# What Works Clearinghouse



# Read, Write & Type!™

## Program description

*Read, Write & Type!™ Learning System* is a software program with supporting materials designed to teach beginning reading skills by emphasizing writing as a way to learn to read. The program was developed for six- to nine-year-old students who are just beginning to read and for students who are struggling readers and writers. The main goal of *Read, Write & Type!™* is to help students develop an awareness of the 40 English phonemes and the ability to associate each phoneme with a letter or a combination of letters and a finger stroke on the keyboard. Other goals of the program include identifying phonemes in words and fluency in sounding out, typing, and reading regularly spelled words.

## Research

One study of *Read, Write & Type!™* met the What Works Clearinghouse (WWC) evidence standards. The study included 150 students from first grade in five elementary schools.[1]

The WWC considers the extent of evidence for *Read, Write & Type!™* to be small for alphabetics and comprehension. No studies that met WWC standards with or without reservations addressed fluency or general reading achievement.

## Effectiveness

Based on the one study, *Read, Write & Type!™* was found to have potentially positive effects on alphabetics and no discernible effects on comprehension. Findings on fluency and general reading achievement were not reported in the study.

| | *Alphabetics* | *Fluency* | *Comprehension* | *General reading achievement* |
|---|---|---|---|---|
| Rating of effectiveness | Potentially positive effects | na | No discernible effects | na |
| Improvement index[2] | Average: +8 percentile points<br>Range: –10 to +29 percentile points | na | Average: +3 percentile points<br>Range: –2 to +15 percentile points | na |

na = not applicable

1. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.
2. These numbers show the average and range of improvement indices for all findings across the study.

## Additional program information

### Developer and contact

Developed by Dr. Jeannine Herron and Dr. Leslie Grimm, *Read, Write & Type!*™ is distributed by Talking Fingers, Inc. Address: One St. Vincent Drive, San Rafael, California 94903. Email: contact@talkingfingers.com. Web: www.talkingfingers.com. Telephone: (800) 674-9126.

### Scope of use

*Read, Write & Type!*™ was developed in 1994. Information is not available on the number or demographics of students, schools, or districts using the software.

### Teaching

Game-like computer activities with animated characters lead students sequentially through each lesson of *Read, Write & Type!*™. Each of the program's 40 lessons explicitly teach one of the 40 phonemes. Lessons in the activity book correspond to the software and include activities on identifying beginning, middle, and ending sounds, thinking about sounds in words, rhyming, spelling words, and dictating. The lessons begin by having students say and write individual sounds and the letters that represent those sounds, and then progress to having students write words, sentences, and stories. After attaining a certain level, students do the *Power Fountain* activity to practice speed and accuracy in writing and typing. *The E-mail Tower,* a simulated e-mail program, is another optional activity for students to practice their newly acquired skills by writing short messages.

The software program can be used at school or home, where teachers or parents can print out individual or group reports of student progress.

### Cost

The program can be purchased for in-school use for $89.00 for two discs/licenses. A site license costs $699.00 for 25 discs and classroom materials. The software can be purchased for in-home use for $79.00.

## Research

One study reviewed by the WWC investigated the effects of *Read, Write & Type!*™. The study (Torgesen, Wagner, Rashotte, & Herron 2003) was a randomized controlled trial that met WWC evidence standards.

### Met evidence standards

Torgesen, Wagner, Rashotte, & Herron (2003) included 150 low-achieving first grade students in five elementary schools. At two of the schools, students were randomly assigned either to the *Read, Write & Type!*™ condition or to the *Auditory Discrimination in Depth*® condition. At three schools, students were randomly assigned to *Read, Write and Type (RWT), Auditory Discrimination in Depth*® *(ADD),* or a regular instruction comparison group. The beginning reading review presents data relevant to comparisons of RWT with ADD and of RWT with regular instruction.[3] The beginning reading review presents findings from all comparisons.[4]

### Extent of evidence

The WWC categorizes the extent of evidence in each domain as small or moderate to large (see the What Works Clearinghouse Extent of Evidence Categorization Scheme). The extent of evidence takes into account the number of studies and the total sample size across the studies that met WWC evidence standards with or without reservations.[5]

The WWC considers the extent of evidence for *Read, Write & Type!*™ to be small for alphabetics and comprehension. No studies that met WWC standards with or without reservations addressed fluency or general reading achievement.

3. Description of the assignment procedure was based on personal communication with the first study author on September 7, 2006.
4. The WWC review of beginning reading includes all comparisons that meet evidence standards because all schools provide some type of reading instruction and there is no typical comparison condition.
5. The Extent of Evidence categorization was developed to tell readers how much evidence was used to determine the intervention rating, focusing on the number and size of studies. Additional factors associated with a related concept, external validity, such as students' demographics and the types of settings in which studies took place, are not taken into account for the categorization.

## Effectiveness

### Findings

The WWC review of interventions for beginning reading addresses student outcomes in four domains: alphabetics, fluency, comprehension, and general reading achievement.[6] The Torgesen et al. (2003) study addressed outcomes in the alphabetics and comprehension domains. The findings below present the authors' and the WWC-calculated estimates of the size and statistical significance of the effects of *Read, Write & Type!*™ on students' performance.

*Alphabetics.* The Torgesen et al. (2003) study findings for alphabetics are based on the performance of *Read, Write & Type!*™ students and comparison students on three measures of phonological awareness and two measures of phonics.

- When the *Read, Write & Type!*™ group was compared with the *Auditory Discrimination in Depth*® group, the study authors found that there were no statistically significant differences between the groups on any of the three phonological awareness measures (phoneme blending, phoneme elision, and phoneme segmenting subtests of the Comprehensive Test of Phonological Processes) or the two phonics measures (word attack and word identification subtests of the Woodcock Reading Mastery Test).
- When the *Read, Write & Type!*™ group was compared with the regular classroom instruction/support group, the authors reported, and the WWC confirmed, statistically significant positive effects of *Read, Write & Type!*™ on one of the phonological awareness measures (phoneme segmenting) and on one of the phonics measures (word attack). The authors did not find statistically significant effects of the program on the second phonics measure (word identification) or on the other two phonological awareness measures (phoneme blending and elision).

In the alphabetics domain, one study with a strong design met WWC evidence standards. It showed statistically significant positive effects for one comparison group and no effects for the other, so the intervention was categorized as having potentially positive effects on alphabetics.

*Comprehension.* The Torgesen et al. (2003) study examined comprehension using the passage comprehension subtest of the Woodcock Reading Mastery Test and an estimated verbal IQ measure (based on the vocabulary subtest of the Stanford Binet Intelligence test).

- When the *Read, Write & Type!*™ group was compared with the *Auditory Discrimination in Depth*® group, the authors reported no statistically significant difference between the groups on the comprehension measures.
- When the *Read, Write & Type!*™ group was compared with the regular classroom instruction/support group, the authors reported no statistically significant difference between the groups on the comprehension measures.

In the comprehension domain, one study with a strong design met WWC evidence standards. Neither of the two comparisons showed statistically significant effects. The average effect size across the two comparisons was also not statistically significant and was not large enough to be considered substantively important according to WWC criteria. Therefore, the intervention was categorized as having no discernible effects on comprehension.

### Rating of effectiveness

The WWC rates the effectiveness of an intervention in a given outcome domain as: positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings,[7] the size of the difference between participants in the intervention and the comparison conditions, and the consistency in findings across studies (see the WWC Intervention Rating Scheme).

6. For definitions of the domains, see the Beginning Reading Protocol.
7. The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation, see the WWC Tutorial on Mismatch. See Technical Details of WWC-Conducted Computations for the formulas the WWC used to calculate the statistical significance. In the case of *Read, Write & Type!*™, corrections for multiple comparisons were needed.

**The WWC found *Read, Write & Type!™* to have potentially positive effects for the alphabetics domain and no discernible effects for the comprehension domain**

### Improvement index

The WWC computes an improvement index for each individual finding. In addition, within each outcome domain, the WWC computes an average improvement index for each study and an average improvement index across studies (see Technical Details of WWC-Conducted Computations). The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is based entirely on the size of the effect, regardless of the statistical significance of the effect, the study design, or the analyses. The improvement index can take on values between –50 and +50, with positive numbers denoting results favorable to the intervention group.

The average improvement index for alphabetics is +8 percentile points in one study across two comparisons, with a range of –10 to +29 percentile points across findings.

The average improvement index for comprehension is +3 percentile points in one study across two comparisons, with a range of –2 to +15 percentile points across findings.

### Summary

The WWC reviewed one study on *Read, Write & Type!™,* which met WWC evidence standards. Based on the study's results, the WWC found the program to have potentially positive effects in the alphabetics domain and no discernible effects in the comprehension domain. The evidence presented in this report may change as new research emerges.

## Reference

### Met WWC evidence standards

Torgesen, J., Wagner, R., Rashotte, C., & Herron, J. (2003). *Summary of outcomes from first grade study with Read, Write and Type and Auditory Discrimination in Depth Instruction and software with at-risk children* (FCRR Tech. Rep. No. 2). Retrieved from Florida Center for Reading Research Web site: http://www.fcrr.org/TechnicalReports/RWTfullrept.pdf

**For more information about specific studies and WWC calculations, please see the WWC *Read, Write & Type!™* Technical Appendices.**

# Appendix

## Appendix A1 Study characteristics

| Characteristic | Description |
|---|---|
| **Study citation** | Torgesen, J., Wagner, R., Rashotte, C., & Herron, J. (2003). *Summary of outcomes from first grade study with Read, Write, and Type and Auditory Discrimination in Depth Instruction and software with at-risk children* (FCRR Techn. Rep. No. 2). Retrieved from Florida Center for Reading Research Web site: http://www.fcrr.org/TechnicalReports/RWTfullrept.pdf |
| **Participants** | The study included 150 low-achieving first grade students in five elementary schools. All students scored in the lowest 35% on a letter-sound knowledge measure and were considered to be most at-risk for developing reading problems. At two schools, students were randomly assigned either to *Read, Write & Type!™* (RWT) (n = 16) or to *Auditory Discrimination in Depth®* (ADD) (n = 16). At three schools, students were randomly assigned to RWT (n = 38), ADD (n = 38), or a comparison group (n = 42) (J.K. Torgesen, personal communication, September 7, 2006). Two students attrited from each of the RWT and ADD groups, and one student attrited from the comparison group. The final analysis samples included 52 RWT and 52 ADD students located at five schools; and 36 RWT, 36 ADD, and 41 comparison students located at three schools. Approximately 34% of the sample were minority children (primarily African-American). Approximately 35% of the sample received free/reduced lunch, but students ranged in terms of their socio-economic status. |
| **Setting** | The study took place in five elementary schools (location unknown). |
| **Intervention** | Students assigned to the RWT program received services from October through May. Working in groups of three, the students had four 50-minute sessions per week. A trained RWT teacher devoted approximately half of each session to direct instruction, leading students in warm-up activities outlined in the teacher's manual. For the remainder of the session, students worked individually on the computer practicing the same skills, with the teacher in a support role. The teacher occasionally provided further individualized instruction if a child encountered specific difficulties. The computer program emphasizes phonological awareness, letter sound correspondence, and phonemic decoding in the context of children expressing themselves in written language. |
| **Comparison** | ADD students received instruction in the same format and duration as the RWT students, but the type of activities differed. The ADD program focuses on developing phonological awareness and phonemic decoding skills through practicing word reading skills out of context, reading phonetically controlled text, and completing computer activities. The regular instruction comparison groups continued receiving the regular instruction and support typically available to them (J.K. Torgesen, personal communication, September 7, 2006). Two of the three schools with regular instruction comparison groups used Open Court's *Collections for Young Scholars* as the whole-class reading curriculum. |
| **Primary outcomes and measurement** | The authors assessed students at the end of the study period using a battery of tests. All children in the sample pool were given the phoneme blending, phoneme elision, and phoneme segmenting subtests of the Comprehensive Test of Phonological Processes (CTOPP), and the word attack, word identification, and passage comprehension subtests of the Woodcock Reading Mastery Test. Students in the study were also given the vocabulary subtest of the Stanford Binet Intelligence Scale, which the authors used as a proxy measure for verbal IQ. Other outcomes were reported in the study, but not included in this review either because they were outside the scope of the beginning reading review (developmental spelling, probability of reading disability) or because sufficient information on the measure name, description, or validity and reliability was not reported (word efficiency and non-word efficiency) (see Appendix A2.1–2.2 for more detailed descriptions of outcome measures). |
| **Teacher training** | Teachers received training for the intervention, but no information was provided on the nature of the training. |

## Appendix A2.1 Outcome measures in the alphabetics domain by construct

| Characteristic | Description |
|---|---|
| **Phonological awareness** | |
| **Comprehensive Test of Phonological Processes (CTOPP): Phoneme Blending Subtest** | The phoneme blending subtest measures the child's ability to blend separately presented sounds together to form words. This is a standardized test (as cited in Torgesen et al., 2003). |
| **Comprehensive Test of Phonological Processes (CTOPP): Phoneme Elision Subtest** | The phoneme elision subtest measures the child's ability to manipulate sounds in words. This is a standardized test (as cited in Torgesen et al., 2003). |
| **Comprehensive Test of Phonological Processes (CTOPP): Phoneme Segmenting Subtest** | The phoneme segmenting subtest measures the child's ability to isolate and pronounce the sounds in words. This is a standardized test (as cited in Torgesen et al., 2003). |
| **Phonics** | |
| **Woodcock Reading Mastery Test: Word Identification Subtest** | The word identification subtest is a measure of word reading vocabulary in which the child reads list of words of increasing difficulty. This is a standardized test (as cited in Torgesen et al., 2003). |
| **Woodcock Reading Mastery Test: Word Attack Subtest** | The word attack subtest is a measure of phonemic reading ability in which the child reads non-words. This is a standardized test (as cited in Torgesen et al., 2003). |

## Appendix A2.2 Outcome measures in the comprehension domain by construct

| Characteristic | Description |
|---|---|
| **Comprehension** | |
| **Woodcock Reading Mastery Test: Passage Comprehension Subtest** | The passage comprehension subtest measures the child's ability to comprehend the meaning of short passages. This is a standardized test (as cited in Torgesen et al. 2003). |
| **Vocabulary** | |
| **Estimated Verbal IQ** | The measure is based on the vocabulary subtest of the Stanford Binet Intelligence Scale. The vocabulary subtest consists of both providing names of pictures and definitions of words. This is a standardized test (as cited in Torgesen et al., 2003). |

## Appendix A3.1 Summary of findings for the alphabetics domain by construct[1]

| Outcome measure | Study sample | Sample size (students) | Authors' findings from the study: Mean outcome (standard deviation[2]) — *Read, Write & Type!™* group | Authors' findings from the study: Mean outcome (standard deviation[2]) — Comparison group | WWC calculations: Mean difference[3] (*RWT* – comparison) | WWC calculations: Effect size[4] | WWC calculations: Statistical significance[5] (at $\alpha = 0.05$) | WWC calculations: Improvement index[6] |
|---|---|---|---|---|---|---|---|---|
| **Construct: Phonological awareness** | | | | | | | | |
| **Torgesen et al., 2003 (randomized controlled trial)[7]** | | | | | | | | |
| **Comparison #1: *Read, Write & Type!*™ vs. *Auditory Discrimination in Depth®* group** | | | | | | | | |
| CTOPP: Phoneme Blending Subtest | Grade 1 | 104 | 18.90 (4.90) | 18.80 (5.30) | 0.10 | 0.02 | ns | +1 |
| CTOPP: Phoneme Elision Subtest | Grade 1 | 104 | 13.50 (4.50) | 14.30 (4.50) | –0.80 | –0.18 | ns | –7 |
| CTOPP: Phoneme Segmenting Subtest | Grade 1 | 104 | 15.30 (5.30) | 16.20 (6.60) | –0.90 | –0.15 | ns | –6 |
| **Comparison #2: *Read, Write & Type!*™ vs. regular instruction/support group** | | | | | | | | |
| CTOPP: Phoneme Blending Subtest | Grade 1 | 77 | 20.10 (4.50) | 18.20 (5.40) | 1.90 | 0.38 | ns | +15 |
| CTOPP: Phoneme Elision Subtest | Grade 1 | 77 | 13.80 (4.20) | 12.50 (4.60) | 1.30 | 0.29 | ns | +11 |
| CTOPP: Phoneme Segmenting Subtest | Grade 1 | 77 | 15.40 (4.70) | 11.70 (4.50) | 3.70 | 0.80 | Statistically significant | +29 |
| **Construct: Phonics** | | | | | | | | |
| **Torgesen et al., 2003 (randomized controlled trial)** | | | | | | | | |
| **Comparison #1: *Read, Write & Type!*™ vs. *Auditory Discrimination in Depth®* group** | | | | | | | | |
| Woodcock Reading Mastery Test: Word Attack Subtest | Grade 1 | 104 | 106.30 (13.60) | 109.70 (14.00) | –3.40 | –0.24 | ns | –10 |
| Woodcock Reading Mastery Test: Word Identification Subtest | Grade 1 | 104 | 105.10 (13.40) | 107.10 (14.30) | –2.00 | –0.14 | ns | –6 |

*(continued)*

## Appendix A3.1 Summary of findings for the alphabetics domain by construct *(continued)*

| Outcome measure | Study sample | Sample size (students) | Authors' findings from the study: Mean outcome (standard deviation[2]) *Read, Write & Type!™* group | Authors' findings from the study: Mean outcome (standard deviation[2]) Comparison group | WWC calculations: Mean difference[3] (*RWT* – comparison) | WWC calculations: Effect size[4] | WWC calculations: Statistical significance[5] (at $\alpha = 0.05$) | WWC calculations: Improvement index[6] |
|---|---|---|---|---|---|---|---|---|
| **Comparison #2: *Read, Write & Type!* ™ vs. regular instruction/support group** | | | | | | | | |
| Woodcock Reading Mastery Test: Word Attack Subtest | Grade 1 | 77 | 108.30 (12.10) | 99.50 (14.50) | 8.80 | 0.65 | Statistically significant | +24 |
| Woodcock Reading Mastery Test: Word Identification Subtest | Grade 1 | 77 | 107.00 (12.40) | 100.10 (15.60) | 6.90 | 0.48 | ns | +18 |
| **Averages[8]** | | | | | | | | |
| **Average for alphabetics, Comparison #1 (Torgesen et al., 2003)** | | | | | | –0.14 | ns | -6 |
| **Average for alphabetics, Comparison #2 (Torgesen et al., 2003)** | | | | | | 0.52 | Statistically significant | +20 |
| **Domain average for alphabetics domain across comparisons (Torgesen et al., 2003)** | | | | | | 0.19 | ns | +8 |

ns = not statistically significant

1. This appendix reports findings considered for the effectiveness rating and the average improvement indices in the alphabetics domain.
2. The standard deviation across all students in each group shows how dispersed the participants' outcomes are: a smaller standard deviation on a given measure would indicate that participants had more similar outcomes.
3. Positive differences and effect sizes favor the intervention group; negative differences and effect sizes favor the comparison group.
4. For an explanation of the effect size calculation, see Technical Details of WWC-Conducted Computations.
5. Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups.
6. The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. The improvement index can take on values between –50 and +50, with positive numbers denoting results favorable to the intervention group.
7. The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation about the clustering correction, see the WWC Tutorial on Mismatch. See Technical Details of WWC-Conducted Computations for the formulas the WWC used to calculate statistical significance. In the case of Torgesen et al. (2003), correction for multiple comparisons was needed, so the significance levels may differ from those reported in the original study.
8. The WWC-computed average effect sizes for each comparison and for the domain across comparisons are simple averages rounded to two decimal places. The average improvement indices are calculated from the average effect sizes.

## Appendix A3.2 Summary of findings for the comprehension domain by construct[1]

| Outcome measure | Study sample | Sample size (students) | Authors' findings from the study: Mean outcome (standard deviation[2]) *Read, Write & Type!™* group | Authors' findings from the study: Mean outcome (standard deviation[2]) Comparison group | WWC calculations: Mean difference[3] (*RWT* – comparison) | WWC calculations: Effect size[4] | WWC calculations: Statistical significance[5] (at $\alpha = 0.05$) | WWC calculations: Improvement index[6] |
|---|---|---|---|---|---|---|---|---|
| **Construct: Reading comprehension** | | | | | | | | |
| **Torgesen et al., 2003 (randomized controlled trial)[7]** | | | | | | | | |
| **Comparison #1: *Read, Write & Type!*™ vs. *Auditory Discrimination in Depth*® group** | | | | | | | | |
| Woodcock Reading Mastery Test: Passage Comprehension Subtest | Grade 1 | 104 | 99.30 (10.50) | 99.90 (12.50) | –0.60 | –0.05 | ns | –2 |
| **Comparison #2: *Read, Write & Type!*™ vs. regular instruction/support group** | | | | | | | | |
| Woodcock Reading Mastery Test: Passage Comprehension Subtest | Grade 1 | 77 | 100.20 (9.60) | 95.40 (14.40) | 4.80 | 0.38 | ns | +15 |
| **Construct: Vocabulary** | | | | | | | | |
| **Torgesen et al., 2003 (randomized controlled trial)** | | | | | | | | |
| **Comparison #1: *Read, Write & Type!*™ vs. *Auditory Discrimination in Depth*® group** | | | | | | | | |
| Estimated Verbal IQ | Grade 1 | 104 | 95.508 | 95.508 | 0.00 | 0.00 | ns | 0 |
| **Comparison #2: *Read, Write & Type!*™ vs. regular instruction/support group** | | | | | | | | |
| Estimated Verbal IQ | Grade 1 | 77 | 95.90 (11.20) | 95.90 (11.30) | 0.00 | 0.00 | ns | 0 |
| **Averages[9]** | | | | | | | | |
| **Average for comprehension, Comparison #1 (Torgesen et al., 2003)** | | | | | | –0.03 | ns | –1 |
| **Average for comprehension, Comparison #2 (Torgesen et al., 2003)** | | | | | | 0.19 | ns | +8 |
| **Domain average for comprehension across comparisons (Torgesen et al., 2003)** | | | | | | 0.08 | ns | +3 |

ns = not statistically significant

1. This appendix reports findings considered for the effectiveness rating and the average improvement indices in the comprehension domain.

*(continued)*

## Appendix A3.2 Summary of findings for the comprehension domain by construct *(continued)*

2. The standard deviation across all students in each group shows how dispersed the participants' outcomes are: a smaller standard deviation on a given measure would indicate that participants had more similar outcomes.
3. Positive differences and effect sizes favor the intervention group; negative differences and effect sizes favor the comparison group.
4. For an explanation of the effect size calculation, see Technical Details of WWC-Conducted Computations.
5. Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups.
6. The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. The improvement index can take on values between –50 and +50, with positive numbers denoting results favorable to the intervention group.
7. The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation about the clustering correction, see the WWC Tutorial on Mismatch. See Technical Details of WWC-Conducted Computations for the formulas the WWC used to calculate statistical significance. In the case of Torgesen et al. (2003), correction for multiple comparisons was needed, so the significance levels may differ from those reported in the original study.
8. The authors did not present standard deviations for this outcome, however, with the assumption that there were positive standard deviations, the zero mean difference between the RWT and the comparison groups generates a zero effect size.
9. The WWC-computed average effect sizes for each comparison and for the domain across comparisons are simple averages rounded to two decimal places. The average improvement indices are calculated from the average effect sizes.

## Appendix A4.1 *Read, Write & Type!*™ rating for the alphabetics domain

The WWC rates an intervention's effects in a given outcome domain as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative.[1]

For the outcome domain of alphabetics, the WWC rated *Read, Write & Type!*™ as having potentially positive effects. It did not meet the criteria for positive effects because only one study met WWC evidence standards. The remaining ratings (mixed effects, no discernible effects, potentially negative effects, negative effects) were not considered because the intervention was assigned the highest applicable rating.

### Rating received

**Potentially positive effects:** Evidence of a positive effect with no overriding contrary evidence.

- Criterion 1: At least one study showing a statistically significant or substantively important *positive* effect.

  **Met.** One comparison within one study showed statistically significant positive effects.

- Criterion 2: No studies showing a statistically significant or substantively important *negative* effect and fewer or the same number of studies showing *indeterminate* effects than showing statistically significant or substantively important *positive* effects.

  **Met.** No studies showed a statistically significant or substantively important negative effect.

### Other ratings considered

**Positive effects:** Strong evidence of a positive effect with no overriding contrary evidence.

- Criterion 1: Two or more studies showing statistically significant *positive* effects, at least one of which met WWC evidence standards for a strong design.

  **Not met.** Only one study met the WWC evidence standards for a strong design and showed statistically significant positive effects.

- Criterion 2: No studies showing statistically significant or substantively important *negative* effects.

  **Met.** No studies showed statistically significant or substantively important negative effects.

1. For rating purposes, the WWC considers the statistical significance of individual outcomes and the domain-level effect. The WWC also considers the size of the domain-level effect for ratings of potentially positive or potentially negative effects. See the WWC Intervention Rating Scheme for a complete description.

## Appendix A4.2 *Read, Write & Type!*™ rating for the comprehension domain

The WWC rates an intervention's effects in a given outcome domain as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative.[1]

For the outcome domain of comprehension, the WWC rated *Read, Write & Type!*™ as having no discernible effects. It did not meet the criteria for other ratings (positive effects, potentially positive effects, mixed effects, potentially negative effects, and negative effects) because the one study that met WWC standards did not show statistically significant or substantively important effects.

### Rating received

**No discernible effects:** No affirmative evidence of effects.

- Criterion 1: None of the studies shows a statistically significant or substantively important effect, either *positive* or *negative.*

  **Met.** No study showed a statistically significant or substantively important effect, either positive or negative.

### Other ratings considered

**Positive effects:** Strong evidence of a positive effect with no overriding contrary evidence.

- Criterion 1: Two or more studies showing statistically significant *positive* effects, at least one of which met WWC evidence standards for a strong design.

  **Not met.** Only one study met the WWC evidence standards for a strong design.

- Criterion 2: No studies showing statistically significant or substantively important *negative* effects.

  **Met.** No study showed statistically significant or substantively important negative effects.

**Potentially positive effects:** Evidence of a positive effect with no overriding contrary evidence.

- Criterion 1: At least one study showing a statistically significant or substantively important *positive* effect.

  **Not met.** No study showed a statistically significant or substantively important positive effect.

- Criterion 2: No studies showing a statistically significant or substantively important *negative* effect and fewer or the same number of studies showing *indeterminate* effects than showing statistically significant or substantively important *positive* effects.

  **Not met.** No study showed a statistically significant or substantively important negative effect, but one study showed indeterminate effects.

**Mixed effects:** Evidence of inconsistent effects as demonstrated through either of the following criteria.

- Criterion 1: At least one study showing a statistically significant or substantively important *positive* effect, and at least one study showing a statistically significant or substantively important *negative* effect, but no more such studies than the number showing a statistically significant or substantively important *positive* effect.

  **Not met.** No study showed a statistically significant or substantively important effect, either positive or negative.

- Criterion 2: At least one study showing a statistically significant or substantively important effect, and more studies showing an *indeterminate* effect than showing a statistically significant or substantively important effect.

  **Not met.** No study showed a statistically significant or substantively important effect, while one study showed indeterminate effects.

*(continued)*

## Appendix A4.2 *Read, Write & Type!*™ rating for the comprehension domain *(continued)*

**Potentially negative effects:** Evidence of a negative effect with no overriding contrary evidence

- Criterion 1: At least one study showing a statistically significant or substantively important *negative* effect.

  **Not met.** No study showed a statistically significant or substantively important negative effect.

- Criterion 2: No studies showing a statistically significant or substantively important *positive* effect, or more studies showing statistically significant or substantively important *negative* effects than showing statistically significant or substantively important *positive* effects.

  **Met.** No study showed a statistically significant or substantively important positive effect.

**Negative effects:** Strong evidence of a negative effect with no overriding contrary evidence.

- Criterion 1: Two or more studies showing statistically significant *negative* effects, at least one of which met WWC evidence standards for a strong design.

  **Not met.** No study showed a statistically significant or substantively important negative effect.

- Criterion 2: No studies showing statistically significant or substantively important *positive* effects.

  **Met.** No study showed statistically significant or substantively important positive effects.

1. For rating purposes, the WWC considers the statistical significance of individual outcomes and the domain-level effect. The WWC also considers the size of the domain-level effect for ratings of potentially positive or potentially negative effects. See the WWC Intervention Rating Scheme for a complete description.

## Appendix A5 Extent of evidence by domain

| Outcome domain | Number of studies | Sample size | | Extent of evidence[1] |
|---|---|---|---|---|
| | | Schools | Students | |
| Alphabetics | 1 | 5 | 146 | Small |
| Fluency | 0 | 0 | 0 | na |
| Comprehension | 1 | 5 | 146 | Small |
| General reading achievement | 0 | 0 | 0 | na |

na = not applicable/not studied

1. A rating of "moderate to large" requires at least two studies and two schools across studies in one domain and a total sample size across studies of at least 350 students or 14 classrooms. Otherwise, the rating is "small."