The Effects of Academic Vocabulary Knowledge Interventions: A Systematic Review

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Abstract

Vocabulary is one of the five core pillars of reading development (National Reading Panel, 2000), and substantial evidence links vocabulary knowledge to reading comprehension (e.g., Elleman et al., 2009) and word learning (e.g., Storch & Whitehurst, 2002). The Institute of Education Sciences' (IES) What Works Clearinghouse (WWC) Practice Guide on foundational reading skills identified teaching academic language, including inferential and narrative language, as a key instructional recommendation. At the time of publication, this recommendation was supported by minimal evidence (Foorman et al., 2016). To build upon this work, this review examined studies published between 2014 and 2025 that included at least one vocabulary outcome for students in kindergarten through Grade 3. The systematic search yielded 23 studies comprising 6,030 participants. Of these, 30 significant findings were identified (i.e., effects), including 27 significant positive effects on proximal measures. Three studies found significant effects on a distal standardized measure of vocabulary knowledge (August et al., 2021; Hassinger-Das et al., 2015; Lovett et al., 2017). Thirteen of these 23 studies were rated as high quality according to WWC standards. Effective practices across studies included: (1) identifying high utility target words to explicitly teach; (2) explicit teaching of target words using child-friendly definitions and visuals, repeated exposure, and discussion with target words; and (3) integration of vocabulary instruction within academic content (e.g., science or mathematics) and with connected text. These findings support and expand the evidence base for the academic language recommendation in early reading instruction.

Keywords: intervention, instruction, academic vocabulary, vocabulary outcomes, research synthesis

Academic Vocabulary

There is mounting evidence that vocabulary knowledge plays a critical role in reading comprehension at every stage of development (e.g., Cromley & Azevedo, 2007; Wagner & Ridgewell, 2009). If students are not reading proficiently by third grade, they will often face persevering academic consequences because these academic challenges tend to persist (Aud et al., 2013; NAEP, 2022; Wanzek et al., 2011). Thus, it is of paramount importance to build foundational literacy skills, including academic vocabulary knowledge, in a child's early years of school.

Students will need academic vocabulary knowledge to understand books, follow instructions, and engage in school-based learning. While children often pick up social language implicitly, academic vocabulary often needs to be taught explicitly (Foorman et al., 2016). Academic language includes the ability to use inferential language to articulate ideas beyond the here and now, narrative language to explain a sequence of events or retell a story and using academic vocabulary knowledge and grammatical structures to make meaning from text (Foorman et al., 2016). Students who lack academic vocabulary tend to be at risk and fall behind, but academic language skills can be taught. With consistent opportunities to hear, discuss, and practice these forms of language, students begin to better understand the kinds of texts and conversations that school demands. Instruction in inferential language, for example, helps students make deeper connections across ideas, while narrative language supports their ability to organize and explain what they read or experience. In this way, academic language development isn't just an add-on to early literacy instruction, it is a central component.

Barriers

Existing research highlights three persistent risk factors for developing academic vocabulary: (1) being an English Language learner (EL; August et al., 2005; Kieffer & Vukovic, 2013); (2) coming from a home environment with fewer language resources, often associated with lower income or parental education (Rowe et al., 2012); and (3) the lack of consistent, evidence-based vocabulary instruction. For ELs, limited exposure to English vocabulary early on can have long-term consequences if left unaddressed (Vadasy et al., 2015). While direct vocabulary instruction has been shown to benefit ELs (e.g., August et al., 2016; Crosson & Lesaux, 2013; Lawrence et al., 2012), studies continue to show that teachers spend limited time on vocabulary instruction (Wright, 2012; Wright & Neuman, 2013). The same cascading effects can be seen in students from homes with limited vocabulary input, particularly if those needs go unmet during the foundational early years (Rowe et al., 2012). These two groups often overlap, compounding risk and contributing to persistent gaps in

academic language development (Farkas & Beron, 2004; Kieffer & Vukovic, 2013). Compounding this issue, even when vocabulary is taught, the methods used vary widely in quality and alignment with research-based practices (Marulis & Neuman, 2013; Wright, 2012). This makes it all the more urgent to identify effective academic vocabulary instruction for the early grades.

Relevant Recent Meta-Analysis and Reviews

Cervetti and colleagues (2023) conducted a rigorous meta-analysis to test the long-standing assumption that direct vocabulary instruction contributes meaningfully to students' overall vocabulary growth and reading comprehension. The authors analyzed 39 experimental and quasi-experimental studies involving students in grades K–5, focusing on two central approaches: explicit instruction in word meanings and semantic strategy instruction (e.g., teaching students how to use morphology or context clues to infer meaning). Although students reliably learned taught words through direct instruction, the findings revealed that this approach did not produce statistically significant gains on measures of breadth of vocabulary knowledge, which assess general vocabulary beyond the taught words. Similarly, semantic strategy instruction showed stronger effects on students' ability to use word-solving strategies, but not on broader vocabulary development. The average effects on standardized or distal measures remained small. These results call into question whether short-term vocabulary programs—particularly those focused solely on direct instruction—can generate the long-term vocabulary growth needed for comprehension. Instead, Cervetti and colleagues argue that vocabulary may be best conceptualized as one component of broader language knowledge, including academic language, syntax, and world knowledge, and they suggest that meaningful gains may require more integrated, long-duration interventions across content areas.

Silverman et al. (2020) conducted a meta-analysis of the effects of language comprehension interventions on K–5 Students' language and literacy Outcomes. Their search yielded 43 studies involving students in grades K–5 and found large significant effects for vocabulary instruction on researcher-developed measures, but negligible effects on standardized measures, reinforcing earlier concerns about the limited generalizability of vocabulary gains. Importantly, they found positive effects for both listening and reading comprehension, but again only on proximal assessments. The findings suggest that while explicit instruction in language comprehension skills benefits students, especially ELs and those from under resourced schools, those benefits do not consistently transfer to broader, standardized outcomes (Cervetti et al., 2023; Silverman et al., 2020). The study also emphasizes the promise of multicomponent interventions and those incorporating discussion or technology but highlights a pressing need for more evidence on how to design instruction that builds

generalizable, long-term language growth—particularly for students from underserved backgrounds.

Taken together with Cervetti et al. (2023), the findings highlight a growing consensus: while direct instruction in vocabulary leads to measurable learning of taught words, its effects often fail to extend to broader vocabulary knowledge or comprehension unless embedded in more sustained instructional contexts. Both reviews point toward the limitations of short-term vocabulary teaching in isolation and call for a shift toward integrated academic language instruction that includes semantic strategies, inferential language, and content-area alignment to support long-term reading development.

The first recommendation in the WWC Practice Guide, *Foundational Skills to Support Reading for Understanding in Kindergarten Through 3rd Grade,* emphasizes the importance of teaching academic language skills—namely, vocabulary knowledge, inferential language, and narrative language (and discourse for ELs). These skills are foundational to reading comprehension and academic success, particularly as students encounter more complex texts across disciplines. However, at the time of publication (2016), the Institute of Education Sciences rated the evidence base for this recommendation as minimal, citing that of the seven studies that met inclusion criteria based on WWC standards, only two showed positive vocabulary effects, and none showed significant gains in syntax or inferential language skills. Several studies showed no discernible effects, and many relied on researcher-developed measures rather than standardized assessments. This reflects a broader gap in the literature: there were few high-quality causal studies that tested vocabulary and academic language instruction in diverse educational settings using rigorous designs.

The Present Study

The purpose of the present study is to revisit the practice guide's review on academic vocabulary to examine whether the research base has grown over the past decade and how it aligns with the guide's recommendations. In other words, this review looks closely at the quality of the evidence and whether instructional approaches align with the three components of academic language outlined in Recommendation 1 to include inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary (which has been highlighted as especially important for ELs), in instruction.

Thus, this review addresses the following research questions:

1. Research question 1 (RQ1): What instructional and intervention characteristics (e.g., quality, dosage, interventionist, multicomponent intervention) and student characteristics (e.g., EL, at risk status) have been tested as part of academic vocabulary knowledge interventions?

2. Research question 2 (RQ2): What does the research say about the effectiveness of academic vocabulary knowledge instruction in improving foundational reading outcomes for readers in grades K-3?

3. Research question 3 (RQ3): Of the studies rated high quality, what features did these studies include? Do the high-quality studies align with the WWC practice guides recommendations to teach inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary?

Method

Study Eligibility Criteria

Literature was identified through a three-step process. First, studies were identified based on key search terms. Next, the titles and abstracts were screened for eligibility. Third, a full-text screening process based on eligibility criteria was implemented. To be included in the review, studies must have met the following criteria: a) employed an experimental or quasi-experimental design with a treatment and a comparison to determine the experimental effect; b) the sample needed to be in grades K-3; c) a literacy-focused intervention with at least one academic vocabulary knowledge outcome (e.g., expressive or receptive word knowledge test); d) written in English and the study took place in the United States or its territories, England, Australia, Ireland, New Zealand, or Canada in a school-based setting, public or private, classroom, clinic, home, or early childhood center.

Search Strategy

In the identification process, an electronic database search was conducted using ERIC (EBSCO), Academic Search Complete, APA PsycINFO. The search terms were developed based on the following categories: study design (e.g., RCT); topic (e.g., vocabulary knowledge); intervention (e.g., strategy, program); population (e.g., K-3,
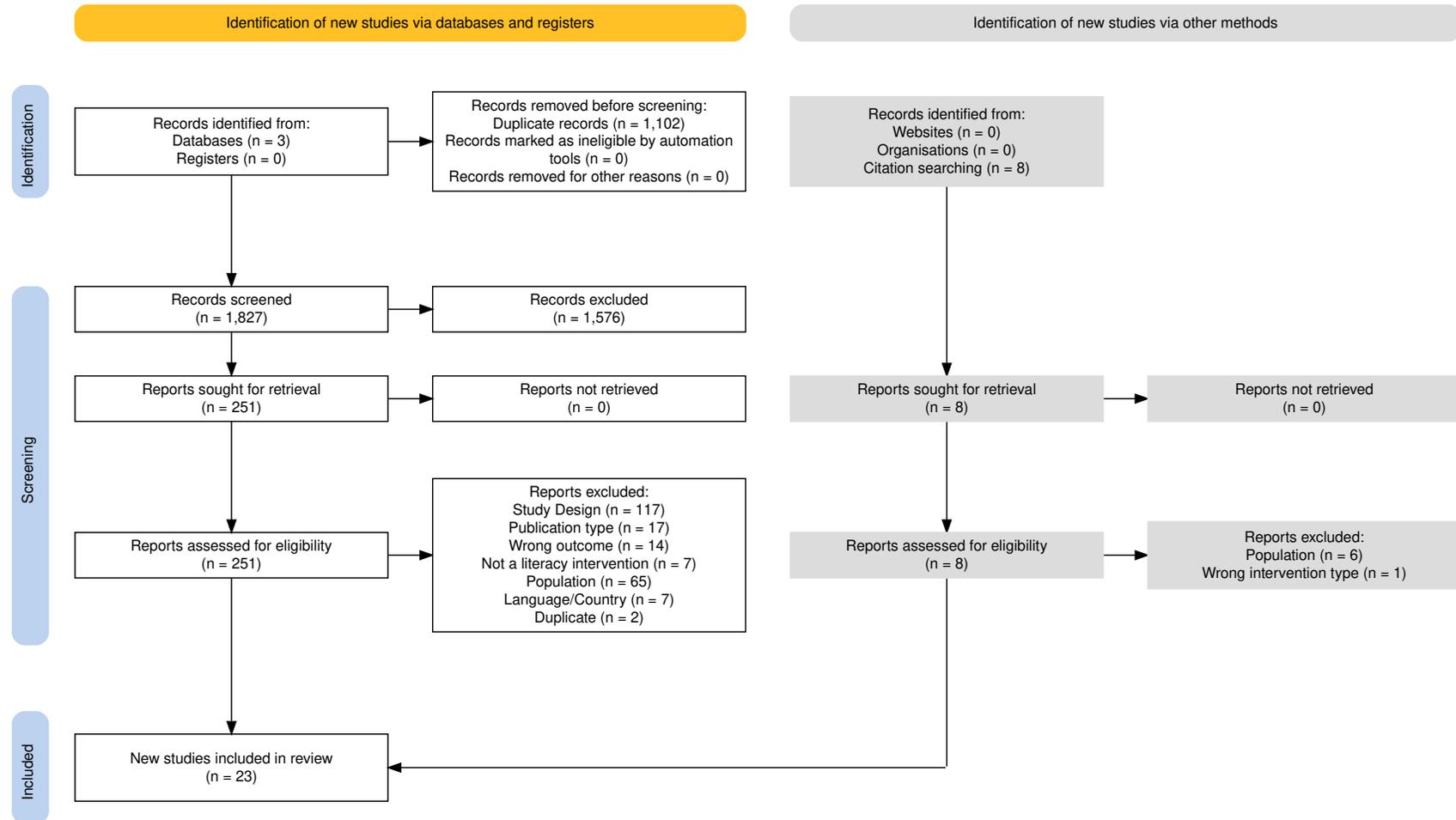
ages 5-9); and outcome (e.g., effect, improvement). Other exclusion criteria included the timeframe and publication type. Studies were also excluded if the focus was exclusively on one specific disability only (e.g., hearing loss). This review aimed to capture vocabulary interventions delivered in general education or mixed-ability settings, including those serving ELs and students receiving special education services. Studies must have been published between 2014 and January 2025 when the search was conducted. Conference papers and dissertations were not eligible for inclusion. Studies related to teacher professional development or teacher preparation were not included.

The database search produced 2,929 records. Once duplicates were removed, 1,827 records remained. The titles and abstracts of the 1,827 records were screened for the eligibility criteria and sorted into two categories ("maybe" or "no"). Using 365 records as a sample to obtain reliability, two researchers screened the records and ensured a 90% agreement percentage. All disagreements were resolved via a discussion. From the screening phase of the process, 1,576 records were excluded leaving 251 eligible for full-text screening.

The 251 records eligible for full-text screening were reviewed and included if they had the following criteria: a) employed an experimental or quasi-experimental design with a treatment and a comparison to determine the experimental effect; b) a student sample in grades K-3; c) a reading-focused intervention with at least one vocabulary knowledge outcome; d) written in English and the study took place in the United States or its territories, England, Australia, Ireland, New Zealand, or Canada in a school-based setting, public or private, classroom, clinic, home, or early childhood center. A spreadsheet was used with "yes" or "no" coding; if one criterion was missing, the record was excluded. From this process, 229 records were excluded leaving 22 records to be synthesized in this systematic review.

After completing the database search, prior literature reviews and meta-analyses related to vocabulary were reviewed. The studies in prior reviews were cross-referenced with the studies included for final inclusion and against the inclusion criteria. One record was included based on the cross-reference screening process, resulting in 23 studies to be included in the review. Figure 1 includes a PRISMA diagram that outlines the selection process.

Figure 1

Identification of new studies via databases and registers	Identification of new studies via other methods

Identification

Records identified from:
Databases (n = 3)
Registers (n = 0)

→

Records removed before screening:
Duplicate records (n = 1,102)
Records marked as ineligible by automation tools (n = 0)
Records removed for other reasons (n = 0)

Records identified from:
Websites (n = 0)
Organisations (n = 0)
Citation searching (n = 8)

Screening

Records screened
(n = 1,827)

→

Records excluded
(n = 1,576)

Reports sought for retrieval
(n = 251)

→

Reports not retrieved
(n = 0)

Reports sought for retrieval
(n = 8)

→

Reports not retrieved
(n = 0)

Reports assessed for eligibility
(n = 251)

→

Reports excluded:
Study Design (n = 117)
Publication type (n = 17)
Wrong outcome (n = 14)
Not a literacy intervention (n = 7)
Population (n = 65)
Language/Country (n = 7)
Duplicate (n = 2)

Reports assessed for eligibility
(n = 8)

→

Reports excluded:
Population (n = 6)
Wrong intervention type (n = 1)

Included

New studies included in review
(n = 23)

Inclusion and Exclusion Criteria

The following includes a more in-depth description of the eligibility criteria:

1. Study design: Included studies employed an experimental or quasi-experimental design with a treatment and a comparison to determine the experimental effect. Correlation studies were not included.

2. Participant sample: Students had to be in grades K-3 (ages 5 years 0 months, through 9 years 11 months), or in any subset of these grades. Studies that contained students in other grades or mixed grades were not included unless a study reported disaggregated results for students in eligible grades on the vocabulary knowledge outcomes.

3. Intervention: Included studies had a reading-focused intervention, specifically with the aim to improve academic vocabulary knowledge, with at least one academic vocabulary knowledge outcome. If teacher outcomes were included, the study was excluded. Studies that had instruction implemented by a researcher, classroom teacher, interventionist, special education teacher, paraprofessional/aide, parent/caregiver, or computer program were included.

4. Language and study location: Included studies were written and conducted in English and the study took place in the United States or its territories, England, Australia, Ireland, New Zealand, or Canada in a school-based setting, public or private, classroom, clinic, home, or early childhood center.

Coding Procedure

The 23 records included in the final analysis were coded using a spreadsheet to extract information on the following categories: a) research design; b) student demographics and location (including how many students participated); c) intervention characteristics (implementer, tier, dosage); d) independent variable description; e) comparison condition description; f) research quality; g) summary of findings (as reported by the authors); h) dependent variable(s) with description; i) effect size, j) which pillars + writing of reading were
included in the intervention; and h) if the instruction included any of the academic language recommendations (i.e., inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary; Foorman et al., 2016).

Analysis

After the 23 studies were coded by extracting the key information, the results were categorized into two tables to synthesize the studies' findings. The first table (Table 1) included the research design, student demographics and location (including how many students participated), intervention characteristics (implementer, tier, dosage), independent variable description (including comparison condition description), research quality, summary of findings (as reported by the authors), dependent variable(s) and description and effect sizes. The second table (Table 2) captured specific components in the intervention including which pillars + writing of reading instruction were included in the intervention and if the instruction included any of the academic language recommendations from the IES practice guide (i.e., inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary; Foorman et al., 2016).

The aforementioned descriptors of interest were examined, as is common in systematic reviews, to help with interpretation of effect sizes, including study conditions, participant details, and study quality (Lipsey, 2019). For study conditions, details about the independent variable (i.e., the academic intervention) were extracted as well as information about the comparison group, as described in the study. Descriptors were described using the language of the source articles (as is recommended; Wilson, 2019). See Table 1 for study condition examples.

Quality was coded based on four indicators: research design, sample size, attrition, and intervention contaminants. WWC standards (2020) for research design quality and previous research focused on reading intervention study quality were utilized (Austin et al., 2019) to identify these key indicators. A study was rated as high quality if group membership was determined through a random process, it had a sufficiently large sample of greater than or equal to 20 participants, it had low attrition (overall and differential) using WWC standards (IES, 2021), and there was no evidence of other intervention contaminants (e.g., events such as students in the control group receiving the treatment) that could have interfered with our ability to make a causal inference about the intervention. A study was rated as medium quality if group membership was not determined through a random process, but equivalence was established at baseline, and there were a sufficient sample size (> 20), low attrition, and no intervention contaminants. A study was rated as low quality if group membership was not determined through a random process and equivalence was not established at baseline or if a study reported high attrition or an insufficient sample size (<20).

After the two tables were completed, the findings were synthesized and analyzed. Studies with ELs and economically disadvantaged students were analyzed, since these students have been reported as significantly more at risk for poor academic vocabulary outcomes. Next, the studies were sorted by quality as per WWC standards and the findings were synthesized for high quality studies only (IES, 2021). Lastly, studies were reviewed for which pillars + writing of reading instruction were included in the interventions and if the instruction included any of the academic language recommendations (i.e., inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary; Foorman et al., 2016).

Results

RQ1. Study and Student Characteristics

The first research question sought to identify what instructional elements of academic vocabulary instruction had been investigated between 2014 and January 2025 and addressed the question: What instructional and intervention characteristics (e.g., quality, dosage, interventionist, multicomponent intervention) and student characteristics (e.g., ELs, at risk status) have been tested as part of academic vocabulary knowledge interventions?

The 23 studies included in this synthesis examined vocabulary instruction interventions for a combined total of 6,030 students in early elementary settings (Kindergarten through Grade 3). Most studies were conducted in the United States, though a few included participants from Australia, Canada, or the United Kingdom. Of the 23 studies, 15 included students identified as ELs, and 17 included students described as at risk for reading difficulty, language delay, or academic underperformance (e.g., based on socioeconomic status or early screening results). Six studies included students receiving special education services or with identified learning disabilities (e.g., dyslexia or speech-language impairment). The majority of studies reported implementing interventions in general education or mixed-ability classrooms, with multiple studies taking place in Title I schools or schools serving predominantly low-income communities.

Across the 23 studies, the majority of vocabulary interventions were implemented as part of Tier 1 (n = 10) or Tier 2 (n = 13) instruction. Of the corpus, 21 studies explicitly taught academic vocabulary, and two studies used techniques with implicit vocabulary teaching (Wright & Dunsmuir, 2019; Young et al., 2019). Some interventions were identified as intensive and individualized, so these interventions

were coded as Tier 2/Tier 3 as per assumptions of the author of this review (Duff et al., 2014; Lovett et al., 2017). Most interventions were delivered during the regular school day. Eleven interventions were led by classroom teachers, while the remaining 12 were implemented by paraprofessionals, AmeriCorps members, 4th grade peers, an app, trained tutors (including virtual tutors), or research staff. Three interventions utilized technology, and one utilized a video recording. Intervention dosage varied widely, ranging from 2.5 hours to more than 100 hours of instruction. Although instructional duration and intensity ranged across studies, many provided explicit vocabulary instruction that included child-friendly definitions, visual supports, and guided discussion. Several studies also embedded vocabulary instruction within broader literacy routines, writing activities, or content instruction (e.g., science or math). Across the corpus, 13 studies were rated as high quality, three were rated medium/high, six were rated medium, and one was rated low according to WWC criteria adapted for this review (see aforementioned criteria).

RQ2. Effectiveness of Interventions on Foundational Vocabulary Knowledge Outcomes

The second question sought to examine the effectiveness of the corpus of studies and addressed the question: What does the research say about the effectiveness of academic vocabulary knowledge instruction in improving foundational reading outcomes for readers in grades K-3? In the corpus of studies (i.e., 23 studies), there were 30 identified significant findings (i.e., effects). Of the 30 significant effects, 27 were on researcher developed proximal (i.e., close transfer) measures. Three studies found significant effects on a distal standardized measure of vocabulary knowledge (August et al., 2021; Hassinger-Das et al., 2015; Lovett et al., 2017). One study did not report effect size between treatment and control (Huang, 2015) but did report higher scores at posttest than pretest in the treatment group on a standardized measure. One study that did not find significant effects, but included only a standardized measure (Young et al., 2019).

RQ3. High Quality Study Findings

The third question sought to examine the high-quality studies and addressed the question: Of the studies rated high quality, what features did these studies include? Do the high-quality studies align with the WWC practice guides recommendations to teach inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary? Across the 13 high-quality studies included in this review, explicit academic vocabulary instruction was a consistent feature (Figure 4), with all 13 studies employing explicit strategies such as

direct teaching of word meanings, guided discussion, and repeated exposure to target vocabulary. In terms of effectiveness, 13 studies reported statistically significant effects on proximal vocabulary outcomes, while only two reported significant gains on standardized or distal measures (Figure 2). When examining alignment with IES' academic language recommendations, all 13 studies addressed academic vocabulary knowledge, while 10 included structured discussion using target words, six incorporated narrative language skills, and five addressed inferential language development (Figure 3). Instructional components extended beyond vocabulary as well: six studies included comprehension (beyond understanding meanings of the target words), four included writing, two included phonics, one addressed phonological awareness, and all 13 focused on vocabulary (Figure 5).
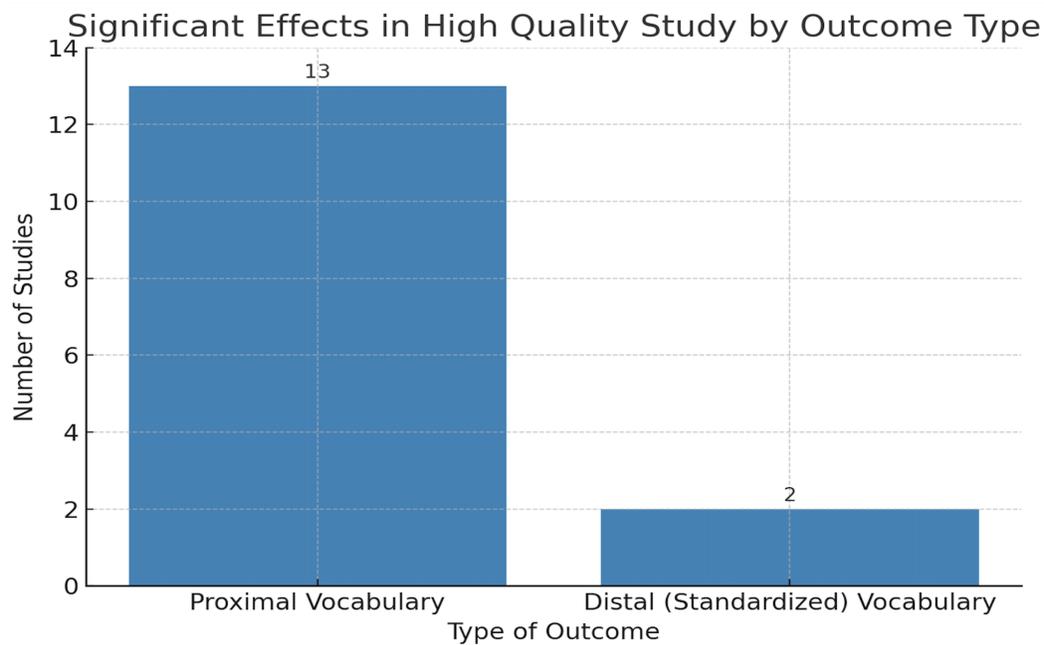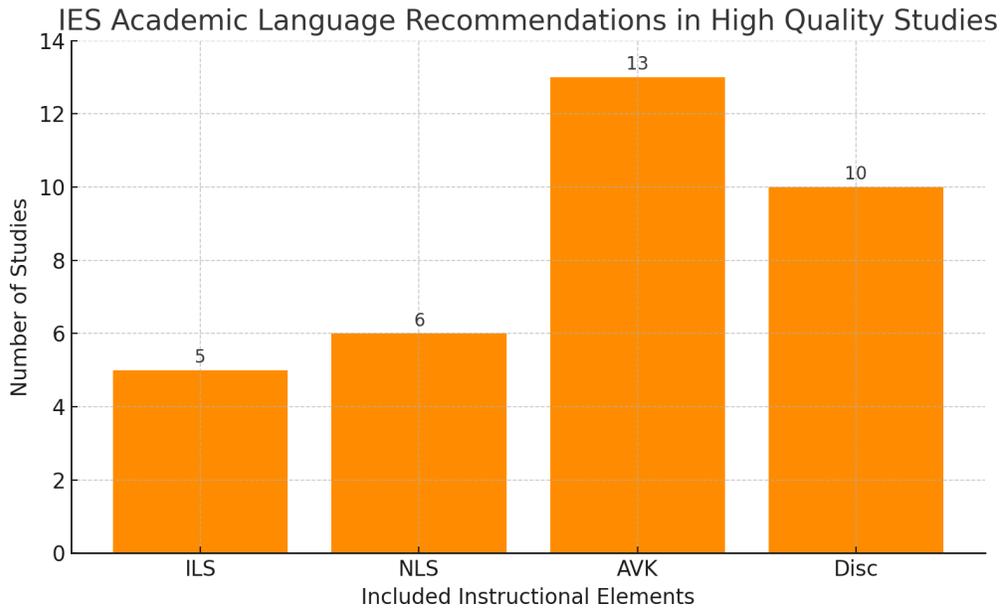
Figure 2

Significant Effects in High Quality Study by Outcome Type

Figure 3

IES Academic Language Recommendations in High Quality Studies

Note: ILS = Inferential Language Skills; NLS = Narrative Language Skills; AVK = Academic Vocabulary Language; Disc = Discussion Utilizing Vocabulary.
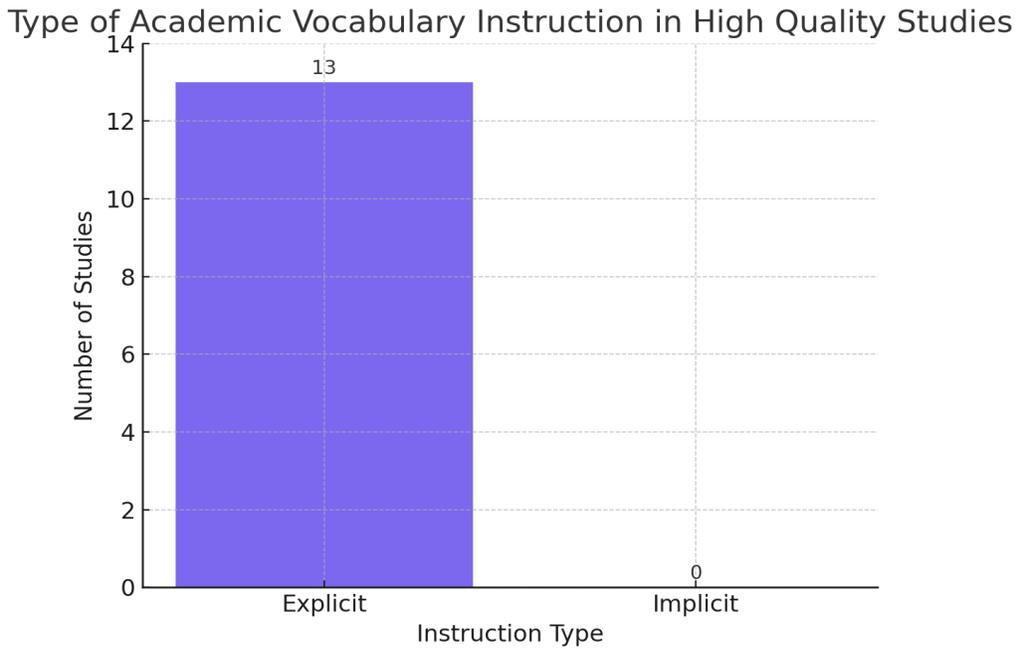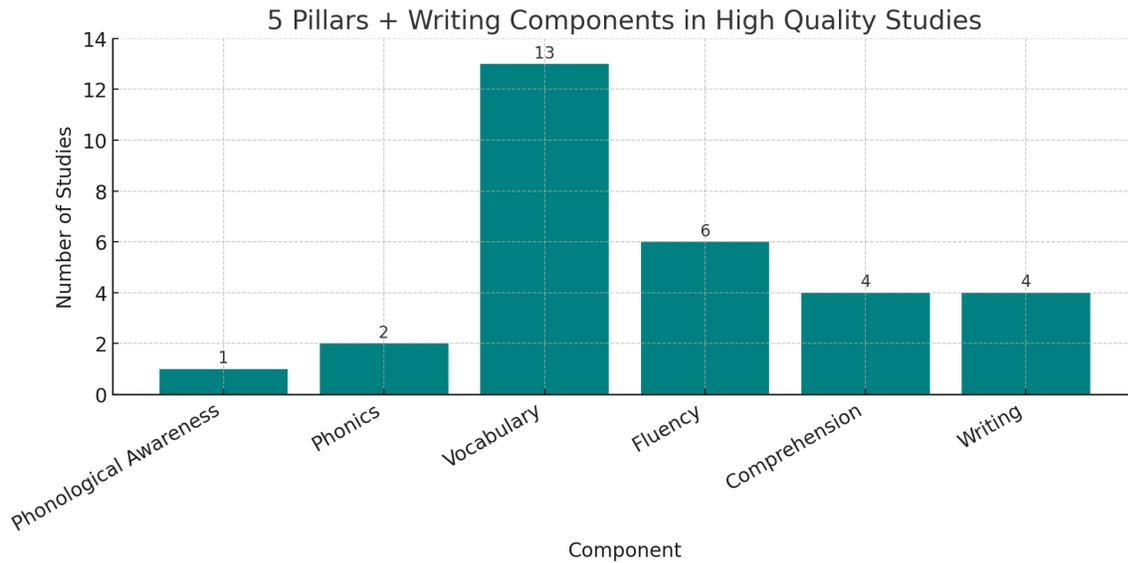
Figure 4

Type of Academic Vocabulary Instruction in High Quality Studies

Figure 5

5 Pillars + Writing Components in High Quality Studies

Discussion

The purpose of the present synthesis was to add to the existing literature by returning to the IES practice guide's review on academic vocabulary and evaluate if the research base has grown over the past decade—and if so, evaluate the strength of the evidence and compare the research with the guide's recommendations. In other words, this review looked closely at the quality of the evidence and whether instructional approaches align with the three components of academic language outlined in Recommendation 1: inferential language skills, narrative language skills, academic vocabulary knowledge, as well as discussion utilizing taught vocabulary, which has been highlighted as especially important for ELs.

RQ1 Study and Student Characteristics

Since IES published their review in 2016, there have been 23 studies published, which aligned with the scope of this synthesis, indicating that there is more evidence to better understand how to foster academic knowledge in K-3 children. Effective practices across studies included: (1) identifying high utility target words to explicitly teach (and being selective); (2) explicit teaching of target words using child-friendly definitions and visuals, repeated exposure and discussion of vocabulary; and (3)

integration of vocabulary instruction within academic content (e.g., science or mathematics) and with connected text. These practices were also found to support ELs and economically disadvantaged students.

RQ2 Effectiveness of Interventions on Foundational Vocabulary Knowledge Outcomes

The systematic search yielded 30 identified significant findings (i.e., effects), including 27 significant positive effects on researcher-developed measures, including expressive and receptive tasks aligned with taught content. This is in line with prior research that academic interventions are less likely to address secondary aims or distal outcomes. For example, in a recent article addressing reading comprehension, Clemens and Fuchs (2022) argued that although standardized distal reading comprehension measures are important, they are uncommonly associated with statistically significant effects. Thus, near-transfer measures are also necessary because they are straightforward and can provide answers to simpler hypotheses, and distal outcomes are more complex. Another example includes a systematic review that investigated the effects of reading interventions on students with both reading and behavior difficulties (Roberts et al., 2020).

The findings included significant effects on reading outcomes (g = 0.86) but no association with improved behavior outcomes. Cervetti and colleagues (2023) analyzed students in grades K–5, focusing on two central approaches: explicit instruction in word meanings and semantic strategy instruction (e.g., teaching students how to use morphology or context clues to infer meaning), and found reliably that students learned taught words through direct instruction, but no statistically significant gains on measures of breadth of vocabulary knowledge, which assess general vocabulary beyond the taught words. The average effects on standardized or distal measures remained small. These converging findings call to question if short-term vocabulary programs—particularly those focused solely on direct instruction—can generate the long-term vocabulary growth needed for comprehension. Cervetti and colleagues (2023) argue that vocabulary may be best conceptualized as one component of broader language knowledge, including academic language, syntax, and world knowledge, and they suggest that meaningful gains may require more integrated, long-duration interventions across content areas. Taken together, it appears that it is common, and perhaps generalizable, that academic interventions will directly address primary aims, yet spillover effects into other areas that are less directly related are minimal.
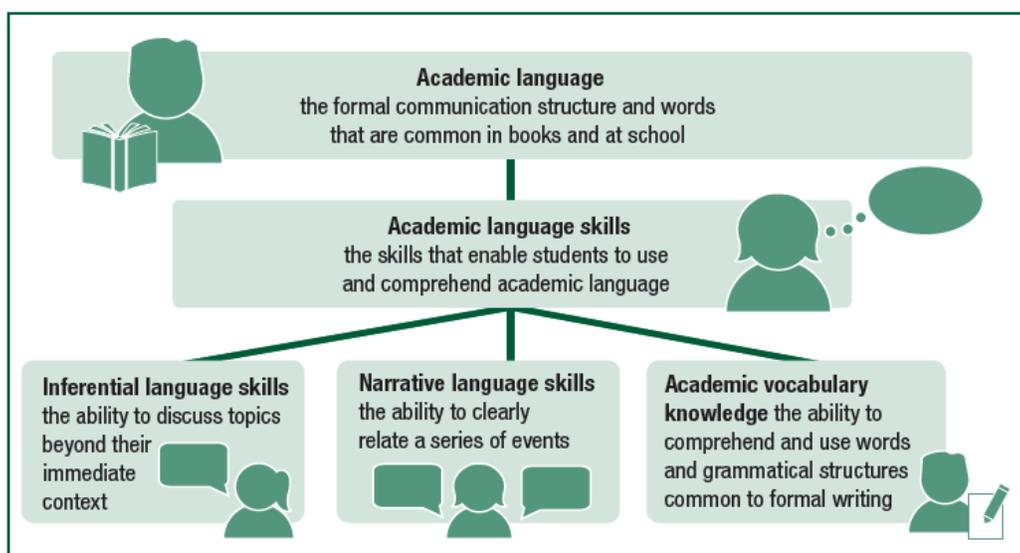
RQ3 High Quality Study Findings

The included high-quality studies were examined based on WWC standards due to the minimal support of evidence in the 2016 practice guide (Foorman et al., 2016). This review resulted in 13 high quality studies (meets standards without reservations) which all demonstrated that explicit academic vocabulary results in learning those vocabulary words. The only two studies in this corpus which did not utilize explicit vocabulary instruction were rated medium quality. One utilized only a standardized measure (Young et al., 2019), so it is difficult to compare with the rest of the studies. The other study, which included implicit teaching of vocabulary words through storytelling, resulted in small proximal gains (Wright & Dunsmuir, 2019), indicating that explicit academic vocabulary instruction may be beneficial.

When examining alignment with the IES' academic language recommendations (see Figure 6), all 13 studies addressed academic vocabulary knowledge, while 10 included structured discussion using target words, six incorporated narrative language skills, and five addressed inferential language development (Figure 3). In alignment with Cervetti and colleague's (2023) recommendation that distal vocabulary outcomes may be more complex, future studies might consider putting more emphasis on narrative language skills and inferential language development alongside explicit vocabulary instruction.

Figure 6
Image from Foorman et al., 2016 IES WWC Practice Guide

Example 1.1. Academic language skills

Academic language
the formal communication structure and words that are common in books and at school

Academic language skills
the skills that enable students to use and comprehend academic language

Inferential language skills the ability to discuss topics beyond their immediate context

Narrative language skills the ability to clearly relate a series of events

Academic vocabulary knowledge the ability to comprehend and use words and grammatical structures common to formal writing

Implications for Practice

There is consistent and solid evidence that explicitly teaching vocabulary helps students learn and understand those specific words (e.g., Marulis & Neuman, 2010). Effective practices include carefully selecting high utility vocabulary words, defining vocabulary terms for students prior to, during, and after instruction, and repeated exposure throughout a unit or module, and discussion through academic contexts. There is also support for additional visual and linguistic support for ELs (August et al., 2016; Dressler et al., 2011).

Limitations

Two noteworthy limitations exist with this synthesis. First, coding for the five pillars+ writing and IES academic language recommendations depended solely on how much information was provided by the study authors, and some inferences were made by the author of this synthesis. For example, if an author wrote that students discussed the text, this would not be enough information to assume that inference language skills were being taught, but it is possible. Next, effect size information was constrained to the exact reporting of study authors and was not analyzed collectively.

Future Research

Future research might consider meta-analyzing this data to better understand effects. Also, future research might include increased multi-component academic language interventions including inferential language skills, narrative language skills, as well as explicitly teaching academic vocabulary knowledge. No studies included in this synthesis included a syntax outcome, and this was an IES WWC recommendation in 2016, so it is still a recommendation for future research. Also, researchers should continue to understand how we can move the needle for K-3 students on distal language outcomes.

Conclusion

This review highlights the urgent need to close long-standing opportunity gaps in vocabulary and academic language development, particularly for ELs and students from low-income backgrounds. Without targeted and sustained support, these gaps risk widening over time, with consequences that stretch far beyond the early grades. One promising and well-supported approach is the explicit instruction of academic vocabulary, which emerged as a central feature in this review, and was already established in the literature. However, vocabulary instruction alone is not a "silver bullet," and there are many unanswered questions regarding how to improve distal outcomes for children. It is important to continue to explore how best to integrate academic language—vocabulary, inferential thinking, narrative skills, and purposeful discussion—into meaningful classroom routines.

Table 1

Characteristics of the Studies, Students, Interventions & Effects

Study and design	Participants and location	Implementer; Tier; Dosage	Treatment condition	Comparison condition	Research quality - Findings summary	Outcome domain and effect size as reported in the study
August et al. (2021) RCT	424; second-grade Spanish speaking (bilingual program) Els; United States	ESL teachers; Tier 2; ~18 wks/ 60 hours	T: *English Learners' Acquisition of Academic Vocabulary*: interactive shared reading, direct instruction of individual words, instruction in cognate use, activities to foster word consciousness and reinforce instructed words, and use of visual and linguistic supports.	C: Given the same trade books and were asked to read the books to students using the same methods usually used by the teachers.	High - Positive treatment effects on proximal receptive vocabulary knowledge and connected words and effects on standardized test of oral language development.	1.The oral vocabulary subtest of the TOLD; standardized ($d = 0.47$) 2. English Learner's Vocabulary Assessment (ELVA) researcher developed receptive knowledge of intervention content words (d= 1.88) 3.English Learner's Connectives Assessment (ELCA) researcher developed proximal test of connected words (e.g., therefore, because; high utility for text comprehension) ($d = 0.41$)
Baker et al. (2020) RCT	638 first grade students (44% ELLs, 18% receiving ESL services, 14% SPED); United States	Teachers; Tier 1: 19 weeks of lessons "during read aloud time"	T: Read alouds- included the systematic use of narrative and expository texts, before-, during-, and after reading components, the use of teacher-facilitated text-based discourse, and explicit comprehension instruction.	C: Given the same books and were encouraged to use as they wanted. Some teachers asked to do a read aloud to observe BAU.	Medium/High *differential attrition on vocab measure - Positive treatment effects on proximal expressive vocabulary knowledge	1. Depth of Vocabulary knowledge (DOK). words used in study. Students are asked to define word and use it in a sentence. ($ES = 0.40$; treatment outperformed on depth of knowledge vocab measure)
Baker et al. (2021) RCT	217 second-grade (Els) from English-only and bilingual programs schools (low SES); United States	Virtual tutor; Tier 2 individualized app for ELLS; units across three months ~3.5 hours	T: An app that consists of sessions that use a virtual tutor and voice rec. software to guide students in reading a passage and learning targeted academic vocabulary words in depth.	C: BAU and teachers in control classrooms were provided the target words but were not observed explicitly teaching them.	High - Positive treatment effects on proximal expressive vocabulary knowledge. No effects on standardized measures.	1. DOK ($ES = 0.38$). 2. Expressive and Receptive One-Word Picture Vocabulary Test, Spanish Bilingual Edition. (EOWPVT-4; Martin & Brownell, 2011; Not significant)
Coyne et al. (2022) RCT	921 kindergarten students at risk for language and learning	School selected staff Tier 2; small-group EVR supplemental intervention (~70	T. Small group Elements of Reading Vocabulary (ERV; 3-4 students) provides opportunity to expanded interactive opportunities to use and discuss vocabulary that were similar in approach to activities included	C: Received only the classroom vocabulary Instruction; No small group.	High Treatment effects for proximal expressive and receptive vocabulary measures	1. Proximal Expressive Measure of Target Words. ($g = 1.05$) 2. Proximal Receptive Measure of Target Words. ($g = 1.14$) 3. Peabody Picture Vocabulary Test, 4th Edition (PPVT-4) –a standardized measure of receptive vocabulary. (No effects)

	difficulties; United States	additional hours)	during Tier 1. (At the beginning of the sequence, teachers introduced all students in the classroom to challenging target vocabulary words that were drawn from a story that was read aloud by the teacher.		only and not standardized.	4. The EVT-2 is standardized test of expressive vocabulary and word retrieval. (No effects)
Duff et al. (2014) RCT	135 6-year-old children; at risk of dyslexia and typically achieving peers; United Kingdom	Trained Teaching Assistants; Tier 2/3; two 9-week blocks of daily intervention (alternating between individual and small group of 2-4); ≈ 37.5 hours total	T: *Reading and Language Intervention* (Multicomponent/ multiformat) including 1. Reading Strand with phonological awareness and reading. 2. The Language Strand focused on training vocabulary and narrative skills using storybooks for themes and structure.	C: Wait list control	High - Treatment effects for proximal expressive vocabulary not standardized expressive vocabulary.	1. Proximal taught vocabulary. (small-to-moderate effects taught vocabulary. *ES* = 0.4 for full sample; *ES* = .46 for at risk sample) 2. Evaluation of Language Fundamentals IV (Semel, Wiig, &Secord, 2003) Standardized Expressive Vocabulary Measure (No significant effects)
Fogarty et al. (2020) RCT	200 third-grade students identified as in need of supplemental vocabulary instruction (including ESL and SPED students); United States	Tech Program (Vocabulators); Tier 1; ~8.6 hours total	T: Technology mediated intervention to improve students' understanding of academic vocabulary of comprehension (e.g., main idea, inference, evidence) and integrate these vocabularies in comprehension application exercises.	C: Typical instructional practices	High - Treatment effects for proximal expressive and receptive vocabulary measures only and not standardized.	1.Expressive target vocabulary (academic/comprehension words) (*ES* = 0.78) 2.Receptive Target Vocabulary – (academic/comprehension words) (*ES* = 0.51) 3.Understanding Vocabulary in Sentences – Receptive proximal (*ES* = 0.65) 4. GMRT Vocabulary – Receptive, distal, standardized, general vocabulary (*ES* not significant)
Griffin et al. (2021) RCT	61; grade 1; general education private elementary school; predominantl	Teachers; Tier 1; T1: 3.5 hours; Group T2: 3.5 hours plus 1 hour 40 min	T1. *Vocabulary Instruction.* Three new vocabulary words were taught per session with definitions pulled from read aloud books. Next, the teacher would model how to use context clues to determine the meaning	C: Business as Usual	High - Treatment effects in the vocabulary + growth mindset group for proximal expressive vocabulary	1. Researcher-developed vocabulary test. Expressive, proximal, open-ended Effect Sizes: Vocabulary + Mindset vs. Control: *g* = 0.45 Vocabulary Only vs. Control: *g* = 0.03 Vocabulary + Mindset vs. Vocab Only: *g* = 0.46

	y typically and advanced readers; United States	of growth mindset	of vocabulary words during read aloud followed by student practice. T2: *Vocabulary +Growth Mindset Instruction*			
Harris et al. (2023) RCT	90 Grades 1–2; high-poverty school; general education (some EL and SPED; United States	Teachers; Tier 2 small group intervention; ≈ 32.5 hours	T: *Self-Regulated Strategy Development (SRSD)Plus* – small-group pull-out the "plus" included: The Plus instruction (spelling, handwriting fluency, vocabulary, and sentence structures) along with the SRSD writing strategy instruction based on science texts (develop background knowledge, discuss it, model it, memorize it, support it, and independence)	C: BAU writers workshop	High - Large treatment effects for proximal receptive vocabulary	1. Researcher-developed vocabulary test – Receptive, proximal –large effect in vocabulary (*ES* = 2.29)
Hassinger-Das et al. (2015) RCT	124; Kindergarten; students identified with early numeracy difficulty (55% ELL; 83% FRL); United States	Trained college students; Tier 2 small group instruction over the course of eight weeks; ~12 hours total	T1: *Storybook Number Competencies (SNC)*: Dialogic reading of vocabulary-rich storybooks, direct instruction of math-related words, guided math activities, structured play, and review games to reinforce word meaning. T2: *Number Sense*: Direct instruction in concepts using manipulatives and structured activities without books or targeted vocabulary instruction.	C: Business as usual	High - SNC intervention yielded significant receptive vocabulary gains on both proximal and standardized measures outperforming both control and alternative math instruction groups on math vocabulary.	1. The Bracken Basic Concept Scale-Third Edition: Receptive: Quantity subtest (BBCS-3:R; Bracken, 2006a)-Receptive, standardized – broad math vocabulary; SNC group significantly outperformed the children in the number sense intervention (*g* = .57) and control group (*g* = .51) a. Subset of BBCS- Proximal Intervention Words; SNC group performing significantly higher than both the number sense (*g* = .61, *p* < .01) and control groups (*g* = .62, *p* < .05).
Huang (2015) RCT	40; second grade; included struggling readers; economically disadvantaged school; United States	Teachers Tier 1; NR	T: Two software vocabulary programs (Exploring Verbs and Nouns) were selected for the intervention based on the participating school's second grade language arts curricula. Also, vocabulary-technology integration strategies were added to classroom instruction.	C: BAU and was provided vocabulary games	Medium - Treatment group scored higher at posttest; ES NR	Expressive Vocabulary Test-2 (EVT-2, Williams, 2007): Significant increase from the pretest to the posttest scores (*t* = −5.280, df = 20, *p* < 0.001). No significant change occurred between the pretest scores and posttest scores for the control group (*t* = 0.737, df =18, *p* = 0.471).

Kim et al. (2021) RCT	674 grade 1 general education students in public schools; (mix of English learners, special education students, and Title I schools); United States	Teachers; Tier 1; ~10 hours	T: *Model of Reading Engagement (MORE)* at school; integrated science and literacy instruction using text sets, read-alouds, concept maps, peer discussion, and TREE-based argumentative writing tasks. Some students received take home book and encouraged to engage in shared reading	C: typical instruction (balanced literacy)	High - MORE intervention had a positive and significant effect on receptive science domain knowledge	1. Vocabulary Depth: Researcher-designed semantic association task – receptive, proximal – domain-specific and general academic vocabulary (e.g., survive, adaptation, diversity); (ES = 0.30 overall, ES = 0.56 for taught words)
Lennox et al. (2018) QED	172 Grade Prep (equivalent to kindergarten; students in low-SES public schools; mix of language backgrounds); Australia	Teachers; Tier 1; 24 weeks (Total: ~96 hours)	T: Interactive read-alouds with embedded vocabulary and comprehension instruction; use of narrative texts to support explicit teaching of word meanings, question asking, prediction, and inferencing	C: BAU	Medium - Treatment group scored higher at posttest with more significant change in scores than BAU; ES between groups NR	Proximal expressive vocabulary task was administered (VOCAB). PrepSTART group showed significantly greater change scores than the BAU group on VOCAB, with large effect sizes." d =2 .01 in PrepSTART compared to d = 1.55 in BAU
Lovett et al. (2017) QED	219 Grades 1–3; (all met criteria for reading disabilities; otherwise diverse sample); United States and Canada	Trained teachers in research team; Tier 2/3- small groups; 100–125 sessions over one school year (Total: 100–125 hours)	T: *Triple Focus:* Multiple-component intervention combining phonics, word identification strategies, fluency, and comprehension strategy instruction. Explicit instruction with scaffolded practice, metacognitive dialogue, and child-centered strategy training.	C: BAU	Medium - Strong positive impact on expressive vocabulary knowledge, especially for students in Grade 2, with gains on both instructed (proximal) and standardized measures; larger gains on experimental measures.	1. Word Knowledge Tests – Multiple Definitions proximal, expressive vocabulary (Bowers, Huisingh, Johnson, LoGiudice, & Orman, 2004)). Multiple Definitions; measure of instructed vocab: (d = 1.44) (2) Flexible Word Use subtest 2 (standardized, expressive vocabulary): (d = 0.61)
Nelson & Kiss (2021)	14 Grade 1; at risk in math; general	Research assistants;	T: 5-minute math vocabulary intervention; Lessons included: (a) students created	C: Students in the active	Low -	1. Mathematics Vocabulary Grade 1 (researcher-developed, receptive/expressive, proximal):

QED	education; some EL and FRL students; United States	Tier 2 (2.5 hours)	or stated their own definition; (b) provided student-friendly definitions; (c) reviewed the previously learned term; and (d) students added the new term to their vocabulary glossary at the end of the lesson.	control received 30 minutes of mathematics instruction per session with "wrap up" activities while the other group worked on vocabulary	Vocabulary intervention group outperformed control at posttest; moderate effect size but gain score comparison not significant.	(ES = .58). Gain score not significant, but treatment group scored higher than control.
Neuman et al. (2021) RCT	493; grades K–1 included in synthesis; (general education, economically disadvantaged; ~15% with disabilities); United States	Teachers; Tier 1; 9 weeks; ~26 hours	T: *Adapted World of Worlds*; Promote cognitively challenging talk around concepts and big ideas in science; Shared book reading with embedded vocabulary instruction, picture cards, child-friendly definitions, scripted and adaptive teacher prompts, turn-taking dialogue, and science-themed concept-building	C: BAU	Medium/High *Attrition NR - Significant vocabulary gains for K and G1 in proximal curriculum-based vocabulary and concept knowledge targeting words and not on standardized measure.	Expressive One-Word Picture Vocabulary Test-IV (EOWPVT; Martin & Brownell, 2000), standardized expressive vocabulary measure (Not significant) **Curriculum-based vocabulary**. Proximal expressive task. Students made significant gains in vocabulary (d = 0.65, 0.55, kindergarten, and first grade) **Concept knowledge.** Proximal conceptual knowledge of the target words for each topic. (d = 0.37, 0.4, kindergarten, and first grade)
Parker et al. (2020) RCT	85; Kindergarten and Grade 1; at risk for low vocabulary based on screening; general education; ~32% EL, 85% FRPL; United States	AmeriCorps members; Tier 2 small groups (3-4); K: 24.48 weeks (Total ≈ 25.9 hours); G1: 24.45 weeks (Total ≈ 27.1 hours)	T: (a) Target words explicitly taught by reading each word, stating its child friendly definition, and briefly discussing two picture cards; (b) the book was read and each target word was identified and reviewed; (c) after the book was read, target words were reviewed and discussed. .	C: BAU	High - Positive effects on researcher-developed expressive vocabulary in kindergarten. Not in G1; No significant gains on standardized receptive measures	Kindergarten: 1. Researcher-developed (expressive, proximal): significant time × condition effect, η² = .21 2. Distal: Individual Growth and Development Indicators version 2.0, Picture Naming (IGDIs-PN), (receptive, distal): no significant effects Grade 1: 1. Researcher-developed (expressive, proximal): No significant effects 2. Distal: 4,000 Word Listening Test (receptive, distal): no significant effects
Powell & Driver (2015) RCT	98; Grade 1; students with math difficulty (scored ≤11th	Trained tutors (undergrad/grad education students); Tier 3 pull out 1:1;	T1: Addition + Vocabulary – math vocabulary taught explicitly using manipulatives, gestures, guided prompts, and student-friendly definitions	C: BAU	High - Both treatment groups significantly outperformed control	On Vocabulary (Powell & Driver, 2013); Researcher-developed receptive math vocabulary measure. Addition + Vocab vs Control: ES = 0.49 - Addition (no vocab) vs

	percentile); ~20% with identified disability; ~17% EL; urban public schools 18 elementary schools, Mid-Atlantic USA; United States	Total ≈ 3 hours	T2: Addition only – same math content without explicit vocabulary instruction; both used flash cards, tutor-led problem solving, and paper-pencil tasks		on math vocabulary. Surprisingly, students who did not receive explicit vocabulary instruction (Addition only) showed slightly larger gains. No difference between the two active treatments.	Control: *ES* = 0.64 - Addition + Vocab vs Addition: ns, *ES* = 0.16
Rojo et al. (2024) RCT	294; Grade 2; general education; 14.6% with disabilities; 4.4% EL; 20.4% FRPL; racially/ethnically diverse sample; 3 public schools in Central Texas, United States	Teachers; Tier 1 ~3 weeks; Total ≈ 7 hours	T: *Scientific explorers* is a program with guided inquiry to science instruction and learning-seeks to bolster student knowledge and application in the area of earth science. The program builds background knowledge, builds student interest, teaches vocabulary with a routine, then there is a read aloud with expository science texts, followed by an "investigation" with physical and simulation-based models.	C: BAU	Medium/High *Attrition not reported - Sci2 produced strong vocabulary gains on the SEVA (expressive, study-specific)	1. Scientific Explorers Vocabulary Assessment (SEVA) – expressive, proximal, researcher-developed: Hedges' *g* = 0.94, statistically significant
Silverman et al. (2017) QED	504 kindergarten students; general education; ~62% FRPL, ~12% EL; United States	Video and 4th grade student monitored/facilitated by teacher; Tier 1 (Whole class cross age peer learning); ~10 weeks; Total ≈ 10 hours	T*: Cross-age peer learning*: kindergarten and 4th grade students paired to watch Martha Speaks videos, talk about vocabulary, play games, read thematically linked books, and complete writing/drawing activities	C: BAU	Medium - MSRB significantly improved proximal vocabulary measures (picture and definition tasks) in kindergarteners but had no significant effect on standardized receptive vocabulary (PPVT).	Kindergarten: 1. The Test of Word Knowledge–Kindergarten (TWK-K) Picture Subtest aligned with the target words – receptive, proximal: (*g* = 0.25) 2. The test of Word Knowledge–Kindergarten (TWK-K) Definition Subtest aligned with the target words– expressive, proximal: (*g* = 0.28) 3. Peabody Picture Vocabulary Test (PPVT; Dunn &Dunn, 2007) – receptive, distal, standardized: (not significant)
Stevens et al. (2023) RCT	70; Grade 3; all with mathematics difficulty	Virtual delivery (due to covid) by trained	T1: WP+V group: Explicit instruction in 35 math vocabulary terms using semantic word maps (student-friendly	C: BAU	High - WP+V group showed significantly greater	1. WPMV-3 (Word-Problem Mathematics Vocabulary – proximal, researcher-developed): - WP+V > WP-only (*ES* = 0.45)

Study	Sample	Interventionist/Tier/Duration	Treatment (T)	Control (C)	Quality & Summary	Outcomes
	(MAP ≤191); 14% EL; 100% FRPL; small % with disabilities; United States	graduate/undergraduate research assistants; Tier 3 (groups of 2 to 3 students); 22 sessions × ~50 min; Total ≈ 18 hours	definitions, visuals, examples, guided discussion, and practice); T2: WP-only group received unrelated math review instead		gains on word-problem vocabulary than both WP-only and BAU groups, supporting the added value of explicit vocabulary instruction.	- WP+V > BAU (*ES* = 0.83) - WP-only > BAU (*ES* = 0.49)
Wood et al. (2018) RCT	287 K and G1; all Spanish English ELs from low-income backgrounds; general education; United States	Computer-administered (e-books; Tier 2; ~17 weeks; Total ≈ 21.25 hours	T: *BLOOM*: e-books with intensive vocabulary strategies embedded with scaffolding through Spanish explanations, repetitions, and highlighted morphology	C: Provided the same e-books; read-only condition	High - Treatment significantly improved vocab on both standardized and proximal measures, though no effect was observed for definition generation.	1. Peabody Picture Vocabulary Test, 4th Edition (PPVT-4) – standardized, receptive: (*g* = 0.18; significant) 2. Labeling Probe – researcher-developed, expressive, proximal: (*g* = 0.38; significant) 3. Definitions Probe – researcher-developed, expressive, proximal: Effect size: no significant difference
Wright & Dunsmuir (2019) QED	194 Age 6–7 (~Grade 1–2); general education; diverse ELL representation; urban schools; United Kingdom	Teachers; Tier 1 (all children in a classroom); 10 weeks; Total ≈ 3.3–10 hours	T: The storytelling group was told a story by their teacher 4 out of 5 days per week for 10 weeks, with a new story told each week. This condition highlighting the emphasis, animation and use of gestures, and intonation utilized in storytelling. T2. The story-reading group was read the same story from a book by their teacher 4 out of 5 days per week for 10 weeks, with a new story read each week	C: BAU	Medium - Storytelling led to significant improvements in oral expressive vocabulary at posttest but no effect on standardized expressive vocabulary.	1. Oral Vocabulary (story retell – number of different words). Storytelling group significantly outperformed story-reading and control at posttest (*ES* = .098) 2. WISC-IV Vocabulary Subtest (standardized, expressive): No significant main effect of intervention group (*ES* = .02) but the story reading group scored higher than the comparison group
Young et al. (2019) QED	76; Grade 2; general education (19.5% ELS; 42.5% at risk for reading	Teachers; Tier 1; 18 weeks; Total ≈ 20–40 hours	T: Repeated reading, teacher modeling, group performance, vocabulary discussions, comprehension questions, student-driven word exploration	C: BAU	Medium - No effects on standardized receptive word knowledge.	1. GMRT-4 Word Knowledge (standardized, receptive; not statistically significant)

	failure; 4.0% receiving special education services); United States				

Table 2

Study Components Aligning with '5 pillars + writing' and IES Academic Language Recommendations

Study	5 Pillars + Writing included	Inferential Language Skills	Narrative Language Skills	Academic Vocabulary Knowledge	Discussion Utilizing Vocabulary (focus for EL learners)
August et al. (2021)	Vocabulary, comprehension, & writing	Y-interactive shared reading questions including inferencing	Y-connecting words	Y-direct instruction of individual words, instruction in cognate use, and reinforcing.	Y- peer talk and class discussion
Baker et al. (2020)	Vocabulary & comprehension	Y-before and during reading	Y-after reading retell	Y- before reading definitions and practice with vocabulary	Y- text-based discourse and language-based elaborations
Baker et al. (2021)	Vocabulary & comprehension	NR	NR	Y- activities develop deep understanding of carefully selected target words.	Y: students talk to the virtual tutor
Coyne et al. (2022)	Vocabulary & comprehension	NR	NR	Y- direct instruction in academic vocabulary	Y- discuss vocabulary
Duff et al. (2014)	All	Y- prediction of story endings	Y- recap of story	Y- explicit teaching of target words	Y- books are discussed
Fogarty et al. (2020)	Vocabulary & comprehension	Y- answering inferential questions	Y- understanding passage	Y- vocabulary of comprehension	
Griffin et al. (2021)	Vocabulary	Y- context clues to figure out word meaning	NR	Y- taught words with definitions	Y- discussed unknown words with a partner
Harris et al. (2023)	Writing, spelling, & vocabulary	NR	Y- sentence structure	Y- explicit teaching of target words	
Hassinger-Das et al. (2015)	Vocabulary	NR	NR	T1- direct instruction of math-related words T2- N	T1: Dialogic Reading T2: N
Huang (2015)	Vocabulary & writing	NR	NR	Y- utilized vocabulary programs exploring verbs and nouns	NR
Kim et al. (2021)	Vocabulary, comprehension, & writing	Y- Inference questions	Y- Structured argumentative writing and citing evidence; understanding main idea	Y- target science words and organize words into concept maps	Y- small and large group discussions
Lennox et al. (2018)	Vocabulary and Comprehension	Y- predicting and inferencing	Y- retell and writing story	Y- explicit teaching of word meanings	NR
Lovett et al. (2017)	Phonemic awareness, phonics, fluency, vocabulary, & comprehension	Y- predicting, questioning	Y- summarizing & syntax & a plot graph	Y- oral and printed language with meaning (polysemous; morphemes)	M- Unclear how much emphasis is on discussion questions throughout

Nelson & Kiss (2021)	Vocabulary	NR	NR	Y-Targeted vocabulary instruction	Y- opportunities to communicate verbally with other students using the word
Neuman et al. (2021)	Vocabulary & comprehension	Y- Open ended questions	Y- intertextual linkages across texts and topics; writing about the topic	Y- Target word instruction	Y- promotes cognitive challenging talk about big ideas and concepts; turn and talks
Parker et al. (2020)	Vocabulary	NR	Y- Discuss big ideas; K included a brief concept of print activity	Y- Explicit target words instruction	Y- Turn and Talks
Powell & Driver (2015)	Vocabulary	NR	NR	Y- Explicit mathematics vocabulary	Y- answered guided prompts
Rojo et al. (2024)	Vocabulary & comprehension	Y- Students make inferences about phenomenon they are learning about	Y-extract salient information from texts and contemplate big ideas	Y- Pre-teach science vocabulary with routine	Y-discuss vocab and share with group; whole class discussions
Silverman et al. (2017)	Vocabulary, comprehension, & writing	NR	NR	Y- Video defining and repeating words and definitions	Y-cross age discussions using target words
Stevens et al. (2023)	Vocabulary	NR	NR	Y- explicit semantic word map routine and multiple exposures	Y- Tutor and student discussion of vocabulary
Wood et al. (2018)	Vocabulary	NR	NR	Y-explicit instruction in English and Spanish on small set of vocabulary words over several days	NR
Wright & Dunsmuir (2019)	Vocabulary	NR	NR	NR	NR
Young et al. (2019)	Vocabulary, fluency, comprehension	Y- modeling question generation	Y-Summarize Readers theater script; retelling	NR	Y- guided high level discussions regarding readers theater script

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Indicates included in review.