What Works Clearinghouse

ies INSTITUTE OF EDUCATION SCIENCES

Lexia Reading

Program Description[1]

Lexia Reading is a computerized reading program that provides phonics instruction and gives students independent practice in basic reading skills. *Lexia Reading* is designed to supplement regular classroom instruction. It is designed to support skill development in the five areas of reading instruction identified by the National Reading Panel.

Research[2]

Two studies of *Lexia Reading* meet What Works Clearinghouse (WWC) evidence standards and one study meets WWC evidence standards with reservations. The three studies included 314 students in kindergarten and first grade in two states.[3]

Based on these three studies, the WWC considers the extent of evidence for *Lexia Reading* to be small for alphabetics, fluency, comprehension, and general reading achievement.

Effectiveness

Lexia Reading was found to have potentially positive effects on alphabetics, no discernible effects on fluency, potentially positive effects on comprehension, and no discernible effects on general reading achievement.

	Alphabetics	*Fluency*	*Comprehension*	*General reading achievement*
Rating of effectiveness	Potentially positive	No discernible effects	Potentially positive	No discernible effects
Improvement index[4]	Average: +11 percentile points Range: –31 to +50 percentile points	+9 percentile points Range: –15 to +30 percentile points	+11 percentile points	+9 percentile points

1. The descriptive information for this program was obtained from a publicly available source: the program's website (www.lexialearning.com, downloaded September 2008). 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.
2. The studies in this report were reviewed using WWC Evidence Standards, Version 1.0 (see the WWC Standards).
3. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.
4. These numbers show the average and range of student-level improvement indices for all findings across the study (studies).

Additional program information

Developer and contact

Lexia Learning was developed by Lexia Learning Systems, Inc. Address: 200 Baker Ave. Extension, Concord, MA 01742. Email: info@lexialearning.com. Web: www.lexialearning.com. Telephone: (800) 435-3942; Outside USA: (978) 405-6200. Fax: (978) 287-0062.

Scope of use

Lexia Learning Systems has been developing reading skills software since 1984. In October 2007, Lexia released its newest version of reading skills software: *Lexia Reading*, which combines the three core Lexia skills programs: *Early Reading, Primary Reading,* and *Strategies for Older Students* (which are intended for pre-K through adult users) under a single management system with Internet-based reporting and data-hosting features that make installation and maintenance easier for schools.

Teaching

Lexia Reading is a computerized, supplementary reading software program designed for regular use, consisting of two to five weekly sessions of 20 to 30 minutes each, in a lab or classroom setting. *Lexia Reading* is compatible with a tiered model of instruction and is designed to be used for 20 to 30 minutes per session. The program is intended for use twice per week for students reading on grade level or above, three to four times per week for students who are at-risk or are English as Second Language/English Language Learners (ESL/ELL) students, and five times per week for special education, Title I, and ESL/ELL students with serious reading deficiencies. Students work independently, and the software tracks student responses and automatically provides additional practice when needed. The Internet-based reports from the developer allow educators to assess and monitor progress at the individual, class, school, or district level. Reports provide ongoing assessments of reading skills and progress to assist educators with choices about differentiated reading instruction. The Internet-enabled version provides on-demand access to *Lexia Reading* in homes, libraries, after-school programs, and community centers.

Cost

Lexia Reading offers customized pricing based on the individual needs of each school or district. For example, operating *Lexia Reading* (including all three reading programs—*Early Reading, Primary Reading,* and *Strategies for Older Students*) in one school with a computer lab of 25 stations would cost $12,500 to purchase licenses and $1,350 for one year of hosting and maintenance (including data storage and technical support). The 25 concurrent licenses would support daily program use for 125 students.

Research

Eleven studies reviewed by the WWC investigated the effects of *Lexia Reading*. Two studies (Gale, 2006; Macaruso, Hook, & McCabe, 2006) are randomized controlled trials that meet WWC evidence standards. One study (Macaruso & Walker, 2008) uses a quasi-experimental design that meets WWC evidence standards with reservations. The remaining eight studies do not meet either WWC evidence standards or eligibility screens.

Meets evidence standards

Macaruso, Hook, and McCabe (2006) randomly assigned 10 classrooms in five schools to either a treatment group that was exposed to *Lexia Reading Phonics Based Reading*[5] and *Strategies for Older Students* components or to a control group that did not. Eighty-three students in the five treatment group classrooms participated in *Lexia Reading* for two to four weekly sessions of 20 to 30 minutes each, and 84 students in the five

5. *Lexia Phonics Based Reading* was an earlier version that was later replaced with *Lexia Primary Reading*.

Research *(continued)*

comparison group classrooms received regular classroom instruction during that time.

Gale (2006) identified kindergarten and first-grade students whose fall Dynamic Indicators of Basic Early Literacy Skills (DIBELS) test scores indicated that they needed substantial intensive intervention. Among those students, 41 kindergarten students and 38 first-grade students were randomly assigned to one of three groups, with 39 kindergarten and 37 first-grade students remaining after attrition: (1) *Lexia Early Reading*, (2) Earobics® Step 1, or (3) control. Students in groups 1 and 2 received the supplemental interventions during the five-week study period in addition to their regular instruction; students in the control group received no reading instruction beyond their regular language arts class time.

Meets evidence standards with reservations

Macaruso and Walker (2008) randomly assigned classrooms to treatment and comparison groups; however, they excluded treatment group students from the analysis sample if they did not complete at least 45 *Lexia Reading* sessions. Because this exclusion leads to a nonrandom sample of classroom students in the analysis sample, the WWC considers this design to be quasi-experimental. The study analyzed the effects of *Lexia Early Reading* on 26 kindergarten students in three classes who were assigned to receive *Lexia Early Reading* compared with 45 students in three classes who were not.

Extent of evidence

The WWC categorizes the extent of evidence in each domain as small or medium 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 meet WWC evidence standards with or without reservations.[6]

The WWC considers the extent of evidence for *Lexia Reading* to be small for alphabetics, fluency, comprehension, and general reading achievement.

Effectiveness

Findings

The WWC review of interventions for Beginning Reading addresses student outcomes in four domains: alphabetics, reading fluency, comprehension, and general reading achievement. The studies included in this report cover all four domains. The findings below present the authors' estimates and WWC-calculated estimates of the size and the statistical significance of the effects of *Lexia Reading* on students.[7]

Alphabetics. Gale (2006) analyzed three alphabetics outcomes (DIBELS: Initial Sounds Fluency, Letter Naming Fluency, and Phoneme Segmentation Fluency subtests) for kindergarten students and three outcomes (DIBELS: Letter Naming Fluency, Phoneme Segmentation Fluency, and Nonsense Word Fluency subtests) for first-grade students. The outcomes of the *Lexia Early Reading* group were compared against those from two other groups: one receiving no supplemental instruction and one receiving Earobics®.

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 *Lexia Reading* is in Appendix A6.
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 an explanation, see the WWC Tutorial on Mismatch. For the formulas the WWC used to calculate the statistical significance, see Technical Details of WWC-Conducted Computations. In the cases of Gale (2006) and Macaruso and Walker (2008), a correction for multiple comparisons was needed, and in the cases of Macaruso, Hook, and McCabe (2006) and Macaruso and Walker (2008), a correction for clustering was needed, so the significance levels may differ from those reported in the original studies.

Effectiveness *(continued)*

The first comparison was *Lexia Early Reading* versus no supplemental instruction. The author reported, and the WWC confirmed, positive and statistically significant effects of *Lexia Early Reading* for two DIBELS subtests: Initial Sounds Fluency (kindergarten) and Phoneme Segmentation Fluency (kindergarten). The author reported statistically significant effects of *Lexia Early Reading* versus no supplemental instruction in first grade for three DIBELS subtests (Phoneme Segmentation Fluency, Letter Naming Fluency, and Nonsense Word Fluency). In WWC calculations, none of these effects were statistically significant, however, the WWC determined that the effects for all of the subtests were positive and large enough to be considered substantively important (that is, an effect size of at least 0.25)

The second comparison was *Lexia Early Reading* versus Earobics®. The author found no statistically significant effect on three of the four DIBELS subtests for either of the two grades. For first-grade students, the author reported a statistically significant difference on the Phoneme Segmentation Fluency subtest. The WWC found that this effect was not statistically significant, however, the WWC determined that three of the negative effects were large enough to be considered substantively important: Initial Sounds Fluency (kindergarten), Phoneme Segmentation Fluency (grade 1), and Nonsense Words Fluency (grade 1).

The WWC found that the combined effect for alphabetics across both comparison groups was not statistically significant, but was positive and large enough to be considered substantively important.

Macaruso and Walker (2008) reported positive but not statistically significant effects of *Lexia Early Reading* when compared to the no intervention group on four alphabetics outcomes, and a positive and statistically significant effect on one outcome (Oral Language Concepts). The WWC found that this effect was not statistically significant. However, the effects of the Gates-MacGintie subtests for Oral Language Concepts and Literacy Concepts were positive and large enough to be considered substantively important. The WWC found that the combined effect for alphabetics across all measures was not statistically significant nor was it large enough to be considered substantively important.

Fluency. Gale (2006) found positive but not statistically significant effects of *Lexia Early Reading* when compared to the no intervention group, and negative but not statistically significant effects of *Lexia Early Reading* when compared to Earobics® on the DIBELS: Oral Reading Fluency subtest. The WWC determined that both the positive and negative effects were large enough to be substantively important.

The WWC found that the combined effect for fluency across both comparison groups was neither statistically significant nor substantively important.

Comprehension. Macaruso and Walker (2008) found a positive but not statistically significant effect of *Lexia Early Reading* when compared to the no intervention group on the Gates-MacGintie Reading Test, Level PR: Listening Comprehension subtest. The WWC determined that the positive effect was large enough to be substantively important.

General Reading Achievement. Macaruso, Hook, and McCabe (2006) found no statistically significant effect of *Lexia Reading* on the Gates-MacGintie Reading Test, Level Beginning Reading (BR): Form S, nor was the effect large enough to be considered substantively important by the WWC.

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 Intervention Rating Scheme).

The WWC found *Lexia Reading* to have potentially positive effects for alphabetics, no discernible effects on fluency, potentially positive effects on comprehension, and no discernible effects on general reading achievement

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 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 results favorable to the intervention group.

The average improvement index for alphabetics is +11 percentile points across the two studies, with a range of –31 to +50 percentile points across findings. The improvement index for fluency is +9 percentile points, with a range of –15 to +30. The improvement index for comprehension is +11 percentile points, reflecting only one outcome. The improvement index for general reading achievement is +9 percentile points, reflecting only one outcome.

Summary

The WWC reviewed 11 studies on *Lexia Reading*. Two of these studies meet WWC evidence standards. One study meets WWC evidence standards with reservations. The remaining eight studies do not meet either WWC evidence standards or eligibility screens. Based on the three studies, the WWC found potentially positive effects of *Lexia Reading* on alphabetics and comprehension and no discernible effects on fluency and general reading achievement. The conclusions presented in this report may change as new research emerges.

References

Meets WWC evidence standards

Macaruso, P., Hook, P. E., & McCabe, R. (2006). The efficacy of computer-based supplementary phonics programs for advancing reading skills in at-risk elementary students. *Journal of Research in Reading, 29*(2), 162–172.

Additional source:

Macaruso, P., Hook, P., & McCabe, R. (2003). *The efficacy of* Lexia *skills-based software for improving reading comprehension*. Retrieved February 4, 2009 from Lexia Learning website: http://www.lexialearning.com.au/library/source/research/revere_030912.pdf.

Gale, D. (2006). *The effect of computer-delivered phonological awareness training on the early literacy skills of students identified as at-risk for reading failure.* Retrieved May, 2008 from the University of South Florida website: http://purl.fcla.edu/usf/dc/et/SFE0001531.

Meets WWC evidence standards with reservations

Macaruso, P., & Walker, A. (2008). The efficacy of computer-assisted instruction for advancing literacy skills in kindergarten children. *Reading Psychology, 29*(3), 266–287.

Studies that fall outside the Beginning Reading protocol or do not meet WWC evidence standards

Lankutis, T. (2001). Reaching the struggling reader. *Technology & Learning, 21*(10), 24–31. This study is ineligible for review because it does not include a student outcome.

Macaruso, P., & Hook, P. (2007). Computer assisted instruction: Successful only with proper implementation. *Perspectives on Language and Literacy*, Summer, 43–46. This study is ineligible for review because it does not examine the effectiveness of an intervention.

References *(continued)*

Macaruso, P., Hook, P., McCabe, R., Rodman, A., & Walker, A. (2007, September). *Closing the reading achievement gap.* Concord, MA: Lexia Learning Systems, Inc. This study is ineligible for review because it does not examine the effectiveness of an intervention.

Macaruso, P., & Rodman, A. (2008). *Benefits of computer-assisted instruction on early literacy skills in young children*. Manuscript submitted for publication in *Reading and Writing Quarterly*. (**Preschool study**). This study is ineligible for review because it does not use a sample within the age or grade range specified in the protocol.

Macaruso, P., & Rodman, A. (2008). *Benefits of computer-assisted instruction on early literacy skills in young children*. Manuscript submitted for publication in *Reading and Writing Quarterly*. (**Kindergarten study**). This study does not meet WWC evidence standards because the measures of effectiveness cannot be attributed solely to the intervention—there was only one unit assigned to one or both conditions.

MacLaughlin, A. I. (2003). *Will a computer based phonics practice program result in higher reading and writing skills for kindergarten children?* Unpublished master's thesis, Salem State College, Salem, MA. This study is ineligible for review because it does not use a comparison group.

Ruth, R. (1997). *Remedial reading instruction using the Accelerated Learning Program.* Retrieved February 27, 2009 from Lexia Learning website: http://www.lexialearning.com.au/library/source/research/robert_ruth_1997.pdf. This study is ineligible for review because it does not use a sample within the age or grade range specified in the protocol.

Stevens, D. A. (2000, March) *Leveraging technology to improve test scores: A case study of low-income Hispanic students.* Paper presented at the meeting of the International Conference on Learning with Technology, Cambridge, MA. This study is ineligible for review because it does not use a sample within the age or grade range specified in the protocol.