# Efficacy Research on the Logic of English Program in Michigan Elementary Schools

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# EXECUTIVE SUMMARY:
# Efficacy Research on the Logic of English Program in Michigan Elementary Schools

In October 2019 The Center for Research and Reform in Education (CRRE) at Johns Hopkins University contracted with Logic of English to conduct a mixed-methods study of the Logic of English program in multiple Michigan elementary schools. The focus of the evaluation was to obtain evidence that meets or exceeds criteria by the Every Student Succeeds Act (ESSA) for Tier 3 in support of program impacts on students' reading achievement.

The evaluation was designed to address three primary research questions:

1. How do students who receive the program in Logic of English schools compare to students in matched control schools on NWEA yearly achievement and growth?
2. What are the perceptions of teachers with regard to:
    - Program implementation?
    - Satisfaction?
    - Impacts?
3. Do program outcomes vary based on:
    - Grade levels?
    - Schools?

The mixed-method design provided high rigor for addressing RQ1 and RQ3 by comparing the NWEA reading scores for Logic of English vs. Control students. We supplemented the quantitative comparisons with qualitative descriptive data on how teachers perceive the program (RQ2) with regard to implementation, satisfaction, and impacts. The data source is a teacher survey administered to Logic of English teachers at several participating Michigan schools that operate under the umbrella of the West Shore Educational Service District (WSESD). This survey was co-developed by CRRE and Logic of English and administered online in late December 2019 through a single address provided to the district's literacy coach.

Based on survey findings, the overall perception of Logic of English is very positive. Respondents highly rated the overall value of Logic of English for teaching and learning. Teachers especially like the explicit and consistent method for teaching phonograms; the program structure; and the use of games and other materials to reinforce content. Finally, teachers appreciate that the program is scientifically based.

Student achievement analyses were conducted for Grade K student cohorts who participated in LoE for the first time in 2017-18 and in 2018-19; and a Grade 1 cohort that participated for the first time in 2017-18. Given that there were considerable

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demographic differences between schools that did and did not use Logic of English, results of the student achievement analyses should be interpreted with caution, particularly for the Grade 1 sample which unlike the Grade K cohorts could not be adjusted statistically (via proximity matching) to achieve equivalence in pretest scores. The main findings, however, were generally positive, showing that:

- Achievement gains within cohorts tended to be more prominent when examining within-year than between-year gains. This trend may be due in part to a "summer slide" type of phenomenon.
- The K cohort in 2018-19 seemed to benefit the most from the LoE program, showing statistically significant positive increases in reading achievement both within and across school years.

The 1st grade cohort in 2017-18 also showed statistically significant fall to spring reading achievement gains within that school year, but did not show positive between-year gains from fall 2017-18 to fall 2018-19. As noted, Grade 1 results should be interpreted with caution due to lack of baseline equivalence. Its pattern of MAP reading scores further revealed an unusual dip from spring 2018 to fall 2018, which was not evidenced in fall 2019 or for the 2017-18 Grade K cohort.

## Recommendations

The following suggestions offered for improvement are based on teacher feedback and intended to offer enhancements to the program.

- Increase accessibility by making improvements to the Logic of English app; increase the activities available on the app; make the app available on the Android operating system; create online resources for parents.
- Review implementation in a whole class setting. Multiple teachers shared difficulty in implementing the games and activities with larger groups of students. While this may be a classroom management issue, a training issue, or both, it warrants further examination by Logic of English developers.
- Evaluate the organization of lessons. Teachers reported the lessons seem to "jump around" and do not always correspond to the accompanying activities or workbook pages.
- Streamline the materials. Teachers report being overwhelmed by the amount of materials and the logistics of storing them. Prepping the materials for lessons is reported to be time consuming.
- Increase professional development opportunities to ensure teachers are prepared to implement the program; more professional development is needed for SPED teachers.

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In October 2019 The Center for Research and Reform in Education (CRRE) at Johns Hopkins University contracted with Logic of English to conduct a mixed-methods study of the Logic of English program in multiple Michigan elementary schools. The focus of the evaluation was to obtain evidence that meets or exceeds criteria by the Every Student Succeeds Act (ESSA) for Tier 3 in support of program impacts on students' reading achievement.

Logic of English Foundations is a multi-sensory curriculum which integrates all of the Language Arts skills into one program where each subject reinforces each other. This research-based curriculum includes the Five Essential Skills of Reading and Spelling: Phonemic Awareness, Systematic Phonics, Fluency, Vocabulary, and Comprehension. The colorful, fun, and active style of delivery is geared towards students in early elementary grades.

Teachers' Manuals are the heart of the Foundations curriculum. The scripted lessons guide the teacher systematically through how to introduce the individual skills needed for reading and writing. Each lesson begins with a quick-glance guide to the lesson objectives, and then moves into learning, with creative instruction and engaging activities for teaching each skill and games to develop mastery. Callouts provide answers to commonly asked questions, and optional additional activities help teachers differentiate instruction. The abundant resources are intended to help new and experienced teachers teach every lesson with success. The Foundations A and B Teacher's Manuals include instructions for teaching both cursive and manuscript so the teacher(s) can choose the handwriting style they prefer for their students. Short assessments, included after every fifth lesson, aid teachers in monitoring students' progress in the foundational skills of reading and writing. Suggested review activities are provided for students who need additional practice.

Foundations Student Workbooks are filled with a wide variety of structured yet playful activities and games to engage students in developing strong reading and writing skills. Consumable student pages for dozens of the games, learning activities, and practice are found in the Foundations Teacher's Manuals. The Foundations Readers distributed throughout the curriculum are engaging texts that grow in complexity as students progress, guiding them systematically on the journey into independent reading. These fiction and nonfiction texts are carefully controlled for the phonograms and spelling rules and do not require students to memorize sight words.

The context for the study are multiple elementary schools in several Michigan school districts that operate under the umbrella of the West Shore Educational Service District (WSESD). WSESD is located in Mason County, a rural district on the shore of

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Lake Michigan. The student population of the treatment schools is predominantly White (80.2%), followed by Hispanic (10.1%), with the remainder reporting as Black (7.1%) or other (2.8%). More than one-quarter (26.6%) of students are considered economically disadvantaged, 17.3% are SPED, and 1.5% are English-language learners. In addition, all schools (both treatment and comparison) are Title 1 eligible schools.

The evaluation was designed to address three primary research questions:

1. How do students who receive the program in Logic of English schools compare to students in matched control schools on NWEA yearly achievement and growth?
2. What are the perceptions of teachers with regard to:
    - Program implementation?
    - Satisfaction?
    - Impacts?
3. Do program outcomes vary based on:
    - Grade levels?
    - Schools?

The mixed-method design provided high rigor for addressing RQ1 and RQ3 by comparing the NWEA reading scores for Logic of English vs. Control students in grades K-3 during the 2019-20 school year. K-3 students were selected because they consisted of all cohorts who were in kindergarten or 1st grade in the 2017-18, 2018-19, or 2019-20 school years. Specifically, we followed K and 1st grade students in 2017-18 through 2018-19 and fall of the 2019-20 school year, and we followed K students in 2018-19 through fall of the 2019-20 school year. We supplemented the quantitative comparisons with qualitative descriptive data on how teachers perceive the program (RQ2) with regard to implementation, satisfaction, and impacts. The data sources include a teacher survey administered to Logic of English teachers at participating schools in WSESD, as well as MAP RIT reading scores. The survey was co-developed by CRRE and Logic of English and administered online in late December 2019 through a single address provided to the district's literacy coach.

# Method

## *Research Design*

The study included a survey of all Logic of English teachers in WSESD elementary schools. The survey was administered online in late December 2019 through a single address provided to the district's literacy coach, who distributed the link through the district's database of teachers. Responses were provided directly to CRRE and analyzed using Qualtrics programming. Longitudinal student-level scores for MAP reading assessments administered during the span of the study were analyzed to measure student achievement.

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We examined program effects on student achievement by analyzing NWEA MAP Reading data from the 2017-18 and 2018-19 school years, along with fall 2019 scores. We conducted multiple regression analyses to determine the association between Logic of English participation and MAP reading gains, both within and between school years, for current grades K-3 students. This grade range was chosen because it encompasses all cohorts of students who were in K and/or 1st grade in the 2017-18, 2018-19, or 2019-20 school years. Descriptive analyses examining patterns of MAP Reading growth for Logic of English students were also included.

## *Participants*

Forty-eight teacher participants opened the online survey, while demographic items were completed by 42 respondents; slightly fewer completed the entire survey. This represents a response rate of 87.5%, suggesting a high level of interest in the effective use of Logic of English in WSESD.

Six of the eight schools in the WSESD implemented the Logic of English program in the 2017-18 school year. The two schools that did not use Logic of English were classified as comparison schools in this study. Table 1 displays student demographics of Logic of English and comparison schools.

Table 1
*Student characteristics for analytic sample*

| | Treatment (LoE) | Comparison |
|---|---|---|
| % White | **81.68** | **56.84** |
| % Hispanic | **8.87** | **39.25** |
| % Black | 6.96 | 2.93 |
| % Other Race | 2.49 | 0.98 |
| % Female | 46.97 | 47.63 |
| % Economically disadvantaged | **57.12** | **93.99** |
| % Students with Disabilities/SPED | 20.55 | 20.95 |
| % ELs | **1.02** | **20.95** |
| N | 1,567 | 716 |

*Note*. Bold font indicates a statistically significant difference between treatment and comparison schools.

Significant demographic differences were apparent between treatment and comparison schools. Logic of English schools had higher proportions of White students and lower proportions of Hispanic, Economically Disadvantaged, and EL students. The ethnic makeup of the LoE and comparison schools, especially in terms of White and Hispanic students, along with economically disadvantaged students and English Language learners, was substantially different in LoE and comparison schools.

## *Measures*

Data sources for the current study include:

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**Teacher Survey.** This survey was co-developed with Logic of English leaders to address teachers' experiences with and reactions to the program. The survey was administered online using Qualtrics, and responses were collected from grade K-2 teachers, reading specialists, SPED teachers, and a reading coach in the six Logic of English elementary schools.

The teacher survey contained four demographic items (identifying respondent's position, school, years of experience, and intervention type), a series of Likert-type items to gauge usage of and satisfaction with Logic of English program elements, and an open-ended opportunity to provide recommendations or suggestions for improvement. A copy of the teacher survey is provided in Appendix A of this report.

**Student achievement: NWEA Map Reading.** Student achievement data were NWEA MAP Reading scores, which were the standard reading exams administered to all district students. Achievement scores were obtained from the fall and spring of the 2017-18, 2018-19, and 2019-20 (fall only) school years. NWEA MAP score data also included demographic variables such as gender, ethnicity, economically disadvantaged, EL status, and special education. Fall reading scores from 2018 and 2017 were used for establishing baseline equivalence for both within year (fall to spring) and between year analyses. It is important to note that true pretest scores were available for all students in 2017-18, as the Logic of English program was implemented during this school year. Specifically, fall 2017 reading scores were pretest scores for all students in this school year:

- 2017-18 kindergarten cohort, who were in Grades 1 and 2, respectively in 2018-19 and 2019-20.
- 2017-18 first grade cohort, who were in Grades 2 and 3, respectively, in 2018-19 and 2019-20.

In addition, fall 2018 scores were true pretest scores only for incoming 2018-19 K students (who were 1st grade students in 2019-20).

## *Analytical Approach*

**Analysis of teacher survey data.** Teacher survey data was analyzed descriptively. Frequencies and percentages of responses were reported, along with means and standard deviations of Likert-scale items. In addition, open-ended questions relating to teacher likes, dislikes, and suggestions related to Logic of English were analyzed, and important patterns in responses were noted.

**Analysis of student achievement data.** We initially analyzed fall 2017 (K-1 students) and fall 2018 (K only) MAP reading scores to determine baseline equivalence of treatment and comparison students. Baseline equivalence is determined to have been met if the standardized mean difference between treatment and control groups is

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less than 0.25 (WWC, 2017)[1]. A standardized mean difference is a measure of the difference between a treatment and comparison group that uses the mean difference between both groups and pooled standard deviation of both groups in the calculation, similar to an effect size, but for pretest measures. Table 2 shows the unadjusted pretest means for treatment and comparison students in 2017 and 2018.

Table 2
*Treatment and comparison unadjusted pretest scores on NWEA MAP reading for the Grades K and 1 cohorts*

| MAP Reading Score | LoE | Comparison | Stan. Mean Diff. |
|---|---|---|---|
| **Fall 2017** | | | |
| K | 139.96 | 138.19 | 0.199 |
| 1st Grade | 160.21 | 153.57 | **0.570** |
| **Fall 2018** | | | |
| K | 139.14 | 137.89 | 0.152 |

*Note:* Means are unadjusted. Bold font indicates baseline equivalence was not met.

As shown in Table 2, baseline equivalence was reached for the two Grade K samples, but not for the Grade 1 sample in fall 2017. We then attempted to apply an analytical procedure called propensity score weighting to derive a comparison group sample that was more comparable to the LoE group in baseline performance. However, the procedure resulted in weights that were excessively large, meaning a small number of comparison students would have an unduly large influence on analysis results. This may have been due to the significant differences in demographics between LoE and comparison schools. For this reason, the original unadjusted scores were used for analyses in this report.

Student achievement data were analyzed using quantitative analysis software (STATA). Multiple linear regression analyses were conducted by cohort to examine differences between treatment and comparison students in fall 2019 MAP Reading achievement scores, controlling for pretest MAP scores. We repeated this analysis with fall 2018 MAP scores as the dependent variable, where the required data were available. We also performed within-year analyses for years where true pretest scores were available for cohorts, using spring MAP reading scores as the dependent variables and controlling for fall MAP reading scores from the same school year. In all analyses, we only included demographic variables that were significantly associated with the dependent variable. Thus, the model that we used to analyze these associations is as follows:

$$Final\ MAP\ score_i = Intercept + LoE_i + Pretest\ MAP\ score_i + Hispanic_i + ED_i + EL_i + SPED_i + e_i$$

[1] What Works Clearinghouse (2017). Standards handbook (Version 4.0). *Washington, DC: Institute of Education Sciences*.

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In this model, final MAP score is the reading achievement score being used as the dependent variable (depends on specific analysis) for student *i*, the intercept is the final MAP score for the average comparison student in the sample, LoE is a dummy variable indicating whether student *i* was enrolled in Logic of English, Pretest MAP score is the fall MAP reading score used as prior reading achievement measure (varies by cohort, as discussed earlier), Hispanic is a dummy variable indicating whether student *i* was Hispanic, and ED, EL and SPED where dummy variables indicating ED status, EL status, and special education status of student *i*, respectively.

# Results

### ***Teacher Survey***

A majority of respondents indicated that they are classroom teachers (n = 32, 76.2%). An additional 5 (11.9%) are reading specialists, while another 5 (11.9%) identified as special education teachers (4) and one reading coach. Table 3 reports the number and percentage of teachers from each of the seven WSESD schools surveyed.

Table 3
*Respondent Numbers by School*

| School Name | Number Responding | Percent Respondents |
|---|---|---|
| Baldwin ES | 6 | 14.3% |
| Franklin ES | 7 | 16.7% |
| Lakeview ES | 7 | 16.7% |
| Scottville ES | 7 | 16.7% |
| Mason County Eastern ES | 7 | 16.7% |
| Pentwater PS | 3 | 7.1% |
| Walkerville PS | 5 | 11.9% |
| Total | 42 | 100% |

Table 4 illustrates the grade level distribution of respondents across schools.

Table 4
*Respondent numbers by grade level*

| Grade level | Number Responding | Percent Respondents |
|---|---|---|
| Kinder only | 10 | 25% |
| First grade only | 10 | 25% |
| Second grade only | 10 | 25% |
| K-2 | 8 | 20% |
| 1 & 2 | 2 | 5% |
| Total | 40 | 100% |

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Table 5 reports on how Logic of English is used across schools.

Table 5
*Respondent numbers by intervention type*

| Intervention | Number Responding | Percent Respondents |
|---|---|---|
| Whole class | 20 | 51.3% |
| Intervention | 5 | 12.8% |
| Both whole class/intervention | 14 | 35.9% |
| Total | 39 | 100% |

Survey participants reflect a highly experienced group of teachers, with the majority (75%) having 10 or more years teaching experience, as reported in Table 6.

Table 6
*Respondent numbers by experience*

| Years experience | Number Responding | Percent Respondents |
|---|---|---|
| Less than one year | 2 | 5.0% |
| 1-3 years | 3 | 7.5% |
| 4-10 years | 5 | 12.5% |
| 10+ years | 30 | 75.0% |
| Total | 40 | 100% |

### *Initial training*

Teachers were asked about Logic of English training and instructional opportunities. Twenty-four respondents (60%) indicated that they participated in a 4-day in-person training from Logic of English staff, while 8 (20%) received a 4-day in-person training provided by someone in their district. The remaining options included a one or two-day in-person training provided by district personnel, a 4-day online training, no training, or other, which included evening training. See Figure 1 for the percentages of training types received.

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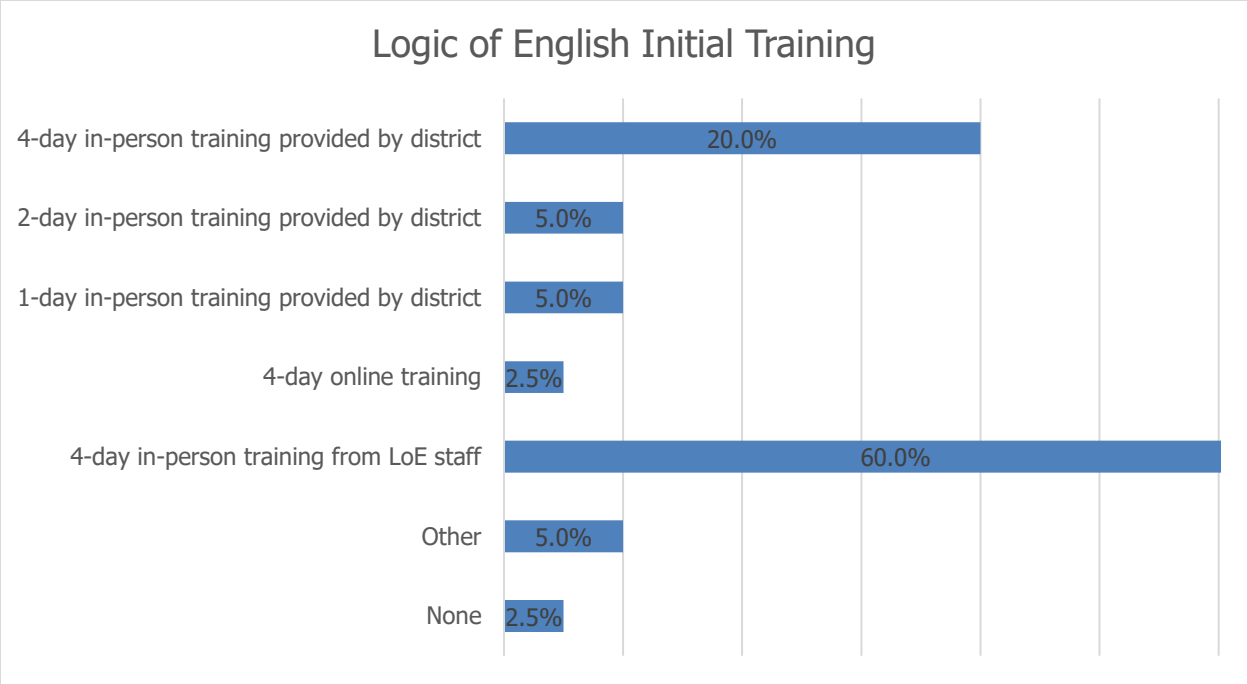



*Figure 1: Logic of English Initial Training*

Teachers rated their level of satisfaction with their initial training on a scale of 1 (very dissatisfied) to 5 (extremely satisfied). These results are reported in Table 7.

Table 7
*Satisfaction with initial training*

| Rating | Number Responding | Percent Respondents |
|---|---|---|
| Extremely dissatisfied | 5 | 12.5% |
| Somewhat dissatisfied | 4 | 10.0% |
| Neutral | 1 | 2.5% |
| Somewhat satisfied | 11 | 27.5% |
| Extremely satisfied | 19 | 47.5% |
| Total | 40 | 100% |

Table 8 links respondents' level of satisfaction with the type of training they received.

Table 8
*Satisfaction with duration of initial training*

| Initial Training | Extremely Dissatisfied | Somewhat Dissatisfied | Neutral | Somewhat Satisfied | Extremely Satisfied |
|---|---|---|---|---|---|
| 4 day in-person by LOE | 3 | 1 | | 5 | 15 |
| 4 day in-person by ESD | 1 | 2 | | 3 | 2 |
| 2 day in-person by ESD | | | | 2 | |

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| | | | | | |
|---|---|---|---|---|---|
| 1 day in-person by ESD | | 1 | | | 1 |
| 4-day online | | | | | 1 |
| Other | | | 1 | 1 | |
| None | 1 | | | | |

Further, the majority of respondents (n = 32, 80%) indicated that they had participated in additional training during the course of the year, while the remaining 8 (20%) had not.

Next, teachers were asked to indicate agreement with four statements related to Logic of English preparation, materials, and curriculum on a scale of 1 (strongly disagree) to 5 (strongly agree). As illustrated in Table 9, the highest mean level of satisfaction (M=4.50) was reported for being "prepared to implement Logic of English effectively." The lowest (M=4.10) was reported for both having received the necessary materials and student enjoyment of the curriculum.

Table 9
*Teacher agreement with Logic of English preparation, materials, curriculum (n = 40)*

| | *M* | *SD* | *Variance* |
|---|---|---|---|
| I felt prepared to implement Logic of English effectively this year | 4.50 | 0.84 | 0.70 |
| I would recommend Logic of English to other teachers | 4.35 | 0.99 | 0.98 |
| I received all of the necessary materials to implement the curriculum | 4.10 | 1.26 | 1.59 |
| My students enjoy the Logic of English curriculum | 4.10 | 0.99 | 0.99 |

Figure 2 provides another view of these data, showing the percentage of respondents indicating each satisfaction level. More than half of respondents strongly agreed that they were prepared to implement the curriculum and would recommend it to other teachers.

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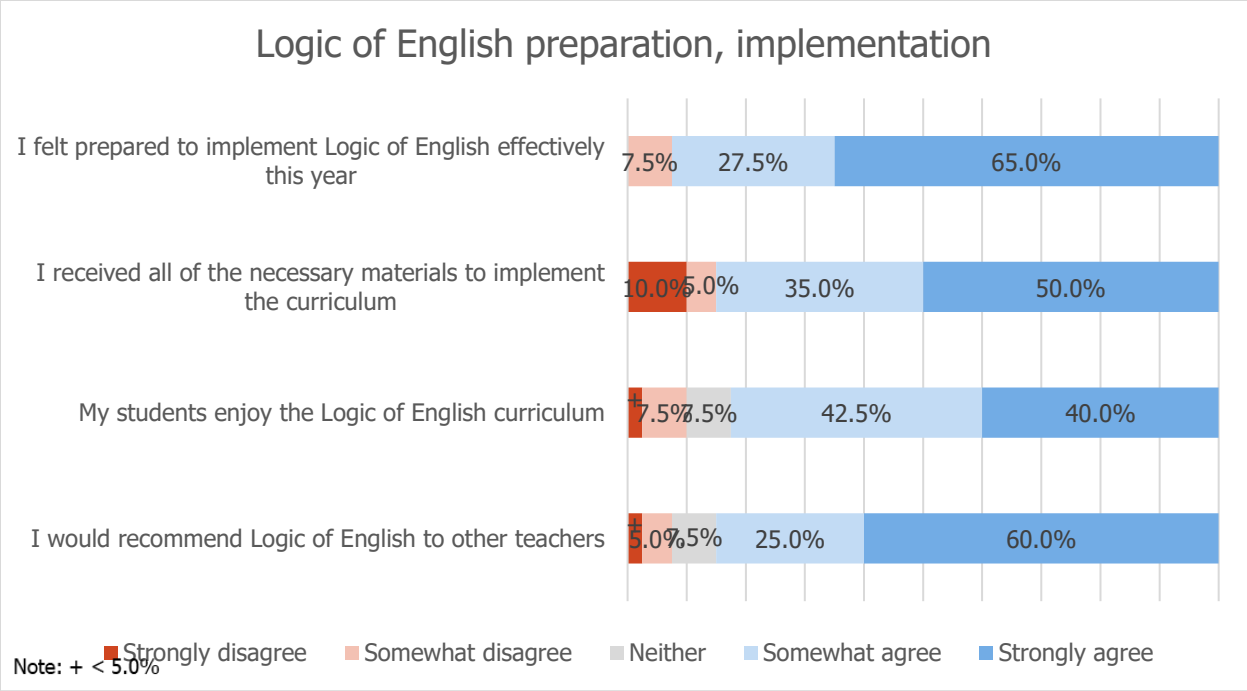



*Figure 2: Level of Teacher Agreement with preparation, implementation*

Participants were asked for their level of satisfaction (using a Likert scale of 1 = extremely dissatisfied, to 5 = extremely satisfied) with the following statements regarding the value of Logic of English components. Table 10 presents the means for those items, which are fairly close to each other and all above the neutral 3.0 point.

Table 10
*Teacher Satisfaction with Logic of English components (n = 39)*

| | *M* | *SD* | *Variance* |
|---|---|---|---|
| The overall value of Logic of English for teaching and learning | 4.46 | 0.67 | 0.45 |
| Workbook activities | 3.89 | 0.85 | 0.73 |
| The value of the Progress Monitoring checklist | 4.06 | 0.75 | 0.57 |
| The value of suggested review ideas for struggling students | 4.09 | 0.74 | 0.55 |
| The value of games embedded into the curriculum | 4.00 | 1.07 | 1.14 |

Figure 3 presents the percentage of responses to the five Likert scale choices. The overall value of Logic of English for teaching and learning received an extremely high level of somewhat/extremely satisfied (94.9%) from participants.

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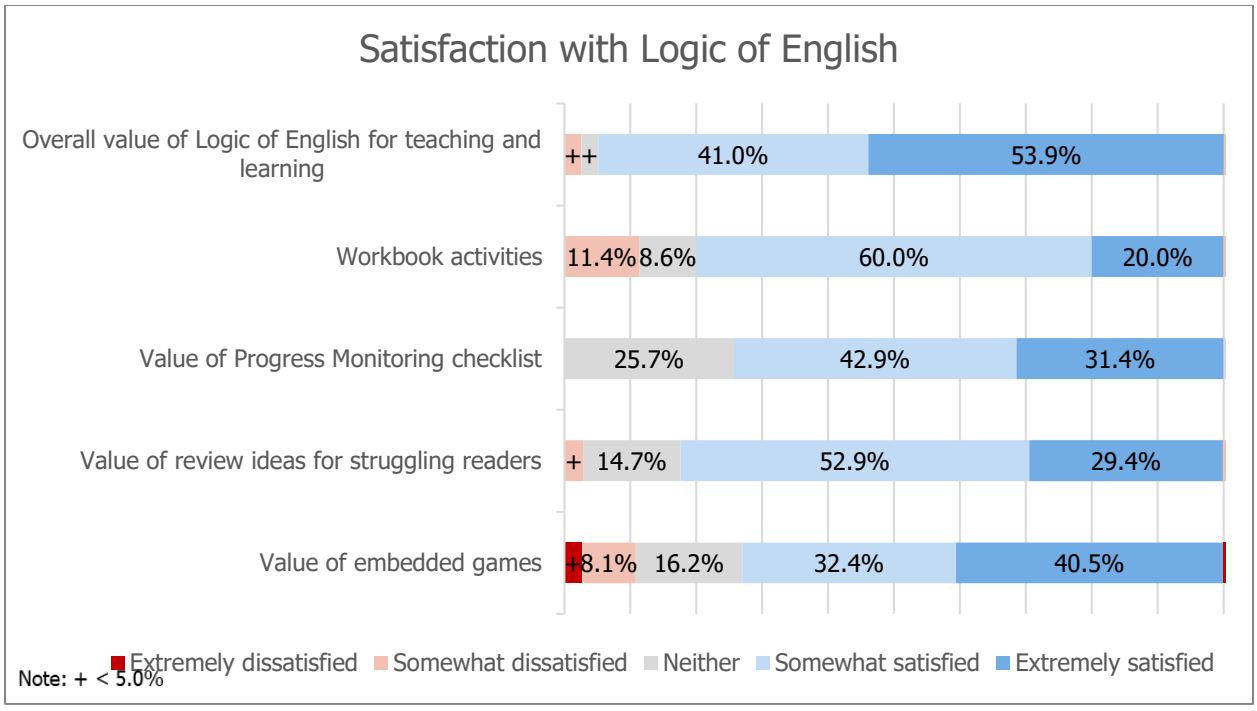



*Figure 3: Teacher Satisfaction with Logic of English*

A list of eight types of lessons from the curriculum were provided to participants, who were asked to report on frequency of use for each lesson, using a scale of 1 = never to 4 = frequently. Table 11 illustrates teacher-reported usage frequencies for each type of lesson. Phonemic Awareness and the Alphabetic Principle and systematic phonics lessons were reported as the most frequently used (71.8% and 61.5% respectively), while Reviews/Assessments were used with the least frequency, or rarely (48.7%).

Table 11
*Frequency of lesson usage (n = 39)*

| | *M* | *SD* | *Variance* |
|---|---|---|---|
| Phonemic Awareness | 3.69 | 0.51 | 0.26 |
| Alphabetic Principle | 3.56 | 0.59 | 0.35 |
| Fluency/high frequency words | 3.10 | 0.84 | 0.71 |
| Handwriting | 2.92 | 1.00 | 0.99 |
| Spelling | 3.28 | 0.71 | 0.51 |
| Vocabulary | 2.90 | 0.93 | 0.86 |
| Reading comprehension | 2.49 | 1.08 | 1.17 |
| Reviews/Assessments | 2.41 | 0.81 | 0.65 |

Figure 4 provides an overall picture of teachers' usage of the Logic of English curriculum components, and illustrates that all teachers are using the lessons at least occasionally, or several times a week. And, while the number of respondents is small, it may be notable that 10 teachers reported never using the reading comprehension lessons (25.6%).

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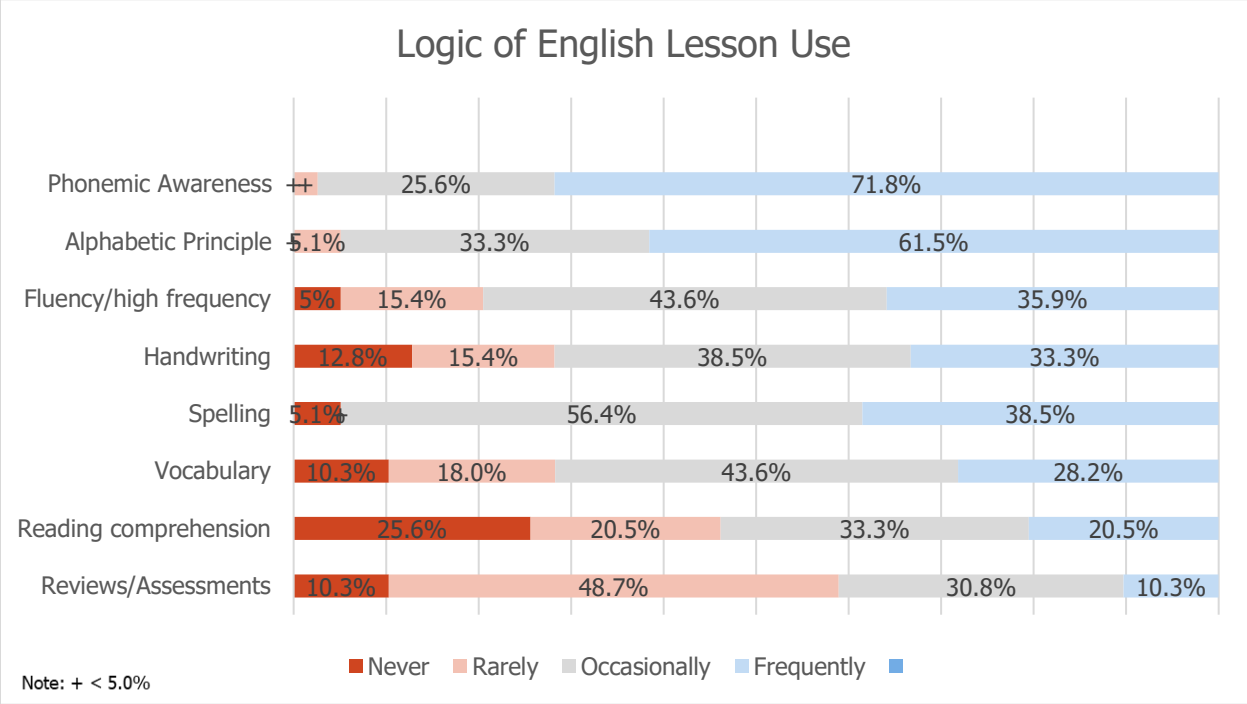



*Figure 4: Frequency of use of Logic of English lessons*

At the time of the survey, respondents reported teaching from the following Foundations books, and were asked to select all that applied. Responses are summarized in Table 12.

Table 12
*Foundations Book(s) currently teaching*

| Foundations Book | Number Responding | Percent Respondents |
|---|---|---|
| A | 15 | 29.4% |
| B | 16 | 31.4% |
| C | 15 | 29.4% |
| D | 5 | 9.8% |
| Total | 51 | 100% |

A majority of participants (n = 24, 61.5%) reported that they spent 31-60 minutes covering a lesson, while 13 (33.3%) reported spending 10-30 minutes per lesson. The remaining two respondents indicated they spent over one hour per lesson (5.1%).

Not surprisingly, a majority of those spending 31-60 or 60+ minutes per lesson split the lesson into two days. However, almost half of those spending 10-30 minutes per lesson also split the lesson into two days. Table 13 reports on these findings:

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Table 13
*Length of teaching per lesson (n = 39)*

| Length of Lesson | 1 day (Number Responding) | Percent Responding | 2 days (Number Responding) | Percent Responding |
|---|---|---|---|---|
| 10-30 minutes | 8 | 20.5% | 5 | 12.8% |
| 31-60 minutes | 7 | 17.9% | 17 | 43.6% |
| 60+ minutes | | | 2 | 5.1% |
| Total | 15 | | 24 | 100% |

The length of lesson by grade levels and Foundations books used are reported in the following tables.

Table 14
*Grade levels by Foundations books, 10-30 minute lessons*

| | Foundations | | | | | |
|---|---|---|---|---|---|---|
| Grade Level | A | B | C | A, B | B, C | A, B, C |
| Kindergarten | 3 | | | | | |
| Grade 1 | | 2 | | | | |
| Grade 2 | | | 3 | | | |
| Grades 1 & 2 | | | | | | 1 |
| Grades K-2 | 1 | | | 1 | 1 | 1 |

Table 15
*Grade levels by Foundations books, 31-60 minute lessons*

| | Foundations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grade Level | A | B | C | D | B, C | C, D | A, B, C | B, C, D |
| Kindergarten | 5 | | | | | | | |
| Grade 1 | | 6 | 1 | | 1 | | | |
| Grade 2 | | 1 | 2 | 3 | | 1 | | |
| Grades 1 & 2 | | | 1 | | | | | |
| Grades K-2 | | | 1 | | | | 1 | 1 |

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The two teachers who taught more than 60-minute lessons both taught kindergarten and used Foundations book A.

When asked about skipping part or parts of lesson plans, a majority responded rarely (n = 19, 48.7%), while other ratings are reflected in Table 16.

Table 16
*Frequency of skipping any part of a lesson*

| Rating | Number Responding | Percent Respondents |
|---|---|---|
| Never | 0 | 0.0% |
| Rarely (about once/week) | 19 | 48.7% |
| Occasionally (several times/week) | 13 | 33.3% |
| Frequently (most or all days) | 7 | 18.0% |
| Total | 39 | 100% |

Regarding the frequency of reviewing phonograms or playing phonogram games from the curriculum, more than half of respondents indicated they did this frequently (most or all days), where n = 20, or 51.3%. This was followed closely by occasionally (n = 17, 44%), and rarely (n = 2, 5.1%). No one responded "never." These responses are summarized in Table 17.

Table 17
*Frequency of reviewing/playing phonograms games*

| Rating | Number Responding | Percent Respondents |
|---|---|---|
| Never | 0 | 0.0% |
| Rarely (about once/week) | 2 | 5.1% |
| Occasionally (several times/week) | 17 | 43.6% |
| Frequently (most or all days) | 20 | 51.3% |
| Total | 39 | 100% |

A majority of participants reported that they taught spelling analysis as scripted (n = 36, 92.3%), while 3 reported that they did not (7.7%). When asked to explain why they might not teach spelling analysis as scripted, open-ended responses included:

- Write on paper, Ipad, shaving cream, white boards, etc.
- I do not this year. My students are not ready to be writing words.
- I do not do the spelling portion within my Title I Reading groups.

When asked about the use of Readers in whole class or small group settings, the responses were almost evenly split between the two: Small group (n = 16, 41%), whole class (n = 15, 38.5%), while 8 teachers indicated both (20.5%).

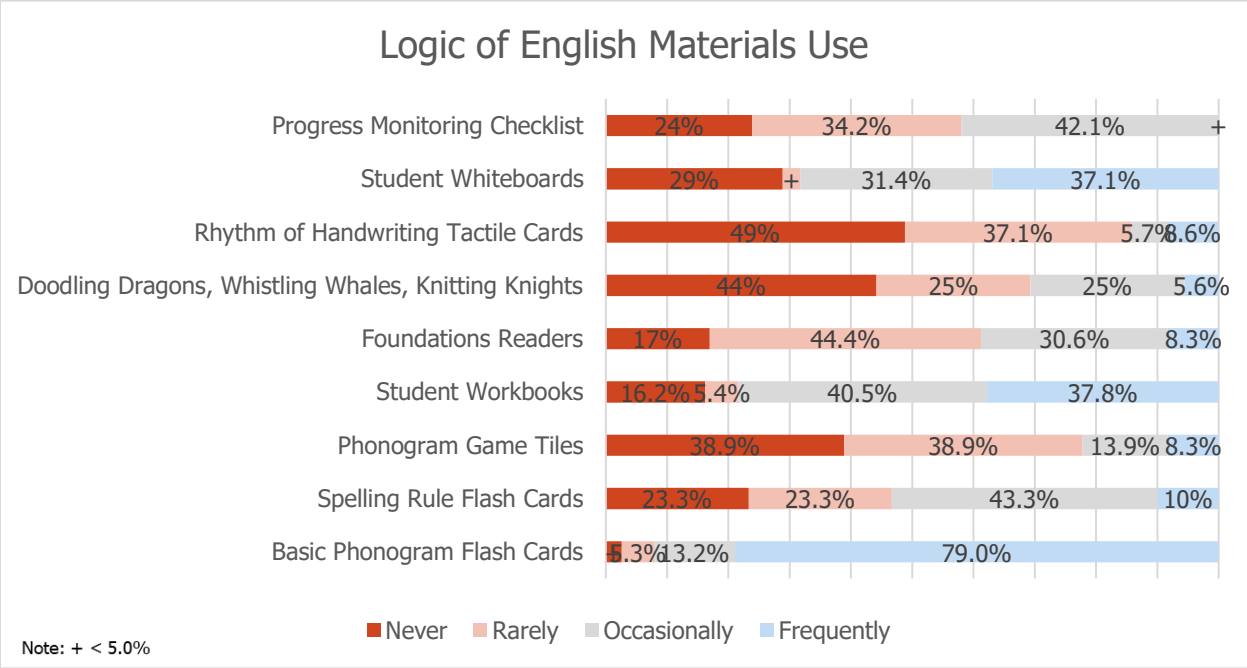
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Participants described the frequency of material usage on the following scale: 1 (never), 2 (rarely: about once a week), 3 (occasionally: several times a week), or 4 (frequently: most or all days). Three items fell below the midpoint of 2: Phonogram Game Tiles; Doodling Dragons, Whistling Whales, Knitting Knights; and Rhythm of Handwriting Tactile Cards. Meanwhile, materials that had the highest frequency of use were the Basic Phonogram Flash Cards, Student Workbooks, and Student Whiteboards. It should be noted that not all items are called for in daily lessons or at each level of instruction. Table 18 reports the means for all items.

Table 18
*Frequency of materials use (n = 38)*

| | *M* | *SD* | *Variance* |
|---|---|---|---|
| Basic Phonogram Flash Cards | 3.68 | 0.69 | 0.45 |
| Spelling Rule Flash Cards | 2.40 | 0.95 | 0.91 |
| Phonogram Game Tiles | 1.92 | 0.92 | 0.85 |
| Phonogram Game Cards | 2.17 | 0.83 | 0.69 |
| Student Workbooks | 3.00 | 1.04 | 1.08 |
| Foundations Readers | 2.31 | 0.84 | 0.71 |
| Doodling Dragons, Whistling Whales, Knitting Knights | 1.92 | 0.95 | 0.91 |
| Rhythm of Handwriting Tactile Cards | 1.74 | 0.91 | 0.82 |
| Student Whiteboards | 2.77 | 1.22 | 1.49 |
| Progress Monitoring Checklist | 2.18 | 0.79 | 0.62 |

These findings are further illustrated in Figure 5.




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*Figure 5: Logic of English Materials Use*
*(Note: Key = Never; Rarely: about once a week; Occasionally: several times a week; Frequently: most or all days.*

### *Open-Ended Questions*

Participants were asked to provide their likes, dislikes, and suggestions for improvement in an open-ended format. Responses are listed in order of greatest to least.

### *Likes*

- ***Phonograms.*** Teachers most appreciate the explicit and consistent method for teaching phonograms through the program. One respondent noted, "Students are learning to blend/segment words because so much time is spent on individual phonograms. They are recognizing them better."
- ***Structure.*** Teachers describe the program's approach as systematic and consistent, and appreciate the structure of the lessons, which are "quick and scripted and clear instruction." Teachers report the method of phoneme instruction facilitates integration into reading and writing. One teacher stated, "It is systematic and it incorporates all the skills in ways that are easy for my class to understand and fun for them to practice."
- ***Games, materials.*** Teachers like using the games to reinforce content, as well as the number of activities in lessons, the flash cards, and other supporting supplies.
- ***Spelling.*** Teachers note the spelling analysis and spelling rules as positive aspects of the program.
- ***Lessons.*** Teachers appreciate that the program is scientifically based and includes a kinesthetic component.

### *Dislikes*

- ***Materials.*** Teachers report that the amount of materials can be overwhelming, such as having to sort out cards for the games; difficulty with managing the games for a class of 25+, and storing the materials. The workbook pages could be grouped by lesson for ease of use, and the games organized per book. One teacher noted an issue with copying/re-copying workbook pages that should be double-sided. Another noted having to put the student books together. A final comment was that the student pages should have instructions on them so that parents can understand what their child is doing in the classroom.
- ***Not for whole group.*** A handful of teachers find the lessons/games more suitable for small-group, one-on-one, or homeschool instruction, specifically noting that the games are not manageable in a whole class setting.
- ***Organization.*** Some teachers find the lessons not well organized, and that the order of phonogram instruction seems "to jump around." Another teacher stated,

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"The order of phonograms seems off. There are some very frequently used phonograms that are not taught until later."

- ***Transfer of skills.*** A few teachers report that their students learn the phonograms but this does not always transfer to an understanding of written words or their own writing.
- ***Scripted lessons.*** A small number of teachers indicate that the scripted lessons are boring for students, the lessons require a lot of prep work, and the time and length of the lessons as negatives.

Final dislikes include the cost of materials, specifically copying books; the spelling analysis; and the comprehension/reading activities are too easy for second grade students.

***Suggestions for improvement***

- ***Accessibility.*** Teachers recommend improving the "Phonics with Phonograms by Logic of English app," making the phonogram app available for the Android operating system, having more games, readers, and workbooks on the app; having workbook pages useable on a Promethean board; creating kinesthetic videos on YouTube to accompany movements on the phonogram chart; and at-home online resources for parents.
- ***Games.*** Increase the number of games; make them more challenging.
- ***Organization.*** It's difficult to follow the order of phonogram lessons; the sight word lists do not follow a pattern. Rules should be numbered to fit the lessons where they are introduced. One teacher summarized by stating, "during the first year of implementation, I felt that the flow of the lesson as it is presented in the teacher guide was not smooth. Specifically, the materials were used in alternating sections. This makes for rough transitions and loss of time in the lesson."
- ***Pacing.*** The lessons should be slowed down, especially for younger students and struggling learners. One teacher recommended that the phonograms be taught more rapidly and reviewed daily.
- ***Whole group.*** Change some of the activities for ease of implementation with larger groups of students.
- ***Comprehension/skill transfer.*** Provide varied levels of reading comprehension; create higher thinking workbook pages; improve comprehension overall. Add a writing component to tie reading and writing together.
- ***Materials.*** Add a curriculum map; add a blank page between lesson pages and review pages; make the student-made books more user friendly and not so many pages. Provide instructions on the game pages in the workbooks so families can practice with their child at home. Better checklists.
- ***Professional Development.*** Increase professional development, as one teacher stated, "During the trainings, more time needs to be spent on mastering the phonogram sounds. Even after the four-day training, many of our teachers and/or para professionals still did not know the correct sounds."

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- ***SPED.*** More training, instruction, and activities for special education teachers and students.

## *Achievement Analyses*

To analyze the association between LoE enrollment and reading achievement gains, we examined three years of reading achievement data across three cohorts of students. Due to the 1st grade cohort in 2017-18 not achieving baseline equivalence, we report results from the two kindergarten cohorts (2017-18 and 2018-19, respectively) first, followed by results from the 1st grade cohort in 2017-18. For each cohort, we first descriptively examine reading achievement for LoE and comparison students, and then move to regression analyses, which allowed us to examine whether associations between LoE enrollment and reading achievement were statistically significant, as well as to control for demographic variables such as ethnicity, gender, EL status, ED status, and special education status. Analysis by cohort allowed us to examine how these associations varied across multiple cohorts of LoE students.

## *2017-18 and 2018-19 Grade K Cohorts*

**Within year analyses.** We first descriptively examine the patterns of MAP reading scores for LoE and comparison students within school years, by cohort. Table 19 shows the average MAP RIT reading score for LoE and comparison students in the fall and spring of the 2017-18 and 2018-19 school years. It is important to note that fall 2017 reading scores are true pretest scores for all students, as these represent scores obtained before the LoE program was implemented. Fall 2018 scores would only be true pretest scores for kindergarten students in that school year (current 1st grade students), as all other LoE students would already have experienced the LoE program the previous year.

Table 19
*Average MAP Reading score, by year and cohort*

| | Pretest | Posttest | Mean change |
|---|---|---|---|
| **2017-18** | | | |
| Grade K | | | |
| Logic of English (n = 246) | 138.19 | 155.39 | 17.20 |
| Comparison (n = 154) | 139.96 | 160.90 | 20.94 |
| **2018-19** | | | |
| Grade K | | | |
| Logic of English (n = 307) | 138.94 | 159.86 | 20.92 |
| Comparison (n = 136) | 138.07 | 152.09 | 14.02 |

We then conducted within-year regression analyses, which allowed us to test for statistical significance of LoE associations with reading achievement gains while

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controlling for prior reading knowledge and demographic variables. Table 20 displays the results of these analyses for kindergarten students in 2017-18 and 2018-19.

Table 20
*Association between Logic of English enrollment and reading achievement, Fall 2017-Spring 2018 and Fall 2018-19*

| Grade K | Estimate | Standard error | P-value |
|---|---|---|---|
| 2017-18 (n = 400) | 0.241 | 1.283 | .851 |
| 2018-19 (n = 443) | 5.653 | 1.177 | <.001 |

Results show no significant associations between LoE enrollment and within-year MAP reading score gains in 2017-18. However, encouragingly for LoE, the association was significant and positive in 2018-19. The regression estimates displayed in these tables represent the score gain in spring MAP reading score associated with LoE enrollment, after controlling for fall MAP reading score and demographics. For example, LoE enrollment in the 2018-19 school year was associated with an approximately 5.7 point increase in spring 2019 MAP reading scores for K students, compared to otherwise similar comparison kindergarten students.

**Multi-year analyses.** We now examine the association between LoE enrollment and reading achievement across multiple years for 2017-18 and 2018-19 Grade K students. We first descriptively analyze mean MAP reading scores by year and cohort. Table 21 displays these means by school years. It is important to consider that we only included students who had non-missing pretest and posttest scores for analysis. Thus, the fall 2017-fall 2018 analysis means we only considered those students with non-missing scores for fall 2017 and fall 2018, and likewise for fall 2017-fall 2019 and fall 2018-fall 2019. As in the previous set of analyses, the fall 2017 score is a true pretest for 2017-18 kindergarten students, while the fall 2018 pretest is a true pretest only for 2018-19 kindergarten students.

Table 21
*Average MAP Reading score, across school years, by Grade K cohort*

| | Pretest | Posttest | Mean change |
|---|---|---|---|
| **2017-18 K Cohort** | | | |
| *Fall 2017 - Fall 2018* | | | |
| Grade K | | | |
| Logic of English (n = 248) | 140.06 | 159.63 | 19.57 |
| Comparison (n = 159) | 138.23 | 156.68 | 18.45 |
| *Fall 2017 – Fall 2019* | | | |
| Grade K | | | |
| Logic of English (n = 238) | 140.21 | 171.71 | 31.50 |
| Comparison (n = 161) | 138.32 | 173.78 | 35.46 |

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| **2018-19 K Cohort** | | | |
|---|---|---|---|
| *Fall 2018 – Fall 2019* | | | |
| Grade K | | | |
| Logic of English (n = 304) | 138.83 | 160.55 | 21.72 |
| Comparison (n = 138) | 137.89 | 154.43 | 16.54 |

We next conducted longitudinal regression analyses by cohort, in order to control for prior reading achievement and demographic variables. Table 22 displays the results of analyses examining the association between LoE enrollment and MAP reading gains from fall 2017 to fall 2018 and fall 2017 to fall 2019; and for the second cohort, the same analyses from fall 2018 to fall 2019.

Table 22
*Longitudinal associations between Logic of English enrollment and reading achievement, Fall 2017-18 and 2018-19 kindergarten cohorts*

| Fall 2017-18 Cohort | Estimate | Standard error | P-value |
|---|---|---|---|
| 2017-2018 (n = 407) | -3.399 | 1.270 | .008 |
| 2017-2019 (n = 399) | -8.328 | 1.796 | <.001 |
| **Fall 2018-19 Cohort** | **Estimate** | **Standard error** | **P-value** |
| 2018-2019 (n = 442) | 3.560 | 1.346 | .008 |

The results of these longitudinal analyses were very mixed. For the initial, 2017-18 Grade K cohort, there was a significant negative association between LoE enrollment and MAP reading score gains in both fall 2018 and fall 2019. However, for the second, 2018-19 cohort, LoE enrollment was associated with significantly positive associations in the fall of 2019. Specifically, LoE was associated with an approximately 3.5 point gain in fall 2019 MAP reading scores. These patterns suggest that LoE may have been more effective once kindergarten teachers had prior experience with implementation, i.e., with their second cohort of students.

## *2017-18 Grade 1 cohort*

**Within year analyses.** As with the kindergarten cohorts, we first descriptively examine the patterns of MAP reading scores for LoE and comparison students within school year. Table 23 shows the average MAP reading score for the fall and spring in the 2017-18 school year. As with the kindergarten cohort in 2017-18, the fall 2017 MAP reading score was used as a pretest score for this cohort. Descriptively, LoE students in this 1st grade cohort had fall to spring gains that were about three points larger, on average, than did comparison students.

Table 23
*Average MAP Reading score, Grade 1 students in 2017-18*

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| Grade 1 | Pretest | Posttest | Mean change |
|---|---|---|---|
| Logic of English (n = 347) | 160.21 | 180.56 | 20.33 |
| Comparison (n = 151) | 153.57 | 171.12 | 17.55 |

We then conducted within-year regression analysis, which allowed us to test for statistical significance of LoE associations with reading achievement gains while controlling for prior reading knowledge and demographic variables. Table 24 shows this association for 1st grade students in the 2017-18 school year.

Table 24
*Association between Logic of English enrollment and reading achievement, Fall 2017-Spring 2018*

| Grade | Estimate | Standard error | P-value |
|---|---|---|---|
| 1st (n = 498) | 3.563 | 0.955 | <.001 |

LoE enrollment was associated with an approximately 3.5 point gain in MAP reading score for 1st grade students in 2017-18. This positive association was statistically significant, indicating that 1st grade LoE students performed significantly better on the MAP reading assessment in the spring of 2018 than did 1st grade comparison students.

**Multi-year analyses.** Next, we examined the association between LoE enrollment and reading achievement for the 2017-18 1st grade cohort. Table 25 displays these means by school years. As with previous analyses, we only included students who had non-missing pretest and posttest reading scores for analysis. One notable finding here (and in the previous set of analyses) is that pretest scores for LoE 1st grade students were considerably higher than those for comparison students. This reinforces the earlier finding that baseline equivalence was not met, and it also may have served as a ceiling for potential growth for LoE students.

Table 25
*Average MAP Reading score, across school years*

| **Fall 2017 – Fall 2018** | | | |
|---|---|---|---|
| Grade 1 | Pretest | Posttest | Mean change |
| Logic of English (n = 340) | 160.19 | 172.02 | 11.83 |
| Comparison (n = 151) | 153.44 | 171.96 | 18.52 |
| **Fall 2017 – Fall 2019** | | | |
| Grade 1 | | | |
| Logic of English (n = 320) | 160.15 | 184.18 | 24.03 |
| Comparison (n = 149) | 153.58 | 180.13 | 26.55 |

Another interesting pattern in trends appears when looking at both descriptive tables (Tables 23 and 25) together. LoE students in this cohort experienced a large

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increase in scores from fall 2017 to spring 2018. However, average scores from spring 2018 (in Table 23) to fall 2018 (Table 25) dropped over eight points. This is a large decline from spring to fall, even given possible explanatory phenomena such as the "summer slide." This is an unusual pattern of scores that, along with the lack of baseline equivalence, continues to justify caution in interpreting the Grade 1 results.

We next conducted longitudinal regression analyses on this cohort, in order to examine these patterns of reading achievement gains while controlling for prior reading achievement and demographic variables. Table 26 displays the results of analyses examining the association between LoE enrollment and MAP reading gains from fall 2017 to fall 2018 and fall 2017 to fall 2019.

Table 26
*Longitudinal associations between Logic of English enrollment and reading achievement, Fall 2017 Grade 1 students*

| Grade 1 | Estimate | Standard error | P-value |
|---|---|---|---|
| 2017-2018 (n = 469) | -3.141 | 1.491 | .036 |
| 2017-2019 (n = 491) | -6.716 | 1.236 | <.001 |

Unlike the within-year analysis, the between-year analyses showed significant negative associations between LoE enrollment and reading achievement. However, the lack of baseline equivalence for this cohort may be one mitigating factor in these regression results. LoE students were starting at a considerably higher average score than were comparison students. This may have allowed for more potential growth for comparison students, which in turn may help explain the negative associations between LoE enrollment and reading achievement.

In summary, when breaking down analyses by grade and cohort, some positive associations appeared, especially within school years from fall to spring. Across school years, however, the first year 2017-18 cohorts showed negative patterns, although anomalies in the first-grade patterns and possible ceiling effects for LoE students in association with the sampling inequivalence certainly raises cautions. Notably, the third cohort (K in 2018-19) had a positive association between LoE enrollment and reading achievement both between and across school years. One possible interpretation of differences in cohort success is that teachers of the original cohort in 2017-18 had just begun working with the LoE curriculum, while teachers of the 2018-19 cohort had a year of experience, which may have helped to maximize potential LoE benefits for that particular cohort.

## Discussion

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The purpose of this evaluation was to examine the association between Logic of English enrollment and reading achievement gains. This report includes findings from teacher survey data, as well as multiple years of MAP RIT reading achievement scores.

Based on survey results, the overall perception of Logic of English was very positive, and respondents highly rated the overall value of Logic of English for teaching and learning. The following recommendations offered for improvement are based on teacher feedback and intended to offer enhancements to the program. These findings should be viewed with caution, however, due to the very small sample size and limited amount of available data. Further evaluation is needed on the efficacy of Logic of English, where student performance and teaching fidelity are examined over multiple years and compared to similar schools that do not implement the program.

When examining the associations between LoE enrollment and reading achievement growth by cohort, varied patterns were found. Patterns of associations were generally more positive when examining within-year (fall to spring) achievement gains than when examining between-year gains. Specifically, a positive association between LoE enrollment and gains from fall to spring on MAP reading scores was found for 1st grade students in the 2017-18 school year and kindergarten students in the 2018-19 school year. When examining between-year gains, patterns of associations were negative for the original, 2017-18 cohorts but positive for the second-year, 2018-19 Grade K cohort. In the Results section, we discussed the possibility of teachers becoming more skilled in LoE implementation in the second year, but also several serious concerns about the comparability of the first-grade LoE and comparison samples. Consequently, the latter results could be spurious. An additional potential mitigating factor may be the presence of summer programming in the two comparison schools. Due to the comparison schools having higher proportions of ELLs, these schools receive extra funding for summer academic programming that the LoE schools do not receive. This additional summer programming may be a factor in explaining the lack of a positive association between reading achievement gains across multiple years and LoE enrollment in two cohorts.

In conclusion, the first-year Grades K and 1 cohorts demonstrated success within-years but an inverse pattern across years. The second-year Grade K cohort, however, demonstrated consistent within- and between-year gains. The latter results clearly suggest promise for the program with greater teacher experience, but also the need for further research to corroborate this effect.

## Recommendations

This report and these recommendations relate most directly to the implementation of Logic of English in the West Shore Educational Service District, as well as the association between Logic of English enrollment and reading achievement, but could also have broader value and validity for national program usage and

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continuous improvement. For the WSESD implementation, these recommendations are presented with the knowledge that this was a very small sample size and that for a deeper understanding of program fidelity, more in-depth data collection is warranted.

- Increase accessibility by making improvements to the Logic of English app; increase the activities available on the app; make the app available on the Android operating system; and create online resources for parents.
- Review implementation in a whole class setting. Multiple teachers shared difficulty in implementing the games and activities with larger groups of students. While this may be a classroom management issue, a training issue, or both, it warrants further examination by Logic of English developers.
- Evaluate the organization of lessons. Teachers reported the lessons seem to "jump around" and do not always correspond to the accompanying activities or workbook pages.
- Streamline the materials. Teachers report being overwhelmed by the amount of materials and the logistics of storing them. Also prepping the materials for lessons is time consuming.
- Increase professional development opportunities to ensure teachers are prepared to implement the program; more professional development is needed for SPED teachers.

Regarding conclusions and recommendations based on the association between Logic of English enrollment and reading achievement, it is important to consider that there were considerable demographic differences between schools that did and did not use Logic of English, so results of these correlational analyses should be interpreted with a degree of caution.

- Associations within cohorts tended to be more promising when examining within-year achievement gains than between-year gains. This may be evidence of a "summer slide" type of phenomenon.
- The K cohort in 2018-19 seemed to benefit the most from the LoE program, showing statistically significant positive increases in reading achievement both within and across school years. The 1st grade cohort in the 2017-18 also showed statistically significant fall to spring reading achievement gains within that school year.
- Results for the 1st grade cohort in 2017-18 should be interpreted with an additional degree of caution, as baseline equivalence was not met for this cohort, and the general patterns of MAP reading scores were unusual in relation to the other cohorts.

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# Appendix A

*Logic of English – Teacher Reaction Survey*

**Section One: Background**

1. Please indicate your school (dropdown menu)
2. What is your position? (dropdown menu: classroom teacher, facilitator, reading specialist, other?)
3. What grade of students do you currently teach? (check all that apply)
4. How many years of experience do you have teaching: (select one)
    a. Less than one year
    b. 1-3 years
    c. 4-10 years
    d. 10 years or more

5. How much initial training did you receive prior to implementing Logic of English? (dropdown menu: 4 day in-person training from LOE staff; 4 day in-person training from district personnel; 4 day online training; 1 or 2 day training; other (please explain)).

6. On a scale of 1-5, please indicate your satisfaction with the overall value of your initial training: 1 = very dissatisfied, 5 = very satisfied.

7. Have you participated in any additional training during the school year? Y/N

**Section Two: Overall Reactions**

Use the scale below to indicate the degree to which you agree or disagree with each statement.
1 = Strongly Disagree, 5 = Strongly Agree

1. I felt prepared to implement Logic of English effectively this year.
2. I received all of the necessary materials to implement the curriculum.
3. My students enjoy the Logic of English curriculum.
4. I would recommend Logic of English to other teachers.

**Section Three: Student Outcomes**

Please indicate your satisfaction with the following on a scale of 1 (very dissatisfied) to 5 (very satisfied):

The overall value of Logic of English for teaching and learning
Workbook activities
The value of the Progress Monitoring Checklist
The value of the suggested review ideas for struggling students
The value of the games embedded in the curriculum

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N/A

**Section Four: Program Tools and Components**

1. Do you use Logic of English for the whole class or as an intervention? (check all that apply: whole class; intervention)

2. How frequently do you implement the following Logic of English lessons?

    Never
    Rarely (About once a week)
    Occasionally (Several times a week)
    Frequently (Most or all days)

    a. Phonemic Awareness
    b. The Alphabetic Principle and systemic phonics
    c. Fluency and high frequency words
    d. Handwriting
    e. Spelling
    f. Vocabulary
    g. Reading comprehension
    h. Reviews/Assessments

3. Which Foundations book are you currently teaching?
    A
    B
    C
    D

4. How long does it take to cover a lesson? (dropdown menu):
    10-30 minutes
    31-60 minutes
    Over 60 minutes
    Skip logic for those choosing options 2 or 3: If you chose more than 30 minutes, how are lessons delivered: (dropdown menu: all in one day; split between two days)

5. How frequently do you skip any part(s) of the lesson plans?
    Never
    Rarely (About once a week)
    Occasionally (Several times a week)
    Frequently (Most or all days)

6. How frequently do you review the phonograms or play phonogram games from the curriculum?
    Never
    Rarely (About once a week)

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Occasionally (Several times a week)
Frequently (Most or all days)

7. Do you teach spelling analysis as scripted? (Y/N) (skip logic: If No, how do you assess spelling?) (Open response)

8. Do you use Readers with whole class or small groups? (Check all that apply: whole class; small groups)

9. How frequently do you use these materials?
   Basic Phonogram Flash cards
   Spelling Rule Flash Cards
   Phonogram Game Tiles
   Phonogram Game Cards
   Student Workbooks
   Foundations Readers
   Doodling Dragons; Whistling Whales; Knitting Knights
   Rhythm of Handwriting Tactile Cards
   Student Whiteboards

   N/A This item is not needed for the Foundations level I am currently teaching
   Never
   Rarely (About once a week)
   Occasionally (Several times a week)
   Frequently (Most or all days)

10. How frequently do you use the Progress Monitoring Checklist?
    Never
    Rarely (About once a week)
    Occasionally (Several times a week)
    Frequently (Most or all days)

**Section Six: Open-Ended**

1. What do you like best about Logic of English?
2. What do you like least?
3. What recommendations do you have for improving Logic of English?

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