

# What Works Clearinghouse



## Peer-Assisted Learning Strategies

### Program description<sup>1</sup>

*Peer-Assisted Learning Strategies (PALS)* is a peer-tutoring program. According to the developer’s web site, it is designed to be incorporated into the existing curriculum with the goal of improving the academic performance of children with diverse academic needs. Teachers train students to use *PALS* procedures. Students partner with peers, alternating the role of tutor

while reading aloud, listening, and providing feedback in various structured activities. *PALS* is typically implemented three times a week for 30 to 35 minutes. Although *PALS* can be used in different subject areas and grade levels, this intervention report focuses on the use of *PALS* to improve reading skills of students in kindergarten through third grade.<sup>2</sup>

### Research

Four studies of *Peer-Assisted Learning Strategies* met the What Works Clearinghouse (WWC) evidence standards with reservations. The four studies included more than 360 students from first to third grades in the United States.<sup>3</sup> The WWC considers

the extent of evidence for *PALS* to small for alphabets, fluency, and comprehension. No studies that met WWC evidence standards with or without reservations addressed general reading achievement.

### Effectiveness

*PALS* was found to have potentially positive effects on alphabets, fluency, and comprehension.

	Alphabets	Fluency	Comprehension	General reading achievement
Rating of effectiveness	Potentially positive effects	Potentially positive effects	Potentially positive effects	na

(continued)

1. The descriptive information for this program was obtained from publicly available sources: the program’s web site (<http://kc.vanderbilt.edu/pals/>, retrieved March 2007) and the research literature (Fuchs, Fuchs, Kazdan, & Allen, 1999; Mathes & Babyak, 2001; Mathes, Howard, Allen, & Fuchs, 1998; and Mathes, Torgesen, Clancy-Menchetti, Santi, Nicholas, Robinson, & Grek, 2003). 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 What Works Clearinghouse (WWC) also reviewed the effects of *PALS* on the reading achievement of English language learners with learning disabilities. The findings are reported in a separate WWC intervention report.
3. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

**Effectiveness** *(continued)*

	<b>Alphabetics</b>	<b>Fluency</b>	<b>Comprehension</b>	<b>General reading achievement</b>
<b>Improvement index<sup>4</sup></b>	Average: +19 percentile points Range: -15 to +45 percentile points	Average: +13 percentile points Range: -8 to +31 percentile points	Average: +13 percentile points Range: -17 +28 percentile points	na

na = not applicable

**Additional program information<sup>2</sup>**

**Developer and contact**

Developed by Lynn and Doug Fuchs, *Peer-Assisted Learning Strategies* is distributed by Vanderbilt Kennedy Center for Research on Human Development. Address: Vanderbilt University, Attn: Flora Murray/PALS Orders, Box 328 Peabody, Nashville, TN 37203-5701. Email: flora.murray@vanderbilt.edu. Web: <http://kc.vanderbilt.edu/pals/>. Telephone: (615) 343-4782.

**Scope of use**

*Peer-Assisted Learning Strategies* was developed more than ten years ago to be used with students in kindergarten through high school. It has been implemented in Tennessee, and teacher trainings have been conducted in Iowa, Minnesota, Illinois, Arizona, and Ohio. The program has been used with students with diverse ability levels, including English language learners and students with learning disabilities.

**Teaching**

*PALS* is designed to supplement the existing reading curriculum. It includes separate versions for kindergarten (called *K-PALS*), grade 1 (*First-Grade PALS*), and grades 2–6. In each version students engage in peer-tutoring routines through a series of structured interactions. *K-PALS Reading* and *First-Grade PALS*

include a set of 70 student lesson sheets, and teachers choose appropriate reading material for partner reading. In higher grades *PALS* does not provide any reading material; teachers select appropriate reading materials.

*PALS* sessions usually last 30 to 35 minutes three times a week. A typical lesson for the first-grade students begins with 15 minutes of Sounds and Words, which focuses on learning to hear and identify sounds, sounding out words, learning sight words, and practicing passage reading. The next 15 minutes of Story Sharing focuses on predicting story plots, oral reading, and retelling stories. A typical lesson for students in grades 2 to 6 includes specific activities to improve reading accuracy, fluency, and reading comprehension.

*PALS* offers teacher training in an all-day workshop where teachers learn to implement the program through modeling and role playing. Teachers are also provided with a manual describing the program.

**Cost**

The manual for each grade-level reading version of *PALS* costs \$35. It includes teaching scripts and master copies of necessary student materials. Video materials that provide an overview of the grades 2 to 6 program are available for \$15. Information on the cost of *PALS* training workshops is not available.

4. These numbers show the average and range of improvement indices for all findings across the studies.

**Research** Eleven studies reviewed by the WWC investigated the effects of *PALS*. Four studies met WWC evidence standards with reservations. Two studies (Fuchs, Fuchs, Kazdan, & Allen, 1999; Mathes & Babyak, 2001) were randomized control trials with randomization problems, and two studies (Mathes, Howard, Allen, & Fuchs, 1998; Mathes, Torgesen, Clancy-Menchetti, Santi, Nicholas, Robinson, & Grek, 2003) were quasi-experimental designs. The remaining seven studies did not meet WWC evidence screens.

#### **Met evidence standards with reservations**

Fuchs et al. (1999) included 45 second- and third-grade students from 15 general education classrooms. Fuchs et al. compared two interventions—*Peer-Assisted Learning Strategies* and *Peer-Assisted Learning Strategies plus Help Giving*—to a comparison group that used the same curriculum as the intervention group but did not implement collaborative learning. Teachers were randomly assigned to the intervention or comparison group, but after random assignment, teachers selected three students with different achievement levels within each participating classroom to be part of the study. The WWC review of this study focused on the comparison of *PALS* and the comparison group with a total of 10 at-risk students in the second and third grades.<sup>5</sup>

Mathes and Babyak (2001) included 110 first-grade students from five schools in a medium-sized school district in Florida. Mathes and Babyak compared two interventions—*Peer-Assisted Learning Strategies* and *Peer-Assisted Learning Strategies plus Mini-Lessons*—to a comparison group that used a typical reading curriculum with no supplement. Teachers were matched on demographic characteristics to form a stratified sample and randomly assigned to the intervention or comparison group, but after random assignment,

teachers selected five students with different achievement levels within each participating classroom to be part of the study.<sup>6</sup>

Mathes et al. (1998) included 96 first-grade students from six schools in an urban school district in the southeastern United States. Some teachers were randomly assigned to the treatment or comparison condition, but some were matched based on teaching profiles, generating a quasi-experimental study design. After teacher-level assignment, study authors selected five students with different achievement levels per classroom to be part of the study. The study compared *PALS* to a comparison group that used a typical reading curriculum with no supplement.

Mathes et al. (2003) included 89 low-achieving first-grade students taught by 22 teachers from six schools in a medium-sized southeastern school district. Some teachers were randomly assigned to the treatment or comparison condition, but some were matched based on teaching profiles, generating a quasi-experimental study design. After teacher-level assignment, study authors selected up to five low-achieving students per classroom to participate in the study. Mathes et al. compared *PALS* to a program similar to *PALS* but with teacher-directed instruction, and to a comparison group that participated in their usual reading curriculum.

#### **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.<sup>7</sup>

5. Findings on the comparison of *PALS plus HG* and the comparison groups are included in Appendix A4.3 but do not factor into the intervention rating.
6. Findings for the comparison between *PALS plus ML* and the comparison groups are included in Appendices A4.1 and 4.2 but do not factor into the intervention rating.
7. 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.

The WWC considers the extent of evidence for *PALS* to be small for alphabets, fluency, and comprehension. No studies

that met WWC evidence standards with or without reservations addressed general reading achievement.

## Effectiveness Findings

The WWC review of interventions for beginning reading addresses student outcomes in four domains: alphabets, including phonemic awareness and phonics constructs; fluency; comprehension; and general reading achievement.<sup>8</sup> The four studies reviewed in this intervention report address student outcomes in the alphabets, fluency, and comprehension domains. The findings below present the authors' and the WWC-calculated estimates of the size and statistical significance of the effects of *PALS* on student performance.<sup>9</sup>

*Alphabets.* Three studies examined the effects of *PALS* on two constructs in the alphabets domain: phonological awareness and phonics.

For phonological awareness, Mathes and Babyak (2001) found that *PALS* students had greater growth than comparison students on one measure (Continuous Progress Monitoring (CPM) Phonological Awareness Augmentation subtest). The WWC confirmed the statistically significant positive effect.

Mathes et al. (1998) found statistically significant positive growth in phonological awareness for low-achieving students but no statistically significant effect for average- and high-achieving students on one measure (CPM phonological awareness segmentation subtest). The WWC did not find a statistically significant effect of *PALS* for any single group, but found a statistically significant positive effect of *PALS* across all three ability groups combined.

Mathes et al. (2003) compared *PALS* students to two other groups.

- When *PALS* was compared with the usual curriculum group, the authors reported statistically significant positive effects on

two measures of phonological awareness (the Comprehensive Test of Phonological Processes (CTOPP) Phonemic Segmentation subtest and the CPM Phoneme Segmentation subtest). The WWC confirmed the first but not the second finding.

For phonics, the study authors found statistically significant positive effects on two of three measures (the Test of Word Reading Efficiency (TOWRE) Phonemic Decoding subtest and the Woodcock Reading Mastery Tests–Revised (WRMT–R) Word Attack subtest). The WWC confirmed the statistically significant effect on the second.

- When *PALS* was compared with the teacher-directed instruction group, the authors and the WWC did not find any statistically significant differences between the groups on either phonological awareness test or any of the three phonics outcomes.

The average effect size across all comparisons and outcomes in the alphabets domain in Mathes et al. (2003) was statistically significant and positive.

*Fluency.* Three studies examined outcomes in the fluency domain. Mathes and Babyak (2001) reported that low- and average-achieving students, but not high-achieving students, made greater gains than comparison students on one fluency measure (CPM Oral Reading Fluency subtest). The WWC found that there were no statistically significant differences for any of the groups, but the average effect across all groups was large enough to be considered substantively important according to WWC criteria (that is, at least 0.25).

Mathes et al. (1998) reported a statistically significant positive effect on the low-achieving group and no statistically significant

8. For definitions of the domains, see the [Beginning Reading Protocol](#).

9. 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 *Peer-Assisted Learning Strategies*, corrections for clustering and multiple comparisons were needed.

## Effectiveness *(continued)*

differences for the average- and high-achieving groups on one fluency measure (CPM Oral Reading Fluency subtest). The WWC found no statistically significant differences for any of the groups, but the average effect across all groups was large enough to be considered substantively important.

Mathes et al. (2003) compared *PALS* students with the two groups described in the research section on two fluency measures (the WRMT–R Word Identification subtest and the CPM Oral Reading subtest). The study authors and the WWC did not find any statistically significant differences between any of the groups and the average effect size was not large enough to be considered substantively important.

*Comprehension.* Two studies examined outcomes in the comprehension domain. Fuchs et al. (1999) reported and the WWC confirmed a statistically significant positive effect on one comprehension measure (Stanford Diagnostic Reading Test-III Reading Comprehension subtest).

### The WWC found *Peer-Assisted Learning Strategies to have potentially positive effects on alphabets, fluency, and comprehension*

#### 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.

Mathes et al. (2003) compared *PALS* students with two comparison groups on one comprehension outcome (the WRMT–R Passage Comprehension subtest). For both comparisons, the study authors and the WWC found no statistically significant effect of *PALS*. In addition, across comparisons, the average effect size was not large enough to be considered substantively important.

#### 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 average improvement index for alphabets is +19 percentile points across three studies with a range of –15 to +45 percentile points across findings. The average improvement index for fluency is +13 percentile points across three studies with a range of –8 to +31 percentile points across findings. The average improvement index for comprehension is +13 percentile points across two studies with a range of –17 to +28 percentile points across findings.

#### Summary

The WWC reviewed 11 studies on *PALS*.<sup>10</sup> Four of these studies met WWC evidence standards with reservations; the remaining studies did not meet WWC evidence screens. Based on these four studies, the WWC found potentially positive effects in alphabets, fluency, and comprehension. The evidence presented in this report may change as new research emerges.

10. A single-case design study was identified but is not included in this review because the WWC does not have standards yet for reviewing single-case design studies.

## References **Met WWC evidence standards with reservations**

- Fuchs, L. S., Fuchs, D., Kazdan, S., & Allen, S. (1999). Effects of peer-assisted learning strategies in reading with and without training in elaborated help giving. *The Elementary School Journal, 99*(3), 201–219.
- Mathes, P. G., & Babyak, A. E. (2001). The effects of peer-assisted literacy strategies for first-grade readers with and without additional mini-skills lessons. *Learning Disabilities Research & Practice, 16*(1), 28–44.
- Mathes, P. G., Howard, J. K., Allen, S. H., & Fuchs, D. (1998). Peer-assisted learning strategies for first-grade readers: Responding to the needs of diverse learners. *Reading Research Quarterly, 33*(1), 62–94.
- Mathes, P. G., Torgesen, J. K., Clancy-Menchetti, J., Santi, K., Nicholas, K., Robinson, C., et al. (2003). A comparison of teacher-directed versus peer-assisted instruction to struggling first-grade readers. *The Elementary School Journal, 103*(5), 459–479.

## **Did not meet WWC evidence screens**

- Bergeron, J. (1998). A comparison of classwide cross-age and same-age peer tutoring for second-grade students at risk for reading failure. *Dissertation Abstracts International, 59*(09), 3390A. (UMI No. 9905010)<sup>11</sup>
- Fuchs, D., Fuchs, L. S., Mathes, P. G., & Simmons, D. (1997). Peer-assisted learning strategies: Making classrooms more responsive to diversity. *American Educational Research Journal, 34*(1), 174–206.<sup>12</sup>

- Fuchs, L. S., Fuchs, D., & Kazdan, S. (1999). Effects of peer-assisted learning strategies on high school students with serious reading problems. *Remedial and Special Education, 20*(5), 309–318.<sup>13</sup>
- Hudson, K. G. (2004). The effects of Peer-Assisted Learning Strategies on the reading achievement of elementary students with and without decoding weaknesses. *Dissertation Abstracts International, 65*(10), 3754A. (UMI No. 3149163)<sup>13</sup>
- Pearson, J. J. M. (2004). The effect of peer-assisted literacy strategies on the social standing of first-grade readers. *Dissertation Abstracts International, 65*(02), 412A. (UMI No. 3122359)<sup>14</sup>
- Sáenz, L. M., Fuchs, L. S., & Fuchs, D. (2005). Peer-Assisted Learning Strategies for English language learners with learning disabilities. *Exceptional Children, 71*(3), 231–247.<sup>12</sup>
- Wehby, J. H., Falk, K. B., Barton-Arwood, S., Lane, K. L., & Cooley, C. (2003). The impact of comprehensive reading instruction on the academic and social behavior of students with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders, 11*(4), 225.<sup>15</sup>

## **Disposition Pending**

- Falk, K. B., & Wehby, J. H. (2001). The effects of peer-assisted learning strategies on the beginning reading skills of young children with emotional or behavioral disorders. *Behavioral Disorders, 26*(4), 344–359.<sup>16</sup>

---

**For more information about specific studies and WWC calculations, please see the [WWC Peer-Assisted Learning Strategies Technical Appendices](#).**

11. Confound: there was only one classroom in each study condition, so the effects of the intervention could not be separated from the effects of the teacher.
12. The sample is not appropriate for this review: the parameters for this WWC review specified that students should be in grades kindergarten through 3; this study did not disaggregate students in the eligible range from those outside the range.
13. The sample is not appropriate to this review: the parameters for this WWC review specified that students should be in grades kindergarten through 3 at the time of the intervention; this study did not focus on the targeted grades.
14. The outcome measures are not relevant to this review: the parameters for this WWC review specified student outcome measures, but this study did not focus on students.
15. Confound: this study included *PALS* but combined it with another intervention, so the analysis could not separate the effects of the intervention from other factors.
16. The disposition is pending development of WWC evidence standards for single subject designs.