

## RESEARCH UPDATE

**Lawrence Public Schools**  
Lawrence, Massachusetts***System 44*<sup>®</sup> Students in Massachusetts Demonstrate Growth on Independent Measures of Word-Reading Skills****PROFILE**

**District:** Lawrence Public Schools, MA

**Evaluation Period:** 2009–2010 School Year

**Grades:** 5–10

**Model:** 60-minute Standalone Classrooms

**Assessment:** *Scholastic Phonics Inventory* (SPI),  
Test of Word Reading Efficiency (TOWRE),  
Woodcock-Johnson III (WJ III)

**DISTRICT CHARACTERISTICS**

Located in northeastern Massachusetts, Lawrence Public Schools (LPS) serves approximately 12,000 students at 13 elementary schools, 10 middle schools, and eight high schools. During the 2009–2010 school year, the district's student population was predominantly Hispanic (89%), with small percentages of Caucasian (6%), Asian (2%), African American (2%), multiracial (1%), and Native American (1%) students. Nearly 80% of all LPS students spoke a primary language other than English at home. Eighty-seven percent of all students were eligible for free or reduced-price lunch, as compared with 31% of their statewide peers.

**IMPLEMENTATION OVERVIEW**

In the fall of 2009, LPS piloted *System 44* at two middle schools and two high schools, for struggling readers who had not yet mastered basic phonics and decoding skills.

**Implementation Model**

During the 2009–2010 school year, *System 44* was implemented using a 60-minute standalone model five days a week, with the exception of one high school classroom that was limited to a 50-minute model. All classrooms followed the recommended rotational model, including a whole-group introduction in which

the teacher led a short warm-up activity to engage students and build phonemic awareness and phonics skills, followed by two 20- to 25-minute rotations on the instructional software or in teacher-led small-group instruction.

**Participants**

A total of 52 students in Grades 5–10 comprise the sample in this report. Students were selected to participate based on a number of criteria, including performing poorly on the Massachusetts Comprehensive Assessment System (MCAS), scoring below 400 Lexiles<sup>®</sup> on *Scholastic Reading Inventory* (a secondary measure of reading comprehension), and exhibiting difficulty with word-reading skills on *Scholastic Phonics Inventory*. Ninety percent of the students in the sample were Hispanic and 96% spoke Spanish as a first language; more than half (58%) were classified as limited English proficient (LEP). The majority (73%) were male, just under half (48%) received special education (SPED) services, and 92% received free or reduced-price lunch. This sample differed from the district as a whole in that there were higher numbers of students who spoke Spanish as a first language (96% vs. 79% in the district) and a greater percentage of students enrolled in SPED (48% vs. 20% in the district).

**Measures**

*Scholastic Phonics Inventory* (SPI)

SPI is a computer-based test that is designed to measure fluency for two word-level reading skills: phonological decoding and sight word reading. Phonological decoding fluency is assessed by the speed and accuracy with which pronounceable nonwords are decoded. Sight word fluency is assessed by the speed and accuracy with

which high-frequency words are read. An overall accuracy and fluency score reflects the performance for these two skills. Based on the scores, the student is placed into one of four performance levels: Pre-Decoder, Beginning Decoder, Developing Decoder, or Advanced Decoder. SPI contains three equivalent forms for screening and progress monitoring purposes. The software selects the appropriate form automatically; each time a student logs in to take a test, the software delivers a new form. In this study, SPI was administered in October/November 2009 and in April/May 2010.

*Test of Word Reading Efficiency (TOWRE)*

The nationally normed Sight Word Efficiency and Phonemic Decoding Efficiency subtests from the TOWRE were administered in November 2009 and in May 2010. The Sight Word subtest requires recognizing familiar words as whole units or “sight words,” and the Phonemic Decoding Efficiency subtest measures students’ ability to “sound out” nonwords. The TOWRE Total Word Reading Efficiency score is based on the combined performance on the two subtests.

*Woodcock-Johnson III (WJ III)*

The nationally normed Letter-Word Identification and Word Attack subtests from the WJ III were administered in fall 2009 and spring 2010. Letter-Word Identification measures word identification skills, starting with the identification of

letters and progressing to increasingly more difficult words. Word Attack measures proficiency in applying phonic and structural analysis skills to the pronunciation of unfamiliar printed words. The Basic Reading Skills cluster score is based on the combined performance from these two subtests.

**RESULTS**

**SPI Results**

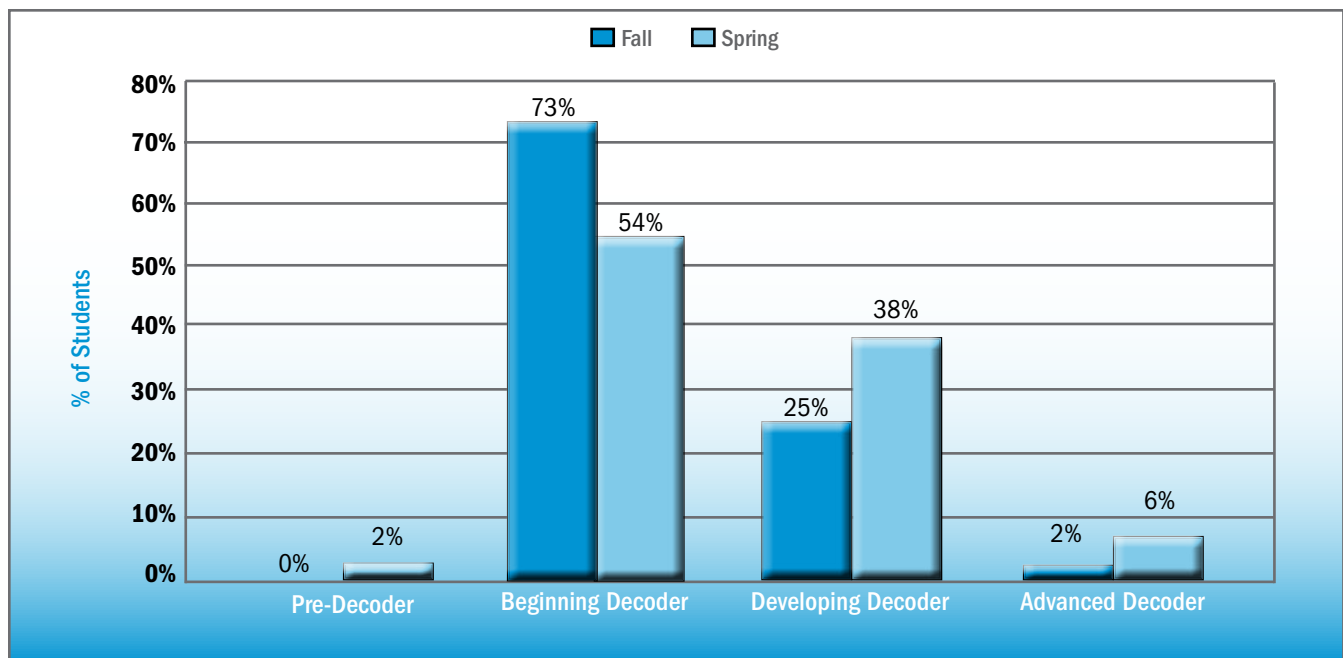
Results demonstrated that LPS students made significant improvements in word-reading skills, as measured by SPI. In fall 2009, prior to the implementation of *System 44*, only 27% of LPS students placed at the Developing Decoder or Advanced Decoder performance levels. By spring 2010, the percentage of students scoring at these highest levels had increased significantly, to 44%. Conversely, the percentage of students scoring in the Pre-Decoder or Beginning Decoder performance levels decreased from 73% in fall 2009 to 56% in spring 2010 (Graph 1). Overall, students averaged statistically significant gains of 5.5 points in Total Accuracy ( $t = 5.84, p = .00$ ) and 2.6 points in Total Fluency ( $t = 2.33, p = .02$ ).

**WJ III and TOWRE Results**

Students demonstrated positive growth on the WJ III, shown in Table 1. On average, students exhibited statistically significant gains of 9 points on the WJ III Word Attack subtest, 10 points on the WJ III Letter-Word Identification subtest,

**Graph 1.**

Lawrence Public Schools System 44 Students in Grades 5–10 ( $n = 52$ )  
 SPI Performance Levels, Fall 2009 and Spring 2010



Note. The increase in percentage of students performing at the Developing Decoder or Advanced Decoder leveled was statistically significant ( $t = 2.63, p = .00$ ).

and 10 points in the WJ III Basic Reading Skills cluster score. Table 1 also shows that students demonstrated statistically significant gains on the TOWRE. On average, students gained 3 points in TOWRE Total Word Reading Efficiency, 3 points in TOWRE Sight Word Efficiency, and 2 points in TOWRE Phonetic Decoding Efficiency.

### WJ III and TOWRE Results as a Function of Time on Software

Further analysis of WJ III and TOWRE results showed that students who spent more time on the *System 44* instructional software demonstrated greater gains in word-reading skills on certain measures (Table 2). Specifically, students completing 20 or more hours on the software averaged significantly higher gains on the WJ III Letter-Word Identification (15 vs. 7 points) than students who completed fewer hours. Students with greater exposure to the instructional software also demonstrated a significantly greater average gain than students with less software exposure on the TOWRE Total Reading Efficiency (5 vs. 2

points).

### CONCLUSION

Overall, *System 44* students in Lawrence Public Schools demonstrated significant improvements in word-reading skills over the course of the 2009–2010 school year, as measured by the SPI, WJ III, and TOWRE. On SPI, students improved in word-reading accuracy and fluency, with approximately one-quarter of students improving by one or more performance levels. Students who participated in *System 44* also showed statistically significant fall-to-spring growth in decoding and sight word reading on the WJ III and TOWRE. Furthermore, results suggest that it is important for students to receive adequate time on the instructional software in order to achieve desired growth. Together, these results indicate that *System 44* has a positive impact on the word-reading achievement of students who struggle with foundational reading skills.

**Table 1.**

Lawrence Public Schools *System 44* Students in Grades 5–10 ( $n = 52$ )  
Performance on WJ III and TOWRE, Fall 2009 to Spring 2010

Test	Mean Fall Standard Score	Mean Spring Standard Score	Mean Gain in Standard Score	Significance
WJ III Basic Reading Skills	64 (1st percentile)	74 (4th percentile)	10	$t = 7.50, p = .00$
WJ III Word Attack	74 (4th percentile)	83 (13th percentile)	9	$t = 7.25, p = .00$
WJ III Letter-Word ID	61 (< 1st percentile)	71 (3rd percentile)	10	$t = 6.06, p = .00$
TOWRE Total Word Reading Efficiency	65 (1st percentile)	68 (2nd percentile)	3	$t = 4.04, p = .00$
TOWRE Sight Word Efficiency	69 (2nd percentile)	71 (3rd percentile)	3	$t = 3.40, p = .00$
TOWRE Phonetic Decoding Efficiency	73 (4th percentile)	75 (5th percentile)	2	$t = 3.24, p = .00$

**Table 2.**

Lawrence Public Schools *System 44* Students in Grades 5–10 ( $n = 52$ )  
Performance on WJ III and TOWRE by Software Usage, Fall 2009 to Spring 2010

Measure	Less than 20 Hours on <i>System 44</i> Software ( $n = 30$ )	20 or More Hours on <i>System 44</i> Software ( $n = 22$ )
WJ III Letter-Word ID Gain	7	15
TOWRE Total Reading Efficiency Gain	2	5

Note. Measures for which there is a statistically significant relationship between gains and software time: WJ III Letter-Word ID ( $F=5.16, p=.03$ ), and TOWRE Total Reading Efficiency ( $F=4.87, p=.03$ ).

## RESEARCH UPDATE



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