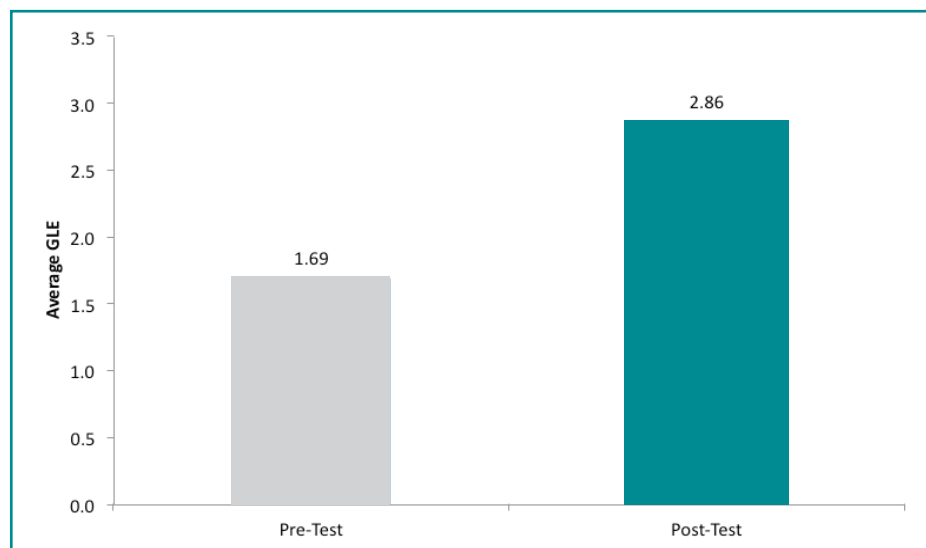
The results of the gain analyses are summarized in Table 11, below.

**Table 11:** Average Grade Level Equivalent (GLE) gains on the *Academy of READING* Placement Test

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
<i>Academy of READING</i> Placement Test	1.18	0.19	6.08	50	<.001

On average, students who received *S.P.I.R.E.* instruction achieved significant gains of over a full grade level on the *Academy of READING* Placement Test (see Table 11).

**Figure 9:** Average pre- and post-test grade-level equivalent (GLE) scores on the *Academy of READING* Placement Test



As expected, based on the inclusion criteria for this study, the average GLE at the start of the study was quite low (Figure 9). Nonetheless, students achieved significant gains on the *Academy of READING* Placement Test after receiving *S.P.I.R.E.* instruction.

## Section F: Performance Improvements on *Path Driver for Reading Oral Reading Fluency Assessment (ORF)*

### Introduction

This section examines student performance gains on the *Path Driver for Reading Oral Reading Fluency (ORF)* assessment. Scores are reported as number of words read correctly (WCPM) during the one-minute test.

### Student Performance

**Table 12:** Average WCPM gains on the *Path Driver for Reading ORF* assessment

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
ORF Assessment (WCPM)	21.89	1.93	11.35	60	<.001

The results of these analyses are clear (Table 12). Students achieved significant WCPM gains on the ORF assessment after receiving *S.P.I.R.E.* instruction.

**Figure 10:** Average pre- and post-test WCPM on the *Path Driver for Reading ORF* assessment

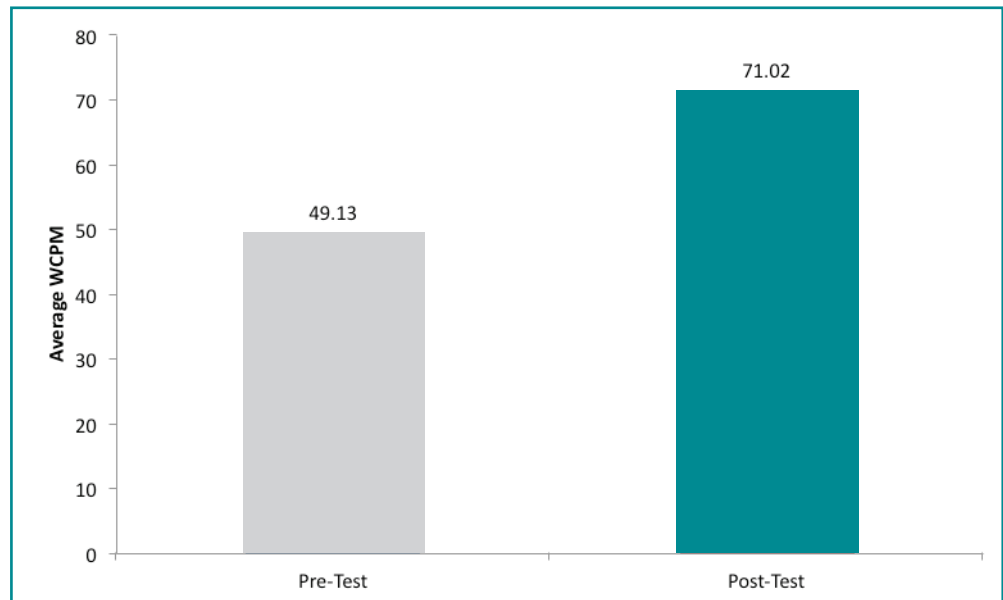


Figure 10 summarizes the pre- and post-test WCPM data. Students who received *S.P.I.R.E.* instruction achieved significant oral reading fluency gains.

## Section G: Performance Improvement on TerraNova

### Introduction

This portion of the report examines the scaled-score gains students achieved on the TerraNova test. This standardized test of academic ability focuses on achievement in a variety of academic subjects. However, for the purposes of this report, only data from the reading and language components of the test was examined.

### Student Performance

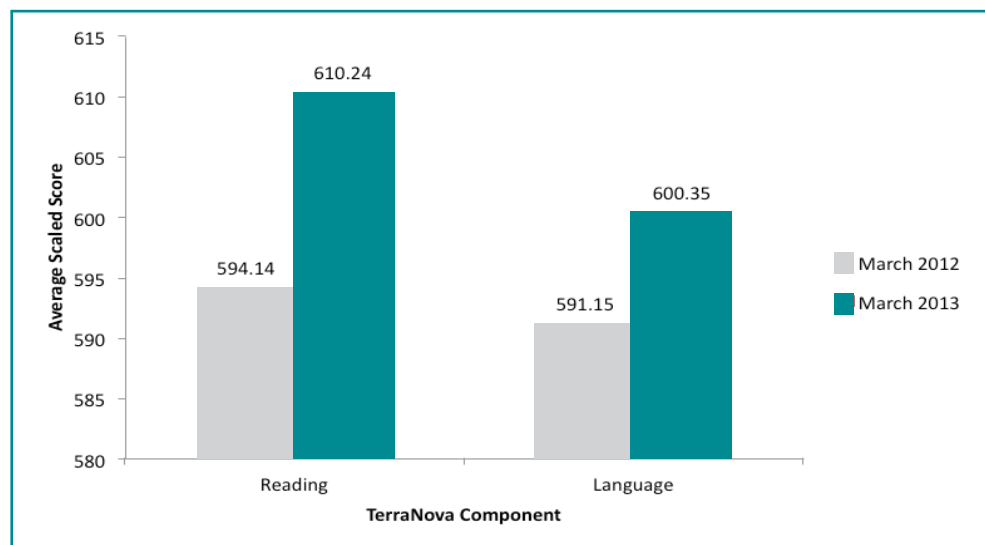
All available TerraNova data from the March 2012 and March 2013 administrations of the test for students who received *S.P.I.R.E.* instruction were examined in this section.<sup>1</sup> Scaled scores were examined, not raw scores, since they extend across grades and are equal-interval measures of performance. The results of the gain analyses are summarized in Table 13, below.

**Table 13:** Average scaled score gains on the TerraNova assessment

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
TerraNova Reading	16.07	3.31	4.87	50	<.001
TerraNova Language	9.20	5.66	1.62	39	0.11

Students who received *S.P.I.R.E.* instruction achieved statistically significant scaled-score gains on the reading portions of TerraNova (Table 13). The gains on the language portions of TerraNova were not as significant.

**Figure 11:** Average pre- and post-test scaled scores on TerraNova



The data summarized in Figure 11 clearly illustrates the gains that students achieved on the reading component of TerraNova. Although students did not achieve significant gains on the language component of TerraNova, these results are not necessarily unexpected. The reading component of TerraNova evaluates many of the skills taught in *S.P.I.R.E.* In contrast, the language component focuses on writing. Because the study's daily 45-minute instructional period often didn't allow time for completion of the full 10 steps of a *S.P.I.R.E.* lesson, growth in writing abilities was less dramatic than it would have been if all 10 steps had been delivered consistently.

<sup>1</sup> Data from one extreme outlier was omitted from the TerraNova Reading analyses.

## SECTION H: Performance Improvements on the Ohio Test of English Language Acquisition (OTELA)

### Introduction

This section of the report examines *S.P.I.R.E.* students' scaled-score gains on the reading component of OTELA. All students identified as ELL who attend school in Ohio must complete this test of English language acquisition every year. Only the results from the reading component of OTELA were considered, since they are most relevant to *S.P.I.R.E.* instruction.

### Performance Results

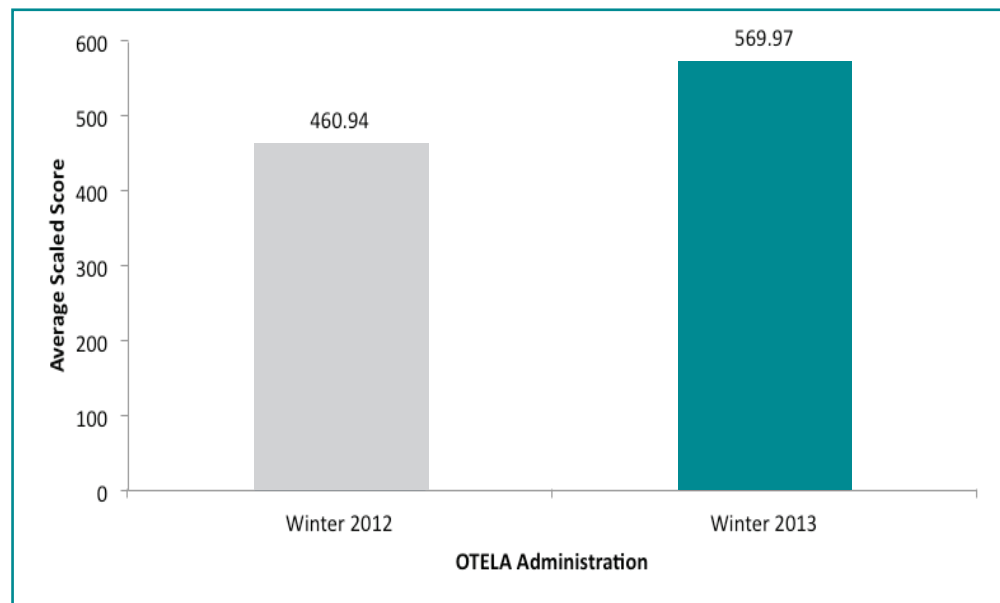
The results of all available OTELA data are summarized in Table 14. Scaled scores were used, as they are equal-interval scores and can be averaged. As OTELA is only administered to ELL students, a large number of students were excluded from this analysis. Therefore, caution is warranted in interpreting the results.

**Table 14:** Average scaled score gains on the OTELA reading component

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
OTELA Reading	109.03	22.71	4.80	33	<.001

Students who received *S.P.I.R.E.* instruction achieved significant OTELA reading scaled-score gains (see Table 14).

**Figure 12:** Average pre- and post-test scaled scores on the reading component of the OTELA



The results of this analysis were positive (Figure 12). Students who received *S.P.I.R.E.* instruction achieved average scaled-score gains of approximately 100 points.

## SECTION I: Performance Improvements on the Ohio Achievement Assessment (OAA)

### Introduction

This final section of the student performance results section examines *S.P.I.R.E.* students' scaled-score gains on the reading component of the OAA. Every year, all students attending school in Ohio complete the OAA, which is a standardized assessment of academic ability. Because *S.P.I.R.E.* is designed to improve reading ability, only data from the reading component of the OAA is considered in this report.

### Student Performance

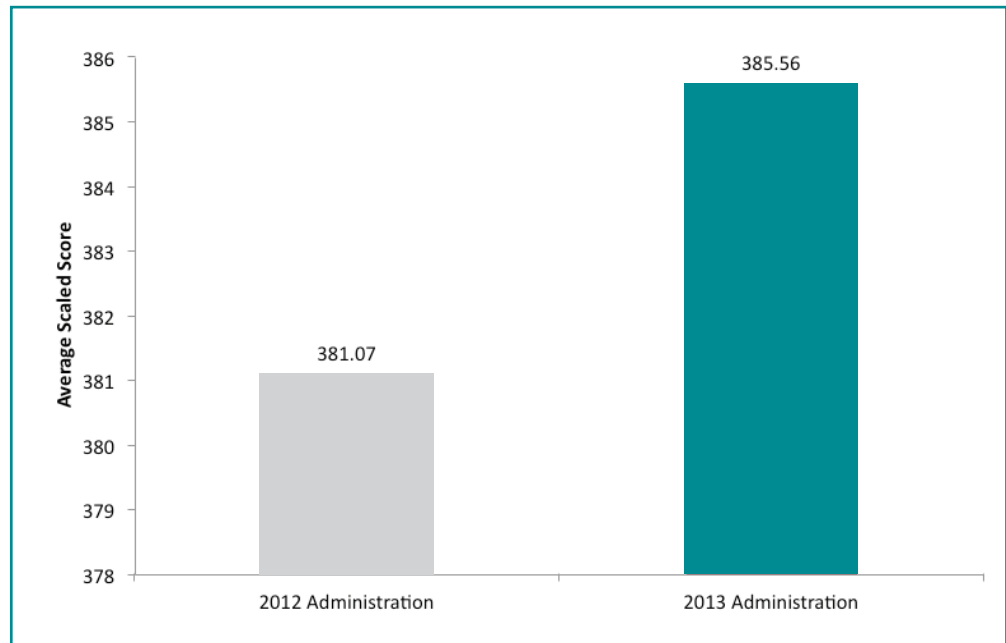
All available OAA data for reading was submitted for this analysis. Scaled scores were used because they are equal-interval measures that can be averaged. The OAA is only administered to students in grades 3 through 8. Therefore, students who were in either grades 2 or 3 and grades 9 or above who were instructed in *S.P.I.R.E.* are not represented in this analysis. The reason for this is that these students were missing data from 2012 or 2013 because they did not complete the OAA, thus gains scores could not be calculated. Therefore results of this analysis must be interpreted cautiously.

**Table 15:** Average scaled score gains on the OAA reading component

OUTCOME MEASURE	Gains (Mean)	Standard Error	t-value	df	p-value
OAA Reading	4.49	3.24	1.38	40	0.17

The gain analyses indicated that although *S.P.I.R.E.* students achieved a small average increase in reading scaled-scores, this gain did not achieve statistical significance (Table 15).

**Figure 13:** Average pre- and post-test OAA reading scaled score



*S.P.I.R.E.* students achieved small average-scaled score gains on the reading component of the OAA (Figure 13), but these gains did not qualify as statistically significant. Recall that a large proportion of the *S.P.I.R.E.* students were enrolled in grades 2 and 3 ( $n = 24$ ; 32% of total sample) or 9 and above ( $n = 8$ ; 11% of total sample). Due to the fact that the OAA is only administered to students in grades 3 through 8, approximately 43% of the students examined in this report were automatically excluded from this analysis. Therefore, caution is warranted in interpreting the results.

### Summary of Student Performance Results on Secondary Outcomes

The last several sections (E through I) examine the gains of students who received *S.P.I.R.E.* instruction, based on the secondary outcomes of this study. These outcome measures evaluated various aspects of reading ability, but they were not as closely linked to the skills that students learn in *S.P.I.R.E.*, and they were often administered well before the study began and/or before the study ended.

Overall, the results for the secondary outcome measures were positive. *S.P.I.R.E.* students achieved significant growth on the *Academy of READING* Placement Test, *Path Driver for Reading* ORF assessment (WCPM), TerraNova (Reading Component), and OTELA (Reading). Although there were indications that students had achieved growth on other secondary outcome measures, these gains did not reach the traditional threshold of statistical significance.

## STUDENT ATTITUDES TOWARDS READING

### Introduction

At the conclusion of the study, students who received *S.P.I.R.E.* instruction were administered a brief survey to examine their attitudes towards reading. The survey consisted of five questions evaluating students' attitude towards recreational reading and five questions evaluating their attitude towards reading in an academic setting. Their ratings on all ten questions were also reported as a combined score to produce an indicator of their overall attitude towards reading. Higher scores on the measure indicate a more positive attitude towards reading.

### Student Responses

Only responses from students who had completed all questions on the reading survey were included in this section. Ratings for the recreational and academic-attitude components of the survey ranged from 5 to 20. Ratings on the overall reading attitude scale ranged from 10 to 40. *S.P.I.R.E.* students' average ratings on all survey components are summarized in Table 16.

**Table 16:** Average student ratings from reading attitude survey

Reading Attitude Area	Average Rating	SD	Range
Recreation	13.14	4.24	5-20
Academic	12.88	3.36	5-20
Overall	26.01	6.87	10-40

There was no significant difference in *S.P.I.R.E.* students' attitudes toward recreational or academic reading,  $t(64) = -0.63, p = .53$ . Their ratings on both subcomponents and overall reading attitude were close to the midrange of possible values. These results indicate that although these students struggle with reading, they do not have an overly negative or positive attitude toward reading.

## TEACHERS SURVEY RESULTS

Two other surveys were distributed to teachers in the Whitehall City School District. First, teachers who used *S.P.I.R.E.* for instruction were asked a series of questions to determine their perception of the gains *S.P.I.R.E.* students achieved, and their opinion of *S.P.I.R.E.* as an instructional program. Second, homeroom teachers who had students who received *S.P.I.R.E.* instruction were given a brief survey to examine their perception of the gains *S.P.I.R.E.* students achieved. As this report focuses on reading gains after using *S.P.I.R.E.*, only those questions will be focused in this report.

### *S.P.I.R.E.* Teacher Survey

Teachers who instructed students using *S.P.I.R.E.*, and whose data is included in this report, were asked to respond to a researcher-designed survey. Thirteen teachers responded to the survey. Of primary interest to this report were the opinions of *S.P.I.R.E.* teachers concerning reading gains that students achieved.

In terms of the improvements that students experienced, *S.P.I.R.E.* teachers were asked to rate their endorsement of a series of statements that examined whether teachers thought *S.P.I.R.E.* students reading skills had improved. Teachers were asked to use a 5-point Likert scale that ranged from 1, “Strongly Disagree”, to 5, “Strongly Agree.”

**Table 17:** Average *S.P.I.R.E.* teacher endorsement of student reading gains; results are sorted from most to least strongly endorsed

Question	Mean	SD
Students who used <i>S.P.I.R.E.</i> have improved their <b>phonemic awareness</b> .	4.54	0.66
Students who used <i>S.P.I.R.E.</i> this year have improved their <b>general reading ability</b> .	4.38	0.65
Students who used <i>S.P.I.R.E.</i> have improved their <b>phonics/word decoding abilities</b> .	4.38	0.51
Students who used <i>S.P.I.R.E.</i> like the program.	4.38	0.51
Students who used <i>S.P.I.R.E.</i> have a more <b>positive attitude</b> about reading now than they did at the start of the year.	4.31	0.63
Students who used <i>S.P.I.R.E.</i> have improved their <b>reading fluency</b> .	4.23	0.60
Students who used <i>S.P.I.R.E.</i> have <b>increased confidence</b> in reading and spelling now than they did at the start of the year.	4.23	0.73
Students who used <i>S.P.I.R.E.</i> have improved their <b>vocabulary</b> .	4.00	0.58
Students who used <i>S.P.I.R.E.</i> are "decoding" when they <b>read</b> in class.	4.00	0.71
Students who used <i>S.P.I.R.E.</i> have improved their <b>reading comprehension</b> abilities.	3.92	0.76
Students who used <i>S.P.I.R.E.</i> are "encoding" when they <b>spell</b> in class.	3.77	0.73

Overall, the results of this survey were positive. With the exception of two questions, on average, teachers “agreed” that *S.P.I.R.E.* helped students improve most aspects of their reading ability and that they liked the program. The most strongly endorsed aspects of reading that *S.P.I.R.E.* teachers believed the program improved were phonemic awareness, general reading ability, and phonics/word decoding abilities. These results are not surprising, given that these are aspects of *S.P.I.R.E.* instruction. Although teachers still highly endorsed the belief that *S.P.I.R.E.* students had improved their reading comprehension and used decoding and encoding skills when spelling in class, these were the two most weakly endorsed items on the survey.

## Homeroom Teacher Survey

Homeroom teachers who had *S.P.I.R.E.* students in their classroom were asked to complete a brief survey that examined their perception of the reading gains students achieved. Ten teachers responded to the survey, but only nine completed all of the questions. The teachers were asked the same questions as *S.P.I.R.E.* teachers had been asked, to determine their perceptions of the benefits that *S.P.I.R.E.* instruction had on specific aspects of students’ reading abilities. Average ratings for each question have been calculated and presented in Table 18.



**Table 18:** Average homeroom teacher’s endorsement of student’s reading gains, sorted from most to least strongly endorsed

Question	Mean	SD
Students who used <i>S.P.I.R.E.</i> this year have improved their <b>general reading ability</b> .	4.00	0.50
Students who used <i>S.P.I.R.E.</i> are "decoding" when they <b>read</b> in class.	4.00	0.50
Students who used <i>S.P.I.R.E.</i> have <b>increased confidence</b> in reading and spelling now than they did at the start of the year.	4.00	0.71
Students who used <i>S.P.I.R.E.</i> have improved their <b>phonemic awareness</b> .	3.89	0.33
Students who used <i>S.P.I.R.E.</i> have improved their <b>phonics/word decoding</b> abilities.	3.89	0.33
Students who used <i>S.P.I.R.E.</i> have a more <b>positive attitude</b> about reading now than they did at the start of the year.	3.89	0.78
Students who used <i>S.P.I.R.E.</i> like the program.	3.89	0.33
Students who used <i>S.P.I.R.E.</i> have improved their <b>reading fluency</b> .	3.78	0.67
Students who used <i>S.P.I.R.E.</i> are "encoding" when they <b>spell</b> in class.	3.78	0.44
Students who used <i>S.P.I.R.E.</i> have improved their <b>vocabulary</b> .	3.67	0.50
Students who used <i>S.P.I.R.E.</i> have improved their <b>reading comprehension</b> abilities.	3.44	0.73

Overall, homeroom teachers gave slightly lower ratings than *S.P.I.R.E.* teachers did. Nonetheless, the average endorsement was between “Neither Agree or Disagree” and “Agree” for all questions on the survey. When taken together, these results indicate that both *S.P.I.R.E.* teachers and homeroom teachers both believe that *S.P.I.R.E.* students demonstrated improvement with all aspects of their reading ability.

## CONCLUSION

This *S.P.I.R.E.* study was conducted to measure the effectiveness of the program with ELL and Special Education students in elementary, middle, and high school who struggle with reading. Five schools across the Whitehall City School District in Ohio participated in the study. The findings in this report represent a sample of 75 students in grades 2 through 10 who were selected to receive *S.P.I.R.E.* instruction during the 2012/2013 school year.

Overall, the students who received *S.P.I.R.E.* instruction demonstrated significant learning gains during the study period. These gains were reflected in the primary outcome measures. Specifically, based on the primary outcome measures, students improved their general vocabulary, general comprehension, and overall reading abilities. They also improved their decoding efficiency, overall reading efficiency, and silent word recognition fluency. *S.P.I.R.E.* instruction did not have a significant effect on students’ sight word efficiency, however.

The impact of *S.P.I.R.E.* instruction based on the secondary outcome measures was generally positive. Students’ oral reading fluency improved. As expected, because of the emphasis on writing, *S.P.I.R.E.*

students' Language abilities, as indexed by the TerraNova assessment, did not improve. Had students received the full 10 Step Lesson every day would we expect to see gains in their writing abilities. Students gained over a full grade level, in terms of their general reading ability, ESL students significantly improved their OTELA reading scores, and TerraNova Reading scores also significantly increased.

Students had neither overly negative nor overly positive attitudes towards reading at the end of the study. In general, both *S.P.I.R.E.* teachers and homeroom teachers felt students achieved reading gains over the course of the school year. Note that longer time in program (daily and year over year) has been shown to produce significant gains. Students who receive *S.P.I.R.E.* instruction through level 8 can be expected to read and write at approximately an 8<sup>th</sup> grade level.

In summary, the results of this study indicate that *S.P.I.R.E.* is an effective reading intervention program for Special Education and ELL students. Results indicate that students who received *S.P.I.R.E.* instruction became significantly better readers by the end of the year.

## ACKNOWLEDGMENTS

We wish to thank the students, teachers, and administrators in the Whitehall City School District. Particular thanks are extended to Dr. Susie Carr, Juliette Peoples, Dr. James Freeman, and Naja Bailey from the district office. Without your hard work and dedication, this study would not have been possible.

---

*Correspondence concerning this report  
should be addressed to:*

***Edina Torlaković, Ph.D. (ABD),  
Senior Research Scientist***  
*edina.torlakovic@schoolspecialty.com*

EPS Literacy and Intervention  
PO Box 9031  
Cambridge, MA 02139-9031  
800.225.5750  
epsbooks.com

## REFERENCES

- Clark-Edmands, S. (2012). *S.P.I.R.E.*® *Teacher's Guide: Level 3*. Cambridge, MA: EPS Literacy and Intervention.
- CTB McGraw-Hill. (2008). *Introducing TerraNova™, Third Edition: The new standard in achievement*. Monterey, CA: Author. Retrieved from <http://www.ctb.com/ctb.com/control/openFileShowAction?mediaId=737>
- EPS Literacy and Intervention. (2010). *Academy of READING®: Instructor's Resource Guide*. Cambridge, MA.
- EPS Literacy and Intervention. (2013). *Path Driver for Reading™: Professional development manual*. Cambridge, MA.
- MacGinitie, W. H., MacGinitie, R. K., Maria, K., & Dreyer, L. G. (2002). *Gates-MacGinitie Reading Tests: Technical reports Forms S and T*. Rolling Meadows, IL: Riverside Publishing.
- Mather, N., Hammill, D. D., Allen, E. A., & Roberts, R. (2004). *Test of silent word reading fluency: Examiner's manual*. Austin, TX: Pro-Ed.
- McKenna, M. C., & Kear, D. J. (1990). Measuring attitude towards reading: A new tool for teachers. *The Reading Teacher, 43*, 626-639.
- Ohio Department of Education. (2013a). *Achievement Tests*. Retrieved from <http://education.ohio.gov/Topics/Testing/Achievement-Tests>
- Ohio Department of Education. (2013b). *Ohio Test of English Language Acquisition (OTELA)*. Retrieved from <http://education.ohio.gov/Topics/Testing/Ohio-Test-of-English-Language-Acquisition-OTELA>
- Ohio Department of Education. (2013c). *District Profile Report for Fiscal Year 2012* [Data file]. Retrieved from <http://education.ohio.gov/Topics/Finance-and-Funding/Finance-Related-Data/District-Profile-Reports> on July 4, 2013.
- Ohio Department of Education. (2012). *Whitehall City School District 2011-2012 School Year Report Card*. Retrieved from [http://ilrc.ode.state.oh.us/districts/District\\_Questions.asp?sel=045070,Whitehall%20City,Franklin%20County](http://ilrc.ode.state.oh.us/districts/District_Questions.asp?sel=045070,Whitehall%20City,Franklin%20County) on July 4, 2013.
- Ritchey, K. D., & Goeke, J. L. (2006). Orton-Gillingham and Orton-Gillingham-based reading instruction: A review of the literature. *The Journal of Special Education, 40*, 171-183.
- Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (2012). *Test of word reading efficiency: Examiner's manual* (2<sup>nd</sup> ed.). Austin, TX: Pro-Ed.
- Torlaković, E. (2011). *Academy of READING® Efficacy Study (Randomized Control Study)*. EPS Literacy and Intervention: Cambridge, MA. [http://epsbooks.com/downloads/studies/ES\\_randomized\\_acadread.pdf](http://epsbooks.com/downloads/studies/ES_randomized_acadread.pdf)

## APPENDIX A: ASSIGNMENT OF IPA SKILLS MASTERED

The *S.P.I.R.E.* IPA identifies which level of the program students should start in and which skills in the program students have already mastered. The number of skills mastered was used as a primary outcome measure in this report. The test does not generate a score for skills mastered. To do so, the researchers examined the concepts that *S.P.I.R.E.* teaches (Clark-Edmands, 2012) and assigned a numeric value to them using the table below. Note that some skills include multiple concepts that are assessed individually on the IPA and some skills listed are not assessed on the IPA (see chart).

Skills Mastered	S.P.I.R.E Level	Concept
0	1	short <i>a</i>
1	1	short <i>i</i>
2	1	short <i>o</i>
3	1	short <i>u</i>
4	1	short <i>e</i>
5	1	<i>sh</i>
6	1	<i>ch</i>
7	1	<i>th</i>
8	1	<i>wh</i>
9	1	<i>ang, ing, ong, ung</i>
10	1	<i>ank, ink, onk, unk</i>
11	2	<i>ff, ll, ss</i>
12	2	<i>al</i>
13	2	<i>wa</i>
14	2	<i>qu</i>
15	2	<i>ck</i>
16	2	<i>tch</i>
17	2	<i>a-e, i-e, o-e, u-e, e-e</i>
18	2	Vse
19	3	open syllables ( <i>so, he, fly</i> )
20	3	exceptions ( <i>ild, old, ind, ost, oll</i> )
21	3	<i>ay</i>
22	3	<i>-ed</i>
23	3	suffixes <i>-s, -es, -ing, -er, -est, -en, -ish, -ly, -ful, -ness, -less</i>
24	3	twin-consonant syllable division
25	3	nontwin-consonant syllable division
26	3	<i>ou</i>
27	3	Prefix <i>a-</i>

*Continued...*

Skills Mastered	S.P.I.R.E Level	Concept
28	4	<i>ea</i>
29	4	consonant <i>-le</i> syllables
30	4	<i>oa</i>
31	4	<i>ai</i>
32	4	<i>ee</i>
33	4	<i>oo</i>
34	4	<i>igh</i>
35	4	<i>ie</i>
36	5	soft <i>c</i>
37	5	soft <i>g</i>
38	5	<i>er, ur, ir, ear, wor</i>
39	5	<i>dge</i>
40	5	<i>s = /z/</i>
41	5	<i>ow</i>
42	5	<i>kn</i>
43	5	<i>oe</i>
44	5	<i>or</i>
45	5	<i>ar</i>

Consider the following illustrative example. A student receives a score on the IPA of “Level 1; *sh*” in the fall. By consulting the table above, it is determined that the student has mastered 5 skills at the start of the study. In the spring, the student receives a score on the IPA of “Level 2; *tch*”. Consulting the table above it is determined the student has mastered 16 skills. Therefore, this student has mastered 11 skills ( $16 - 5 = 11$ ) after *S.P.I.R.E.* instruction.

## APPENDIX B: STUDENT PERFORMANCE RESULTS BY SCHOOL

Measure (Score Type)	<i>n</i>	Average Pre-Test	Average Post-Test	Average Gains	t-value	p-value
<b>IPA (Skills Mastered)</b>						
Beechwood ES	8	10.00	15.88	5.88	1.49	.18 <sup>ns</sup>
Etna Road ES	25	4.04	15.48	11.44	5.29	<.001*
Kae Avenue ES	16	9.81	19.50	9.69	3.86	.002*
Rosemore MS	15	23.47	23.67	0.20	0.06	.95 <sup>ns</sup>
Whitehall-Yearling HS	5	26.40	40.60	14.20	2.97	.04*
<b>GMRT Vocabulary (Scaled Scores)</b>						
Beechwood ES	7	406.57	448.43	41.86	3.28	.02*
Etna Road ES	19	403.00	431.84	28.84	4.19	.001*
Kae Avenue ES	13	429.38	458.62	29.23	5.03	<.001*
Rosemore MS	15	458.20	468.93	10.73	1.72	.11 <sup>ns</sup>
Whitehall-Yearling HS	7	485.00	500.57	15.57	2.49	.05*
<b>GMRT Comprehension (Scaled Scores)</b>						
Beechwood ES	8	416.63	457.38	40.75	2.84	.03*
Etna Road ES	25	410.36	431.60	21.24	4.04	<.001*
Kae Avenue ES	17	403.53	442.06	38.53	4.12	.001*
Rosemore MS	15	460.53	475.20	14.67	1.73	.11 <sup>ns</sup>
Whitehall-Yearling HS	7	494.00	517.43	23.43	2.77	.03*
<b>GMRT Total (Scaled Scores)</b>						
Beechwood ES	8	412.38	449.13	36.75	3.23	.01*
Etna Road ES	25	402.84	428.96	26.12	5.59	<.001*
Kae Avenue ES	17	410.53	444.00	33.47	6.63	<.001*
Rosemore MS	15	462.07	474.53	12.47	2.28	.04*
Whitehall-Yearling HS	7	492.86	513.71	20.86	2.89	.03*
<b>TOWRE Sight Word Efficiency (Scaled Scores)</b>						
Beechwood ES	8	77.50	81.38	3.88	2.09	.08 <sup>†</sup>
Etna Road ES	25	77.44	79.16	1.72	1.02	.32 <sup>ns</sup>
Kae Avenue ES	16	76.19	78.69	2.50	1.18	.26 <sup>ns</sup>
Rosemore MS	15	71.27	72.53	1.27	0.79	.44 <sup>ns</sup>
Whitehall-Yearling HS	8	77.75	75.63	-2.13	-1.21	.27 <sup>ns</sup>

\* Significant Difference ( $p < .05$ ); † Marginally Significant Difference ( $p < .10$ ); <sup>ns</sup> No Significant Difference

*Continued...*

Measure (Score Type)	<i>n</i>	Average Pre-Test	Average Post-Test	Average Gains	t-value	p-value
<b>TOWRE Phoneme Decoding Efficiency (Scaled Scores)</b>						
Beechwood ES	8	81.88	81.13	-0.75	-0.85	.42 <sup>ns</sup>
Etna Road ES	25	78.60	78.76	0.16	0.08	.94 <sup>ns</sup>
Kae Avenue ES	17	76.24	81.53	5.29	2.87	.01*
Rosemore MS	15	65.80	68.60	2.80	1.39	.19 <sup>ns</sup>
Whitehall-Yearling HS	8	69.00	72.38	3.38	1.65	.14 <sup>ns</sup>
<b>TOWRE Total Word Reading Efficiency Index (Scaled Scores)</b>						
Beechwood ES	8	78.63	80.38	1.75	1.76	.12 <sup>ns</sup>
Etna Road ES	25	76.88	77.84	0.96	0.60	.55 <sup>ns</sup>
Kae Avenue ES	16	75.19	79.63	4.44	2.49	.03*
Rosemore MS	14	67.07	68.64	1.57	0.94	.37 <sup>ns</sup>
Whitehall-Yearling HS	8	71.50	72.63	1.13	0.81	.44 <sup>ns</sup>
<b>TOSWRF (Scaled Scores)</b>						
Beechwood ES	8	90.75	92.75	2.00	1.08	.32 <sup>ns</sup>
Etna Road ES	25	85.32	93.68	8.36	7.76	<.001*
Kae Avenue ES	17	85.29	92.47	7.18	3.47	.003*
Rosemore MS	15	78.53	80.60	2.07	1.16	.27 <sup>ns</sup>
Whitehall-Yearling HS	8	74.25	78.13	3.88	1.27	.24 <sup>ns</sup>
<b>Academy of READING Placement Test (GLE)</b>						
Beechwood ES	6	2.00	3.67	1.67	3.95	.01*
Etna Road ES	20	1.00	2.20	1.20	4.19	<.001*
Kae Avenue ES	15	1.73	3.00	1.27	3.54	.003*
Rosemore MS	4	1.50	3.00	1.50	1.73	.18 <sup>ns</sup>
Whitehall-Yearling HS	6	3.67	3.83	0.17	0.24	.82 <sup>ns</sup>
<b>Oral Reading Fluency Assessment (WCPM)</b>						
Beechwood ES	8	48.50	68.38	19.88	4.89	.002*
Etna Road ES	24	43.08	68.00	24.92	7.87	<.001*
Kae Avenue ES	15	43.73	72.07	28.33	7.28	<.001*
Rosemore MS	10	57.50	66.90	9.40	2.95	.02*
Whitehall-Yearling HS	4	86.00	100.75	14.75	2.54	.09 <sup>†</sup>

\* Significant Difference ( $p < .05$ ); † Marginally Significant Difference ( $p < .10$ ); <sup>ns</sup> No Significant Difference

*Continued...*

Measure (Score Type)	<i>n</i>	Average Pre-Test	Average Post-Test	Average Gains	t-value	p-value
<b>TerraNova Reading (Scaled Scores)</b>						
Beechwood ES	7	592.00	611.86	19.86	2.09	.08 <sup>†</sup>
Etna Road ES	17	576.76	598.18	21.41	3.51	.003 <sup>*</sup>
Kae Avenue ES	11	593.64	603.00	9.36	1.00	.34 <sup>ns</sup>
Rosemore MS	16	613.88	627.31	13.44	3.75	.002 <sup>*</sup>
Whitehall-Yearling HS	—	—	—	—	—	—
<b>TerraNova Language (Scaled Scores)</b>						
Beechwood ES	5	569.00	599.40	30.40	1.99	.12 <sup>ns</sup>
Etna Road ES	9	583.22	589.44	6.22	0.43	.68 <sup>ns</sup>
Kae Avenue ES	10	591.60	592.90	1.30	0.13	.90 <sup>ns</sup>
Rosemore MS	16	602.25	611.44	9.19	1.06	.31 <sup>ns</sup>
Whitehall-Yearling HS	—	—	—	—	—	—
<b>OAA Reading (Scaled Scores)</b>						
Beechwood ES	5	384.00	398.00	14.00	1.46	.22 <sup>ns</sup>
Etna Road ES	11	380.55	386.18	5.64	0.98	.35 <sup>ns</sup>
Kae Avenue ES	10	385.90	387.30	1.40	0.15	.89 <sup>ns</sup>
Rosemore MS	15	377.27	379.80	2.53	0.67	.51 <sup>ns</sup>
Whitehall-Yearling HS	—	—	—	—	—	—
<b>OTELA Reading (Scaled Scores)</b>						
Beechwood ES	5	419.00	638.40	219.40	3.27	.03 <sup>*</sup>
Etna Road ES	9	357.33	451.44	94.11	2.00	.08 <sup>†</sup>
Kae Avenue ES	12	438.75	571.17	132.42	4.53	.001 <sup>*</sup>
Rosemore MS	3	591.67	667.33	75.67	0.90	.46 <sup>ns</sup>
Whitehall-Yearling HS	5	664.20	653.60	-10.60	-0.28	.80 <sup>ns</sup>

\* Significant Difference ( $p < .05$ ); † Marginally Significant Difference ( $p < .10$ ); <sup>ns</sup> No Significant Difference