



2021 STAR Review of Research

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Introduction

The Student Achievement in Reading (STAR) project is a 15+-year initiative by the U.S. Department of Education, Office of Career, Technical, and Adult Education, designed to assist states and local programs in making systematic and instructional changes required to improve the reading achievement of intermediate-level adult learners, including grade-level equivalents (GLE) 4.0–8.9, National Reporting System (NRS) Levels 3 and 4, adult basic education (ABE), or English as a second language (ESL). STAR works with states, local programs, and teachers to provide training in evidence-based reading instruction (EBRI) and technical assistance in developing the systems and procedures needed to implement and sustain EBRI.

The overarching goal of this review is to update the STAR community on evidence-based reading research that may inform the STAR training or practitioners' instructional approaches. The review highlights findings and implications for instruction that may improve adult reading achievement outcomes. This review includes intervention studies conducted with adults with low literacy skills between 2001 and 2021.

When synthesizing the effects of all the studies reviewed in this report, instructors in ABE programs should find encouragement in the overall findings. For example, the literature reviewed generally supports the notion that reading instruction can have statistically significant effects on adults and that the impact of that instruction, while small, seems worthwhile. In short, ABE students can become more proficient readers with the proper instruction and use of evidenced-based programs. This report supports several of these instructional practices, which are described below.

First, instructors in ABE programs should feel confident that instruction in each of the essential components of reading skills (alphabeticity, vocabulary, fluency, and comprehension) is a worthwhile endeavor that can have significant and positive effects on ABE student reading achievement. Cautions for instructors derived from this research include: (1) instructors should be aware that ABE students will have a variety of reading component skill strengths and weaknesses, and (2) instructors need to assess individual student reading needs and tailor instructional plans to address both strengths and improve skills that are not as strong. Programming that attempts to teach all reading component skills to all students in the same fashion may be counterproductive.

Progress monitoring and formative assessment can be key aspects of effective reading programs for ABE students. Common adult literacy achievement measures like the Test of Adult Basic Education (TABE) and the Comprehensive Adult Student Assessment System (CASAS) do not report all component reading skill levels. Therefore, ABE instructors implementing EBRI should continue to use assessments that are more diagnostic and identify reading component skill profiles for each student in the program. For example, assessments that target foundational skills (word reading, vocabulary) and more complex skills (inference) would capture a more complete profile of adults' needs. This would help target specific reading strengths and areas in need of additional instruction.

Background Context

Significant numbers of adults demonstrate low proficiency in reading comprehension. According to the U.S. Department of Education, 54% of U.S. adults (ages 16–74 years) demonstrate low proficiency in literacy and read at the equivalent of a sixth-grade level. Limited skills in reading comprehension can present significant challenges for adults in their career path, health advocacy, economic success, and family life and could be costing the United States as much as \$2.2 trillion a year.¹

Note about Research. Many researchers and practitioners believe that translating research to practice is a major challenge. Instructors play a critical role in ensuring that interventions and instructional strategies, supported by rigorous research, become practice in ABE programs. This role requires that instructors become critical readers of the research supporting instructional strategies and interventions so they can thoughtfully translate research to practice.

As instructors consider the practices in the following research review, it may be helpful to keep the difference between *research-based* and *evidence-based* instructional strategies in mind. Simply stated, research-based means that the strategy or intervention has been built around practices that others have found to be effective. On the other hand, evidence-based interventions have been rigorously tested and evaluated, and the specific approach has been found to have a significant impact or effect on student outcomes. In the literature review below, the studies could all be considered as having rigorous research designs targeted toward identifying evidence-based practices.

Effect Size. The effect size is a valuable statistic that tells us how powerful the results of the study were in changing or improving student outcomes. While the range of small, moderate, or large effects are estimates, they provide some indication of expected impact. Generally, an effect size of 0.20 is considered small, an effect size of .50 is moderate, and an effect size of 0.80 is large.

Index by Topic

The following reviews of recent reading research are organized in the index below by instructional strategy, and each research title is hyperlinked directly to its review in this document below. Readers may scroll through the reviews from top to bottom or select a specific study in the index below and click it to be directed straight to the review.

Word Level*

- [Effects of a Structured Decoding Curriculum on Adult Literacy Learners' Reading Development](#)
- [A Study Designed to Increase the Literacy Skills of Incarcerated Adults](#)
- [Meaningful Reading Gains by Adult Literacy Learners](#)
- [A Randomized Control Study of Instructional Approaches for Struggling Adult Readers](#)

Vocabulary

- [Morpho-phonemic Analysis Boosts Word Reading for Adult Struggling Readers](#)

Reading Comprehension

- [Efficacy of Learning Strategies Instruction in Adult Basic Education](#)
- [The Effects of Metacognitive Reading Strategy Instruction on Reading Performance of Adult ESL Learners with Limited English and Literacy Skills](#)
- [Effects of Structure Strategy Training and Signaling on Recall of Text](#)
- [A Randomized Control Study of Instructional Approaches for Struggling Adult Readers](#)

Technology Supported

- [The Efficacy of a Literacy Intervention for Incarcerated Adolescents](#)

Comprehensive

- [A Randomized Control Study of Instructional Approaches for Struggling Adult Readers](#)

*Under the topic of word-level instruction, the review includes reading component skills related to phonological awareness, decoding, spelling, word recognition, word attack, word analysis, and letter-word identification. Other researchers have conducted syntheses and reviews by looking at each of those word-level skills as being separate and independent reading component skills. The authors chose not to do that given the limited number of studies that focused on one or more component skills.

Literature Summaries

Effects of a Structured Decoding Curriculum on Adult Literacy Learners' Reading Development²

Link to study/curriculum: A description of the *Making Sense of Decoding and Spelling* (MSDS) curriculum is available at <https://pubmed.ncbi.nlm.nih.gov/22163055/>

Of interest to STAR trainers and teachers: The MSDS curriculum seems to be somewhat effective when teaching decoding and spelling to adults in intermediate ABE programs but not significantly impactful when teaching word recognition, fluency, and reading comprehension. The extent of any change was small. The MSDS curriculum is specifically designed to be part of a three-part curricula that includes (1) decoding and spelling, (2) vocabulary, and (3) comprehension. A key finding in this study supports the notion that students in intermediate ABE classes will need explicit instruction in all reading skill components and that instruction in decoding and spelling alone may be insufficient to impact reading comprehension proficiency.

Summary, method, and findings: The authors sought to develop and test the impact of the decoding curriculum MSDS on the reading skills of adult literacy learners. The MSDS curriculum was used to teach decoding and spelling and basic alphabetic decoding skills to 349 adult learners in 16 ABE programs that offered class-based reading instruction to adult learners at the Low-Intermediate level. Researchers used a randomized controlled trial (RCT) with random assignment at the program level to treatment (MSDS program) and control (ABE program standard literacy instruction) groups. The results were mixed: while the MSDS program had significant and positive effects on students' scores for decoding and spelling, word recognition results were mixed, fluency scores were not significant, and reading comprehension results were negative.

A Study Designed to Increase the Literacy Skills of Incarcerated Adults³

Link to study/curriculum: A description of the Pure and Complete Phonics (PCP) curriculum can be found at <https://www.jstor.org/stable/26508041> (Accessible with the creation of a free account.)

Of interest to STAR trainers and teachers: The researchers in the current study found that moderate effects in three of four measures could be attained by using the PCP curriculum compared to the control group, which made little or no gains after 15 weeks of instruction.

Summary, method, and findings: The authors sought to determine if adult students with a learning disability who received an adaption of the PCP (Orton-Gillingham) curriculum would outperform control groups who received the correctional institution's standard reading curriculum. The adaption was to include group-based instruction practices. Instruction included direct, explicit, and multisensory instruction. Forty-one participants across two women's and three men's adult institutions in a Midwest state

completed the full program. Instruction was implemented for 15 weeks, 5 days a week, for 1 hour a day by certified teachers. All participants had fifth-grade or lower scores on the TABE. The analysis of the pre- and posttest scores between the treatment (PCP curriculum) and control groups showed a positive effect for the treatment group on three of four measures: letter-word identification, phonological skills, and reading fluency.

Meaningful Reading Gains by Adult Literacy Learners⁴

Link to study/curriculum: The full report and program descriptions can be found at https://www.researchgate.net/publication/257643701_Meaningful_reading_gains_by_adult_literacy_learners

Of interest to STAR trainers and teachers: For ABE students with very low word-level skills, the three programs evaluated in this study hold promise for increasing student phonological, decoding, and word recognition skills.

Summary, method, and findings: The purpose of this study was to examine individual gains by adult learners in response to three kinds of reading instruction: (1) Corrective Reading, which is a direct instruction phonics program with the main aim to strengthen decoding and identifying printed words; (2) the RAVE-O program, which focuses on retrieval, automaticity, vocabulary, engagement, and orthography; and (3) Guided Repeated Reading, which is widely used with younger students to strengthen fluency skills. A three-group random assignment experiment including 148 students was conducted to help determine the effectiveness of reading curricula for individual students and examined within individual gains replicated over tests. Performance was higher on the posttest than on the pretest, and all three instructional approaches were effective in improving reading skills, as measured by the demonstration of at least a half-year gain in two or more aspects of reading proficiency. The largest average increase was seen for phonological skills.

Morpho-phonemic Analysis Boosts Word Reading for Adult Struggling Readers⁵

Link to study/curriculum: A description of the instructional strategy can be found in the full report at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5752731/>

Of interest to STAR trainers and teachers: Morpho-phonemic analysis-focused instruction may help students generalize their developing reading comprehension skills, which is a challenge. The finding that morpho-phonemic intervention supported generalization is promising. While the study failed to demonstrate improvements in overall comprehension, this may be a consequence of the intervention's limited duration of 32 hours and small sample size of 34 General Equivalency Diploma (GED) students.

Summary, method, and findings: The purpose of the study was to compare the effects of two kinds of vocabulary instruction on comprehension skills of 34 adult struggling readers who identified as either English language learners or native speakers. Participants received tutoring to learn 40 academic vocabulary words embedded within a civics curriculum and were assigned to either morpho-phonemic analysis, which is the examination of the meaningful parts of a word like the roots, suffixes or prefixes to understand its overall meaning, or traditional whole-word study.

An RCT study was used to assess effectiveness. Participants were 34 GED students who were minority language learners aged 19–31. Both groups made comparable gains in learning the target words, but the morpho-phonemic group showed greater gains in reading unfamiliar words on standardized tests of word reading, including word attack and word recognition. However, vocabulary and reading comprehension scores showed a small or negative impact on some measures.

Efficacy of Learning Strategies Instruction in Adult Basic Education⁶

Link to study/curriculum: Additional information on cognitive strategy instruction can be found at <https://kucrl.ku.edu>

Of interest to STAR trainers and teachers: A strong data base supporting the effectiveness of cognitive reading strategy instruction for adolescents exists, but the instructional time limitations for ABE students in this study suggest that this approach for students with limited exposure to the intervention may not be effective.

Summary, method, and findings: The study sought to evaluate the effects of cognitive reading strategies on the reading comprehension proficiency of ABE students. Results from RCTs of learning strategies instruction with 375 ABE participants are reported. Participants in the experimental and control groups each included approximately 37% Caucasians, 53% Blacks, 5% Hispanics, and 3% Asians who ranged in age from 16 to 74 years with an average age of 27.7 years. Four reading strategies were taught: the Bridging Strategy (multiple word-level skills), the Building Fluency Strategy, the Prediction Strategy, and the Summarization Strategy. Both experimental and control conditions experienced high attrition and low attendance, thus limiting results: exposure to instruction did not approach the levels required for demonstrated instructional gains. Ultimately, data analysis showed no significant differences between experimental and control classes for reading comprehension assessments.

The Effects of Metacognitive Reading Strategy Instruction on Reading Performance of Adult ESL Learners with Limited English and Literacy Skills⁷

Link to study/curriculum: The study, published online in *COABE Journal: The Resource for Adult Education* in 2012, is no longer available online.

Of interest to STAR trainers and teachers: Researchers compared reading gains among various initial reading levels. They found metacognitive strategy instruction to be most effective with readers who scored higher on pretests. Thus, lack of word-level skills may hamper metacognitive reading strategy instruction.

Summary, method, and findings: This study examines the effects of metacognitive reading strategy instruction on the reading performance of adult ESL learners with limited English and literacy skills. A quasi-experimental design was used to compare results of metacognitive strategy instruction between a treatment group (metacognitive instruction) and a comparison group (standard ESL instruction). Instruction was implemented over 4 months with 18 ESL learners enrolled in a beginning ABE literacy program. Analysis of reading comprehension scores showed that metacognitive reading strategy instruction can be effective for adult ESL learners with limited English skills,

with those scoring higher on pretests demonstrating the highest skill gains compared to those with lower word-level skills.

Effects of Structure Strategy Training and Signaling on Recall of Text⁸

Link to study/curriculum: A detailed explanation of the instructional procedures used in the study and data analysis are provided in Meyer, B. J. F., & Poon, L. W. (2001).

Of interest to STAR trainers and teachers: The authors of the literature review believe the findings of this study are important for STAR practitioners because they show that readers can be trained with a structure strategy, and they can use it effectively to increase their total recall regardless of whether text structures are provided.

Summary, method, and findings: The purpose of this study was to evaluate the effectiveness of text structure strategy training (i.e., analyzing text structures to understand the information contained within the text) on total recall from texts and informative videos. The structure strategy was used to teach learners to identify and use signaling in text to aid their encoding and organize their recall. Training involved direct instruction, modeling, and practice, individually as well as with a partner, to teach effective use of text structure for encoding and retrieval with a wide variety of texts. Through a stratified random assignment procedure, a total of 121 participants, split into 56 young adults and 65 older adults, were assigned to the training conditions. Participants' age range was approximately 20 to 71 years. Structure strategy training increased the amount of information remembered as well as recall of the most important information.

A Randomized Control Study of Instructional Approaches for Struggling Adult Readers⁹

Link to study/curriculum: A detailed explanation of the instructional approaches examined in the study are available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3237050/>

Of interest to STAR trainers and teachers: Overall growth in reading component skills seems limited in this study. Comprehensive reading programs may not always generalize effects to adult populations.

Summary, method, and findings: The primary aim of this study was to investigate which intervention or combination of interventions is the most effective in increasing the reading and reading-related skills of adults who read between the 3.0 and 5.9 grade equivalences on single-word identification. The interventions focused on remediating deficits in decoding, fluency, and reading comprehension and varied from very explicit and scripted instruction to more implicit and learner-centered instruction. The 198 students were randomly assigned to one of the following approaches: (1) Decoding and Fluency, Decoding, Comprehension; (2) Fluency Extensive Reading; (3) Decoding, Comprehension, Extensive Reading, and Fluency; and (4) a generic Control/Comparison approach. Results indicated continued weaknesses in all reading component skills with small effects or impact scores.

The Efficacy of a Literacy Intervention for Incarcerated Adolescents¹⁰

Link to study/curriculum: The full report can be found at <https://www.hmhco.com/research/read-180-the-efficacy-of-a-literacy-intervention-for-incarcerated-adolescents>

Of interest to STAR trainers and teachers: Multiple studies of the Read 180[®] curriculum have been conducted with adolescents. This study extends the research supporting the Read 180[®] approach with adults in residential facilities.

Summary, method, and findings: This RCT investigated the efficacy of Read 180[®], a blended literacy intervention curriculum, for low-performing readers in juvenile corrections (JC) setting over a 31-month period. It examined treatment effects using curriculum-based measures of comprehension, oral reading fluency, and spelling based on standardized diagnostic reading and language assessments. Students received 110 minutes of daily literacy instruction. The average total amount of instruction across both groups was 137 hours. This study was conducted in one rural, private, medium-security, long-term JC residential facility. Participants included approximately 41% Caucasian, 48% Black, and 12% Hispanic students, and 43% of participants had an Individualized Education Program (IEP). Both treatment and control groups made significant growth on the following measures: brief reading, broad reading, letter-word dedication, oral comprehension, passage comprehension, and reading fluency, but the treatment group (blended literacy intervention) demonstrated a statistically significant gain over the control group. The authors conclude that Read 180[®] has the potential to improve adult reading proficiency.

Appendix

The 2020–2021 Review of the Literature Procedures

Determining Eligibility and Exclusion Criteria. Specific criteria were established for inclusion and exclusion of research studies to focus the initial search. Specific inclusion and exclusion criteria were identified as follows:

Inclusion Criteria. In developing the 2021 STAR Review of Research, the authors included studies that: (1) were published in English; (2) included students who were at least 16 years old and not enrolled in high school classes; (3) focused on adults with low literacy skills enrolled in literacy or vocational programs that included instruction in reading skills; (4) had at least one outcome measure assessing reading performance and evaluating the effects of the intervention; (5) employed an RCT, quasi-experimental study, or single-case experimental design and compared students in control or comparison treatment groups taught using a specific reading intervention with those in control groups; (6) were delivered in English and included only students who were English-speaking struggling readers; (7) focused on word study, fluency, vocabulary, reading comprehension strategies, or multiple components of reading instruction; and (8) included data that could be used to calculate an effect size.

Exclusion Criteria. The authors excluded studies that: (1) employed a single-group pre-/posttest design; (2) targeted a population with a reading level below the 5th percentile; and (3) were “think pieces” that did not include original data on ABE reading outcomes.

Search Procedures and Summary

To maximize the number of experiments on adult literacy/reading, the authors conducted a search of electronic databases, findings from meta-analyses conducted on adult readers with low comprehension, and ancestry data from relevant cited references in the identified research articles. The 331 articles that aligned with the initial search criteria were identified after removing duplicate articles. After careful review of the articles according to the inclusion and exclusion criteria outlined above, the authors conducted an analysis of the remaining 17 group research studies. There were 195 effect sizes included: 94 effect sizes that fell under the topic of *word-level* interventions, 70 effect sizes reflective of *reading comprehension* interventions, 20 effect sizes for *vocabulary* studies, and 14 effect sizes that focused on *fluency* interventions.

Limitations

The number of *rigorous research* studies conducted with adults in ABE programs is significantly limited. The authors’ search resulted in 17 studies that met the inclusion criteria established for this review. Of these, nine were within the 2001–2021 publication window. The limited number of studies can skew findings. For example, the authors are not convinced that their analysis of the impact of vocabulary instruction with ABE students reflects findings from other studies. A significant negative outlier may have skewed the vocabulary finding and thus the relatively low impact of vocabulary may be misleading.

- ¹ U.S. Department of Education, National Center for Educational Statistics, Statistics Canada and Organization for Economic Cooperation and Development (OECD), International Adult Literacy Survey (IALS), 1994–98. (2021).
- ² Alamprese, J. A., Macarthur, C. A., Price, C., & Knight, D. (2011). Effects of a structured decoding curriculum on adult literacy learners' reading development. *Journal of Research on Educational Effectiveness*, 4(2), 154–172. doi:10.1080/19345747.2011.555294
- ³ Robinson, S. A. (2018). A study designed to increase the literacy skills of incarcerated adults. *The Journal of Correctional Education*, 69(1), 60–72.
- ⁴ Scarborough, H. S., Sabatini, J. P., Shore, J., Cutting, L. E., Pugh, K., & Katz, L. (2012). Meaningful reading gains by adult literacy learners. *Reading and Writing*, 26(4), 593–613. doi:10.1007/s11145-012-9385-4
- ⁵ Gray, S. H., Ehri, L. C., & Locke, J. L. (2018). Morpho-phonemic analysis boosts word reading for adult struggling readers. *Read Writ*, 31(1), 75–98. doi:10.1007/s11145-017-9774-9
- ⁶ Hock, M. F., & Mellard, D. F. (2011). Efficacy of learning strategies instruction in adult basic education. *Journal of Research on Educational Effectiveness*, 4(2), 134–153. doi:10.1080/19345747.2011.555291
- ⁷ Huang, J., & Newbern, C. (2012). The effects of metacognitive reading strategy instruction on reading performance of adult ESL learners with limited English and literacy skills. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, 1(2), 66–77.
- ⁸ Meyer, B. J. F., & Poon, L. W. (2001). Effects of structure strategy training and signaling on recall of text. *Journal of Educational Psychology*, 93(1), 141–159. doi:10.1037//0022-0663.93.1.141
- ⁹ Greenberg, D., Wise, J., Morris, R., Fredrick, L., Nanda, A. O., & Pae, H. K. (2011). A randomized control study of instructional approaches for struggling adult readers. *Journal of Research on Educational Effectiveness*, 4(2). doi:10.1080/19345747.2011.555288
- ¹⁰ Houchins, D. E., Gagnon, J. C., Lane, H. B., Lambert, R. G., & McCray, E. D. (2018). The efficacy of a literacy intervention for incarcerated adolescents. *Residential Treatment for Children and Youth*, 35(1), 60–91. doi:10.1080/0886571X.2018.1448739