What Works Clearinghouse

ies INSTITUTE OF EDUCATION SCIENCES

Reading Plus®

Program Description[1]

Reading Plus® is a web-based reading intervention that uses technology to provide individualized scaffolded silent reading practice for students in grade 3 and higher. *Reading Plus*® aims to develop and improve students' silent reading fluency, comprehension, and vocabulary. *Reading Plus*® is designed to adjust the difficulty of the content and duration of reading activities so that students proceed at a pace that corresponds to their reading skill level. The intervention includes differentiated reading activities, computer-based reading assessments, tools to monitor student progress, ongoing implementation support, and supplemental offline activities.

Research[2]

One study of *Reading Plus*® that falls within the scope of the Adolescent Literacy review protocol meets What Works Clearinghouse (WWC) evidence standards with reservations. The study included 13,128 students, ranging from grade 5 through grade 9, who attended schools in Miami-Dade County in Florida.[3]

Based on one study, the WWC considers the extent of evidence for *Reading Plus*® on adolescent learners to be small for the comprehension domain. The one study that meets WWC evidence standards with reservations did not examine the effectiveness of *Reading Plus*® on adolescent learners in the alphabetic, reading fluency, or general literacy achievement domains.

Effectiveness

Reading Plus® was found to have potentially positive effects on comprehension for adolescent learners.

	Alphabetics	*Reading fluency*	*Comprehension*	*General literacy achievement*
Rating of effectiveness	na	na	Potentially positive effects	na
Improvement index	na	na	+2 percentile points	na

na = not applicable

1. The descriptive information for this program was obtained from a publicly available source: the developer's website (http://www.readingplus.com/, downloaded December 2009). The WWC requests developers to review the program description sections for accuracy from their perspective. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review. The literature search reflects documents publicly available by March 2010.
2. The studies in this report were reviewed using WWC Evidence Standards, Version 2.0 (see the WWC Procedures and Standards Handbook, Chapter III), as described in protocol Version 2.0.
3. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

Additional program information

Developer and contact

Reading Plus® was developed by Taylor Associates/Communications, Inc. Address: Reading Plus®/Taylor Associates, 110 West Canal Street, Suite 301, Winooski, VT 05404. Email: info@readingplus.com. Web: http://www.readingplus.com/. Telephone: (800) 732-3758; (802) 735-1942. Fax: (802) 419-4786.

Scope of use

The program is used in public and private elementary and secondary schools, colleges and universities, and reading clinics, as well as through home study courses. Students of all abilities and from multiple subpopulations, in both urban and rural settings, use *Reading Plus*®.

Teaching

Reading Plus® includes web-based assessment and intervention components, as well as supplemental offline activities for direct instruction. After a student completes the initial assessments that determine the individual independent silent reading rate and level, the computer-based program assigns the student to the appropriate *Reading Plus*® intervention path and adapts to meet individual needs while the program is being used. The program length (and intensity) can vary from 9 weeks (3–4 times per week) to 30 weeks (5 times per week).

Within a typical 45-minute *Reading Plus*® session, students engage in the following activities:

- Visual perceptual warm-up activities that aim to build attention, left-to-right tracking, perceptual accuracy, and the visual memory required for proficient reading
- Scaffolded silent reading activities that dynamically adjust content-level difficulty, degree of repetition, duration of reading, rate, and style of presentation
- Contextual analysis activities that aim to build word knowledge and contextual analysis skills, vocabulary mastery, and predictive and inferential abilities

Competency with 25 comprehension skills is tracked during the scaffolded silent reading activities, and students are assigned appropriately leveled offline skills lessons that target identified deficiencies. Teachers are provided guidelines for organizing small-group and whole-group comprehension skills instruction using these offline assignments.

Cost

Reading Plus® license and hosting costs for schools are based on the number of participating students. Costs in typical installations vary from $15 to $30 per student.

Research

Eighteen studies reviewed by the WWC investigated the effects of *Reading Plus*® on adolescent learners. One study (Reading Plus, 2008) is a quasi-experimental design that meets WWC evidence standards with reservations. The remaining 17 studies do not meet either WWC evidence standards or eligibility screens.

Meets evidence standards with reservations

Reading Plus (2008) conducted a quasi-experimental study that examined the effects of *Reading Plus*® on students in grades 5 to 9 across 98 schools in Florida. Students who completed one or more *Reading Plus*® lessons during the 2006–07 school year formed the intervention group, and students who completed no *Reading Plus*® lessons during the same period constituted the comparison group. Although impacts of *Reading Plus*® were analyzed for various grades and student populations, baseline equivalence[4] between intervention and comparison conditions was established only for low-achieving students (who scored at level 1 or 2 on the 2006 reading portion of the Florida

4. Baseline equivalence of the analytical sample was established using these criteria (see the WWC Procedures and Standards Handbook, Version 2.0, Chapter III, p. 15): (1) the reported difference of the observed characteristics (defined in the topic area review protocol) must be less than 0.25 of a standard deviation (based on the variation of that characteristic in the pooled sample), and (2) the effects must be statistically adjusted for baseline differences in the characteristics if the difference is greater than 0.05 of a standard deviation.

Research *(continued)*

Comprehensive Assessment Test [FCAT]).[5] The WWC based its effectiveness ratings on findings from comparisons of the 6,070 low-achieving students who received *Reading Plus*® and the 7,058 low-achieving comparison students who did not receive *Reading Plus*®. The study reported students' outcomes after six months of program implementation.

Extent of evidence

The WWC categorizes the extent of evidence in each domain as small or medium to large (see the WWC Procedures and Standards Handbook, Appendix G). The extent of evidence takes into account the number of studies and the total sample size across the studies that meet WWC evidence standards with or without reservations.[6]

The WWC considers the extent of evidence for *Reading Plus*® to be small for the comprehension domain for adolescent learners. The one study that meets WWC evidence standards with reservations did not examine the effectiveness of *Reading Plus*® on adolescent learners in the alphabetic, reading fluency, or general literacy achievement domains.

Effectiveness

Findings

The WWC review of Adolescent Literacy interventions addresses student outcomes in four domains: alphabetics, reading fluency, comprehension, and general literacy achievement. The study included in this report covers one domain—comprehension. The findings below present the authors' estimates and WWC-calculated estimates of the size and the statistical significance of the effects of *Reading Plus*® on adolescent learners.[7]

Comprehension. Reading Plus (2008) found a statistically significant positive effect of *Reading Plus*® on the reading portion of the FCAT for low-achieving students. The WWC-calculated effect was small (0.06) but statistically significant. Thus, for the comprehension domain, one study showed statistically significant positive effects.

Rating of effectiveness

The WWC rates the effects 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, the size of the difference between participants in the intervention and the comparison conditions, and the consistency in findings across studies (see the WWC Procedures and Standards Handbook, Appendix E).

The WWC found *Reading Plus*® to have potentially positive effects on comprehension for adolescent learners

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 WWC Procedures and Standards Handbook, Appendix F). The improvement index represents the difference between the percentile rank of the average student in the intervention condition and the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement

5. Analyses for the whole sample, for each grade (5, 6, 7, 8, and 9), and for subpopulations (by ethnicity, for the average/high achieving subgroup), and for students receiving 40 or more *Reading Plus*® lessons, do not meet WWC evidence standards because the intervention and comparison groups were not shown to be equivalent at baseline.
6. 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 the students' demographics and the types of settings in which studies took place—are not taken into account for the categorization. Information about how the extent of evidence rating was determined for *Reading Plus*® is in Appendix A5.
7. The level of statistical significance was reported by the study authors or, when necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For the formulas the WWC used to calculate the statistical significance, see WWC Procedures and Standards Handbook, Appendix C for clustering and WWC Procedures and Standards Handbook, Appendix D for multiple comparisons. In the case of Reading Plus (2008), no corrections for clustering or multiple comparisons were needed.

The WWC found *Reading Plus*® to have potentially positive effects on comprehension for adolescent learners *(continued)*

index is entirely based on the size of the effect, regardless of the statistical significance of the effect, the study design, or the analysis. The improvement index can take on values between –50 and +50, with positive numbers denoting favorable results for the intervention group.

The improvement index for comprehension is +2 percentile points for a single finding from one study.

Summary

The WWC reviewed 18 studies on *Reading Plus*® for adolescent learners. One of these studies meets WWC evidence standards with reservations; the remaining 17 studies do not meet either WWC evidence standards or eligibility screens. Based on one study, the WWC found potentially positive effects on comprehension for adolescent learners. The conclusions presented in this report may change as new research emerges.

References

Meets WWC evidence standards with reservations

Reading Plus. (2008). *Reading improvement report: Miami-Dade regions II and III.* Huntington Station, NY: Taylor Associates/ Communications, Inc.

Studies that fall outside the Adolescent Literacy review protocol or do not meet WWC evidence standards

Allen, L. A. (2006). Metacognition and reading: Strategies for struggling readers (Master's thesis, Pacific Lutheran University). *Masters Abstracts International, 45*(03), 57–1186. The study is ineligible for review because it does not use a comparison group design or a single-case design.

Barnes, J. E. (2003). *A pilot study regarding the effects of the* Reading Plus *program on reading levels.* Unpublished master's thesis, Western Michigan University, Kalamazoo. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.

Marrs, H., & Patrick, C. (2002). A return to eye-movement training? An evaluation of the *Reading Plus* program. *Reading Psychology, 23*(4), 297. The study is ineligible for review because it does not use a comparison group design or a single-case design.

Matthews, A. (2005). *Effects of using* Reading Plus 2000® *on the reading rate of students with learning disabilities and visual efficiency problems.* Unpublished educational specialist's thesis, Valdosta State University, GA. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample includes less than 50% general education students.

Petscher, Y., & Feller, K. (2010). *The value-added of a silent reading fluency instructional protocol and grade 4–10 students' achievement in reading comprehension and general literacy.* Unpublished manuscript. The study does not meet WWC evidence standards because it uses a quasi-experimental design in which the analytic intervention and comparison groups are not shown to be equivalent.

Petscher, Y., & Feller, K. (2010). *The value-added of a silent reading fluency instructional protocol and retained students' achievement in reading comprehension and general literacy.* Unpublished manuscript. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.

Phillips, S. (2006). Hi-tech goggles said to aid reading. *Times Educational Supplement* (4691), 20 The study is ineligible for review because it is not a primary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Rasinski, T., Samuels, S. J., Hiebert, E., Petscher, Y., & Feller, K. (in press). *The relationship between a silent reading fluency instructional protocol on students' reading comprehension and achievement in an urban school setting.* Forthcoming in *Reading Psychology*. The study does not meet WWC evidence standards because it uses a quasi-experimental design in which the analytic intervention and comparison groups are not shown to be equivalent.

References *(continued)*

Reading Plus. (2007). *National research project: Nicoma Park Intermediate School overview 2005–2006.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study is ineligible for review because it does not use a comparison group design or a single-case design.

Reading Plus. (2007). *National research project: Prescott High School overview 2006–2007.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study is ineligible for review because it does not use a comparison group design or a single-case design.

Reading Plus. (2007). Reading Plus *national research project: Belle Valley Elementary School overview 2005–2006.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study is ineligible for review because it does not use a comparison group design or a single-case design.

Reading Plus. (2007). Reading Plus *national research project: Fourth grade study overview 2005–2006.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study is ineligible for review because it uses a randomized controlled trial design that either did not generate groups using a random process or had nonrandom allocations after random assignment, and the subsequent analytic intervention and comparison groups are not shown to be equivalent.

Reading Plus. (2007). Reading Plus *national research project: Galatas Elementary study summary 2005–2006.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.

Reading Plus. (2007). Reading Plus *national research project: Golden West High School overview 2005–2006.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study does not meet WWC evidence standards because it uses a quasi-experimental design in which the analytic intervention and comparison groups are not shown to be equivalent.

Reading Plus. (2007). Reading Plus *national research project: Second grade study overview 2005–2006.* Huntington Station, NY: Taylor Associates/Communications, Inc. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.

Schlange, D., Patel, H., & Caden, B. (1999). Evaluation of the *Reading Plus 2000* and visagraph system as a remedial program for academically "at risk" sixth and eighth grade students: A pilot study. *Optometry and Vision Science, 76*(poster 11). The study is ineligible for review because it does not use a comparison group design or a single-case design.

Slavin, R. E., Cheung, A., Groff, C., & Lake, C. (2008). Effective reading programs for middle and high schools: A best-evidence synthesis. *Reading Research Quarterly, 43*(3), 290–322. The study is ineligible for review because it is not a primary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Appendix

Appendix A1 Study characteristics: Reading Plus, 2008

Characteristic	Description
Study citation	Reading Plus. (2008). *Reading improvement report: Miami-Dade regions II and III.* Huntington Station, NY: Taylor Associates/Communications, Inc.
Participants	This quasi-experimental study was conducted in 98 schools and included students in grades 5 to 9 who had valid 2006 and 2007 Florida Comprehensive Assessment Test (FCAT) reading scores. Students who completed one or more *Reading Plus*® lessons during the 2006–07 school year formed the intervention group, and students who completed no *Reading Plus*® lessons during the same period constituted the comparison group. Although *Reading Plus*® was used by students in various grades and student populations within each of the 98 schools,[1] this review focuses on students who scored at achievement level 1 or 2 (non-proficient) on the 2006 reading portion of the FCAT. The analysis sample consisted of 6,070 low-achieving students in the *Reading Plus*® group and 7,058 low-achieving students in the comparison group.
Setting	The study was conducted in 98 schools located in two regions that are part of the Miami-Dade School District in Florida. The participating schools served more than 90% minority students and 22% English language learners, and 15% of the student population received special education services.
Intervention	*Reading Plus*® is a computer-based program that is implemented online. It encompasses the following activities: instant word recognition practice with less familiar words, reading practice with text difficulty matched to each student's reading ability, exposure to high-utility words within assigned texts, attention building activities, sustained reading time matched with each student's attention span, vocabulary building, word acquisition activities, and practice with 25 comprehension skills. The participating schools implemented *Reading Plus*® to varying degrees. Most schools followed a schedule of either two 45-minute sessions per week or three 30-minute sessions per week for approximately six months. The average number of lessons completed by students participating in the study was 33.
Comparison	Comparison students completed no *Reading Plus*® lessons. Most nonparticipating students used Scholastic's *Read 180* and/or Renaissance Learning's *Accelerated Reader.*
Primary outcomes and measurement	For both the pretest and the posttest, students took the Florida Comprehensive Assessment Test (FCAT). Reading comprehension was measured using the developmental scaled scores on the reading section of the FCAT. For a more detailed description of this outcome measure, see Appendix A2.
Staff/teacher training	Intervention teachers were trained on the use and intent of *Reading Plus*® during the fall of 2006. No other information is available about the training.

1. Analyses for the whole sample, for each grade (5, 6, 7, 8, and 9), and for subpopulations (by ethnicity, for the average/high achieving subgroup), and for students receiving 40 or more *Reading Plus*® lessons, do not meet WWC evidence standards because the intervention and comparison groups were not shown to be equivalent at baseline.

Appendix A2 Outcome measure for the comprehension domain

Outcome measure	Description
Reading comprehension construct	
Florida Comprehensive Assessment Test (FCAT) reading portion	The reading portion of this standardized test is a group-administered, criterion-referenced test consisting of six to eight informational and literary reading passages (Florida Department of Education, 2005).[1] In grades 3 through 10, students respond to between 6 and 11 multiple-choice items for each passage and are assessed across four content clusters: (1) reading comprehension in the areas of words and phrases in context, (2) main idea, (3) comparison and cause and effect, and (4) reference and research. In grades 4, 8, and 10, open-ended questions are included (as cited in Reading Plus, 2008; Schatschneider et al., 2004).[2]

1. Florida Department of Education. (2005, September). *Florida Comprehensive Assessment Test summary of tests and design*. Retrieved August 21, 2008, from http://fcat.fldoe.org/pdf/fc05 designsummary.pdf
2. Schatschneider, C., Buck, J., Torgesen, J. K., Wagner, R. K., Hassler, L., Hecht, S., and Powell-Smith, K. (2004). *A multivariate study of factors that contribute to individual differences in performance on the Florida Comprehensive Reading Assessment Test* (Technical Report No. 5). Tallahassee: Florida Center for Reading Research.

Appendix A3 Summary of study findings included in the rating for the comprehension domain[1]

Outcome measure	Study sample	Sample size (schools/ students)	Authors' findings from the study: Mean outcome[2] (standard deviation)[3] — *Reading Plus*® group	Authors' findings from the study: Mean outcome[2] (standard deviation)[3] — Comparison group	WWC calculations: Mean difference[4] (*Reading Plus*® – comparison)	WWC calculations: Effect size[5]	WWC calculations: Statistical significance[6] (at $\alpha = 0.05$)	WWC calculations: Improvement index[7]
Reading Plus, 2008[8, 9]								
FCAT reading portion	Grades 5–9 (levels 1–2)	98/13,128	1,554.54 (275.07)	1,538.59 (295.19)	15.95	0.06	Statistically significant	+2
Domain average for comprehension (Reading Plus, 2008)[10]						**0.06**	**Statistically significant**	**+2**

FCAT= Florida Comprehensive Assessment Test

1. This appendix reports findings considered for the effectiveness rating and the average improvement indices for the comprehension domain.
2. The *Reading Plus*® group mean outcome values for Reading Plus (2008) are the unadjusted comparison group posttest means plus the difference in mean gains between the intervention and comparison groups.
3. The standard deviation across all students in each group shows how dispersed the participants' outcomes are: a smaller standard deviation on a given measure indicates that participants had more similar outcomes.
4. Positive differences and effect sizes favor the intervention group; negative differences and effect sizes favor the comparison group.
5. For an explanation of the effect size calculation, see WWC Procedures and Standards Handbook, Appendix B.
6. Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups.
7. The improvement index represents the difference between the percentile rank of the average student in the intervention condition and that of the average student in the comparison condition. The improvement index can take on values between –50 and +50, with positive numbers denoting favorable results for the intervention group.
8. The level of statistical significance was reported by the study authors or, when necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For the formulas the WWC used to calculate the statistical significance, see WWC Procedures and Standards Handbook, Appendix C for clustering and WWC Procedures and Standards Handbook, Appendix D for multiple comparisons. In the case of Reading Plus (2008), no corrections for clustering or multiple comparisons were needed.
9. For Reading Plus (2008), the mean outcomes and standard deviations were received through communication with the authors.
10. This row provides the study average, which in this instance is also the domain average. The WWC-computed domain average effect size is a simple average rounded to two decimal places. The domain improvement index is calculated from the average effect size.

Appendix A4 *Reading Plus*® rating for the comprehension domain

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

For the comprehension outcome domain, the WWC rated *Reading Plus*® as having potentially positive effects for adolescent learners. The remaining ratings (mixed effects, no discernible effects, potentially negative effects, or negative effects) were not considered, as *Reading Plus*® 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 study showed statistically significant positive effects.

AND

- 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 statistically significant or substantively important negative effects.

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. One study, which did not meet WWC evidence standards for a strong design, showed statistically significant positive effects.

AND

- 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. For a complete description, see the WWC Procedures and Standards Handbook, Appendix E.

Appendix A5 Extent of evidence by domain

Outcome domain	Number of studies	Sample size		Extent of evidence[1]
		Schools	Students	
Alphabetics	na	na	na	na
Reading fluency	na	na	na	na
Comprehension	1	98	13,128	Small
General literacy achievement	na	na	na	na

na = not applicable/not studied

1. A rating of "medium 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." For more details on the extent of evidence categorization, see the WWC Procedures and Standards Handbook, Appendix G.