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Evidence and Gap Map of Tier 2 Literacy Interventions for Grades K-3 in the Commonwealth of the Northern Mariana Islands

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Evidence and Gap Map of Tier 2 Literacy Interventions for Grades K–3 in the Commonwealth of the Northern Mariana Islands

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The Commonwealth of the Northern Mariana Islands Public School System requested a systematic review of Tier 2 literacy interventions for students in grades K-3. This review defines a Tier 2 literacy intervention as a supplemental instructional program for students who require support in addition to the Tier 1 core reading program. Of the 267 studies on Tier 2 literacy interventions identified, 20 met What Works Clearinghouse 5.0 standards with or without reservations. Two interventions—Reading Recovery and Literacy First—had strong evidence of positive effects (as defined by the Every Student Succeeds Act) on students' literacy skills. One additional intervention—Achieve3000—had moderate evidence of positive effects. This report includes an evidence and gap map and a supplemental matrix that highlights implementation strategies used in each intervention.

Why this study?

More students in the Commonwealth of the Northern Mariana Islands (CNMI) Public School System (PSS) have been identified for Tier 2 services—defined as targeted interventions for students at risk of not meeting benchmarks—than the CNMI PSS is able to serve. In 2019 only 24 percent of grade 3 students were reading at or above grade level, as measured by the ACT Aspire (Grindal et al., 2021). This gap widened during the Covid-19 pandemic (Commonwealth of the Northern Mariana Islands, 2021).

The CNMI PSS asked Regional Educational Laboratory (REL) Pacific to identify the state of evidence on Tier 2 literacy interventions for students in grades K-3 and recommend interventions and strategies. To address these needs, the REL Pacific study team conducted a systematic review of the research literature on Tier 2 literacy interventions for students in grades K-3, including interventions currently used by the CNMI PSS. The review identified strategies supported by strong or moderate evidence of improvements in students' literacy skills that the CNMI PSS might consider implementing. This report presents findings from the systematic review in the form of an evidence and gap map that identifies the Tier 2 literacy interventions that have positive findings from rigorous research. The report also describes some of the discrete strategies used in the reviewed interventions.[1] The primary aim of this report is to support the CNMI PSS educators and administrators in selecting appropriate Tier 2 interventions and strategies for their schools. Education systems outside of the CNMI may also be interested in the findings.

Research questions

This evidence review included two core research questions:

1. What Tier 2 literacy interventions for students in grades K-3 have strong or moderate evidence, as defined by the Every Student Succeeds Act (ESSA), of improvements in students' literacy skills?
2. What intervention strategies are used by the reviewed interventions?

For additional information, including the study review protocol, study details, and a list of the 37 studies reviewed using the What Works Clearinghouse 5.0 evidence standards, see the appendices for the report on the Institute of Education Sciences website.

1. Since evidence ratings were synthesized at the intervention level rather than for individual strategies within a larger intervention, the individual strategies should not be considered evidence based. The design of the studies reviewed for this report did not enable examining the specific effect of individual strategies used in an intervention.

Box 1 presents key terms for this report, and box 2 summarizes the data sources, study sample, and methodology. A more detailed discussion of methodology is included in the text below box 2 and in appendix A.

Box 1. Key terms

Every Student Succeeds Act (ESSA) tiers of evidence. There are four ESSA evidence tiers: strong evidence (Tier 1), moderate evidence (Tier 2), promising evidence (Tier 3), and demonstrates a rationale (Tier 4). These tiers provide districts and schools with a framework for determining which programs, practices, strategies, and interventions work in which contexts and for which students. Figure 1 in the main body of the report defines each tier.[1]

Evidence and gap map. A visual display of research evidence and gaps in evidence on interventions in a specific area of interest–in this case, outcomes related to literacy.

Improvement index. A measure of an intervention's effect on an outcome that can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +5 means that a comparison group student at the 50th percentile would have scored at the 55th percentile if the student had received the intervention.

Intervention strategy. The discrete elements that comprise an intervention.

Tier 2 literacy intervention. Supplemental instruction, in addition to the Tier 1 core reading program, that is intended to support readers who may be at risk of not meeting reading proficiency benchmarks. Tier 2 literacy interventions include learning goals for students and are designed to directly affect reading or writing achievement. They are typically delivered in a small-group setting and include direct instruction, scaffolding, and student interaction (Wanzek et al., 2016).

Note

1. There is no corresponding What Works Clearinghouse (WWC) rating for an ESSA Tier 4 rating; studies that qualify as ESSA Tier 4 would not be rated by WWC.

Box 2. Data sources, study sample, and methods

Data sources. Studies for the evidence review were drawn from an electronic search of 11 databases and a hand search[1] for unpublished studies from 23 research organizations and professional associations. The literature search was limited to Tier 2 interventions identified by the National Center for Intensive Intervention and to five interventions identified by the Commonwealth of the Northern Mariana Islands (CNMI) Data Wayfinding Partnership for the Improvement of Literacy that were previously implemented in the CNMI Public School System (PSS) or that are of interest to partnership members. Appendix A contains further information on the data sources used in the literature search.

Study sample. The literature search was limited to the past 10 years–from 2013 to 2023. Study populations were eligible if they included students in grades K-3 in the United States or its territories or in Organisation for Economic Co-operation and Development countries in which English is the primary or most used language. The scope of the review erred on the side of inclusivity and included studies of students who were dual-language learners and students in special education. The initial search yielded 267 studies, of which 37 met eligibility criteria. Of these 37 studies on 18 Tier 2 literacy interventions, 20 studies met What Works Clearinghouse (WWC) standards with or without reservations, and 17 studies did not. None of the studies eligible for review was conducted in CNMI or in other Pacific islands; all eligible studies were conducted in the United States. The review did not identify which interventions were culturally relevant for CNMI.

Methodology. All eligible studies were reviewed using *What Works Clearinghouse Procedures and Standards Handbook, Version 5.0* (What Works Clearinghouse, 2022) and the WWC's *Study Review Protocol, Version 5.0* (What Works Clearinghouse, 2023). Studies that met WWC standards with or without reservations were double coded and reconciled by a third reviewer. If the first reviewer determined that a given study did not meet WWC standards, the review was finalized by the reconciler without a second review. This report limits the presentation of findings to domains in the WWC's *Study Review*

Protocol, Version 5.0 that are relevant for assessing Tier 2 literacy interventions: reading fluency, reading comprehension, phonics and related alphabetics, vocabulary, literacy achievement, writing quality, writing conventions, and academic dispositions. In addition, a supplemental matrix of intervention strategies was developed to aid CNMI PSS staff in selecting a Tier 2 literacy intervention. Additional details about the methodology of the literature search, coding, and development of the supplemental matrix are included in the sections below this box and in appendix A.

Note

1. Hand searches are manual methods of scanning journals and of mining reference lists of journal articles for additional sources.

Scope of the evidence review

This review of the literature for the period 2013–23 included studies of literacy interventions identified by the CNMI Data Wayfinding Partnership for the Improvement of Literacy, as well as impact studies of Tier 2 literacy interventions available online (see appendix A for more details).

Eligible research included four types of designs that have the potential to meet WWC standards corresponding to ESSA Tier 1 (strong) or Tier 2 (moderate) levels of evidence: randomized controlled trials, quasi-experimental designs, regression discontinuity designs, and single case designs (figure 1).[2]

Figure 1. Every Student Succeeds Act tiers of evidence

	TIER 1 Strong evidence	TIER 2 Moderate evidence	TIER 3 Promising evidence	TIER 4 Demonstrates a rationale
Study design	Well-designed and implemented experimental study, meets WWC standards without reservations	Well-designed and implemented quasi-experimental study, meets WWC standards with reservations	Well-designed and implemented correlational study, statistically controls for selection bias[a]	Well-defined logic model based on rigorous research
Results of the study	Statistically significant positive effect on a relevant outcome	Statistically significant positive effect on a relevant outcome	Statistically significant positive effect on a relevant outcome	An effort to study the effects of the intervention is planned or currently under way
Findings from related studies	No strong negative findings from experimental or quasi-experimental studies	No strong negative findings from experimental or quasi-experimental studies	No strong negative findings from experimental or quasi-experimental studies	na
Sample size and setting	At least 350 participants, conducted in more than one district or school	At least 350 participants, conducted in more than one district or school	na	na
Match	Similar population *and* setting to your setting	Similar population *or* setting to your setting	na	na

na is not applicable.

WWC is What Works Clearinghouse.

a. Findings from experimental and quasi-experimental students that either meet the first three criteria for Tiers 1 and 2 but not the sample size, setting, or match requirements or do not meet WWC standards

Source: Regional Educational Laboratory Midwest, 2019.

2. Although similar in name, the ESSA levels of evidence tiers are unrelated to the tiers used in Multi-Tiered System of Supports.

All studies were reviewed using the WWC's *Study Review Protocol, Version 5.0*, which includes a wide range of eligible outcome domains (What Works Clearinghouse, 2023). The presentation in this report is limited to the following outcome domains relevant to the selection of Tier 2 literacy interventions, along with their definition in the WWC's *Study Review Protocol, Version 5.0*:

- **Literacy achievement.** Content in two or more distinct literacy domains. Outcomes limited to the vocabulary and reading comprehension domains are reviewed under reading comprehension; outcomes limited to multiple writing domains are reviewed under writing quality; and outcomes including either expressive or receptive communication are reviewed under proficiency in the English Language.
- **Phonics and related alphabetics.** Letter identification, phonemic awareness, phonics, phonological awareness, spelling, and print awareness for the English language.
- **Reading comprehension.** Understanding the meaning of written texts or passages in English, which may be combined with receptive or expressive vocabulary in the vocabulary domain. This domain does not include tests of content knowledge.
- **Reading fluency.** Reading English words and text accurately, automatically, and with expression. This domain includes word fluency.
- **Vocabulary.** Understanding the meanings of English words, whether oral or written, using receptive vocabulary or expressive vocabulary.
- **Writing conventions.** Using rules of standard English language, such as word usage, syntax/sentence structure, grammar, morphology/word inflections, language mechanics/capitalization and punctuation, handwriting quality, and spelling. When spelling skills are assessed on writing samples, they are included in this domain; otherwise, they are included in the phonics and related alphabetics domain.
- **Writing quality.** Writing effective, clear, well-organized text in English, such as narrative, informative, persuasive, or creative writing, including poetry. This domain includes measures of writing quality combined with measures in the writing conventions domain.
- **Academic dispositions.** Indicators that are focused on self-reported or -assessed student attitudes toward academics or participation in school activities. Outcomes in this domain include academic growth mindset, academic motivation, academic or subject-specific self-efficacy, academic engagement, and academic grit. Measures are included in this domain if they reflect attitudes toward learning, as opposed to observable behaviors (student behavior), mental well-being (mental health), or schoolwide environment (school climate). Unlike the other domains, this domain has no direct relation to reading or writing and is therefore not alphabetized with the other domains listed above.

The primary outcome of interest is in the literacy achievement domain, since the purpose of the review is to support the CNMI PSS's goal of grade 3 students reading at or above grade level. As indicated in the *What Works Clearinghouse Procedures and Standards Handbook, Version 5.0* (What Works Clearinghouse, 2022), literacy and math outcomes were subject to an assessment of measure independence. A measure is considered nonindependent–and therefore not eligible for synthesis as a main finding–if it was developed by study authors and is not documented in other studies as being in wider use, or if it was developed by the intervention's developers. One study included all nonindependent measures, so all outcomes in that study were classified as supplemental and were not presented in the findings.

Literature search

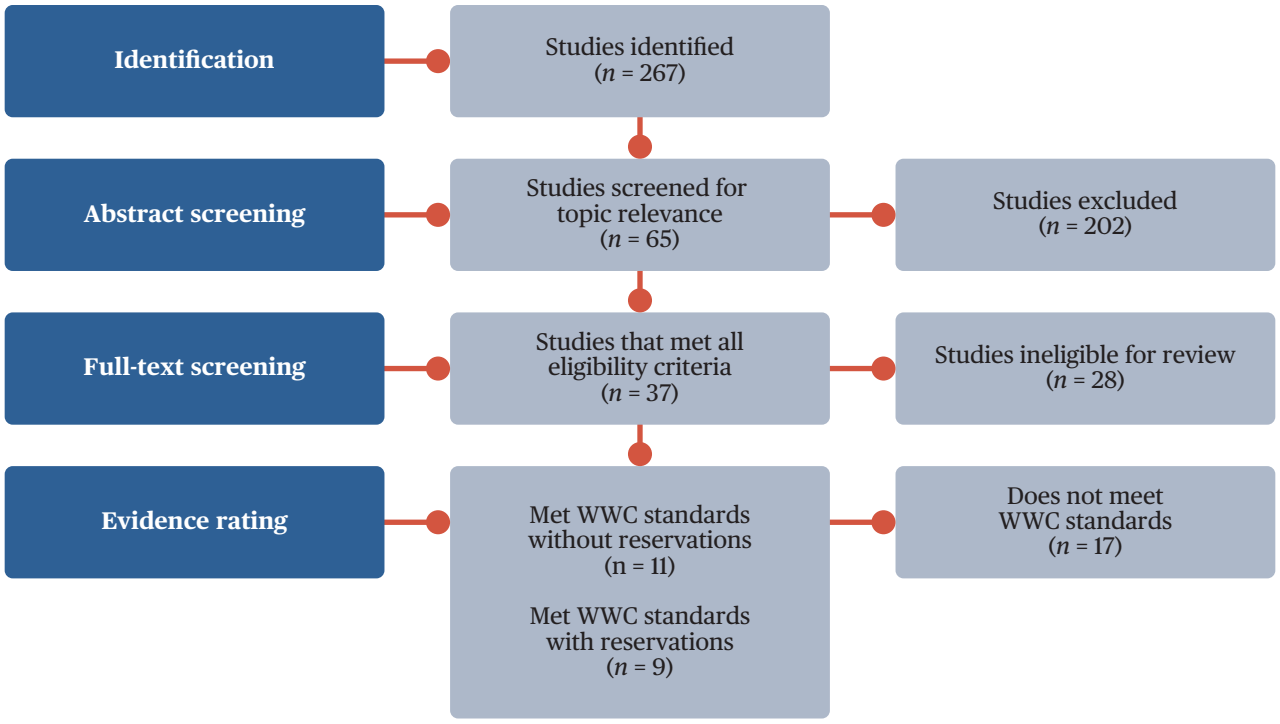
The REL Pacific study team conducted a systematic literature search for Tier 2 literacy interventions following an initial meeting with the CNMI Data Wayfinding Partnership for the Improvement of Literacy. During this meeting the study team collected information about the Tier 2 literacy interventions that interested members

of the partnership, which included Achieve3000, Amira Reading, Lalilo, Reading Mastery, and HMH Into Reading. These interventions either were previously implemented in the CNMI PSS or are of interest to partnership members. These interventions were included in the search terms that were used in an electronic search of 11 databases, including the Education Resources Information Center. Additional details about the search strategies are in appendix A.

Additionally, the study team conducted a hand search of unpublished studies (see box 2) from organizations listed in the WWC's *Systematic Review Protocol for English Language Arts Interventions, Version 4.1* (What Works Clearinghouse, 2021), including research organizations and professional associations, such as the American Educational Research Association, the American Evaluation Association, and the Association for Public Policy Analysis and Management (see appendix A for a full list). A lead reviewer searched each of these organizations' websites using the search term "Tier 2 Literacy" on publications, repositories, and research report pages to find relevant literature.

The electronic search yielded 256 studies, and the hand search identified an additional 11 studies. After an initial screening of study abstracts, the study team identified 65 studies eligible for full text screening and 37 studies eligible for WWC review (figure 2). Of these 37 studies, 20 were determined to have met WWC standards, with or without reservations. Additional details on the reviews are in appendix A, along with a detailed discussion of methodology used to create evidence ratings, aggregate improvement indices, and statistical significance. The 20 studies that met WWC standards, with or without reservations, are described in detail in table B1 in appendix B.

Figure 2. Studies identified, screened, and reviewed for the evidence and gap map



WWC is What Works Clearinghouse.

Source: Authors' construction.

Evidence and gap map. The study team constructed an evidence and gap map (EGM) that includes the improvement index and ESSA evidence tier (see box 1) for each outcome domain from the 20 studies that met WWC standards with or without reservations. The 20 eligible studies covered 18 interventions. The EGM displays the findings for the eight outcome domains (literacy achievement, phonics and related alphabetics, reading comprehension, reading fluency, vocabulary, writing conventions, writing quality, and academic dispositions) for each intervention (see table 1 later in the report). The cells of the EGM are color coded and populated to show the strength of the evidence and the direction and magnitude of study findings. By presenting information from the systemic review in this visual format, EGMs highlight both where evidence is robust and where it is lacking. The EGM's grid format also helps policymakers and practitioners understand the availability and quality of the existing evidence to support evidence-based decisionmaking.

Supplemental matrix of intervention strategies. The study team developed a supplemental matrix that outlines essential implementation strategies used in the 18 interventions reviewed (see table 2 later in the report). This matrix can help CNMI PSS staff evaluate the feasibility of implementing evidence-based interventions and inform their decisionmaking when selecting a Tier 2 literacy intervention. If implementation of a full intervention is not possible due to cost or other constraints, this matrix provides individual strategies that the CNMI PSS may want to consider for implementation and future research.

The framework for the supplemental matrix is structured using the Tier 2 reading elements developed by the Michigan Multi-Tiered System of Supports (MiMTSS) Technical Assistance Center.[3] MiMTSS has identified seven key elements of Tier 2 reading interventions: explicit instruction, small group instruction, matching instruction to student needs, opportunities to practice, frequent feedback, progress monitoring, and fading supports (see box 3).

The study team validated these seven key elements by reviewing the literature (Doing What Works, 2009; St. Martin et al., 2020), including a WWC practice guide addressing K-3 literacy (Gersten et al., 2008), as well as WWC- and REL Pacific-reviewed Tier 2 literacy interventions. The definitions of the seven key elements serve as a framework for identifying more discrete intervention strategies that align with the key elements of Tier 2 literacy interventions.

Box 3. Seven key elements of Tier 2 reading interventions

Explicit instruction. This instructional approach uses a structured curriculum that covers essential reading components, including comprehension, fluency, phonemic awareness, phonics, and vocabulary. Skill development is systematic, beginning with individual instruction of skills, followed by gradual integration of those skills. This allows students to progress from simpler to more complex concepts, building on their knowledge and learning. A distinctive feature of explicit instruction is that it involves a high level of teacher and student interaction, including frequent opportunities for practice and feedback.

Small group instruction. Tier 2 instruction typically involves groups of three to four students, meeting three to five times a week for 20–40 minutes. The instruction is supplemental and aligned to Tier 1 core instruction. Instruction can take place within the general classroom setting or as pull-out sessions. It can further extend to one-on-one sessions tailored to individual student needs.

Matching instruction to student needs. This element emphasizes personalized instruction based on student needs, identified through universal screening or progress monitoring. Within an intervention, personalized instruction can be offered through diverse learning pathways, leveled readers, or instructional materials responsive to student strengths and needs.

3. The MiMTSS framework was selected because it was developed by experts in the field and was not the product of an intervention developer. The link to the framework was recently removed from MiMTSS's website. It can be seen on the Wayback Machine site here: https://web.archive.org/web/20220129064015/https://mimtsstac.org/practices/reading/tier-2-reading.

Opportunities to practice. These include guided practice sessions with teachers and independent practice opportunities, which allow students to apply new skills under guided supervision and independently reinforce their understanding of the material.

Frequent feedback. It is important to pair opportunities to practice with immediate, clear, and corrective feedback. Timely feedback not only facilitates correction of errors but can also empower students to persist in completing tasks and activities.

Progress monitoring. This involves evaluating students' performance and mastery of targeted skills and concepts at regular intervals. Progress monitoring data are used to identify additional areas of needed support, measure student growth, and inform instructional decisions. Interventions can incorporate progress monitoring systems to enable teachers to easily administer assessments and review progress-monitoring data.

Fading supports. This refers to a gradual shift in support, beginning with teacher or interventionist support, followed by peer support, with the ultimate goal of independent student practice. To facilitate this transition, scaffolded support should be built into instruction.

Note: These definitions were drawn from the Michigan Multi-Tiered System of Supports Technical Assistance Center's description of Tier 2 reading supports.

The study team developed coding questions based on the seven key elements defined in box 3. Using these questions, one reviewer coded intervention strategies described in original documents, supplementing this information with data from sources such as the developer's website, intervention manuals, and WWC intervention reports. Because documents often lack critical implementation details, the coding focused on recording the strategies specified in each program model rather than those implemented in the studies reviewed.

To ensure coding accuracy and consistency, a reviewer documented the sources of the coded intervention components and noted any unique or specific aspects of the interventions. A lead reviewer verified the sources and codes and addressed any questions or discrepancies before finalizing the codes. The full list of coding questions is in table A1 in appendix A.

Findings

The findings of the review are summarized in the EGM in table 1, which shows the WWC average improvement index of interventions and the direction of the effect (+/–). Gray-shaded cells with a § indicate uncertain evidence (findings that were not statistically significant); light blue cells with a † indicate promising evidence; dark blue cells with a ‡ indicate moderate evidence; and green cells with a * indicate strong evidence, as defined by ESSA. A large improvement index value does not necessarily denote a strong ESSA rating because the ESSA rating is based on the strength of the study design, whether study findings were statistically significant, and other factors noted in figure 1.

Reading Recovery and Literacy First showed strong evidence of positive effects on at least one literacy-related outcome

Two of the reviewed interventions, Reading Recovery and Literacy First, showed strong evidence of positive effects on at least one literacy-related outcome (see table 1). The improvement indices for the findings with strong evidence range from +8 to +26, indicating that the percentile rank of the average student would increase by 8–26 percentile points on a given outcome if they received the intervention.

- Reading Recovery is a widely used Tier 2 intervention that provides one-on-one tutoring to grade 1 students with low literacy achievement to improve student reading and writing skills. It tailors the content of each lesson—such as phonemic awareness, phonics, vocabulary, fluency, comprehension, writing, oral language, and motivation—based on observations and analyses of a student's strengths and weaknesses from prior

Table 1. Evidence and gap map, by intervention and outcome domains (What Works Clearinghouse average improvement index of interventions and the direction of effects: +/-)

Intervention	Literacy achievement	Phonics and related alphabetics	Reading comprehension	Reading fluency	Vocabulary	Writing conventions	Writing quality	Academic dispositions
Achieve3000			0[U]	+2[M]				
Early Reading Intervention		-2[U]		-6[U]				
Early Vocabulary Intervention					+1[U]			
Guided Reading		+9[U]	+1[U]	+10[U]				
i-Ready Reading	-1[U]							
Istation	0[U]							
LetterWorks		+28[P]		+7[U]				
Leveled Literacy Intervention			-2					
Lexia Core5	+8[P]			-4[U]				
Literacy First	+8[U]	+13[S]	+8[S]	+14[S]				
Literacy Now	+3[U]							
PALS		+8[U]						
PALS (modified)		+23[U]		-4[U]				
QuickReads			+3[U]					
Reading Recovery	+26[S]							+27[M]
Seeing Stars		+31[P]		+13[U]				
Sound Partners		+33[U]						
Tier 2 Literacy Intervention (Case, 2014)		+9[U]		+4[U]				

Note: The number in each cell is the aggregate improvement index for a given outcome domain and intervention, with the +/- indicating the direction of the effects. The domain-level improvement index represents the difference in percentile rank between the average intervention group student and the average comparison group student. (Appendix E of the *What Works Clearinghouse Procedures and Standards Handbook, Version 5.0*, contains a detailed description of the procedure for computing the improvement indices; What Works Clearinghouse, 2022.) For example, an improvement index of +8 on reading comprehension for Literacy First indicates that the average Literacy First student would increase their percentile rank by 8 points on reading comprehension relative to the average comparison group student. Gray cells with [U] indicate uncertain evidence, yellow cells with [P] indicate promising evidence, dark blue cells with [M] indicate moderate evidence, and green cells with [S] indicate strong evidence. A cell with a large improvement index value may not necessarily receive a higher Every Student Succeeds Act (ESSA) rating than a cell with a lower improvement index value because ESSA ratings are based on whether study findings are statistically significant, the number of studies, the strength of the study design, and other factors. The evidence and gap map (EGM) includes only interventions evaluated by studies that met What Works Clearinghouse (WWC) standards with or without reservations. Two interventions—i-Ready Reading and Reading Recovery—had two studies each that met WWC standards; all other interventions reflect findings for a single study. One study of i-Ready Reading (Randel et al., 2020) is not reflected in the EGM because all findings in that study were determined by the WWC to be based on noninde-pendent measures and therefore ineligible to be presented in a synthesis product.

Source: Analysis using outcome domains from the WWC's *Study Review Protocol, Version 5.0* (What Works Clearinghouse, 2023).

lessons. Reading Recovery teachers, who receive a full year of training from a registered Reading Recovery teacher leader, deliver tutoring daily in 30-minute, one-on-one sessions over 12-20 weeks. Reading Recovery had strong evidence of positive effects for general literacy achievement and moderate evidence of positive effects for academic dispositions, which included an outcome from one study that measured students' attitudes toward reading and literacy.

- Literacy First serves approximately 1,600 students annually in five districts in central Texas. The intervention aims to address disparities in literacy due to poverty through intensive tutoring and relationship building. Literacy First tutors focus on students' assets and follow a culturally driven model, with one-on-one tutoring offered in both English and Spanish for 20-30 minutes each day during the school year. Literacy First incorporates motivational practices, as well as research-based literacy practices, into daily tutoring.

Tutors receive more than 50 hours of training during the school year, and supervisors are on-site at least once a week to observe lessons, monitor student progress, and help tutors tailor instruction to individual student needs. This intervention had strong evidence of positive effects in phonics and related alphabetics, reading fluency, and reading comprehension.

Although the findings of strong evidence of literacy achievement for Reading Recovery may align better than the findings for Literacy First to the CNMI PSS's goal of increasing the proportion of grade 3 students who are reading at grade level, Reading Recovery is focused on grade 1 students only. It provides a more intensive—but shorter duration—intervention than Literacy First, which targets students in grades K-2. Because Literacy First is designed to serve a greater range of age groups, it may better support the CNMI PSS's goal of increasing the proportion of students who are on track for grade-level reading by the end of grade 3. However, the evidence for Literacy First on literacy achievement—the primary outcome of interest to the CNMI PSS—was uncertain..

One other intervention, Achieve3000, showed moderate evidence of positive effects for reading fluency:

- Achieve3000 is a supplemental online literacy program that provides nonfiction reading practice to students in grades preK-12 for 30 minutes a day, twice a week, during the school year. Achieve3000 focuses on building phonemic awareness, phonics, fluency, reading comprehension, vocabulary, and writing skills. Assignments are tailored to each student's reading ability level. Progress reports and student usage data provided by the online tool enable teachers to track both whole-class and individual student progress. Achieve3000 had modest effects for reading fluency and met ESSA's moderate tier of evidence.

Three additional interventions—LetterWorks, Lexia Core5 Reading, and Seeing Stars—had, at most, promising evidence. Promising evidence requires at least one quasi-experimental study, at least one finding with a statistically significant positive effect, and no findings with statistically significant negative effects. The remaining 12 interventions had uncertain evidence of effects.

The Tier 2 literacy interventions examined had several strategies in common, including a structured curriculum, small group instruction, and assessment tools for monitoring progress

Table 2 presents the intervention strategies for each intervention. The top row of headings represents the key elements of Tier 2 literacy interventions from the MiMTSS framework. The second row of headings represents discrete intervention strategies aligned with the MiMTSS key elements of Tier 2 literacy interventions, identified through the coding process. A checkmark indicates that an intervention includes the specified strategy.

The study team found that of the 18 interventions examined, 12 incorporate a structured curriculum. These curricula are designed to cover essential reading components, such as comprehension, fluency, phonemic awareness, phonics, and vocabulary. Furthermore, 8 of the 18 interventions are designed to be delivered in small-group format only, 6 are designed to be delivered individually only, and 4 can be delivered individually or in small groups. Interventions delivered in one-on-one settings were mainly tutoring and online instructional programs.

Few interventions explicitly offer strategies to help teachers match their instruction to student needs. Five interventions offer leveled reading materials, and five provide adaptive learning pathways. In terms of practice and feedback, nine interventions include either guided or independent practice, or both, and five include corrective or supportive feedback. Additionally, five interventions have embedded progress monitoring tools, such as student dashboards, teacher dashboards, and student reports, that educators can use to make instructional decisions and measure student growth. Eight interventions also include discrete assessment tools, like mastery checks and formative assessments, to monitor student progress, and six interventions included scaffolded support. Three interventions included peer support.

Table 2. Supplemental matrix of interventions by MiMTSS key elements of Tier 2 literacy interventions and intervention strategies

	Explicit instruction		Small group instruction		Matching instruction to student needs			Opportunities to practice		Frequent feedback		Progress monitoring			Fading supports	
Intervention	Structured curriculum	Gradual skill-building	Small group	Individual	Responsive and targeted	Leveled materials	Learning pathway	Guided	Independent	Corrective	Supportive	Data use	Embedded system	Assessment tools	Peer support	Scaffolded support
Achieve3000	✓			✓		✓	✓		✓				✓	✓		✓
Early Reading Intervention[a]	✓	✓	✓					✓								
Early Vocabulary Intervention		✓	✓						✓						✓	
Guided Reading		✓	✓		✓	✓							✓	✓		
i-Ready Reading	✓		✓	✓			✓		✓		✓	✓		✓		✓
Istation	✓		✓	✓		✓	✓		✓				✓	✓		
LetterWorks[b]			✓													
Leveled Literacy Intervention	✓	✓	✓			✓	✓						✓			✓
Lexia® Core5®	✓			✓			✓	✓			✓	✓	✓	✓		✓
Literacy First	✓			✓	✓							✓		✓		
Literacy Now	✓		✓											✓		
PALS			✓							✓	✓				✓	
PALS (modified)		✓	✓	✓						✓						
QuickReads				✓				✓	✓	✓	✓					
Reading Recovery	✓			✓	✓							✓		✓		
Seeing Stars	✓		✓	✓												
Sound Partners	✓			✓		✓		✓								✓
Tier 2 Literacy Intervention (Case, 2014)	✓		✓						✓						✓	✓

MiMTSS is the Michigan Multi-Tiered System of Supports.

Note: See box 3 for definitions of the MiMTSS Technical Assistance Center's seven key elements of Tier 2 reading interventions and table A1 in appendix A for additional information on how discrete intervention strategies were identified and defined. Although this supplemental matrix provides insights into the instructional strategies used by Tier 2 literacy interventions with varying Every Student Succeeds Act (ESSA) ratings, the individual strategies should not be considered evidence based since the ESSA evidence ratings were synthesized at the intervention level.

a. Early Reading Intervention titles are no longer available through the developer.

b. LetterWorks was studied as a supplement to Reading Recovery.

Source: Authors' compilation from study documents and developer websites.

The most common strategies of the 18 examined studies were also generally included in the three Tier 2 interventions with the highest ESSA ratings. However, because the studies reviewed were not designed to enable examination of the effect of individual strategies used by an intervention, caution is warranted when considering links between these strategies and the effect of the full intervention.

In addition to the intervention strategies, the study team also documented pertinent intervention information, including intervention developer or distributor, intended grade levels, intervention type, and cost elements (including instructional materials and technology, intensity and duration, personnel, training duration, ongoing support, and any additional cost details; table 3). Cost ingredients denoted with a * indicate information that was derived from sources outside the study manuscript.

Limitations and implications

This review has some notable limitations:

1. None of the studies that met WWC standards were conducted in CNMI, which limits the generalizability of the findings to the CNMI PSS. Findings on interventions may be more generalizable if studies are replicated across multiple locations and conducted with diverse populations and if school-level findings are consistent across locations and populations. While the generalizability of this review's findings is limited, important lessons can still be drawn.
2. The literature search was limited to the years 2013-2023, so it does not include many seminal studies on Tier 2 literacy interventions. This review of the most recent evidence on Tier 2 literacy interventions can complement other WWC products that have reviewed relevant studies prior to 2013. Box 4 presents WWC publications published in the past 10 years that can be used as reference material or to supplement the findings in this report.
3. To ensure that this review had a manageable scope, the review protocol limited the search for Tier 2 literacy interventions to a list from the National Center on Intensive Intervention. Although that list was extensive, it could have omitted some lesser-known interventions, which are less likely to be the subject of rigorous research but could include some important studies and their findings.
4. The review did not identify which Tier 2 literacy interventions are culturally relevant for the CNMI PSS. The study team will discuss these findings with the CNMI Data Wayfinding Partnership for the Improvement of Literacy as the CNMI PSS identifies which findings are best suited to inform the selection of a Tier 2 literacy intervention.

Box 4. Relevant What Works Clearinghouse products published in the past 10 years

Intervention reports

- Reading Recovery (June 2023): https://ies.ed.gov/ncee/WWC/InterventionReport/730
- Achieve3000 (February 2018): https://ies.ed.gov/ncee/wwc/InterventionReport/692
- Leveled Literacy Intervention (September 2017): https://ies.ed.gov/ncee/wwc/InterventionReport/679

Practice Guide

- Foundational Skills to Support Reading for Understanding in Kindergarten Through 3rd Grade (July 2016; Revised December 2019): https://ies.ed.gov/ncee/WWC/PracticeGuide/21

Table 3. Other intervention information and cost elements

	Intervention information			Cost element					
Intervention	Developer or distributor	Type	Intended grades	Instructional materials and technology	Intensity and duration	Personnel	Training duration	Ongoing support	Cost details
Achieve3000	McGraw Hill	Online literacy program	PreK-12	Computer or tablet, internet connection*	30 min, twice a week	Teachers	1-2 days*	NR	NR
Early Reading Intervention	Pearson/ Scott Foresman	Curriculum	K	NR	30 min, 5 days a week	Classroom teachers	2 days	NR	NR
Early Vocabulary Intervention	NR	Vocabulary instruction	K	NR	30 min, 4 times a week, for approximately 23 weeks	Paraprofessionals, certified teachers, reading teachers, other specialists	1 day	Frequent check-ins, support, and consultation	NR
Guided Reading	Fountas and Pinnell	Instructional context	K-6	Leveled textbooks	45 min, 4 days a week, for 23-25 weeks	Certified teachers, experienced clinical tutors	27 hrs	Professional development	NR
i-Ready Reading	Curriculum Associates	Online instruction program	K-8	Laptop, tablet, or desktop computers	30-40 min, 5 days a week, for 30 weeks	Paraeducators	Up to 6 hrs*	At-cost interventionist training*	$30 per student per year (includes i-Ready assessment and personalized instruction)*
Istation	Istation	Digital instructional tool	K-3	Computer or tablet, internet connection*	2-3.5 hrs (throughout the school year)	Teachers	NR	NR	NR
LetterWorks	NR	iPad app	1	iPad	NR	Reading Recovery teachers	NR	NR	NR
Leveled Literacy Intervention	Fountas and Pinnell	Curriculum	K-12	Leveled readers	30 min, 5 days a week, for 12-18 weeks	Teachers, reading interventionists	NR	NR	$2,900-$4,950 per class*
Lexia Core5	Lexia	Technology-based instruction	PreK-5	Computer or tablet, internet connection	20-80 min a week	Special education teachers	1-4 hrs (initial training)*	Lexia staff support	$40 per student (reduced for student groups larger than 250, includes training and professional development)*
Literacy First	University of Texas-Austin	Tutoring	K-2	NR	30 min, daily (throughout the school year)	Volunteer tutors	70+ hrs	Literacy First visits and coaching (weekly)	NR
Literacy Now	Literacy Now	Tutoring	K-3	NR	25 weeks	Literacy Now interventionists	NR	Training on the Neuhaus reading readiness program curriculum	Approximately $2,000 per student
PALS	Lynn and Doug Fuchs	Peer tutoring	1	NR	35 min, 3 times a week, for 22 weeks	Teachers, students	1 day (teachers), 4 hrs (students)	Classroom visits: Weeks 1-9 (2 times per week), Weeks 10-18 (1 time per week)	At-cost teacher manual ($60-$65)*

(continued)

Table 3. Other intervention information and cost elements *(continued)*

Intervention	Intervention information			Cost element					
	Developer or distributor	Type	Intended grades	Instructional materials and technology	Intensity and duration	Personnel	Training duration	Ongoing support	Cost details
PALS (modified)	Lynn and Doug Fuchs	Peer tutoring	K	NR	30 min, 5 times a week, for 8 weeks	Undergraduate students, classroom teachers	Up to 5-15 hrs	Ongoing training, weekly check-ins	NR
QuickReads	Savvas Learning Company	Reading fluency program	2-6	Desktop computer, headset, books	15 min, 3 times a week, for 19 weeks	Classroom teachers	1 hr (print-only) 3 hrs (print and technology)	NR	NR
Reading Recovery	Marie Clay; Reading Recovery	Tutoring	1	Collection of short books*	30 min a day, 5 days a week, for 12-20 weeks	Reading Recovery teachers	1-year graduate course	On-site coaching, periodic coaching post-training year	Approximately $600 per teacher per year $4,995-$7,925 per teacher one-time training and materials $2,750-$2,850 per teacher reusable texts*
Seeing Stars	Lindamood-Bell	Curriculum	K-12	NR	4 hrs a day, 5 days a week, for 6 weeks (summer)	Lindamood-Bell-trained teachers	80 hrs formal instruction + 80 hrs clinical observation	Levels 1-4: Online training, coaching, webinars, forums, project management, testing*	Levels 1-4: $7,650-$13,000*
Sound Partners	Voyager Sopris Learning	Tutoring	K-2	NR	30 min, 4 days a week, for minimum of 8 weeks	Trained graduate students	NR	NR	$120 per tutor (materials)*
Tier 2 Literacy Intervention	Case et al., 2014	Tutoring	1	NR	40 min, 3 times a week, for 12 weeks	Tutors	Minimum 20 hrs	NR	NR

NR is not reported.

Note: Cost ingredients denoted with a * indicate information that was derived from sources outside the study manuscript.

Source: Authors' compilation from study documents and developer websites.

The findings from this evidence review are intended to inform the selection of interventions by the CNMI PSS. Ultimately, however, the CNMI PSS's selection of an intervention will likely also depend on several factors:

- **ESSA evidence ratings.** While findings of strong evidence for Reading Recovery and Literacy First are compelling, there may be certain targeted skills, such as reading fluency, that affect the CNMI PSS's decision about which intervention to adopt. It is also possible that different interventions may be considered most appropriate for adoption at different grade levels—for example, Reading Recovery in grade 1, followed by Literacy First in grade 2.
- **Cost of the intervention.** If the CNMI PSS is facing resource constraints, selection of a Tier 2 literacy intervention might consider the most effective intervention for the price.
- **Feasibility of implementing the intervention.** In addition to cost, the selection of an intervention could consider whether the instructional strategies are compatible with the CNMI PSS—culturally relevant, politically feasible, and sufficiently flexible—to ensure that the intervention can be tailored while retaining fidelity.
- **Use of the supplemental matrix to identify which instructional strategies to consider for a homegrown intervention.** If the CNMI Data Wayfinding Partnership for the Improvement of Literacy does not believe that any of the branded interventions will be feasible for the CNMI PSS to adopt, the supplemental matrix can provide insights into the instructional strategies used by Tier 2 literacy interventions with varying ESSA ratings. However, while the supplemental matrix in table 2 provides insights into the instructional strategies used by Tier 2 literacy interventions with varying ESSA ratings, the individual strategies should not be considered evidence-based since the ESSA evidence ratings were synthesized at the intervention level.

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