



What Works for Comprehension? A Systematic Review of Reading Interventions for School-Age Learners, 2020–2026

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ABSTRACT

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This systematic review examined evaluative studies on reading interventions affecting schoolchildren's comprehension outcomes, published from 2020 to 2026. Per PRISMA 2020 guidelines, 265 records were reviewed overall, out of which 166 unique records were screened, 52 full-text articles were reviewed, and 18 satisfactory records matched the inclusion criteria. The records included studies from 11 countries and comprised more than 2900 learners across 17 studies, with sample sizes ranging from preschool to high school. Due to heterogeneity among interventions, designs, and measures taken, a synthesis without meta-analysis was conducted, classifying 5 different intervention types and summarizing the overall findings. The results showed that 12 of 18 studies were positive, 2 had mixed results, 2 showed no effect on the outcome, and 2 were ambiguous in their reporting. The four studies that used explicit comprehension strategies yielded the most reliable results; among them, a tier one intervention had an effect size of +0.79, and a two-stage instructional approach had an effect size of +0.26. Code-based instruction was effective in three of four studies that used this method. Technology was effective in four of six studies, but the largest evaluated experiment did not show convincing results. Out of seven total experiments made by random sampling, five had positive outcomes, and it should be mentioned that no research was conducted in the Philippines. The studies' outcomes emphasize the importance of supporting word recognition alongside explicit comprehension instruction.

KEYWORDS:

Reading, comprehension, reading intervention, struggling readers, systematic review

I. INTRODUCTION

The aim of reading instruction is to provide reading proficiency and establish a foundation for learning in all subjects. However, many learners read without comprehension. According to the 2022 Program for International Student Assessment (PISA) results, 15-year-old students in the Philippines scored only 347 points on average, well below the OECD average of 476 points (OECD, 2023). Data at the school level support this trend. For example, in a study of 368 students from the seventh grade of a private school in Isabela, the Philippines, only one-third of students (32.88%) scored within the limits of low-average and poor, with the weakest scores in tests of vocabulary, comprehension,

and rearrangement, respectively (Astrero et al., 2024). When these learners participated in a reading program, 65.79% were below the frustration level (Astrero & Eugenio, 2025).

Policies have reacted to such evidence. In 2024, Republic Act No. 12028, known as the Academic Recovery and Accessible Learning (ARAL) Program Act, created a national tutorial program in reading, math, and science for learners who do not achieve grade-level competencies, and the Department of Education made ARAL-Reading a priority for the School Year 2025-2026 (Daily Tribune, 2025; Republic Act No. 12028, 2024). Such large-scale interventions require strong evidence to answer a key question: which reading interventions lead to the desired level of comprehension, and for whom and under what conditions?

A. Conceptual Framework

The simple view of reading demonstrates that reading comprehension is based on the ability to recognize words and language understanding (Gough & Tunmer, 1986).

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Interventions can be made in comprehension by helping students strengthen decoding and word recognition and areas relating to language comprehension, like vocabulary, knowledge, and text structure. The active view of reading builds on the original view by adding bridging and self-regulation processes that connect the two components and can be taught (Duke & Cartwright, 2021). According to this theory, code-oriented approaches improve comprehension only when word recognition limits comprehension, whereas strategy- and knowledge-oriented approaches matter only when decoding is sufficient. The review's results align with these theoretical assumptions.

B. Prior Syntheses

Numerous syntheses of recent content have focused on reading intervention research; however, few identified comprehension as a target outcome across educational grades and contexts. In their meta-analysis, Hall et al. (2023) reviewed experimental and quasi-experimental studies from 1980 to 2020 involving children in kindergarten through fifth grade with dyslexia or at risk for developing this learning disability. The researchers found a positive average impact of reading interventions compared with controls ($g = 0.33$). The level of dosage was found to moderate effectiveness, with larger impacts reported in grades 1-2 than in grades 3-5; combining spelling with reading instruction had a greater impact than pure reading instruction. Neitzel et al. (2022) synthesized several interventions for struggling young readers and confirmed that tutoring was one of three methods that produced positive results. Other syntheses explored the effectiveness of intervention types: the effect of motivation interventions on comprehension was positive ($d = 0.27$; van der Sande et al., 2023), the use of tech-based interventions for elementary students was beneficial according to one single-case study (Alqahtani, 2024), and the results of teaching English, especially for students of English as a foreign language, were good in South Korea (Shin & Kim, 2025).

Additionally, three gaps remain. First, most analyses focus on basic skills and English-dominated, rich settings, so it is unclear whether findings can be generalized to other multilingual, poorer scenarios. Second, previous reviews of the literature treat comprehension as one of several outcomes rather than the main result. Third, the post-pandemic period has seen an influx of new studies including tech-enabled and tier-based interventions that have not been synthesized. A review of recent studies that improve comprehension can inform current federal programs like ARAL-Reading.

C. Study Purpose and Research Questions

This systematic review synthesized intervention studies published between 2020 and 2026 that evaluated the effects of reading interventions on school-age learners' reading comprehension. We asked:

1. What are the characteristics of the learners, interventions, and research designs in recent studies evaluating reading interventions on comprehension?
2. What are the direction and reported magnitude of comprehension effects across intervention categories?
3. Which learner, intervention, and methodological characteristics appear to be associated with comprehension gains?

II. METHODOLOGY

This review has been prepared following the standards set out by the PRISMA 2020 statement (Page et al., 2021) and the SWiM reporting guidance (Campbell et al., 2020). A review protocol was not registered beforehand.

A. Information Sources and Search

On 18 August 2026, information was retrieved through the Scopus database, which covered articles from various publishers. The search terms were chosen according to the intervention mechanism (like "reading intervention", "reading program", "remedial reading"), different types of populations involved in reading issues (like "struggling readers", "reading difficulties", and "people with dyslexia"), and the measurement of outcomes (like "reading comprehension"). The final search string was TITLE-ABS-KEY ("reading intervention" OR "reading program" OR "remedial reading" OR "reading instruction") AND ("struggling reader" OR "reading difficulty" OR "dyslexia" OR "poor reader") AND ("reading comprehension" OR "comprehension"), limited to publications between 2020 and 2026 belonging to the category "social sciences." All collected articles were merged into one corpus.

B. Eligibility Criteria

The review included studies that met all the requirements set out below. (a) Population: any students from early preschool through the end of high school (Grade 12), including those who suffered from reading disorder(s) or those who did not suffer from any. (b) Intervention: reading intervention, program, or strategy devised by researchers or the school and implemented in a specified manner. (c) Comparison: any methodology used, such as a control group, business-as-usual condition, or other treatments compared to the experiment (e.g., measurements carried out). (d) Outcome: reading comprehension measurement either at the level of a completed passage or text done after the intervention is carried out. (e) Study type: primary empirical studies, including randomized controlled trials, quasi-experimental studies, single-case designs, action research, and mixed-methods studies that report comprehension results. (f) Publication: peer-reviewed articles published in 2020-2026.

C. Selection Process

The process of identifying duplicate records involved comparing file checksums, with identical files found multiple times being flagged. The titles and abstracts of unique records

were then screened based on pre-defined eligibility criteria, and all those that passed this screening were analyzed at full-text level. The reasons for exclusion were noted at both stages using a set of fixed codes. Two reviewers (N.S.C. and I.F.O.) independently screened all records at both stages and independently collected information from the studies included in the review. Any differences were resolved through discussions involving the third author (P.B.), who verified the final inclusion decisions.

D. Data Extraction

Extraction forms were developed in order to capture all data relevant to each study. This information includes details such as the country, language used for instruction, number of participants as well as their characteristics (including the grade/ age of the students, student profiles, and sample size), methodology, description/type of the intervention, duration of the intervention and how the intervention was conducted, comparison measure and results, including the effect size, etc. The discrepancies between initial reports (for example, in terms of sample size or grade) were noted on the data extraction forms.

E. Methodological Rigor

The studies range from cluster-randomized trials to single-learner action research studies. Hence, all of them were assigned an evidence tier. Tier I consists of randomized and/or cluster-randomized studies. Quasi-experimental studies with comparison groups, such as multiple-probe or alternating-treatments designs, were classified in Tier II. Tier III includes one-group pre-and post-design studies, comparisons with a non-equivalent group population (for example, typical peers), and single-learner action research studies without experimental conditions. The tiers offer a useful way to weigh findings rather than exclude any studies.

F. Synthesis Methods

A meta-analysis is inappropriate due to major differences among the studies in relation to types of research design, types of comprehension measures, comprehension levels assessed, and types of statistics used. According to the SWiM framework, proposed by Campbell et al. (2020) and based on the theoretical framework of each study, the studies were grouped into five intervention types: (a) code-based or elementary skills programs, (b) comprehension strategies training, (c) multi-developmental interventions, (d) technology-helped programs, and (e) arts-based interventions. Authors used positive, mixed (referring to the positive effect on only a subgroup), null, or unclear to label comprehension effects for each studied case. Authors determined the size of the effect in question by themselves, while the benchmarks for causal research were utilized for the interpretation of the size of the effect: values below 0.05 were regarded as small, those between 0.05 and 0.20 as medium, and those equal to or above 0.20 as large (Kraft, 2020). Trends were analyzed according to evidence tier, grade band, learner profile, and type of measure utilized.

III. RESULTS

A. Study Selection

Figure 1 shows the procedure for selection. The search engine returned 265 results, including 99 duplicates. The 166 remaining records were screened by title and abstract. The records contained 21 irrelevant records, 11 reviews and meta-analyses, 23 records from before 2020, and 59 records that were not intervention research. Of the 52 full studies, 34 studies were eliminated. Of these, 22 focused on interventions in decoding, fluency, spelling, or vocabulary without comprehension; five were published in a language other than English; one focused on adults; and six had design flaws or were incomplete. The remaining number of studies is 18.

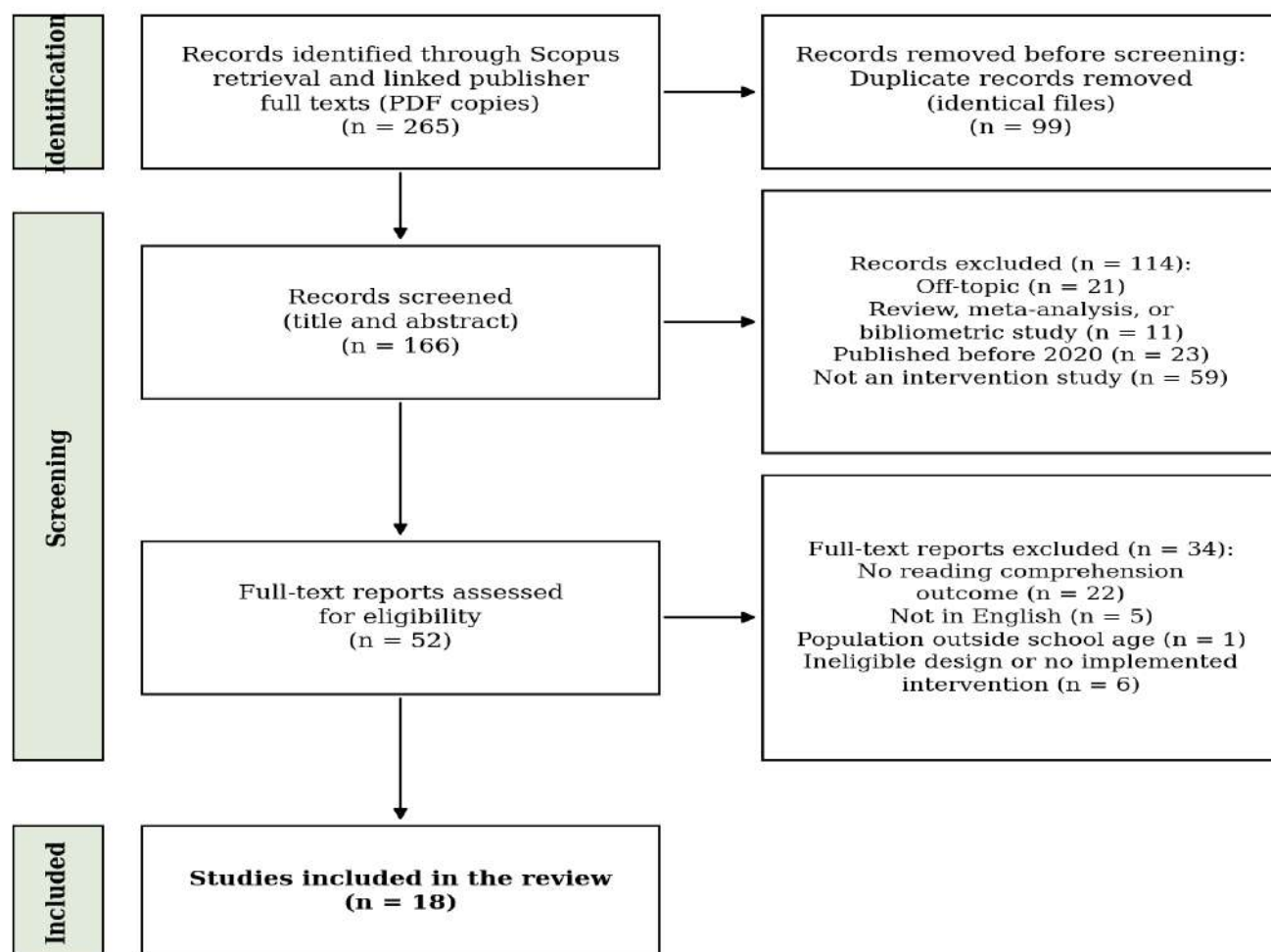


Fig. 1. PRISMA 2020 flow diagram of study selection.

Note. Adapted from the PRISMA 2020 flow diagram template (Page et al., 2021).

B. Characteristics of Included Studies (RQ1)

Table I provides a brief overview of the 18 studies selected for this review. These studies were published between 2020 and 2026; of the eighteen selected studies, ten were published after 2023. The studies were conducted in eleven countries - twelve of them in high-income countries in Western Europe (USA (five studies), UK (three studies), and one each in Germany, Greece, the Netherlands, and Sweden). The remaining four articles were conducted in Turkey and the Middle East (Turkey: two articles; Jordan and Lebanon). There were also two studies conducted in Southeast Asia (Indonesia and Thailand). None of the studies was conducted in the Philippines. The studies used reading in nine languages: English (nine articles, two studies among English learners), Turkish (two articles), Arabic, Dutch, German, Greek, Indonesian, Swedish, and Thai (one article respectively).

Participants in the studies ranged from preschoolers to high school students. Among the eight studies reviewed, five were conducted among children in grades 4 through 6. Four studies

focused on high school students, while the eighth focused on preschoolers through grade 3. Most studies examined populations at risk for reading difficulties or with disabilities such as dyslexia. Other studies were also conducted on students with reading problems, students learning English, students with autism, and students with attention deficits. The number of participants in the studies ranged from at least 1 to over 600.

Among these studies, seven could be categorized as Tier 1 Randomized Studies, seven as Tier 2 (five Quasi-Experimental Studies and 2 single-case studies with experimental control), and four as Tier 2 studies. Ten studies assessed comprehension using standardized measures. Eight studies assessed comprehension using researcher-made or curriculum-based measures. One study assessed comprehension using the sentence-level efficiency measure (Clemens et al., 2026), while another assessed sentence-level comprehension (Cockerill et al., 2023)

TABLE I. CHARACTERISTICS OF INCLUDED STUDIES (N = 18)

Study	Country	Participants (N)	Design (tier)	Intervention and dosage	Comprehension measure	Comprehension effect
Alsultan (2026)	United States	Grade 5 English learners with limited reading proficiency (4)	Multiple-probe SCD (2)	Self-questioning with prompt fading during expository reading	Researcher-made multiple-choice quizzes	+ (maintained at 2 weeks; generalized)
Balantekin (2021)	Türkiye	Grade 3 student with reading and writing difficulties (1)	Action research (3)	Fluency strategies and sentence-level main-idea instruction	Reading inventory questions	+
Bouloukou et al. (2021)	Greece	Grade 4 learners with dyslexia (32)	QED (2)	Rhythm-based music program; 12 weeks	LAMDA written comprehension	Unclear
Clemens et al. (2026)	United States	Grades 2–4, significant word-reading difficulties (68)	RCT (1)	Decoding plus spelling vs. decoding only	TOSREC (sentence level)	Null ($g = -0.16$)
Cockerill et al. (2023)	England	Struggling readers aged 7–9 (186)	RCT (1)	Fluency plus reciprocal reading in small groups; ≥ 12 weeks	Standardized reading test	+ (ES = +0.26)
Cockerill et al. (2024)	England	Struggling Grade 1 readers (620)	RCT (1)	Computer-assisted program (Lexia Core5); one school year	WRMT-III composite incl. passage comprehension	+ (ES = +0.08; +0.18 low SES)
Egarr & Storey (2022)	United Kingdom	Autistic learners aged 8–15 (4)	Alternating-treatments SCD (2)	Video modeling vs. feedforward video self-modeling; 10 sessions	Comprehension questions	Mixed (2 of 4 improved)
Eryılmaz & Balcı (2025)	Türkiye	Grades 1–4, dyslexia and typically developing peers (340)	Nonequivalent comparison (3)	Computer-based multisensory training; 6 weeks, 3 sessions per week	Researcher-selected texts	Unclear (gap persisted)
Hingstman et al. (2023)	Netherlands	Grade 1 learners at risk (299)	QED (2)	Success for All with tiered tutoring; one school year	Begrijpend Lezen	Mixed (ES = +0.26 cohort 1; ns cohort 2)
Hurwitz & Macaruso (2021)	United States	Struggling middle school readers (155)	Cluster RCT (1)	Blended program (Lexia PowerUp); ≈ 16.6 weeks	STAR Reading	+
Intasena & Worapun (2024)	Thailand	Secondary students (50)	One-group pre-post (3)	HyFlex learning plan	Researcher-made test	+
Khoueiry & Nabhan (2026)	Lebanon	10-year-old learner with dyslexia (1)	Mixed-methods case study (3)	ChatGPT-supported inquiry-based learning; one school year	School reading grades	+
Müller et al. (2020)	Germany	Grade 2 poor readers (26 small groups)	Randomized wait-list (1)	Syllable-based word-recognition training; 24 sessions	ELFE text comprehension	+

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Nurmahanani (2023)	Indonesia	Elementary learners (350)	QED (2)	Computer-assisted, tiered, and group reading; two semesters	Reading comprehension test	+ (lower grades only)
Solis et al. (2022)	United States	High school students with reading difficulties (375)	RCT, post hoc (1)	Multicomponent word reading and comprehension; 2 years	Standardized comprehension	Null
Stevens et al. (2024)	United States	Grade 4, inattention and reading difficulties (63)	QED (2)	Tier 2 comprehension aligned with Tier 1 content instruction; three 6-week units	Content-area comprehension assessment	+ (ES = 0.79 vs. BAU)
Wolff & Gustafsson (2022)	Sweden	Preschoolers aged 4–5, followed to Grade 3 (364)	Randomized (1)	Phonological awareness training; two 6-week waves	Standardized comprehension, Grades 2–3	+ (indirect)
Ziadat (2021)	Jordan	Grade 3 learners with dyslexia (39)	QED (2)	VAKT multisensory instruction; one semester	Arabic basic skills scale	+

Note. Tier 1 = randomized trial; Tier 2 = quasi-experimental design with a comparison group or single-case design with experimental control; Tier 3 = one-group pre–post, nonequivalent comparison, or case study without experimental control. + = positive effect; BAU = business as usual; ES = effect size as reported by the primary authors; ns = not significant; QED = quasi-experimental design; RCT = randomized controlled trial; SCD = single-case design; SES = socioeconomic status; TOSREC = Test of Silent Reading Efficiency and Comprehension; VAKT = visual–auditory–kinesthetic–tactile; WRMT-III = Woodcock Reading Mastery Tests, Third Edition.

C. Effects on Reading Comprehension (RQ2)

Of the 18 studies included in the analysis, 12 reported a positive effect on comprehension, 2 had mixed results, and 2 recorded no effect, although comprehension results were not adequately reported in 2 studies. Of the seven tier one studies

analyzed, five showed positive results, while two indicated no effect. The reported measures of effectiveness for comprehension or composite reading outcomes ranged from –0.16 to 0.79. A detailed summary of the findings according to the intervention category can be found in Table II.

TABLE II. DIRECTION AND REPORTED MAGNITUDE OF COMPREHENSION EFFECTS BY INTERVENTION CATEGORY

Intervention category	<i>k</i>	Studies	Positive/mixed / null/unclear	Reported effect sizes	Summary
Comprehension strategy instruction	4	Alsultan (2026); Balantekin (2021); Cockerill et al. (2023); Stevens et al. (2024)	4 / 0 / 0 / 0	+0.26; 0.69–0.79	Most consistent category; largest effect when Tier 2 content was aligned with Tier 1 instruction
Code-focused or foundational skills	4	Clemens et al. (2026); Müller et al. (2020); Wolff & Gustafsson (2022); Ziadat (2021)	3 / 0 / 1 / 0	–0.16 (sentence level)	Comprehension gains operated mainly through improved word recognition
Technology-mediated	6	Cockerill et al. (2024); Egarr & Storey (2022); Eryilmaz & Balci (2025); Hurwitz & Macaruso (2021); Intasena & Worapun (2024); Khoueiry & Nabhan (2026)	4 / 1 / 0 / 1	+0.08; +0.18 (low SES)	Blended programs supported by randomized trials; newer tools supported only by Tier 3 designs
Multicomponent or tiered programs	3	Hingstman et al. (2023); Nurmahanani (2023); Solis et al. (2022)	1 / 1 / 1 / 0	+0.26 (one cohort)	Effects varied with grade level and implementation quality

Arts-based	1	Bouloukou et al. (2021)	0 / 0 / 0 / 1	—	Comprehension effect not reported clearly
Total	18		12 / 2 / 2 / 2		

Note. *k* = number of studies; SES = socioeconomic status. Effect sizes are presented as reported by the primary authors and were not recalculated.

1) *Comprehension Strategy Instruction*

Positive results were observed across all four investigations into comprehension strategy training. The strongest evidence came from an integrated tiered framework in which fourth graders with inattention and learning disabilities received tier 2 instruction based on the same content-area knowledge as tier 1 social studies classes. Aligned education outperformed standard ($ES = 0.79$) as well as unrelated tier 1-tier 2 instruction ($ES = 0.69$), although nonconnected instruction did not outstrip the standard (Stevens et al., 2024). An experiment in English schools found that small-group fluency training combined with reciprocal reading improved general literacy results ($ES = +0.26$) by focusing primarily on sentence-level comprehension (Cockerill et al., 2023). A multiple-probe single-case study found that self-questioning with prompt fading improved comprehension quiz performance among fifth graders learning English; effects remained two weeks after the intervention and generalized from science to social studies texts (Alsultan, 2026). Finally, a single-student action research project also showed positive comprehension outcomes from implementing fluency techniques and main idea instruction (Balantekin, 2021).

2) *Code-Focused and Foundational-Skills Interventions*

It was observed that, of the four code-oriented programs, three yielded positive results in comprehension, specifically in improving word-reading skills. Müller et al. (2020) found that Grade 2 students with poor reading ability who underwent a 24-session syllable-based training program improved more than their peers on a waiting list in phonics, word reading, and comprehension. Children who started early phonological training at the age of 4 or 5 were positively affected in their phonological skills and reading ability, so that they were able to achieve better results in comprehension in Grades 2 – 3 through improved word reading and reading speed; children with lower IQ proved to be the most (Wolff & Gustafsson, 2022). It has been shown that Grade 3 students with dyslexia who attended 1 semester of the VAKT program showed better improvement than the group of students controlling for this program (Ziadat, 2021). However, it was noticed that when spelling practice was added to decoding instruction for Grade 2-4 students who experienced major difficulties in word reading, there was an improvement in word reading, but the comprehension results were insignificant ($g = -0.16$) (Clemens et al., 2026).

3) *Technology-Mediated Interventions*

Of the six studies conducted, four reached a positive conclusion regarding the use of technology; however, the largest study found a small effect. In the randomized study

involving up to 620 Grade 1 students from 57 educational establishments, the technology-based program showed a total effect of $+0.08$ for the measure related to reading as a process and $+0.18$ for students with low socio-economic status. The cluster randomized trial, which incorporated a mixed-format program, targeted multiple student groups and showed a drastic increase in students’ knowledge. Promising results found in the HyFlex educational plan meant for Thai secondary learners (Intasena & Worapun, 2024) and in AI-assisted research-based learning adopted for one dyslexic student (Khoueiry & Nabhan, 2026) were derived from designs belonging to Tier 3. In one study, video modeling helped two of four students diagnosed with autism hold an item of knowledge slightly better (Egarr & Storey, 2022). A computer-assisted multisensory program helped students with dyslexia with word-reading activities, but they still showed a significant knowledge gap compared with their non-impaired peers (Eryılmaz & Balci, 2025).

4) *Multicomponent and Tiered Programs*

Multicomponent programs showed mixed results. The Success for All comprehensive reform in the Netherlands showed a notable comprehension effect for at-risk first graders in one cohort ($ES = +0.26$), while in a second cohort the effect was small and nonsignificant because of implementation issues (Hingstman et al., 2023). The two-year multicomponent approach for high school students with reading difficulties did not produce significant differences in comprehension compared with business-as-usual. The Indonesian literacy program, which used computer-assisted, tiered, and group reading, improved comprehension skills in the first grades but did not transfer to higher classes (Nurmahanani, 2023).

5) *Arts-Based Interventions*

Another study looked into a 12-week music program based on rhythm for Grade 4 children with dyslexia, which was conducted in Greece. Results showed improvements in word recognition, spelling, visual sequencing, and rhythm reproduction, although the findings on written comprehension were not clearly described (Bouloukou et al., 2021).

D. Characteristics Associated With Comprehension Gains (RQ3)

Grade level. In younger learners, the impact of interventions was generally larger. For instance, the program implemented in Indonesia positively affected students in lower elementary grades but not in grades 5 and 6 (Nurmahanani, 2023), while preschool phonological training affected students in grade 3

(Wolff & Gustafsson, 2022). However, it should be noted that results were mixed among four studies involving students in secondary education, since there were two experiments belonging to Tier 1 which showed different results: implementing a blended intervention had a positive effect (Hurwitz & Macaruso, 2021), while the two-year-long program comprising various types of interventions had no positive impact (Solis et al., 2022).

Learner profile. Students who began the educational program with fewer skills or faced greater disadvantage mostly gained more benefit, including children with lower fluid intelligence (Wolff & Gustafsson, 2022) and those with low socioeconomic status (Cockerill et al., 2024). However, the level of word-reading skill also determined the response: the stronger word decoders had better results in the blended middle school program (Hurwitz & Macaruso, 2021), while the level of word fluency at the baseline predicted the outcome among the students regardless of the condition (Solis et al., 2022).

Alignment and implementation. Interventions consistent with teaching performed better than inconsistent interventions of equal intensity (Stevens et al., 2024), and low implementation had no impact in the second Success for All cohort (Hingstman et al., 2023).

Measurement. In studies where researchers created their own comprehension measures or used school-curriculum-based measures, neither study reported null results. In contrast, we saw two null results specifically in the Tier 1 trials, which relied on standardized (uniform) measures (Clemens et al., 2026; Solis et al., 2022). It has to be noted, though, that in large trials, the effects (that were estimated using standardized composites) were not as big as in the case of trials where proximal (home-made) measures were used.

IV. DISCUSSION

The review that is presented here provides a synthesis of 18 contemporary studies that have investigated the effects of reading interventions on the level of comprehension among school-aged students. Positive outcomes were found in most of the studies, and the strength of evidence differed substantially from one study to another, while some trends were consistent with the active and straightforward approaches to understanding the nature of reading.

A. Explicit Comprehension Instruction Is the Most Consistent Lever

Gains were reported in all four studies of strategy instruction, and two of these reports have a strong design, namely a randomized trial of fluency with reciprocal reading (Cockerill et al., 2023) and a quasi-experimental design of aligned Tier 1 and Tier 2 instruction (Stevens et al., 2024). The size of the effect ($ES = 0.79$) for the aligned conditions, as well as the absence of an effect in the nonaligned cases, points to the fact that what learners learn in practice is as important as how much intervention is received. This finding helps explain the

dosage effect reported by Hall et al. (2023): additional time is effective when the intervention aligns with the regular classroom content. Self-questioning with prompt fading has also been shown to create durable effects and transfer across content areas (Alsultan, 2026), confirming the importance of behavioral processes according to the active view (Duke & Cartwright, 2021).

B. Word Recognition Remains a Necessary Foundation

When code-centered interventions led to improvements in word recognition, comprehension was also improved since the studies mainly operated in this direction (Müller et al., 2020; Wolff & Gustafsson, 2022). This trend aligns with the simple view of reading and Hall et al.'s (2023) results, which show that foundational-skills interventions benefit young readers with difficulties. Nevertheless, the lack of comprehension gains from introducing spelling in decoding lessons (Clemens et al., 2026) and the persistent comprehension gap after multisensory word-reading instruction (Eryılmaz & Balci, 2025) show that word-level improvement does not necessarily translate into improved comprehension. Thus, interventions for struggling readers must ensure word recognition while also teaching comprehension.

C. Technology Supplements but Does Not Replace Instruction

Technology-based interventions are the largest category, but the best evidence comes from hybrid programs that combine online practice and supervised classes (Cockerill et al., 2024; Hurwitz & Macaruso, 2021), while the largest empirical study found no significant results. The larger effect in lower socioeconomic status groups suggests that technology-based intervention could provide opportunities to practice reading skills even when the environment offers little practice in this skill. Outcomes from novel technologies, including AI-supported inquiry and HyFlex learning, were gathered through a Tier 3 design, so these findings should be regarded as promising but not established, unlike the single-case review results presented by Alqahtani (2024).

D. Implications for the Philippine Context

No relevant study exists in the Philippines, and the only Philippine intervention study included in the literature review examined oral fluency rather than comprehension (Canuto et al., 2024). This deficit is serious, given the ARAL Program's scope (Republic Act No. 12028, 2024). Local studies suggest that comprehension difficulties in the Philippines mostly stem from vocabulary issues and problems with higher-order comprehension (Astrero et al., 2024). Nevertheless, a peer-assistance reading project for 7th graders increased the average comprehension rate to 52.11% and the average number of correct answers to 68.82% (effect $t = 6.11$, $p < .001$; Astrero & Eugenio, 2025). However, the study is not in the database, and because it uses a single-group before-after

experimental design, its implications are seriously limited, given its Tier 3 status.

The current buildup lays the groundwork for four general principles to be followed in creating ARAL-Reading tutorials and similar programs. First, tutorial content should align with the reading material and vocabulary used in students' regular syllabi rather than being offered as an independent course (Stevens et al., 2024). Second, tutor sessions should incorporate fluency practice and explicit comprehension techniques such as questioning, clarification, and summarizing (Alsultan, 2026; Cockerill et al., 2023). The third principle focuses on learners who read at frustration levels and require systematic support for word recognition in addition to comprehension teaching (Müller et al., 2020; Wolff & Gustafsson, 2022). Finally, technology is not expected to substitute, but to complement personal teaching (Cockerill et al., 2024). For teacher training institutions, these principles can shape pre-service teacher training to teach comprehension explicitly and assess interventions compared with other methods.

E. Limitations

These conclusions have certain limitations. First of all, the data were obtained from the same single database, thus omitting studies published in other places. Second, only articles in English published between 2020 and 2026 were included in this review; hence, five relevant studies in Portuguese, Spanish, or Turkish were not considered. Third, even though the two reviewers did data extraction and screening separately, there was some subjectivity in deciding what is to be considered as a measure of comprehension, namely, when determining whether a method of measuring sentence-level efficiency should be included for consideration. Fourth, different experimental designs made a meta-analysis impossible, and voting by result direction does not account for studies' accuracy or size. Fifth, eight of the ten sources were authored by the authors, which led us to assign higher evaluations to these measures than to standardized measures. Lastly, we cannot rule out publication bias toward positive results, especially in smaller Tier 3 studies.

F. Directions for Future Research

Future studies must focus on randomized or quasi-experimental evaluations of comprehension interventions in multilingual populations and low- and middle-income countries, including the Philippines. Studies must report standardized effect sizes, use both standardized and proximal comprehension measures, distinguish between sentence- and passage-level comprehension, and record dosage and implementation fidelity. There is a major need for studies evaluating national tutoring programs such as ARAL-Reading and research on AI-supported reading.

V. CONCLUSION

Recent intervention research shows that comprehension improves when learners receive explicit instruction that accounts for their classroom literacy experiences and proficiency in word recognition. Although technology-mediated and multicomponent programs can support this improvement, successful implementation depends on sound design and effective scaling. Following the expansion of the national reading recovery through the ARAL Program, the Philippines needs to develop and thoroughly evaluate tutorials rooted in these principles.

VI. DISCLOSURE

The authors report no conflicts of interest in this work.

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