KENTUCKY READING RESEARCH CENTER



The Effects of Vocabulary Instruction for Adolescent Learners: A Systematic Review

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Abstract

Vocabulary plays an important role in adolescents' reading comprehension (National Reading Panel, 2000). This review includes 38 studies examining effective elements of vocabulary instruction for adolescent learners. Across these studies, vocabulary outcomes generally improved following vocabulary instruction. In this review, we discuss the common instructional and intervention characteristics along with their reported effects, including how these features and effects vary based on student characteristics.

Introduction

Vocabulary instruction involves teaching the meanings and usage of words (Beck et al., 1982). The goal of vocabulary instruction is to go beyond teaching word meanings so that students master how words work and can be used effectively (McKeown, 2019). Vocabulary is a critical component for students to comprehend spoken and written language (Sedita, 2005; Silverman et al., 2020). As such, vocabulary is a key foundational element to students' success in reading and throughout school (Ehri & Rosenthal, 2007). A robust vocabulary supports students engaging with more complex texts (Moody et al., 2018), which is critical for their academic success (Yopp et al., 2008). Further, the National Reading Panel identified vocabulary as a pillar needed for students to be successful readers and named it an effective technique for teaching children to read (National Reading Panel, 2000).

Several reviews and meta-analyses have identified components of effective vocabulary instruction. Hairell et al. (2011) evaluated 24 studies that implemented vocabulary instruction that were completed between 1999 and 2011. They found that students receiving vocabulary instruction outperformed their peers who did not. The most common components of vocabulary instruction were context analysis, repeated exposure, and semantic strategies. Only two of the 24 studies used standardized measures to assess vocabulary knowledge.

Cervetti and colleagues (2023) investigated the outcomes of vocabulary instruction for elementary students. Their results indicated non-statistically significant positive effects for students who were taught word meanings (g = 0.08). Similarly, semantic strategy instruction had an insignificant, positive effect on vocabulary outcomes (g = 0.25). Additionally, Cervetti et al. (2023) found that researcher-created vocabulary measures and instruction implemented by people other than researchers moderated the effects of vocabulary interventions (i.e., g = 0.59 and g = 0.38, respectively).

Elleman et al.'s (2019) reviewed the literature for middle school vocabulary interventions and recommended purposefully teaching vocabulary, incorporating morphological analysis, emphasize semantic relationships, maximize opportunities to use the new vocabulary, and creating vocabulary-rich environments. Ford-Connors & Paratore (2015)'s synthesis also found that authentic texts and tasks for learning new vocabulary, particularly when facilitated by a skilled teacher, were beneficial for adolescent learners.

Factors Affecting Vocabulary

Vocabulary instruction is necessary for students to acquire new vocabulary, particularly for students with diverse needs (Beach et al., 2015). Features of effective vocabulary instruction differ according to student characteristics. Students who are multilingual learners learning English often have a limited English vocabulary which impacts their literacy outcomes (Kanno et

al., 2024). Fortunately, these students benefit from vocabulary instruction, particularly when it is developmentally appropriate and use multimodal instructional approaches (Zeng et al., 2025).

Students with disabilities often have inadequate vocabularies (Jitendra et al., 2004). Kuder's (2017) literature review identified mnemonics, morphemic analysis, multimedia, and direct instruction as effective components of vocabulary instruction for students with disabilities. Recent reviews also suggest that a phonological-semantic approach to teaching vocabulary is beneficial for students with disabilities, especially those who struggle to process language (Lowe et al., 2018).

Furthermore, students who are at-risk for school failure also benefit from vocabulary instruction that includes specific components. Marulis and Neuman (2013) analyzed 43 articles detailing vocabulary interventions for students at-risk and found that students benefited from word learning instruction (g = 0.87). Similar to other populations, these students demonstrated larger increases on researcher-created tests than on distal standardized measures (g = 1.26, g = 0.69, respectively). They identified poverty as a moderator that significantly and negatively predicts word learning outcomes, and recommended early intervention to support these students so that their gap does not widen further from their peers who are not at-risk.

Barriers

There are multiple types and levels of barriers faced when implementing effective vocabulary instruction. At the system level, schools face several barriers. Schools often have curriculum and time constraints that can impact the priority and time devoted to teaching vocabulary (Lee et al., 2018). Teachers often struggle to know how to select words to teach, when to teach them, and how to evaluate which types of words to target for instruction (e.g., Tier 1, 2, or 3; Beck et al., 2013). Further, teachers often lack the training and support needed to provide effective vocabulary instruction (Kennedy et al., 2018). At the student level, students can have limited background knowledge which can lead to a gap in vocabulary knowledge (Sedita, 2005). A lack of vocabulary impacts students' ability to read fluently and accurately comprehend. This then leads to limited exposure to rich language and negatively impacts students' vocabulary acquisition (Sedita, 2005). This is particularly true for students who are multilingual learners (Akbarian et al., 2020).

Purpose

Our goal was to review the recent research on vocabulary instruction published since 2014.

Specifically, we explored the following questions:

1. Research question 1: What instructional and intervention characteristics (e.g., use of Elkonin boxes, multicomponent instruction, intervention dosage, group size,

implementer, modality) and student characteristics (e.g., age, English learner, disability status) have been tested as part of vocabulary interventions?
2. Research question 2: What does the research say about the effectiveness of vocabulary instruction in improving foundational reading outcomes for readers in grades K-3?
3. Research question 3: What features of instructional interventions (e.g., type of instruction, duration, grade level) are associated with improved outcomes? Do these features differ according to student characteristics?

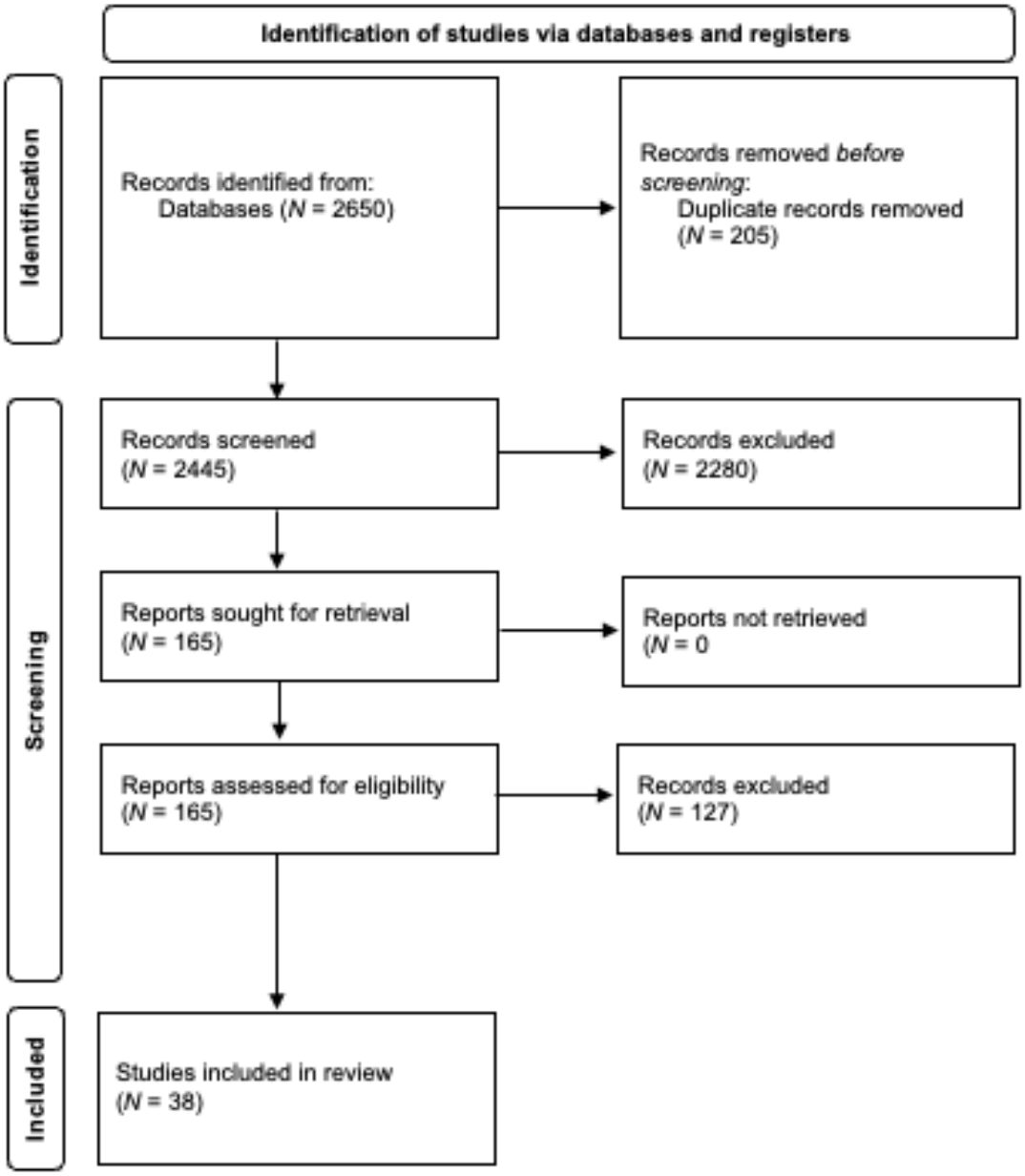
Method

Study Eligibility Criteria

This review explores research from 2014-2025 that examined vocabulary interventions and instruction with adolescents. Studies were included if they met the following criteria: (1) published in a peer-reviewed journal; (2) implemented an experimental research design; (3) included at least 50% of participants in grades 4-9; (4) focused on vocabulary instruction; (5) written in English and conducted in the United States, Canada, Australia, Ireland, New Zealand, or the United Kingdom; and (6) measured students' vocabulary achievement. The search involved three databases: Academic Search Complete, APA PsycInfo, and ERIC.

The search resulted in a total of 2,650 articles. Once we removed duplicates, we screened 2,445 articles based on their titles and abstracts. Of the 2,445, 165 (6.7%) met requirements for full-text screening. During full-text screening, we removed 127 articles that did not meet inclusion criteria of being vocabulary-focused instruction implemented to improve vocabulary outcomes. For example, studies focusing on morphology instruction had a different instructional focus and will be included in a different foundational review targeting morphology (e.g., Crosson & Moore, 2017). Further, studies we excluded if they did not focus on word meaning (e.g., sight word recognition or fluency). Interventions were required to primarily target vocabulary instruction to improve vocabulary outcomes to be included. We excluded a large number of studies because their goal was to improve reading comprehension and part of their multicomponent treatment package included vocabulary instruction. Studies were excluded if they did not directly measure and individually report students' vocabulary (e.g., if vocabulary was assessed as part of an assessment that also measured comprehension or fluency). Additionally, parent studies were included but not secondary analyses. For instance, Kennedy et al. (2022) was included while McDonald et al. (2024) was excluded because it was a secondary analysis of the original data. Once all the articles were full-screened, a total of 38 articles were included in this review. An overview of the search can be seen in Figure 1.

Figure 1
PRISMA Diagram



Coding Procedure

To explore methodological categories, we created categories to examine characteristics of the studies and the interventions' reported effects. Specifically, this coding identified the following: implementer, classroom type, dosage, intensity, duration of the intervention, fidelity measures, descriptions of dependent and independent variables, and the reported results of the interventions. Additionally, coding categories explored the characteristics of student participants

included in these studies. These categories related to descriptions of the participants including the reported ages, grades, disability, and language learner status.

Results

Altogether, 38 articles were included in this literature review. Descriptions of the intervention, instructional arrangement, implementer, and length of the intervention are included in Table 1. The participants, research design, dependent variable, and reported findings are summarized in Table 2.

The first research question explored which instructional and intervention components of vocabulary investigated between 2014 and February 2025.

> Research question 1: What instructional and intervention characteristics (e.g., use of Elkonin boxes, multicomponent instruction, intervention dosage, group size, implementer, modality) and student characteristics (e.g., age, English learner, disability status) have been tested as part of vocabulary interventions?

The results of this analysis are presented in Tables 1 and 2. Figure 2 shows the frequency of instructional techniques used. Figure 3 illustrates how components of interventions fit within the five pillars of reading and writing.

Table 1

Characteristics of Studies

Study	IV Description	Tier and Arrangement	Implementer(s)	Dosage
Adlof, et al. (2019)	• DictionarySquared: an online program where students select the words they work on, then they access definitions, pictures, videos, and cloze reading tasks	Tier 1, Individually	Computer	30-75 min per week over 13 weeks
August, et al. (2016)*	• Eighty words chosen from auxiliary readers related to summer school topics and high frequency words across content • Embedded instruction: clear definition immediately followed word in text, no other instruction provided • Extended instruction: meanings were pre-taught, words highlighted in text, students completed glossary entries related to the words, word wall showed words and meanings, students completed concept maps for word relationships • Reinforcement activities: 10 minutes of game play selecting correct word and corresponding definition	Tier 1, whole group instruction	General education teachers	One hr sessions Five times per week over five weeks

Austin et al. (2022)*	• Twenty word sets created by researchers • Word Reading (WR): instruction focused on grapheme-phoneme correspondence, fluency, repeated reading of target words, and high-frequency words • Word Reading and Word Meaning (WR+WM): first half of lesson mirrored WR condition. Then, explicit vocabulary instruction of the word meaning and a picture of the meaning, practice selecting the right word for sentences, and questioning to test their understanding of the vocabulary	Tier 3, 1:1	Graduate students and hired interventionists	45 min sessions five times per week with12 total sessions
Burt et al. (2022)*	• Twenty-four researcher-selected words from *Charlotte's Web* • Computer-Assisted Instruction (CAI): each session on a computer; students were instructed on word definitions and games with matching the word to related pictures or words. Students might also complete story context tasks, visual learning tasks, semantic maps or feature analysis tasks. • Teacher-Directed Instruction (TDI): students completed the same activities as above without computers, instead they received instruction from the teacher and used paper/pencil methods	Tier 2, Small group of seven to eight or individually	Computer Teachers at a school for students with mild ID	30 min sessions 12 sessions over six weeks
Duff (2019)*	• Thirty-eight words chosen from two texts, *Carnegie* and *Anthony*; each group was taught only 19 words • Robust Vocabulary Instruction (RVI): consists of exposing students to words in multiple contexts with opportunities for deep processing and making connections; following explicit instruction of the definition, students	Tier 3, 1:1 or in groups of 2	Researcher	60 min sessions one session per week for five total sessions

	participated in activities such as sentence generation, identifying examples, word comparisons, and more			
Elleman et al. (2017)*	• Eighty-three words were targeted for instruction from *Young Pioneers*, *Chasing Tornadoes*, and *Secrets of the Rainforests* • Vocabulary Strategy Instruction: following thirty minutes of decoding and fluency instruction, students practiced using the following strategies: determining part of speech, analyzing the word, using context clues, looking up new vocabulary using a glossary • Traditional Comprehension Instruction: this served as a control group that mirrored BAU	Tier 2, in groups of two to four students	Graduate research assistant	90 min sessions two times per week for 24 total lessons
Graves et al. (2018)	• Word Learning Strategies (WLS): students were instructed about using word parts, context, the dictionary, and a combined strategy to determine meanings of new vocabulary	Tier 1, whole group instruction	General education teacher	30 min sessions three times per week over 15 weeks for trials one and two Over 12 weeks for trial 3
Jones et al. (2019)	• Implemented WG (see Lawrence et al., 2014 for description) with adaptations described below • WordGen Elementary: units were 10-days long and lasted 45-50 minutes per day for fourth and fifth graders	Tier 1, whole group instruction	General education teachers	45-50 min sessions five times per week over two school years 20 min sessions

	• WordGen Enhanced: units were one-week long and 20 minutes per day for sixth and seventh graders; 12 units were exactly as described in by Lawrence and colleagues (2014) and the final 12 were focused on science and social studies curriculum			five times per week over two school years
Jozwik & Douglas (2017)*	• Twenty-four words targeted for each dyad, 12 math and 12 ELA terms • Multicomponent Academic Vocabulary Instruction: involved explicit instruction on vocabulary using a graphic organizer with a definition and picture or example, self-regulation procedures, and cooperative learning structures	Tier 1, whole group instruction	Researcher and general education teacher co-teaching	25 min sessions five times per week over 15 days
Jozwik et al. (2021)*	• Eighteen words taught to each dyad; words were ELA or general academic vocabulary; 70% were English/Spanish cognates • Peer-Assisted Multimedia Vocabulary Instruction: students set a self-regulation goal for each lesson; then students completed a graphic organizer for a new word or reviewed ones from prior days, multimedia presentations of words in set; lessons ended with students self-assessing to see if they met their goal	Tier 1, in dyads within an ESL class	ESL teacher	20 min sessions five times per week for 29 total sessions

Kennedy et al. (2023)	• One hundred terms selected from InferCabulary • InferCabulary: technology-based approach that provides students six images of an applied example of the vocabulary word so they can infer definition using semantic reasoning; students then play game in the main game mode where they experience multiple exposures and practice with the new vocabulary • Content Acquisition for Students (CAP-S): each video explicitly teaches the term, connects with relevant background knowledge, give definitions, examples/nonexamples, names morphological features, and reviews the definition	Tier 1, whole group instruction, individually	General education teachers, computers	15-20 min sessions five times per week for an average total of 266 minutes 20 min sessions An average total of 643 minutes across 41 school days
Kennedy et al. (2018)	• Content Acquisition Podcasts-Teacher Slides (CAP-TS): teachers implemented vocabulary instruction with provided multimedia materials that reviewed key background knowledge, definitions, examples/nonexamples, identifying morphological features, connecting with semantically similar terms, and reviewing the definition of the new vocabulary • Content Acquisition Podcast Professional Development (CAP-PD): teachers received PD via podcasts with instructional videos about steps of instruction and modeling; teachers completed the steps outlined in CAP-TS; teachers received feedback about their implementation	Tier 1, whole group instruction	General education science teachers in inclusive classrooms	16-30 min sessions over three months

Kennedy et al. (2020)	• Ninety words selected from InferCabulary • InferCabulary: an app that can be used independently or paired with instruction (this was employed for this study) that supports meaning making of vocabulary through captioned images and definitions; the "game mode" element allows the student to correctly select the vocabulary that corresponds with a picture • In conjunction with the app, teachers implemented lesson plans that employed explicit instruction on vocabulary that used an advance organizer, clear language, opportunities to respond, prompts for inferential think, modeling, definitions, and examples of the new vocabulary	Tier 1, whole group instruction	General education teachers, computers	20 min sessions five times per week over six weeks
Lawrence et al. (2015)	• Word Generation (see Lawrence et al., 2014, for description) with more emphasis on classroom discussions	Tier 1, whole group instruction	General education and content teachers	15 min per session five times per week over the school year
Lawrence et al. (2017)	• Word Generation (see Lawrence et al., 2015, for description)	Tier 1, whole group instruction	Generation education and content teachers	15 minutes per session five times per week over the school year
Lawrence et al. (2014)	• Word Generation (WG): a schoolwide vocabulary intervention designed to be implemented in each content-area class once per week. It follows the below weekly schedule: • Monday: vocabulary is introduced in ELA through divisive passages that spark debate and requires students to take a stance, direct instruction about vocabulary included • Tuesday-Thursday: students engage in WG activities across content areas	Tier 1, whole group instruction	General and special education teachers	15 min per session five times per week over the school year

	• Friday: students write an essay about their stance based on class discussions and reading			
Lee (2024)*	• Twelve instruction words (called moderate-encounter words) and 12 control words (untaught) were researcher-selected • Moderately Rich Vocabulary Instruction: activities were based on principles of rich vocabulary instruction and included associating words with context, creating contexts, and comparing and contrasting words to discover relationships	Tier 2, in small groups	Special education teacher	30 min sessions five times per week for one week total
Lesaux et al. (2014)	• Seventy target words taught were selected from class texts • Academic Language Instruction for All Students (ALIAS): included a variety of whole-group, small-group, and independent activities. Students start each 2-week cycle with exposure to the new vocabulary in text, then instruction focuses on meanings, uses, morphological analyses, the words in novel contexts, and then using the words in writing	Tier 1, whole group Instruction	General education ELA teachers	47 min sessions five sessions per week over 20 weeks
Lowe & Joffe (2017)*	• Twenty words chosen from school science curriculum by science teacher, 10 using phonological-semantic strategies and 10 using BAU strategies • Word maps for two words analyzing phonological and sematic features of the words; word-wise for four words where students thought about definition, phonological form, and usage; sound and meaning bingo	Tier 1, whole group instruction	General education science teacher	50 min sessions nine lessons over three weeks
Lowman & Dressler (2016)*	• Twenty-four words were selected for instruction from school's curriculum selected • Videos contained priming for learning, phonemic instruction, semantic instruction, syntactic instruction, and review	Tier 2, in groups of 8-10, individually	iPods	15 min sessions two times per week over four weeks

Manyak et al. (2021)*	• Three hundred forty words selected for instruction • Multifaceted, Comprehensive Vocabulary Instructional Program (MCVIP): based on Graves's (2006, 2016) four-component framework for vocabulary instruction consisting of the following components (1) providing rich and varied language experiences; (2) teaching individual words; (3) teaching word-learning strategies; and (4) fostering word consciousness • Students received instruction for high-frequency word, content-words, character trait vocabulary, vocabulary graphic organizer, morphological analysis, context clue, personal vocabulary collection, and word categories instruction	Tier 1, whole group instruction	General educator teachers	25-30 min sessions daily sessions for a school year

McKeown et al. (2018)	• Ninety-six to 99 words selected from *Academic Word List* • Robust Academic Vocabulary Encounters (RAVE): exposing students to vocabulary in multiple authentic contexts, defining the word with emphasis on word meaning and context; activities to use the word; instruction about morphology of the words • Over the seven-day instructional cycle, lessons one through three introduced the words, lessons four through seven increased complexity of activities requiring students to extend their knowledge from choosing contexts that fit a word to identifying relationships between words and using vocabulary in writing	Tier 1, whole group instruction	General education reading teachers	10-20 min sessions eleven 7-day cycles over 22 weeks 10-20 min sessions sixteen 7-day cycles over 22 weeks
O'Connor et al. (2015)	• Thirty-six words selected from history text, cross-referenced with school and prominent field word lists • Building Reading Interventions Designed for General Education Subjects (BRIDGES): 5-week cycles where the first three weeks where a researcher taught small groups to decode, teaching academic and history-focused vocabulary, and identifying cause and effect relationships	Tier 2, small group instruction of two to six followed by whole group instruction	Researchers, then general and special education teachers	40-45 min sessions five times per week over 12 weeks

O'Connor et al. (2019)	• Forty-eight target words targeted, selected by researchers through evaluating three prominent word list sources • Creating Habits That Accelerate Academic Language of Students (CHAAOS): involved explicit instruction, active and interactive learning, cumulative practice, and ongoing assessment following a consistent, weekly schedule • Monday: four new vocabulary words introduced, explicit instruction on definitions, synonyms, using the word in context, cloze sentence writing, and answering questions • Tuesday: review weekly vocabulary, then focus on two of the words with sentence generation and whole group discussions • Wednesday: the same as Tuesday with a focus on the other two words • Thursday: instruction focused on reviewing all words, small group activity analyzing syntactic context, independent sentence writing, and whole group discussion	Tier 1, whole group instruction	ELA special education teachers	23 min sessions four sessions per week over 12 weeks
O'Connor et al. (2022)	• Systemic replication of O'Connor et al. (2019) and O'Connor et al. (2021); this study was the third year of the intervention and followed student participants to the next grade	Tier 1, whole group instruction	ELA special education teachers	19 min sessions four sessions per week over 12 weeks
O'Connor et al. (2021)	• Systematic replication of O'Connor et al. (2019); this study was the second year of the intervention and followed the student participants to the next grade	Tier 1, whole group instruction	ELA special education teachers	15-23 min sessions four sessions per week over 12 weeks

Palmet et al. (2014)	• Twenty words selected from vocabulary workbook • Concept Mapping (CM): explicit instruction on new words and students completed Frayer Models for new vocabulary identifying the definition, created a sentence, wrote words with relationships to the new vocabulary, and drew pictures of the words • Dictionary Approach (DA): students used a dictionary to locate definitions, created a sentence with the words, and participated in a class discussion about the new vocabulary	Tier 2, resource ELA classroom, in groups of 4	Special education teacher was lead researcher	20 min sessions one session per week, each phase lasted four sessions, with two phases of CM and two of DA
Reed et al. (2019)*	• Fifteen words selected from research team and district's science coordinator • Independent Frayer Model: students completed an electronic graphic organizer independently and found definition, characteristics, examples, and non-examples of new vocabulary • Online Discussion Frayer Model: students independently found a definition of the vocabulary then worked with peers to identify characteristics, examples, and nonexample • Students were randomly assigned to Frayer Model only or Frayer Model with online discussion	Tier 1, individually Groups of two to three	Computer (Google classroom)	19.5 min sessions two times per week for 30 total lessons 26.25 min sessions two times per week for 30 total lessons
Robb et al. (2014)*	• Sixty words chosen from Scholastic Aptitude Test (SAT) resources • Vocabulary Theatre (VT): involved peer-teaching of vocabulary terms; completing a word power handout with definition, synonyms, antonyms, part of speech, and picture; completing a mini poster about the word with a	Tier 1, whole group instruction	ELA general education teachers	40 min sessions 3 times per week, each condition lasted three weeks

	sentence using the word; creating a skit including the new vocabulary • Teacher Directed Instruction (TDI): students used a dictionary to find definitions and wrote the words in sentences			
Sanchez & O'Connor (2022)	• Systematic replication of O'Connor et al. (2019) • Compared this CHAAOS intervention group to BAU from O'Connor et al. (2019)	Tier 1, whole group Instruction	ELA special education teachers	15 min sessions four times per week over four weeks
Shore et al. (2015)*	• Twenty-one to 36 science terms included across three units of students • Dictionary strategy consists of students writing out vocabulary definitions from the glossary • Pictionary strategy requires of students reading the glossary definition and drawing pictures to represent the words on a three-by-five index card • Conversation strategy involves students reading the glossary definition and creating their own explanation to share their understanding with a peer	Tier 1, whole group instruction	General education teachers	10-20 min sessions three weeks per strategy/unit over three units
Solis et al. (2022)*	• One word from interest-based text or expository text was taught in each session • Explicit instruction on the target word's definition and provided a vocabulary sheet with a visual representation, synonyms, an example sentence, and two discussion questions to prompt background knowledge • Most of the lesson focused on main idea summarization	Tier 3, 1:1	Tutors	30-40 min sessions four to five times per week for 19-26 total sessions

Solis et al. (2021)*	• One word from passage taught in each session • Explicit instruction on the target word's definition and provided a vocabulary sheet with a visual representation, synonyms, an example sentence, and two discussion questions to prompt background knowledge • Most of the lesson focused on main idea summarization	Tier 2, in groups of two to three	Special education teachers	25-40 min sessions five times per week for 37-40 total sessions
Solis et al. (2017)*	• Twenty-four vocabulary words were selected from grade-level history texts or were high-utility • Each instructional session included four parts: introducing self-monitoring and goal-setting, vocabulary instruction, text-based reading, and conclusion or self-monitoring and self-evaluation	Tier 2, in groups of two to three	Tutors	30 min sessions 8 sessions over 2 weeks
Swanson et al. (2024)	• Seventy-two high-utility words beneficial for social studies understanding • Strategies to Read Information Texts and Vocabulary Effectively (STRIVE): a PD model targeting evidence-based vocabulary and reading strategies during social studies. Teachers were randomly assigned to researcher-supported PD, school-supported PD, or BAU conditions • Before reading, teachers primed students' background knowledge using illustrations and class discussions followed by explicit vocabulary instruction providing definitions, visual representations, and examples in context using a semantic map. Students used context clue strategy to determine word meaning. Then, students would read a text and focus on comprehension. Then the lessons finished with	Tier 1, whole group instruction	Primarily general education teachers	45 min sessions 12 sessions across three 6-week units 36 total sessions

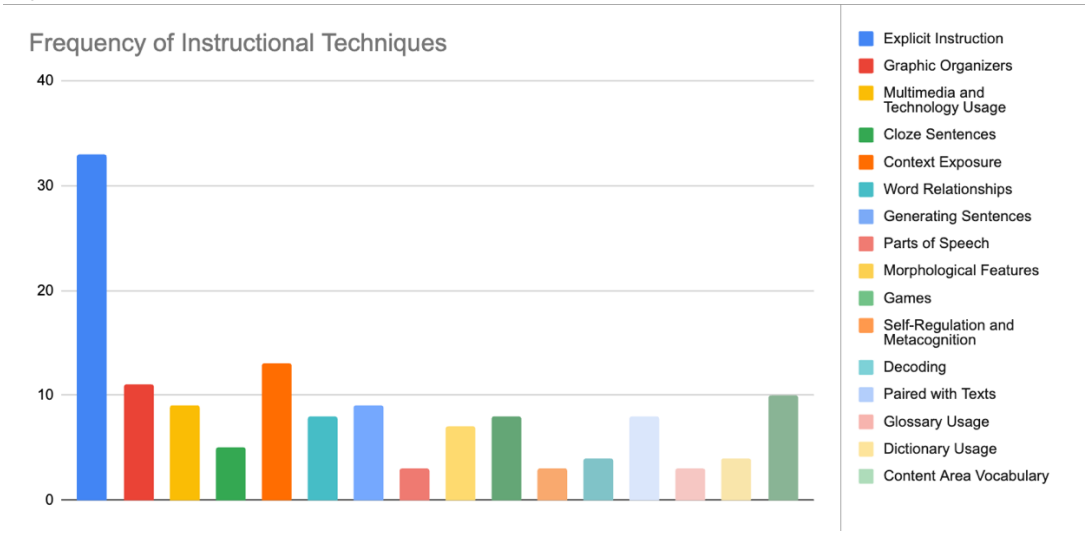
	more explicit vocabulary instruction with the semantic maps focusing on word relationships, using the sentence correctly in sentences, and adding affixes to the words			
Vadasy et al. (2015)*	• One hundred forty target words from two novels, *A Long Way* and *Maniac Magee* • Rich Vocabulary Instruction (RVOC): created using Beck et al. (2008) handbook and followed the below weekly progression • Day 1: introduce definitions, examples, making sentences, and examining word relations • Day 2: matching synonyms, making sentences from sentence stems with vocabulary, and selecting the right word in context • Day 3: answering a variety of questions about the novel using vocabulary • Day 4: matching definitions, writing sentences about the novel using vocabulary, and paragraph writing with novel words • Day 5: quiz on understanding	Tier 1, whole group instruction	General education teachers	30 min sessions for first four days, 10 min session on day five, taught five times per week over 6 months

Van Orman (2021)	• Science teachers and researchers developed 90-word list to be targeted from science units • 6 words taught and 4 review each week in Science Vocabulary Support (SVS) program • Monday: explicit instruction for new and review words' definition, description, and pronunciation; students used a graphic organizer to redefine and draw word accompanied by a group discussion • Tuesday-Friday: practice activities included discussions, small group tasks, spelling pyramid, sentence generation, homework reviews, games, cloze exercise quiz, and science learning activities	Tier 1, whole group instruction	General education teachers	5-15 min sessions five times per week over 15 weeks
VanUitert et al. (2020)	• 56 terms taught total • Content Acquisition Podcasts (CAP-S): See description in Kennedy et al. (2023)	Tier 1, whole group instruction, individually	General education science teachers in inclusive classrooms, computers	20 min sessions over 10 weeks

Note. *= Researcher-Created Intervention or Teacher-Created Intervention.

Figure 2

Frequency of Instructional Techniques

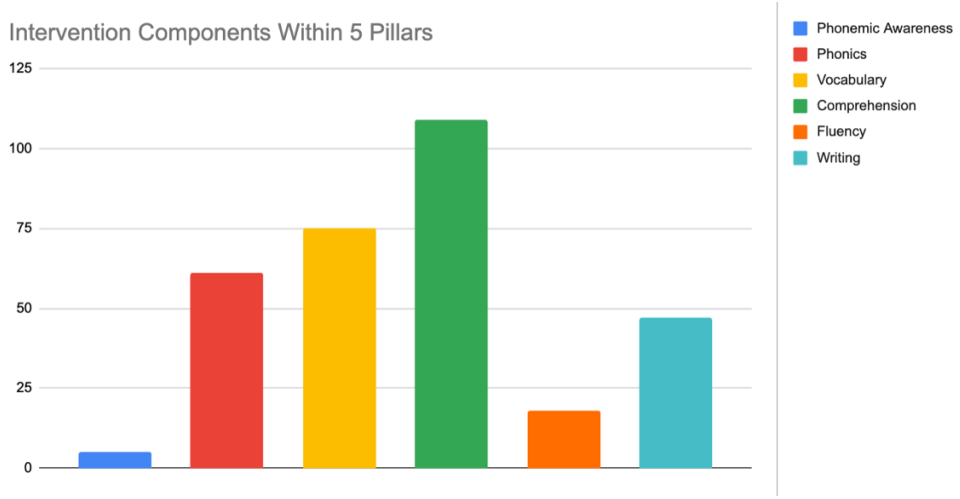


Instructional Techniques

The frequency of instructional techniques across studies is reported above in Figure 2. The most frequently used instructional techniques were explicit instruction, context exposure, and graphic organizers. Most studies employed explicit instruction, although some referred to it as direct instruction. Similarly, authors used disparate terms for context exposure; however, we coded as if these authors discussed exposing and teaching words in multiple contexts. Studies were coded as using cloze sentences if they followed the procedure of selecting the correct term to complete a sentence or passage. Additionally, it should be noted that self-regulation and metacognition primarily refer to goal setting or students evaluating their understanding of a word.

Figure 3

Intervention Components within Five Pillars of Reading Plus Writing



We analyzed intervention components to see how they fit within the five pillars of reading plus writing. Figure 2 displays the count of individual elements across the included studies. Within comprehension, the most frequent element included was listening comprehension. Within the vocabulary pillar, vocabulary instruction and oral language development were the most common. For phonics, sentence fluency was the most common element and was often included in interventions when students read sentences with new vocabulary (e.g., O'Connor et al., 2019). Another prevalent strand observed in interventions was writing, which involved students writing the new vocabulary words, definitions, and sentence generation (e.g., Palmer et al., 2014).

Table 2

Dependent Variables and Reported Effects

Study	Participants	Research Design	Dependent Variable(s)	Reported Findings
Adlof et al. (2019)	*N* = 264 for Phase 5 264 ninth graders	Quasi-experimental	Peabody Picture Vocabulary Test (PPVT) Gates-MacGinitie Reading Test-Vocabulary Subtest	Effects were only reported for 53 students because of a flood that affected research activities. Scores improved with DictionarySquared, although no statistically significant effects detected, g = 0.18. Scores improved with DictionarySquared, although no statistically significant effects detected, g = 0.22.
August, et al. (2016)	*N* = 509 Third and fourth graders 509 ML 509 AR	Within-subjects	Vocabulary Assessment	Significant gains in both conditions (extended instruction, *g* = 1.7; embedded instruction, *g* = 0.57) gains for words learned through extended instruction were greater than through embedded instruction (*g* = 0.71).
Austin et al. (2022)	*N* = 22 13 fourth graders 9 fifth graders 22 students IWD	Within-subjects	Word Meaning Knowledge of Target Words	Score differences immediately following intervention ($t(21) = -9.349$, $p < .001$, $d = 1.92$) favoring WR+WM (*M* = 8.67, *SD* = 1.06) over WR (*M* = 6.23, *SD* = 1.44); statistically significant differences at posttest ($t(20) = -14.459$, $p < .001$, $d = 1.03$) favoring WR+WM (*M* = 7.99, *SD* = 1.88) over WR instruction (*M* = 6.00, *SD* = 2.01).
Bur et al. (2022)	*N* = 40 7 seventh graders 12 eighth graders 11 ninth graders	Within-subjects	Word Associates Format	Both groups gained from pretest to posttest, although gains were not significant between the groups at the first test ($p = 0.879$) or maintenance test ($p = 0.512$).

	7 tenth graders 2 ML 40 students IWD			
Duff (2019)	*N* = 23 23 sixth graders	Within-subject design, random assignment	Measures of Lexical Semantic Knowledge of Taught Words – Total Semantic Knowledge (TSK)	Posttest scores improved (*M* = 6.71, *SD* = 6.68) compared to pretest, (*M* = 4.34, *SD* = 8.31), *t* (22) = 23.93, *p* < .001. The effect size was large (*d* = 2.26).
Elleman et al. (2017)	*N* = 68 21 fourth graders 15 fifth graders 3 sixth graders	Pre/posttest with random assignment to control and treatment groups	Vocabulary Acquisition	Vocabulary group scored significantly higher than traditional comprehension group (γ_{001} = .929, *z* = 3.305).
Graves et al. (2018)	*N* = 42 21 fourth graders 21 fifth graders 4 ML 7 IWD	Pre/posttest	Word Learning Strategies Test	Scores increased by 18% (*M* = 5.45, *p* <.001).
	N = 98 98 fourth and fifth graders 29 ML	Quasi-experimental	Word Learning Strategies Test	Intervention scores increased by 21% (*d* = 1.29, *p* <.01).
	N = 180 180 fifth graders	Pre/posttest	Word Learning Strategies Test	Scores increased by 14% (*M* = 14.29, *p* <.001).
			Vocabulary Assessment Study in Education test (VASE)	Mean converted gain score of 1.032 (*t* = 19.62, *p* < 0.001).
			Gates-MacGinitie Reading Test-Vocabulary Subtest	Mean gain score of 1.39 (*t* = 3.01, *p* < 0.01).
Jones et al. (2019)	*N* = 10965 10965 fourth to seventh graders 957 ML 1870 students IWD	Randomized-control trial	General Academic Words	Year 1: statistically significant impact for students in 4th and 5th grades who scored 22% of a standard deviation higher than control group (*p* < .001, *q* = .001) on vocabulary; similarly, significant impacts observed for 6th and 7th graders receiving

				intervention who scored 13% of a standard deviation higher than control group (p = .006, q = .03) on vocabulary Year 2: statistically significant effects for the 4th and 5th graders in treatment (ES = .28, p < .001, q = .001) and for 6th and 7th graders receiving intervention (ES = .16, p = .001, q = .006).
Jozwik & Douglas (2017)	N = 6 6 fifth graders 6 ML 2 students IWD 6 AR	Multiple probes across word sets	Percent Accuracy Reading and Defining Vocabulary Vocabulary Knowledge Scale (VKS)	Functional relation observed for all students, with some positive effects maintained over the extended maintenance phases; Comparisons between data from probe conditions and the intervention condition reflect no overlapping data points or 100% percentage of nonoverlapping data. Scores reflected a 49% to 66% increase over pretest scores.
Jozwik et al. (2021)	N = 6 6 ninth graders 6 ML 1 student IWD 5 AR	Multiple probes across word sets	Number of Words Defined Correctly	Six clear functional relations were observed. Upon introduction of the independent variable, students' vocabulary scores immediately increased and maintained higher levels than baseline scores.
Kenned et al. (2018)	N = 1779 1779 middle schoolers 251 students IWD	Randomized-control trial	Curriculum-Based Vocabulary Probes	Students with teachers in the CAP-PD condition scored significantly better than peers with teachers in CAP-TS condition on all three probes, CBM 1, $F(1, 240) = 6.5$, p = .011, d = .33; CBM 2, $F(1, 239) = 31.5$, p < .001, d = .73; CBM 3, $F(1, 228) = 28.2$, p < .001, d = .70.

Kennedy et al. (2023)	*N* = 656 656 fifth graders 64 ML 74 students IWD	Quasi-experimental with randomized vocabulary term assignment	Researcher-Created Multiple Choice Vocabulary Measure	Students IWD in CAP-S, $F(1, 47) = 27.4$, $p < .001$, $d = 1.73$, and InferCabulary, $F(1, 49) = 11.0$, $p = .002$, $d = 1.48$, outperformed the control group. The same effect was seen for students without disabilities in CAP-S, $F(1, 330) = 83.4$, $p < .001$, $d = 1.25$, and InferCabulary, $F(1, 372) = 100.6$, $p = .002$, $d = 1.17$. no significant findings were found between the two treatments for either group of students.
			Sentence Identification Items	Students IWD in CAP-S, $F(1, 47) = 19.6$, $p < .001$, $d = 2.42$, and InferCabulary, $F(1, 49) = 36.4$, $p < .001$, $d = 2.31$, outperformed the control group. The same effect was seen for students without disabilities in CAP-S, $F(1, 330) = 131.8$, $p < .001$, $d = 1.72$, and InferCabulary, $F(1, 372) = 127.0$, $p < .001$, $d = 1.72$. no significant findings were found between the two treatments for either group of students.
			Picture Identification Items	Students IWD in CAP-S, $F(1, 47) = 14.1$, $p < .001$, $d = 2.12$, and InferCabulary, $F(1, 49) = 10.7$, $p = .002$, $d = 1.67$, outperformed the control group. The same effect was seen for students without disabilities in CAP-S, $F(1, 330) = 111.9$, $p < .001$, $d = 1.20$, and InferCabulary, $F(1, 372) = 113.9$, $p < .001$, $d = 1.47$. no significant findings were found between the two treatments for either group of students.
Kennedy et al. (2020)	*N* = 75 75 fifth graders 11 students IWD	Counterbalanced	Researcher-Created Multiple Choice Vocabulary Measure	Scores were significantly higher for InferCabulary group than BAU in week 1 ($F(1, 41) = 26.1$, $p = .001$, $d = 1.42$), week 3 ($F(1, 41) = 10.1$, $p = .003$, $d = .878$), week 4 ($F(1, 41) = 210.6$, $p = .002$, $d = .925$), week 5 ($F(1, 41) = 11.0$, $p = .002$, $d = .978$), and week 6

			Sentence Identification Items Picture Identification Items	(*F*(1, 41)= 26.1, *p* =.001, *d* = .978); scores were not significantly higher for week 2 (*F*(1, 41)= 2.2, *p* =.145, *d* = .465). Scores were significantly higher for InferCabulary group than BAU in week 1 (*F*(1, 41)= 21.1, *p* =.001, *d* = 1.39), week 3 (*F*(1, 41)= 5.4, *p* =.026, *d* = .656), week 4 (*F*(1, 41)= 5.1, *p* =.029, *d* = .691), week 5 (*F*(1, 41)= 11.6, *p* < .001, *d* = .981), and week 6 (*F*(1, 41)= 6.2, *p* =.017, *d* = .763); scores were not significantly higher for week 2 (*F*(1, 41)= 0.360, *p* =.552, *d* = -.185). Scores were significantly higher for InferCabulary group than BAU in week 1 (*F*(1, 41)= 18.7, *p* =.001, *d* = 1.26), week 3 (*F*(1, 41)= 7.0, *p* =.011, *d* = .76), week 4 (*F*(1, 41)= 10.8, *p* =.002, *d* = 1.00), week 5 (*F*(1, 41)= 9.3, *p* = .004, *d* = .88), and week 6 (*F*(1, 41)= 12.4 *p* < .001, *d* = .88); scores were not significantly higher for week 2 (*F*(1, 41)= 0.940, *p* =.338, *d* = .31).
Lawrence et al. (2015)	*N* = 1552 513 sixth graders 680 seventh graders 361 eighth graders	Randomized-control trial	Academic Vocabulary Knowledge Gates-MacGinitie Reading Test-Vocabulary Subtest	Treatment schools was 1 point greater than average improvement in the control schools, ES = 0.17. Control schools scored higher at posttest than treatment schools, ES = –0.04.

Lawrenc et al. (2017)	*N* = 8,382 2700 sixth graders 2749 seventh graders 3025 eighth graders	Randomized-control trial	Academic Vocabulary Knowledge Gates-MacGinitie Reading Test-Vocabulary Subtest	Treatment schools improved more than control schools ((g = 0.094, p < 0.05). No main effect treatment detected (β= -0.090).
Lawrence (2014)	*N* = 1793 1793 middle schoolers 397 students IWD	Quasi-experimental	General Academic Words	Treatment schools improved more than comparison school (y_{20} = .207, p < 0.001).
Lee (2024)	*N* = 19 5 fourth graders 14 fifth graders 19 IWD	Within-subjects, counterbalanced	Vocabulary Knowledge Test Sentence Verification Test Sentence Completion Test	Significant main effect of word type and testing time interaction benefitting the moderate-encounter condition over the control condition, $F(1, 18) = 67.39$, $p < .001$, $\eta^2 = .79$. Significant difference in scores benefitting the moderate-encounter (M = 78.07, SD = 15.51) over the control (M = 46.49, SD = 16.67) conditions, $t(18) = 6.04$, $p < .001$. Significant difference in scores benefitting the moderate-encounter (M = 69.30, SD = 17.80) over the control (M = 58.77, SD = 20.87) conditions, $t(19) = -2.882$, $p = .010$.
Lesaux et al. (2014)	*N* = 2082 2082 sixth graders 1469 ML	Randomized field trial	Academic Word Mastery Word Association Academic Word Meanings in Context	Significant effects of treatment (d = 0.41, p < .0001). Significant effects of treatment (d = 0.22, p < .0001). Significant effects of treatment (d = 0.17, p = .0020).
Lowe & Joffe (2017)	*N* = 15 15 eighth grade 1 student IWD	Pre/posttest	Word Knowledge Assessment (self-report of word knowledge using rating scale)	Significant change in word knowledge over time for experimental words (χ^2 (2) = 21.396, p< .001), and untaught words (χ^2 (2) = 17.640, p < .001).

				Scores increased more for experimental words (mean gain 8.67, *SD* = 4.14) than untaught words (mean gain 7.27, *SD* = 4.56), but this difference was not significant (*Z* = -1.738, *p* = .082).
Lowman & Dressler (2016)	*N* = 18 12 fifth graders 6 sixth graders 18 students IWD	Within-subjects counterbalanced	Definition Generation Sentence Generation Context Generation Syntactic Recognition Definition Selection	Scores were 1.70 higher, $F(1, 15) = 5.17$, $p < .05$, $f^2 = 0.13$, a small effect. Scores were 3.30 higher, $F(1, 15) = 6.59$, $p < .05$, $f^2 = 0.17$, a medium effect. Scores were 1.3 higher, $F(1, 15) = 7.48$, $p < .01$, $f^2 = 0.11$, a small effect. Scores were 2.1 higher, $F(1, 15) = 4.63$, $p < .05$, $f^2 = 0.20$, a medium effect. Scores were 1.8 higher, $F(1, 15) = 8.46$, $p < .01$, $f^2 = 0.46$, a large effect.
Manyak et al. (2021)	*N* = 589 589 fourth and fifth graders 205 ML	Pre/posttest	Gates-MacGinitie Reading Test-Vocabulary Subtest Specific Vocabulary Knowledge Assessment (SVKA) Morphemic Awareness Assessment (MAA)	Average NCEs across grades and sites increased 4.8, 5.48, and 8.0 across the three-year project, respectively. All t-tests attained statistical significance, with the exception of the Year 1 Grade 5 pretest/posttest comparisons (*p* = .091). Posttests were statistically significantly higher than pretests with large effect sizes ranging from 0.61 to 2.02 (*M* = 1.26). Posttests were statistically significantly higher than pretests, with small to large effect sizes ranging from 0.36 to 1.16 (*M* = 0.67). Posttests were statistically significantly higher than pretests, with small to medium effect sizes ranging from 0.18 to 0.68 (*M* = 0.42).

			Context Analysis Assessment (CAA)	
McKeown et al. (2018)	*N* = 105 105 sixth graders *N* = 87 87 seventh graders	Quasi-experimental	Evaluation of Academic Vocabulary (EAV) Lexical Decision Task Word Knowledge Test Lexical Decision Test	Significant difference of posttest scores in favor of RAVE, *t* (102) = 7.04, *p* < .0001. Posttest scores were significantly higher than pretest scores *t* (102) = 2.87, *p* = .03. RAVE group was faster identifying word definitions *t* (97) = 2.75, *p* = .04, were accurate in identifying word definitions (*M* = 91.11%), and were faster at identifying RAVE words than untaught words, *F* (1, 97) = 11.68, p < .001. Significant main effect of group favoring RAVE, F(1, 36) = 8.31, p = .007. RAVE group was faster identifying word definitions, *t* (82) = 4.86, *p* < .0001, were accurate in identifying word definitions (*M* = 95.86%), and were faster at identifying RAVE words than untaught words, *F* (1, 82) = 17.14, p < .0001.

O'Connor et al. (2015)	*N* = 36 36 eighth graders 15 ML 20 students IWD	Quasi-experimental	Experimenter-Designed Vocabulary Quiz	Scores demonstrated a main effect between pretest and posttest, $F(1, 30) = 96.46$, $p < .001$, ES = .76.
O'Connor et al. (2019)	*N* = 52 52 sixth graders 31 ML 52 students IWD	Quasi-experimental	Multiple-Choice of Word Meanings Usage of Words Maintenance of Taught Vocabulary Words	Significant main effect for treatment in cycle 1($F(1, 38) = 72.71$, $p \leq .001$, $\eta 2 = .68$), cycle 2 ($F(1, 42) = 68.75$, $p \leq .001$, $\eta 2 = .64$), and cycle 3 ($F(1, 41) = 44.26$, $p \leq .001$, $\eta 2 = .54$). Significant main effect for treatment ($F(1, 37) = 3.68$ $p = .063$, $\eta 2 = .10$); cycle 2 ($F(1, 42) = 7.83$, $p = .008$, $\eta 2 = .17$); cycle 3 ($F(1, 41) = 11.54$, $p = .002$, $\eta 2 = .23$). Scores maintained increases on maintenance test ($M = 13.45$, $SD = 4.21$, $p = 1.00$).

O'Connor et al. (2022)	*N* = 53 53 eighth graders 38 ML 53 students IWD	Quasi-experimental	Multiple-Choice of Word Meanings Usage of Words Expressive Vocabulary Maintenance of Taught Vocabulary Words Comprehensive Receptive and Expressive Vocabulary Test (CREVT)	Significant effects for cycle 1 ($F(1, 45)= 71.550$, $p = .000$, $\eta_p^2 = 0.614$), cycle 2 ($F(1, 45)= 79.628$, $p = .000$, $\eta_p^2 = 0.639$), and cycle 3 ($F(1, 45)= 32.195$, $p = .000$, $\eta_p^2 = 0.417$). There were no significant effects for cycle 1 ($F(1, 45)= 2.854$, $p = .098$, $\eta_p^2 = 0.060$), however there were significant effects in cycle 2 ($F(1, 45)= 5.918$, $p = .019$, $\eta_p^2 = 0.116$) and cycle 3 ($F(1, 45)= 4.490$, $p = .040$, $\eta_p^2 = 0.091$). Treatment had significant effects, $\Lambda = 0.643$, $F(6, 39) = 3.613$, $p = .006$, $\eta_p^2 = 0.357$. Treatment had significant effects, $M = 13.97$, $p = .000$). Treatment had significant, positive effects, $F(1, 41) = 6.45$, $p = .015$, $\eta_p^2 = 0.136$.
O'Connor et al. (2021)	*N* = 64 64 seventh graders 45 ML 64 students IWD	Quasi-experimental	Multiple-Choice of Word Meanings Usage of Words	Significant main effect of treatment in cycle 1, $F(1, 58) = 61.282$, $p < .001$, $\eta 2 = .57$; similar, significant main effects observed in cycles 2 and 3. Significant effects for treatment in cycle 1, $F(1, 58) = 6.785$, $p = .011$, $\eta 2 = .081$; similar effects were for cycles 2 ($p < .001$, $\eta 2 = .18$) and 3 ($p = 0.005$, $\eta 2 = .093$). Treatment group had significant increases compared to BAU classrooms. Scores were significantly higher benefitting treatment group, $F(1, 60) = 4.44$, $p = .04$.

			Maintenance of Taught Vocabulary Words Comprehensive Receptive and Expressive Vocabulary Test (CREVT)	
Palmer et al. (2014)	*N* = 4 4 seventh graders 4 IWD	Single case A-B-A-B	Percent Correct Responses of Vocabulary Responses	Four clear functional relations observed with all participants demonstrated higher levels of accuracy during concept mapping conditions versus dictionary approach conditions.
Reed et al. (2019)	*N* = 92 92 fourth graders 4 ML 14 students IWD	Quasi-experimental	Frayer Model Rubric Score	Slightly higher scores for online discussion Frayer Model group (*M* = 66.44%) compared to independent Frayer Model group (*M* = 65.13%).
Robb et al. (2014)	*N* = 121 121 eighth graders	Within-subjects counterbalanced	Vocabulary Knowledge Tests	Tests of simple effects showed gains of VT were significantly greater than TDI ($p < .01$), regardless of intervention order; significant main effect of phase and condition interaction, $F(1, 94) = 22.16$, $p < .001$, $\eta^2 = .191$.
Sanchez & O'Connor (2022)	*N* = 33 33 sixth graders 19 ML 33 students IWD	Quasi-experimental	Multiple-Choice of Word Meanings Usage of Words	Significant effects for cycle 1 ($F(2, 62)= 24.358$, $p = .000$, $\eta_p^2 = .440$), cycle 2 ($F(2, 62)= 41.683$, $p = .000$, $\eta_p^2 = .573$), and cycle 3 ($F(2, 62)= 30.718$, $p = .000$, $\eta_p^2 = .498$). Significant effects in cycle 2 ($F(2, 57)= 7.127$, $p = .022$, $\eta_p^2 = .200$) and cycle 3 ($F(2, 57)= 5.848$, $p = .005$, $\eta_p^2 = .170$).

Shore et al. (2015)	*N* = 398 398 seventh graders	Posttest-only treatment comparison, counterbalanced	Immediate Vocabulary Post Test Retention - 2 Day Vocabulary Post Test	There was a significant difference on scores based on learning strategy, $F(2,440) = 7.31$, $p = .001$, $\eta^2 = 0.03$. Students with lower reading levels demonstrated higher scores after the Pictionary strategy ($M = 0.59$, $SD = 0.26$) than Conversation ($M = 0.38$, $SD = 0.25$) or Dictionary ($M = 0.37$, $SD = 0.23$). Students with moderate reading levels demonstrated higher scores after the Pictionary strategy ($M = 0.71$, $SD = 0.26$) and Dictionary ($M = 0.72$, $SD = 0.25$) strategies than Conversation ($M = 0.61$, $SD = 0.31$). Students with higher reading levels demonstrated higher scores across Pictionary ($M = 0.83$, $SD = 0.21$), Dictionary ($M = 0.81$, $SD = 0.22$), and Conversation ($M = 0.84$, $SD = 0.21$) strategies Students with lower reading levels demonstrated higher scores after the Pictionary strategy ($M = 0.52$, $SD = 0.31$) and Dictionary ($M = 0.49$, $SD = 0.32$) than Conversation ($M = 0.40$, $SD = 0.34$) Students with moderate reading levels demonstrated slightly higher scores after the Dictionary strategy ($M = 0.74$, $SD = 0.28$) and Pictionary ($M = 0.68$, $SD = 0.27$) strategies than Conversation ($M = 0.62$, $SD = 0.31$) Students with higher reading levels demonstrated higher scores across Pictionary ($M = 0.87$, $SD = 0.18$), Dictionary ($M = 0.86$, $SD = 0.19$), and Conversation ($M = 0.81$, $SD = 0.25$) strategies
Solis et al. (2022)	*N* = 7 7 fourth graders 7 students IWD	Concurrent multiple baselines with	Vocabulary curriculum-based measures	Two clear functional relations observed for increased vocabulary with the intervention of seven opportunities; five demonstrations of

		alternating treatments		slight increases with data overlapping with baseline levels although data were more consistently high for four participants during intervention Three students demonstrated higher scores with interest-based texts and four students did with expository texts.
Solis et al. (2021)	*N* = 5 1 sixth grader 4 eighth graders 5 students IWD	Multiple baselines across two groups	Vocabulary curriculum-based measures	Clear functional relations observed for increased vocabulary for both groups with the intervention with some overlap of intervention scores with baseline scores; group 1 scores improved after additional training and modeling provided to the implementer by the research team.
Solis et al. (2017)	*N* = 44 44 fourth graders 16 ML 5 IWD	Pre/posttest with random assignment to control and treatment groups	Curriculum-Based Measure	Significant difference between groups favoring the treatment group, F (1, 42) =13.50, p =.001, partial η2 = 0.24).
Swanson et al. (2024)	*N* = 4757 4757 fourth graders 924 ML 494 IWD	Randomized-control trial	Unit Test of Vocabulary Gates-MacGinitie Reading Test-Vocabulary Subtest	RPD students (γ001 = 12.54, SE = 1.88, p < .001) and SPD students (γ002 = 12.35, SE = 1.99, p < .001) scored significantly higher than BAU. SPD students' scores differed significantly compared to BAU (γ002 = 5.03, SE = 1.52, p = .001). RPD students did not score significantly higher than BAU (γ001 = 2.26, SE = 1.81, p = .21).
Vadasy et al. (2015)	*N* = 1232 597 fourth graders 635 fifth graders 57 ML	Randomized-control trial	Researcher-Developed Curriculum-Based Measure (CBM)-Words Researched-Developed CBM-Sentences	Significant effects found for RVOC group (d = 2.20, p <.001). Significant effects found for RVOC group (d = 1.23, p <.001).

	113 students IWD		Iowa Test of Basic Skills Vocabulary subtest (ITBS)	Significant effects found for RVOC group (d = 0.13, p <.05).
Van Orman et al. (2021)	N = 106 106 seventh graders 88 ML 15 students IWD	Quasi-experimental, matched-group	Vocabulary-of-science Scale-Earth science (VSS-ES) General academic vocabulary measure-subtest (GAVM-S)	Significant difference between SVS and control group, F (1, 78) = 81.96, p < .001. SVS vocabulary scores increased by 28% (M = 28.14, SD = 12.44; d = 1.83). Significant difference between SVS and control group F (1, 76) = 34.87, p < 0.001. SVS vocabulary scores about 13% (M = 12.85, SD = 18.78; d = 0.56).
VanUitert et al. (2020)	N = 43 43 seventh graders 43 IWD	Counter-balanced	Researcher-Created Vocabulary Measures	Scores were statistically different in favor of the students in CAP-S condition on Unit 1 multiple-choice (F(1,41) = 4.30, p = 0.04, d = 0.62) and open-response questions F(1,41) = 22.17, p< 0.001, d = 1.45), Unit 2 multiple-choice (F(1,41) = 13.16, p = 0.0001, d = 1.13) and open-response questions F(1,41) = 12.08, p= 0.001, d = 1.07), Unit 3 open-response questions F(1,41) = 26.94, p< 0.001, d = 1.57), and Unit 4 multiple-choice (F(1,41) = 5.51, p = 0.024, d = 0.73) and open-response questions F(1,41) = 12.79, p = 0.001, d = 1.11). Scores were not statistically different in Unit 3 on the multiple-choice test, F(1,41) = 2.97, p = *0.092*, d = 0.51).

Note. SWD = students with disabilities; ML = multilingual learners; AR = at-risk for school failure; BAU = business as usual; ESL = English as a second language.

Intervention Characteristics

- **Grade level and description of participants**: Eleven studies included students in early adolescence, grades 4-5. Students in grades 6 through 8, or middle adolescence, were in 20 studies. Two studies implemented interventions with ninth graders, and five studies included a mix of all adolescent age groups. Twenty-five studies included student participants identified with a disability. Seventeen studies involved students who were multilingual (ML) learners. Three studies included participants who were at-risk or were reported as receiving Tier 3 support.

- **Instructional arrangement**: The majority of studies (n=23) used whole group instruction. Five studies implemented instruction in small group arrangements. Two studies were conducted individually through technology. Two of the studies involved one-on-one instruction. Six studies were implemented with an assortment of these arrangements (e.g., O'Connor et al., 2015, implemented small group instruction for three weeks followed by whole group instruction).

- **Implementer**: These studies involved a variety of implementers. The most common implementers were general education teachers (n=15). Seven studies were implemented by special education teachers. Technology accounted for the implementation of four studies. Of the remaining studies, two were implemented by the researcher team, two by hired tutors, and one by an English as a second language teacher. The final seven studies were conducted by more than one implementer. For instance, Lawrence and colleagues' (2014) study was implemented by both general and special educators.

- **Instructional setting**: The vast majority (n=27) of studies were Tier 1 interventions. These studies often included whole group instruction. Tier 2 instruction was the second most common arrangement, with eight studies conducted in those settings. Finally, three studies were conducted in Tier 3 settings.

- **Duration, dosage, and intensity**: Session length ranged from 5-15 minutes (see Van Orman et al., 2021) to 90 minutes (see Elleman et al., 2017). Eleven studies had session lengths of less than 20 minutes, and 20 studies lasted between 20 and 45 minutes with six taking longer than 45 minutes per session.

The majority (n=19) of studies implemented sessions five times per week. Other studies held sessions less frequently. For example, eight studies implemented sessions 3-4 times per week while another seven conducted sessions 1-2 times per week.

The length of interventions varied greatly across studies, with some studies lasting one week (Lee, 2024) and others extending over multiple school years (Jones et al., 2019). Twenty studies were implemented for ten weeks or longer, nine studies were conducted over five to nine weeks, and the remaining nine occurred over four weeks or less.

Dependent Variables and Effects

The second research question explored the vocabulary measures and the outcomes of the studies:

> Research question 2: What does the research say about the effectiveness of vocabulary instruction in improving adolescent reading outcomes for readers in grades 4-9?

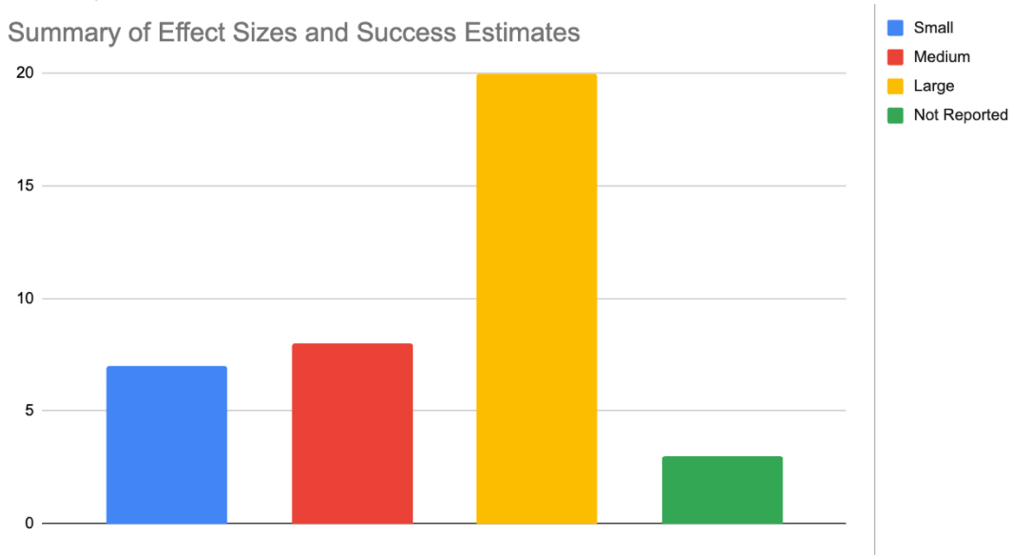
Table 2 includes all of the studies' dependent variables used to assess vocabulary instruction and their reported outcomes. While many of these studies assessed students' progress in multiple areas (e.g., comprehension or science unit tests), the only outcomes analyzed for the purposes of this review were specific to vocabulary. Twenty-nine articles assessed vocabulary using researcher-created measures alone. Eight studies evaluated vocabulary outcomes using both researcher-created and standardized assessments. Only one study assessed students using standardized measures alone (see Adlof et al., 2019).

Figure 4 shows the frequency data of success estimates (Reichow & Volkmer, 2010) and the reported effect sizes (e.g., Cohen's *d*). Success estimates were calculated for single-case research designs using visual analysis of the graphs to determine the ratio of successful demonstrations of functional relations to attempts. For example, the success estimate for Palmer and colleagues (2014) was 4/4 because all four participants demonstrated immediate, increased levels following the introduction of the independent variable. As shown in the Figure, many studies demonstrated large effect sizes and success estimates. Fifteen studies also demonstrated increases, although these were smaller to moderate effects. Three studies did not report effect sizes (i.e., Burt et al., 2022; Reed et al., 2019; Shore et al., 2015).

Of the 38 studies in this review, 35 reported increases in vocabulary with vocabulary instruction. Solis and colleagues' (2022) results were mixed, with a success estimate of 2/7, although most of the participants were more consistent with higher scores post-intervention. Two studies examined only posttest data (Reed et al., 2019; Shore et al., 2015), as these focused more on comparing types of vocabulary interventions. These increases frequently emerged on proximal measures (see VanUitert et al., 2020). Distal and standardized outcomes varied, with some demonstrating improvement while others demonstrated none (e.g., Lawrence et al., 2015; Vadasy et al., 2015). Additionally, students generally performed better on assessments that require selection of the correct answer rather than generation of the correct answer (see Lowman & Dressler, 2016).

Figure 4

Summary of Effect Sizes and Success Estimates



Features Associated with Improved Outcomes

The final research question explored how features of instruction impacted vocabulary outcomes, specifically for students in different populations:

> Research question 3: What features of instructional interventions (e.g., type of instruction, duration, grade level) are associated with improved outcomes? Do these features differ according to student characteristics?

Effect sizes for instructional techniques and intervention characteristics were used to determine which features led to improved vocabulary outcomes. Figures 5 and 6 show the observed effects (i.e., large and small-to-moderate effect sizes) for studies that incorporated each instructional technique. Figures 7-11 show the impacts of intervention characteristics on outcomes. The final figures in this section demonstrate the effects of intervention characteristics for multilingual learners, students with disabilities, and students at-risk (i.e., Figures 14-22).

Effects of Instructional Techniques

A summary of effect sizes for instructional techniques is presented Figure 4. Vocabulary instruction often incorporated multiple instructional techniques. The frequency of effect sizes for each instructional technique is in Figures 5 and 6. Large effects were most frequently observed in studies that implemented explicit instruction, graphic organizers, context exposure, and games. Small effects were most often observed with explicit instruction, content area vocabulary, sentence generation, and context exposure. It is important to note that explicit instruction and context exposure were two of the most implemented instructional techniques overall, so it is unsurprising that these are among the most frequently used with both small and

large effects. Seventeen studies implemented games and graphic organizers. Of these, 16 resulted in large effect results and one resulted in small-to-moderate effects.

Figure 5

Effects of Instructional Techniques

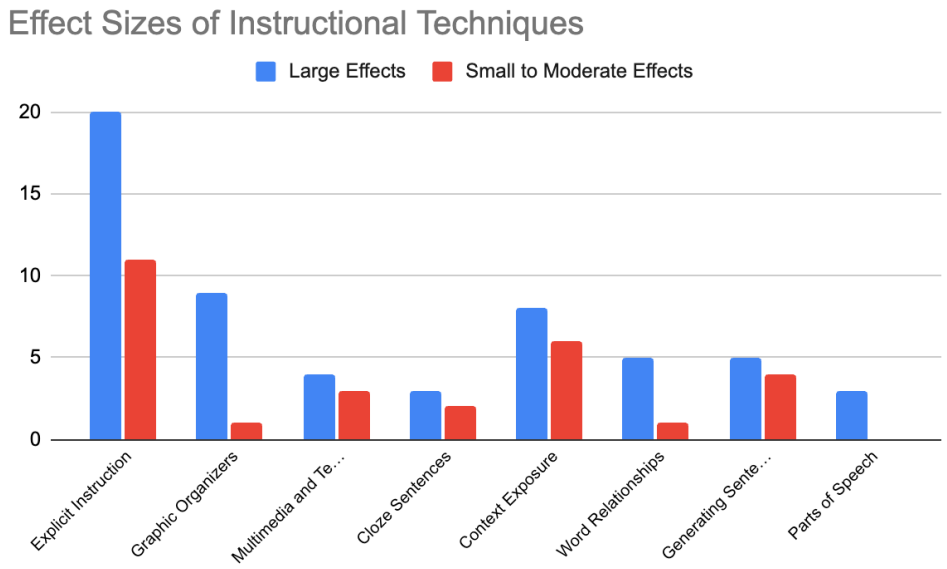
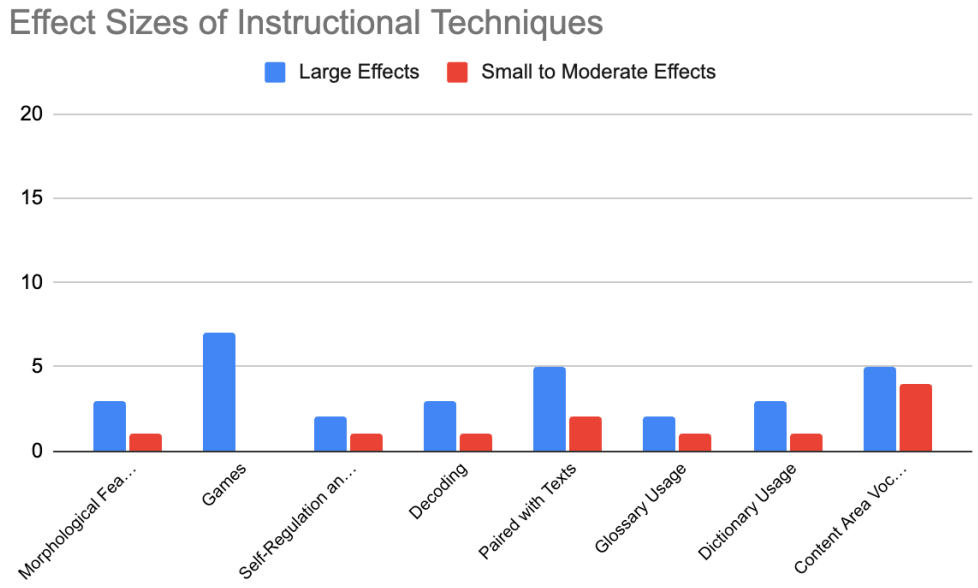


Figure 6

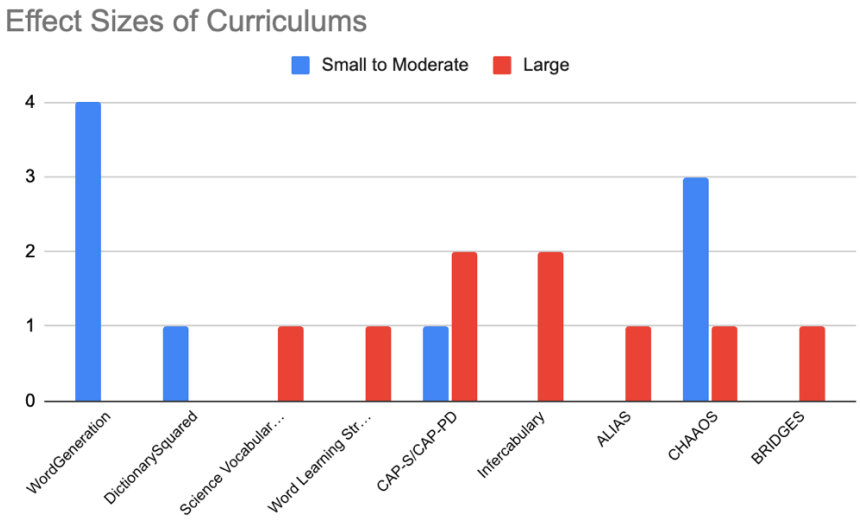
Effects of Instructional Techniques



Studies implemented the following curriculums: *Word Generation, DictionarySquared, Science Vocabulary Support, RAVE, Word Learning Strategies, Infercabulary, ALIAS, CHAAOS, BRIDGES, CAP-S* and *CAP-PD*. Although McKeown and colleagues (2018) did not report effect sizes for *RAVE*, posttest scores were significantly higher than pretest scores. The remaining

curriculums led to positive effects for students, with seven producing large effects (*Science Vocabulary Support, Word Learning Strategies, CAP-S, InferCabulary, ALIAS, CHAAOS,* and *BRIDGES*).

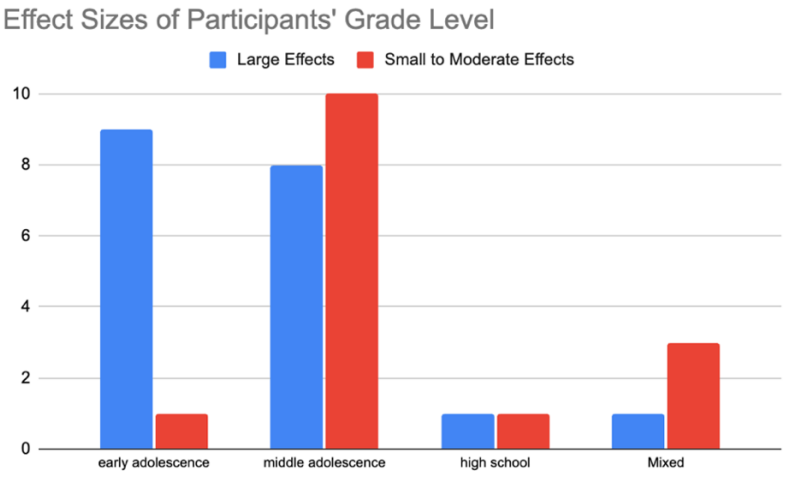
Figure 7
Effects of Curriculums



Effects of Intervention Characteristics

Grade level of participants. Figure 8 presents the effect sizes related to the student participants' grade levels. Twenty-three studies involved early and middle adolescent students, and most of these studies reported large effects (n=16). These findings suggest that vocabulary instruction is particularly effective for students in grades 4 and 5.

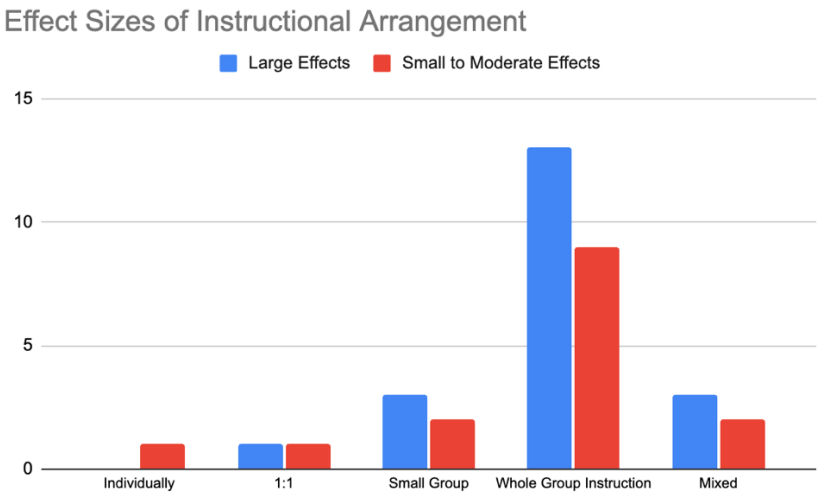
Figure 8
Effects of Grade Level



Instructional arrangement. Figure 9 shows the frequency of small-to-moderate and large effects of outcomes based on instructional arrangement. Most studies (n=23) involved whole group instruction. These studies primarily lead to large effects, although some demonstrated smaller to moderate effects. Few studies that implemented one-on-one or individual instruction demonstrated large effects on vocabulary outcomes.

Figure 9

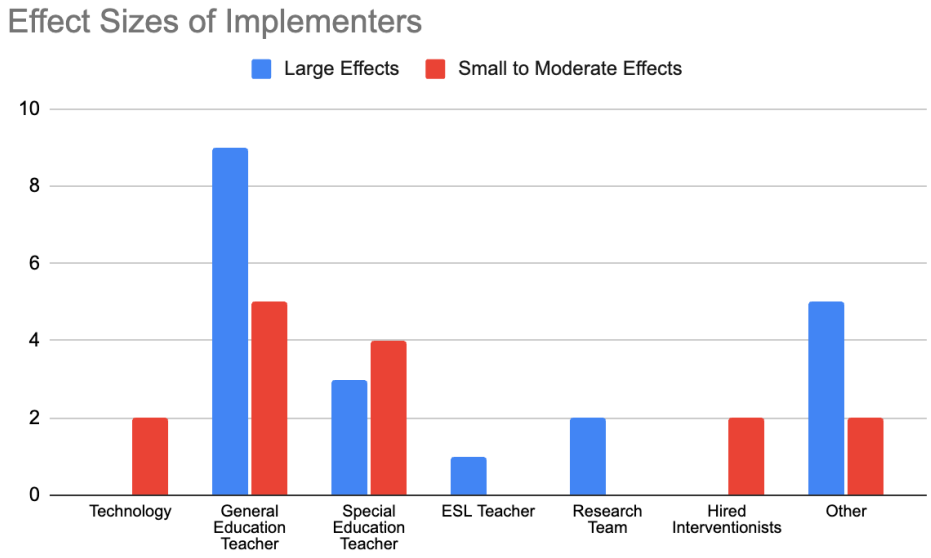
Effects on Instructional Arrangement



Implementer. Figure 10 displays the effect sizes based on the implementer. When general education teachers served as implementers, studies frequently demonstrated large effects for student vocabulary outcomes. Results were mixed across the other implementer categories.

Figure 10

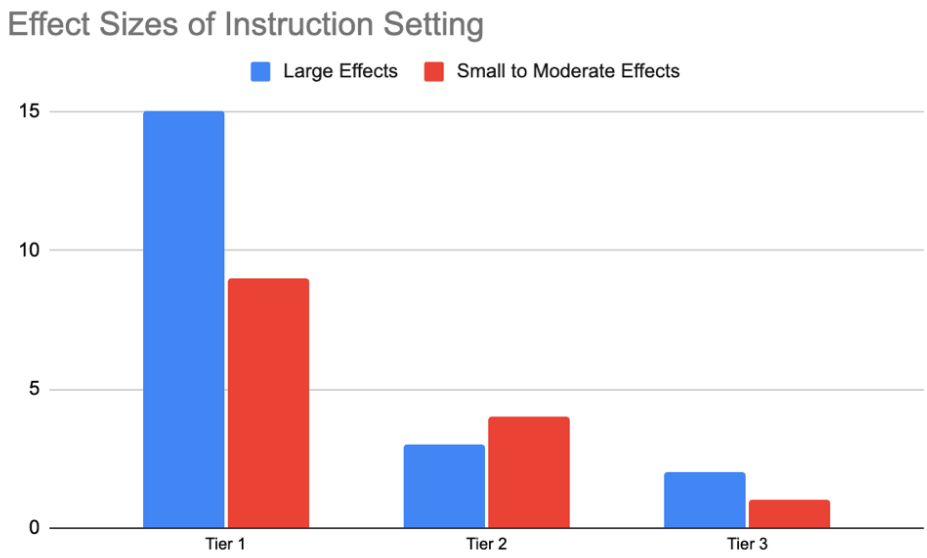
Effects on Implementer



Instructional setting. Frequency data for effect sizes based on instructional setting are shown in Figure 11. Most of the studies were conducted in Tier 1, followed by Tier 2, with the fewest number of studies occurring in Tier 3. Tier 1 interventions generally led to large effects on vocabulary measures. Results regarding effect sizes for Tiers 2 and 3 were less clear.

Figure 11

Effects on Instructional Setting



Duration, dosage, and intensity. Figures 12 and 13 display the small-to-moderate and large effects observed based on the interventions' duration, dosage, and intensity. Overall, session lengths of 20-45 minutes and more than 46 minutes were more effective for participants than sessions lasting less than 20 minutes. Most sessions occurred five times per week, and these generally led to larger effects. Finally, intervention length of more than ten weeks was the most common. The effect sizes for these studies were mostly small-to-moderate while the effect sizes for studies shorter than 10 weeks were generally large. This suggests that interventions lasting nine weeks or shorter can lead to larger vocabulary improvements for students.

Figure 12

Summary of Large Effects for Dosage, Duration, and Intensity

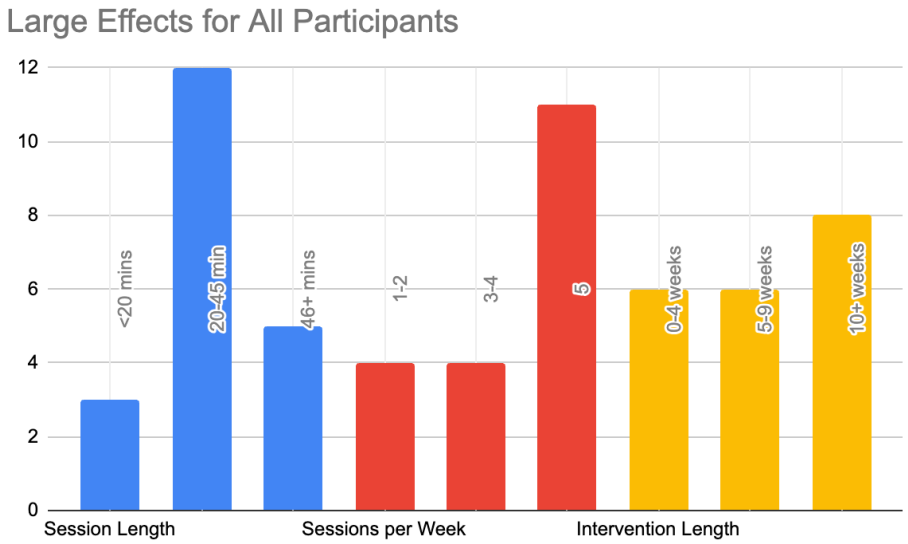
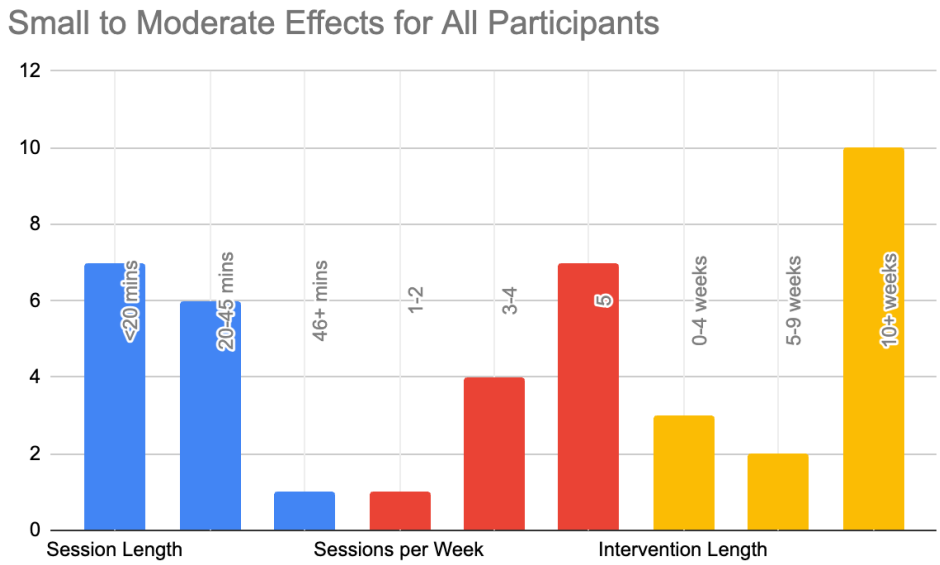


Figure 13

Summary of Small to Moderate Effects for Dosage, Duration, and Intensity



Effects for Multilingual Students

Multilingual students generally made gains with vocabulary interventions. However, these gains varied in comparison to their peers. Specifically, these gains were sometimes less than their peers who were not multilingual (see Van Orman et al., 2021), were commensurate with their monolingual peers (e.g., O'Connor et al., 2022), or were larger for multilingual learners (e.g., Graves et al., 2018).

All information related to effect sizes for multilingual learners based on intervention characteristics can be found in Figures 14-17. For these learners, the most effective interventions incorporated whole group instruction taught by a general education teacher in a Tier 1 setting. Additionally, these students benefited most from sessions that occurred daily. This trend was evident in the work of August and colleagues (2016), in which extended instruction (i.e., word meanings pre-taught, supported with text work and concept maps over 5 weeks) was more beneficial for students than embedded instruction. Interestingly, effects were smaller when special education teachers implemented instruction.

Figure 14

Effects of Classroom Arrangement for Multilingual Students

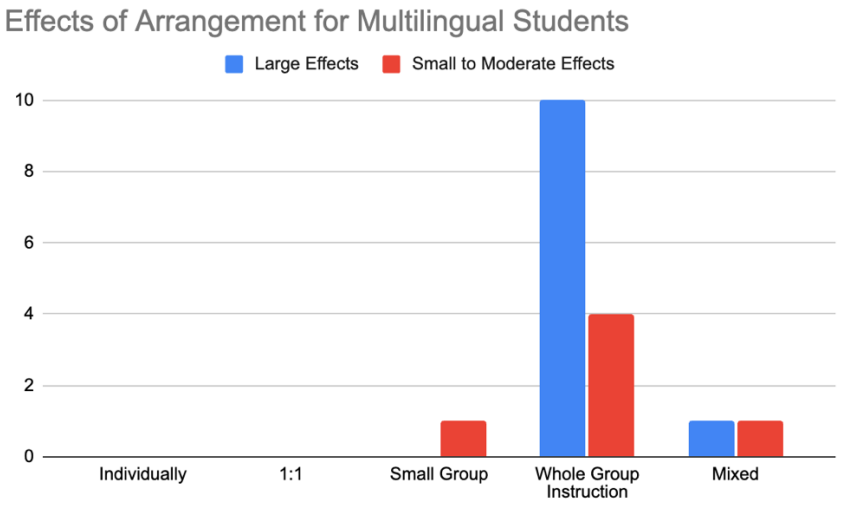


Figure 15

Effects of Implementer for Multilingual Students

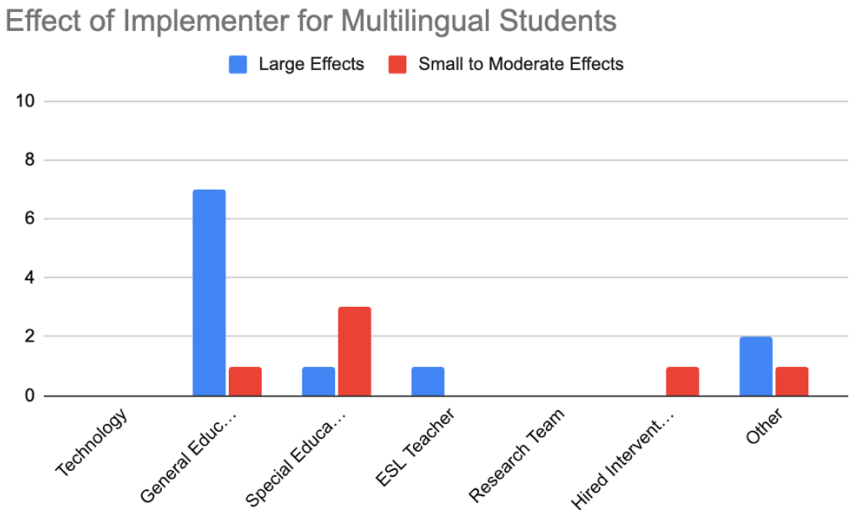


Figure 16

Large Effects for Multilingual Students across Dosage, Duration, Intensity, and Instructional Setting

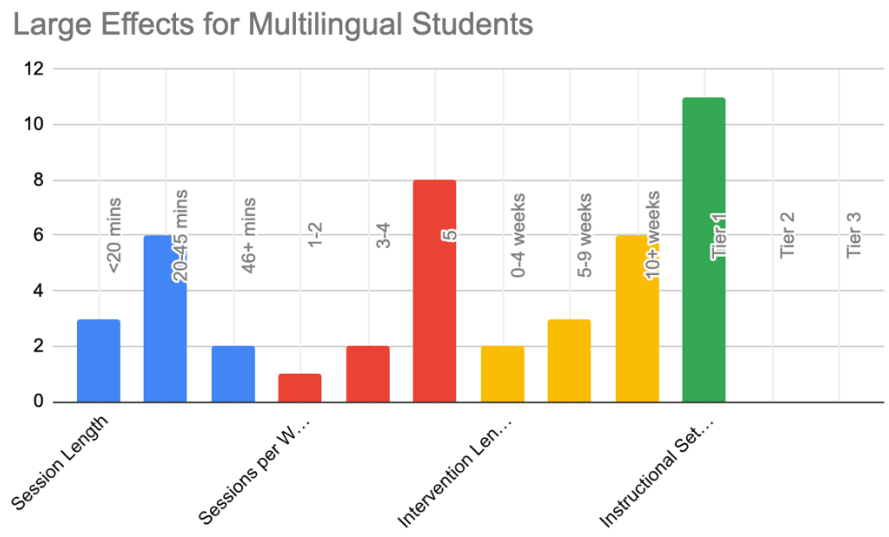
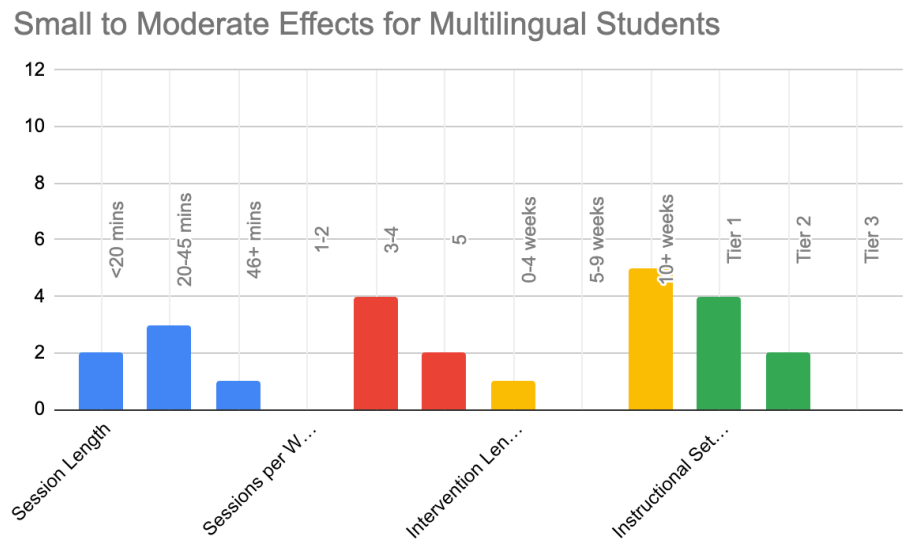


Figure 17

Small to Moderate Effects for Multilingual Students across Dosage, Duration, Intensity, and Instructional Setting



Effects for Students with Disabilities

Students with disabilities demonstrated improvements on vocabulary measures after receiving vocabulary instruction. Figures 18-21 display the effect sizes for students with disabilities based on intervention characteristics. For this population, it appears that interventions with sessions

lasting 20-45 minutes in a Tier 1 setting implemented daily by a general education teacher or mix of implementers, led to the largest effects.

Figure 18

Effects of Classroom Arrangement for Students with Disabilities

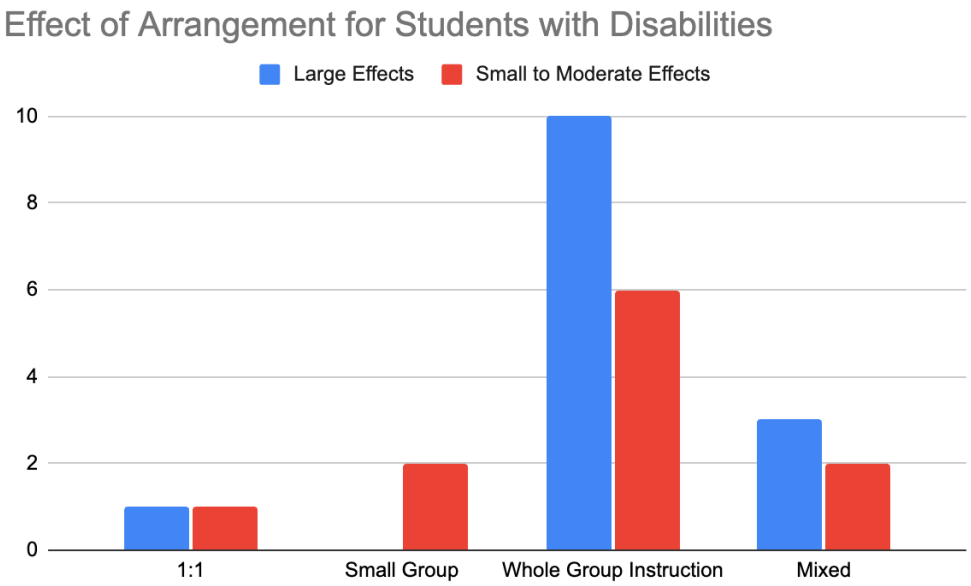


Figure 19

Effects of Implementer for Students with Disabilities

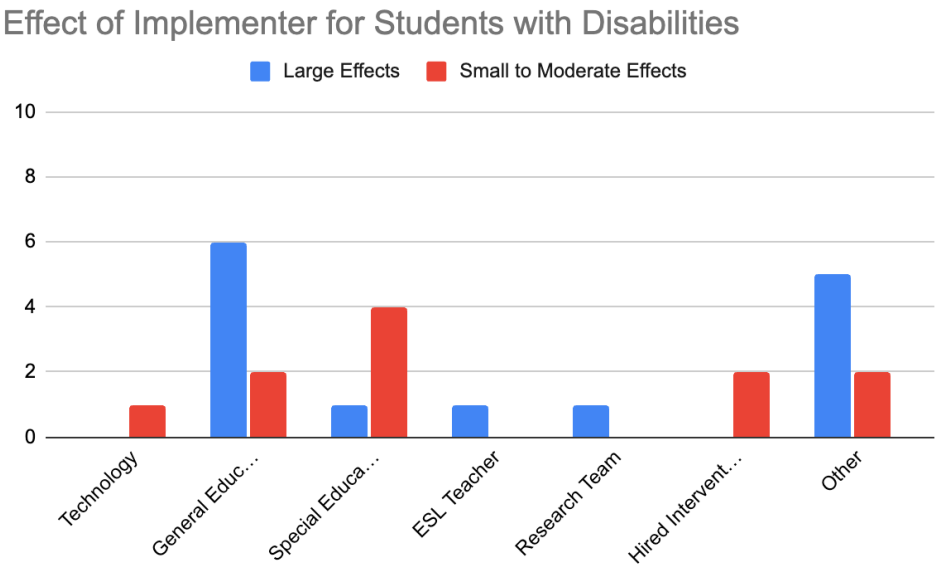


Figure 20

Large Effects for Students with Disabilities across Dosage, Duration, Intensity, and Instructional Setting

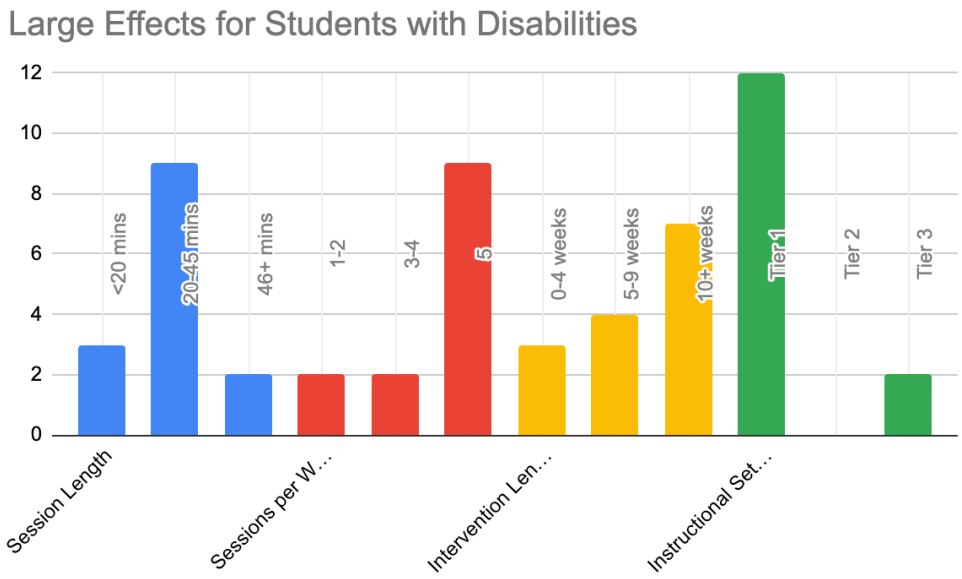
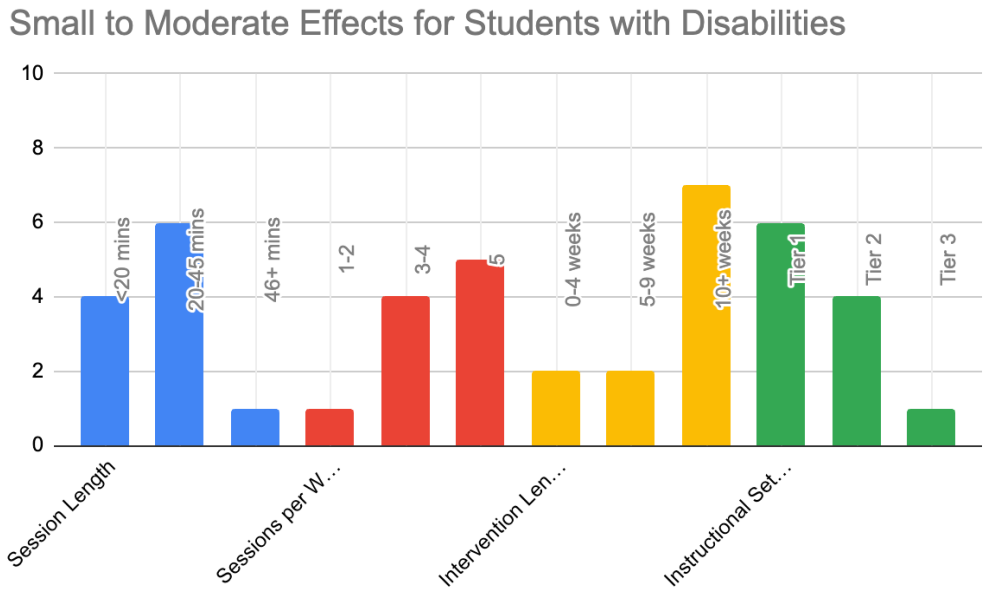


Figure 21

Small to Moderate Effects for Students with Disabilities across Dosage, Duration, Intensity, and Instructional Settings

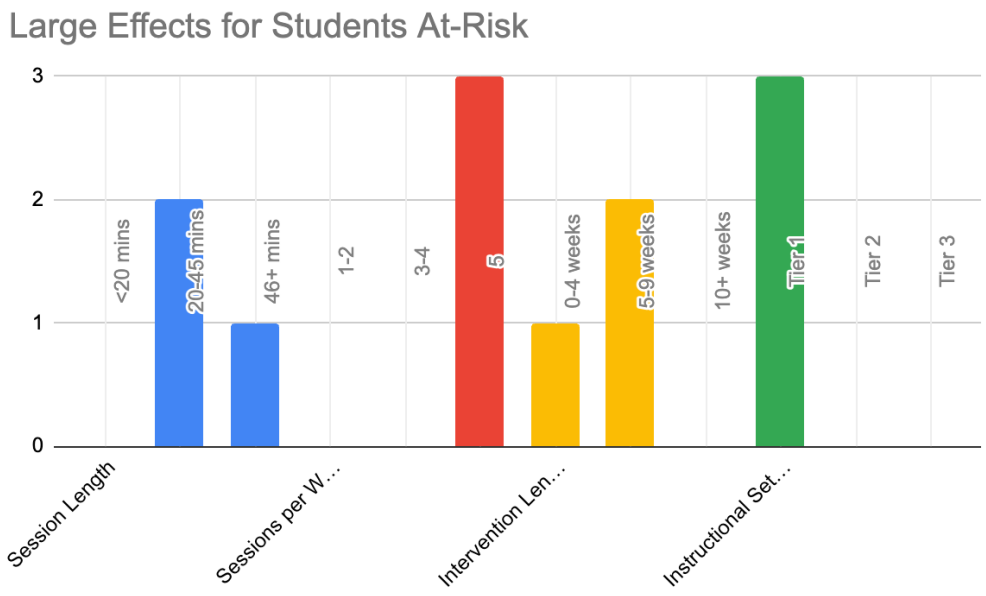


Effects for Students At-Risk

Students who were at-risk improved their vocabulary following vocabulary instruction. Effects based on intervention characteristics are shown in Figure 22. While many authors reported serving students in urban or underserved areas, the studies did not include statistics on how many students were served or report separate effects for these students (e.g., Lawrence et al., 2015). For the purpose of analyzing effects for this population, this review reports effects relative to the studies that did include that pertinent information. This sample was very small, consisting of three studies that reported effect sizes; therefore, all findings should be interpreted cautiously. For this population, the data suggest that students benefit most from Tier 1, whole group instruction lasting nine weeks or fewer.

Figure 22

Large Effects for Students At-Risk across Dosage, Duration, Intensity, and Instructional Setting



Discussion

This review included 38 studies to assess the current literature on vocabulary interventions for adolescents. Several themes emerged related to instructional techniques and intervention characteristics. Findings demonstrate the effectiveness of vocabulary interventions for adolescent learners and highlight specific features that are associated with improved outcomes. Furthermore, these positive effects were observed among multilingual learners, students with disabilities, and students at-risk. Additionally, specific features were identified that supported each population. We present implications for practice and limitations.

First, the most commonly used instructional techniques were explicit instruction, context exposure, and graphic organizers. Studies often incorporated elements from the five pillars of reading plus writing. Specifically, the most frequently included elements were listening comprehension, vocabulary instruction, oral language development, reading sentences, and writing activities. Many studies utilized whole group instruction, implemented by either a general or special educator, and were conducted in Tier 1 settings. Session length varied greatly, ranging from 5 to 90 minutes each, with most sessions occurring at least three times per week. The duration of instruction also varied, spanning from one week to two school years, with most interventions lasting five weeks or more.

Second, students' vocabulary outcomes improved with vocabulary instruction. Nearly all the studies reported positive outcomes, with many reporting large effect sizes. Fifteen studies described small-to-moderate effect sizes, and three did not report any. These findings are consistent with prior reviews indicating that vocabulary instruction supports word learning (Cervetti et al., 2023; Elleman et al., 2019; Hairell et al., 2011). When taken together, this literature suggests that vocabulary instruction generally leads to vocabulary gains for adolescent students.

Vocabulary gains were most commonly observed on researcher-created assessments that directly aligned with instruction, which is consistent with prior literature (Cervetti et al., 2023). While most outcomes were positive, some had mixed results especially when using distal or standardized assessments. Although certain standardized measures showed positive outcomes (O'Connor et al., 2022), others demonstrated small or negative effects (Lawrence et al., 2015; Vadasy et al., 2015). Additionally, effects were higher for recognition-based assessments (e.g., multiple choice tests) than for assessments requiring students to generate definitions or sentences. Overall, these findings indicate that vocabulary instruction is effective, although outcomes vary depending on the assessments used.

Third, the final research question aimed to identify the features of instruction and intervention components associated with improved outcomes. Studies showed that explicit instruction, graphic organizers, and games led to large gains in vocabulary. Notably, 16 of the 17 studies that incorporated games and graphic organizers reported large effects. Vocabulary curriculums were beneficial for students. Specifically, *CAP-S* and *Infercabulary* had large effects on participants' vocabulary knowledge. Effects were larger for students in earlier adolescence. Whole group instruction delivered by a general education teacher in a Tier 1 setting was

generally associated with large effects. Sessions lasting 20-45 minutes and delivered over five days per week were often more effective than shorter sessions held less frequently. Interestingly, sessions that were 10 weeks or longer demonstrated mixed effects, suggesting that more instruction does not necessarily ensure better outcomes.

Moreover, this review explored the impact of these instructional features for different populations of students. Students who were multilingual, identified with disabilities, or at-risk all benefited from vocabulary instruction. While outcomes for monolingual students improved, these gains varied and were sometimes smaller, commensurate with, or larger than their monolingual peers. Positive outcomes for multilingual students were associated with daily, whole group instruction delivered by a general educator in Tier 1 settings that lasted 20-45 minutes. Similarly, students with disabilities demonstrated strong gains in Tier 1 settings with daily instruction from a general educator. Additionally, these students benefitted from mixed implementers (e.g., Kennedy et al., 2023, used general educators and technology). Although data for students at-risk were limited, results suggest that they also benefit from Tier 1 instruction lasting 20 minutes or longer implemented in a whole group arrangement with a duration of nine weeks or less. Overall, the evidence suggests that instruction design–particularly implementer, session length, delivery method, and intervention duration–is impactful for vocabulary outcomes, and this can vary depending on student characteristics.

Implications for Practice

Our findings indicate that vocabulary interventions often lead to large, positive outcomes for students. Effects were largest for students in early adolescence. Generally, students benefitted from whole group instruction conducted in Tier 1 settings by a general education teacher. Further, students benefitted most from instructional sessions that lasted for more than 20 minutes, delivered over five days per week, and from instruction that was less than ten weeks. Relative to instructional techniques, instruction involving explicit instruction, graphic organizers, and games produced the largest effects. Multilingual learners, students with disabilities, and students at-risk improved the most with Tier 1, whole group instruction implemented by general educators in 20–45-minute sessions conducted daily.

Limitations and Directions for Future Research

We identified several limitations in this review. First, many articles were excluded because included vocabulary instruction as part of a larger comprehension-focused intervention package. As such, implications from these studies regarding vocabulary instruction and outcomes were not included. Future research should explore the effects of vocabulary instruction when nested within broader reading interventions. Second, studies varied in their descriptions of interventions and instructional techniques. This impeded our ability to identify instructional and intervention elements that produced larger effects. As such, researchers should provide more information about these instructional features so that the most beneficial arrangements for students can be identified. Third, many studies included ninth grade learners with other high school students and did not report separate findings for this age. This likely contributed to the limited number of

studies implemented with students in later adolescence. Given this, we were not able to identify patterns that supported students in ninth grade. Future research should explore vocabulary instruction for students in later adolescence. Finally, many studies reported serving students at-risk or who were multilingual but did not specifically report the numbers of students in these categories or separately analyze outcomes for these populations. Scholars should report this information in their research so that characteristics of effective interventions can be identified for multilingual learners, students with disabilities, and students at-risk.

Conclusion

Vocabulary is an essential domain that supports skilled reading. The included studies that implemented vocabulary interventions with adolescents and found that strong effect sizes were associated with Tier 1 settings, whole group instruction, and daily instructional sessions that lasted 20-45 minutes. Interventions that incorporated explicit instruction, graphic organizers, and games were the most beneficial for students. Additionally, interventions benefited students who were multilingual, with disabilities, and at-risk. When taken together, these findings suggest that effective vocabulary instruction supports and strengthens adolescent students' vocabulary knowledge.

References

Adlof, S. M., Baron, L. S., Scoggins, J., Kapelner, A., McKeown, M. G., Perfetti, C. A., Miller, E., Soterwood, J., & Petscher, Y. (2019). Accelerating adolescent vocabulary growth: Development of an individualized, web-based, vocabulary instruction program. *Language, Speech, and Hearing Services in Schools*, *50*(4), 579-595.

Akbarian, I. H., Farajollahi, F., & Catalán, R. M. J. (2020). EFL learners' lexical availability: Exploring frequency, exposure, and vocabulary level. *System*, *91*, 102261.

August, D., Artzi, L., & Barr, C. (2016). Helping ELLs meet standards in English language arts and science: An intervention focused on academic vocabulary. *Reading & Writing Quarterly*, *32*(4), 373-396.

Austin, C. R., Vaughn, S., Clemens, N. H., Pustejovsky, J. E., & Boucher, A. N. (2022). The relative effects of instruction linking word reading and word meaning compared to word reading instruction alone on the accuracy, fluency, and word meaning knowledge of 4th-5th grade students with dyslexia. *Scientific Studies of Reading*, *26*(3), 204-222.

Beach, K. D., Sanchez, V., Flynn, L. J., & O'Connor, R. E. (2015). Teaching academic vocabulary to adolescents with learning disabilities. *Teaching Exceptional Children*, *48*(1), 36-44.

Beck, I. L., McKeown, M. G., & Kucan, L. (2002). Bringing words to life: Robust vocabulary instruction. New York, NY: Guilford Press.

Beck, I. L., McKeown, M. G., & Kucan, L. (2008). Creating robust vocabulary: Frequently asked questions and extended examples. New York, NY: Guilford.

Beck, I. L., McKeown, M. G., & Kucan, L. (2013). *Bringing words to life: Robust vocabulary instruction*. Guilford Press.

Beck, I. L., Perfetti, C. A., & McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology*, *74*(4), 506.

Burt, C., Graham, L., & Hoang, T. (2022). Effectiveness of computer-assisted vocabulary instruction for secondary students with mild intellectual disability. *International Journal of Disability, Development and Education*, *69*(4), 1273-1294.

Cervetti, G. N., Fitzgerald, M. S., Hiebert, E. H., & Hebert, M. (2023). Meta-analysis examining the impact of vocabulary instruction on vocabulary knowledge and skill. *Reading Psychology*, *44*(6), 672-709.

Crosson, A. C., & Moore, D. (2017). When to take up roots: The effects of morphology instruction for middle school and high school English learners. *Reading Psychology*, *38*(3), 262-288.

Duff, D. (2019). The effect of vocabulary intervention on text comprehension: Who Benefits? *Language, Speech, and Hearing Services in Schools*, *50*(4), 562-578.

Elleman, A. M., Oslund, E. L., Griffin, N. M., & Myers, K. E. (2019). A review of middle school vocabulary interventions: Five research-based recommendations for practice. *Language, Speech, and Hearing Services in Schools*, *50*(4), 477-492.

Elleman, A. M., Steacy, L. M., Olinghouse, N. G., & Compton, D. L. (2017). Examining child and word characteristics in vocabulary learning of struggling readers. *Scientific Studies of Reading*, *21*(2), 133-145.

Ford-Connors, E., & Paratore, J. R. (2015). Vocabulary instruction in fifth grade and beyond: Sources of word learning and productive contexts for development. *Review of Educational Research*, *85*(1), 50-91.

Hairell, A., Rupley, W., & Simmons, D. (2011). The state of vocabulary research. *Literacy Research and Instruction*, 50(4), 253-271.

Graves, M. F. (2006). The vocabulary book: Learning and instruction. New York, NY: Teachers College.

Graves, M. F. (2016). The vocabulary book: Learning and instruction (2nd ed.). New York, NY: Teachers College Press.

Graves, M. F., Ringstaff, C., Li, L., & Flynn, K. (2018). Effects of teaching upper elementary grade students to use word learning strategies. *Reading Psychology*, *39*(6), 602-622.

Jitendra, A. K., Edwards, L. L., Sacks, G., & Jacobson, L. A. (2004). What research says about vocabulary instruction for students with learning disabilities. *Exceptional Children*, *70*(3), 299-322.

Jones, S., Kim, J., LaRusso, M., Kim, H. Y., Selman, R., Uccelli, P., Barnes, S., Donovan, S., & Snow, C. (2019). Experimental effects of word generation on vocabulary, academic language, perspective taking, and reading comprehension in high-poverty schools. *Journal of Research on Educational Effectiveness*, *12*(3), 448-483.

Jozwik, S. L., & Douglas, K. H. (2017). Effects of multicomponent academic vocabulary instruction for English learners with learning difficulties. *Learning Disability Quarterly*, *40*(4), 237-250.

Jozwik, S. L., Freeman-Green, S., Kaczorowski, T. L., & Douglas, K. H. (2021). Effects of peer-assisted multimedia vocabulary instruction for high school English language learners. *Reading & Writing Quarterly*, *37*(1), 82-100.

Kanno, Y., Rios-Aguilar, C., & Bunch, G. C. (2024). English learners? Emergent bilinguals? Multilingual learners? Goals, contexts, and consequences in labeling students. *TESOL Journal*, *15*(3), e797.

Kennedy, M. J., McDonald, S. D., Griendling, L. M., VanUitert, V. J., & Kunemund, R. L. (2023). Comparing two established multimedia approaches for teaching vocabulary to students with and without disabilities. *Journal of Special Education Technology*, *38*(2), 115-130.

Kennedy, M. J., Rodgers, W. J., Romig, J. E., Mathews, H. M., & Peeples, K. N. (2018). Introducing the content acquisition podcast professional development process: Supporting vocabulary instruction for inclusive middle school science teachers. *Teacher Education and Special Education*, *41*(2), 140-157.

Kennedy, M. J., Romig, J. E., VanUitert, V. J., & Rodgers, W. J. (2020). Impact of the InferCabulary app on vocabulary knowledge of fifth-grade students with disabilities. *Journal of Special Education Technology*, *35*(4), 204-224.

Kuder, S. J. (2017). Vocabulary instruction for secondary students with reading disabilities: An updated research review. *Learning Disability Quarterly*, *40*(3), 155-164.

Lawrence, J. F., Crosson, A. C., Paré-Blagoev, E. J., & Snow, C. E. (2015). Word generation randomized trial: Discussion mediates the impact of program treatment on academic word learning. *American Educational Research Journal*, *52*(4), 750-786.

Lawrence, J. F., Francis, D., Paré-Blagoev, J., & Snow, C. E. (2017). The poor get richer: Heterogeneity in the efficacy of a school-level intervention for academic language. *Journal of Research on Educational Effectiveness*, *10*(4), 767-793.

Lawrence, J. F., Rolland, R. G., Branum-Martin, L., & Snow, C. E. (2014). Generating vocabulary knowledge for at-risk middle school readers: Contrasting program effects and growth trajectories. *Journal of Education for Students Placed at Risk (JESPAR)*, *19*(2), 76-97.

Lee, S. H. (2024). Effects of moderately rich vocabulary instruction on literacy performances of students with reading disabilities. *Communication Disorders Quarterly*, *45*(4), 253-262.

Lee, T., Cheng, Y. C., & Ko, J. (2018). Curriculum reform with a school-based approach: intellectual, structural and cultural challenges. *School Leadership & Management*, *38*(3), 278-301.

Lesaux, N. K., Kieffer, M. J., Kelley, J. G., & Harris, J. R. (2014). Effects of academic vocabulary instruction for linguistically diverse adolescents: Evidence from a randomized field trial. *American Educational Research Journal*, *51*(6), 1159-1194.

Lowe, H., Henry, L., Müller, L. M., & Joffe, V. L. (2018). Vocabulary intervention for adolescents with language disorder: A systematic review. *International Journal of Language & Communication Disorders*, *53*(2), 199-217.

Lowe, H., & Joffe, V. (2017). Exploring the feasibility of a classroom-based vocabulary intervention for mainstream secondary school students with language disorder. *Support for Learning*, *32*(2), 110-128.

Lowman, J. J., & Dressler, E. V. (2016). Effects of explicit vocabulary videos delivered through iPods on students with language impairments. *Journal of Special Education Technology*, *31*(4), 195-206.

Manyak, P., Blachowicz, C. L., & Graves, M. F. (2021). The multifaceted, comprehensive vocabulary instructional program: Quantitative findings from a three-year formative experiment. *Literacy Research and Instruction*, *60*(4), 301-331.

Marulis, L. M., & Neuman, S. B. (2013). How vocabulary interventions affect young children at risk: A meta-analytic review. *Journal of Research on Educational Effectiveness*, *6*(3), 223-262.

McDonald, S. D., Kennedy, M. J., & Hall, C. (2024). Effects of multimedia academic vocabulary instruction for linguistically diverse fifth graders in a rural setting. *Reading & Writing Quarterly*, *40*(2), 152-169.

McKeown, M. G. (2019). Effective vocabulary instruction fosters knowing words, using words, and understanding how words work. *Language, Speech, and Hearing Services in Schools*, *50*(4), 466-476.

McKeown, M. G., Crosson, A. C., Moore, D. W., & Beck, I. L. (2018). Word knowledge and comprehension effects of an academic vocabulary intervention for middle school students. *American Educational Research Journal*, *55*(3), 572-616.

Moody, S., Hu, X., Kuo, L. J., Jouhar, M., Xu, Z., & Lee, S. (2018). Vocabulary instruction: A critical analysis of theories, research, and practice. *Education Sciences*, *8*(4), 180.

National Reading Panel. (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. Washington, DC: National Institute of Child Health and Human Development. Retrieved from http://www.nationalreadingpanel.org/

O'Connor, R. E., Beach, K. D., Sanchez, V. M., Bocian, K. M., & Flynn, L. J. (2015). Building BRIDGES: A design experiment to improve reading and United States history knowledge of poor readers in eighth grade. *Exceptional Children*, *81*(4), 399-425.

O'Connor, R. E., Beach, K. D., Sanchez, V. M., Kim, J. J., Knight-Teague, K., Orozco, G., & Jones, B. T. (2019). Teaching academic vocabulary to sixth-grade students with disabilities. *Learning Disability Quarterly*, *42*(4), 231-243.

O'Connor, R. E., Sanchez, V. M., Jones, B., Suchilt, L., Youkhanna, V., & Beach, K. D. (2022). Continuing CHAAOS: Vocabulary intervention for students with disabilities in eighth grade who are also English learners. *Learning Disability Quarterly*, *45*(2), 108-120.

O'Connor, R. E., Sanchez, V. M., Jones, B. T., Suchlit, L., Youkhanna, V., Beach, K. D., & Widaman, K. (2021). Systematic CHAAOS: Teaching vocabulary in English/language arts special education classes in middle school. *Journal of Learning Disabilities*, *54*(3), 187-202.

Palmer, J., Boon, R. T., & Spencer, V. G. (2014). Effects of concept mapping instruction on the vocabulary acquisition skills of seventh-graders with mild disabilities: A replication study. *Reading & Writing Quarterly*, *30*(2), 165-182.

Reed, D. K., Jemison, E., Sidler-Folsom, J., & Weber, A. (2019). Electronic graphic organizers for learning science vocabulary and concepts: The effects of online synchronous discussion. *The Journal of Experimental Education*, *87*(4), 552-574.

Reichow, B., & Volkmar, F. R. (2010). Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders*, 40(2), 149–166. https://doi.org/10.1007/s10803-009-0842-0

Robb, E., Sinatra, R., & Eschenauer, R. (2014). Vocabulary Theatre: A Peer-Teaching Approach for Academic Vocabulary Acquisition. *Journal of Education and Training Studies*, *2*(1), 117-126.

Sanchez, V. M., & O'Connor, R. E. (2022). Improving academic vocabulary for adolescent students with disabilities: A replication study. *Remedial and Special Education*, *43*(2), 87-97.

Sedita, J. (2005). Effective vocabulary instruction. *Insights on Learning Disabilities*, *2*(1), 33-45.

Shore, R., Ray, J., & Gooklasian, P. (2015). Applying cognitive science principles to improve retention of science vocabulary. *Learning Environments Research*, *18*, 233-248.

Silverman, R. D., Johnson, E., Keane, K., & Khanna, S. (2020). Beyond decoding: A meta-analysis of the effects of language comprehension interventions on K–5 students' language and literacy outcomes. *Reading Research Quarterly*, *55*, S207-S233.

Solis, M., Reutebuch, C. K., Falcomata, T., Jimenez, Z., & Cravalho, D. (2022). Reading intervention for students with ASD in the middle grades: An alternating treatment study of embedded interests reading and expository text conditions. *Developmental Neurorehabilitation*, *25*(1), 45-58.

Solis, M., Reutebuch, C. K., Falcomata, T., Steinle, P. K., Miller, V. L., & Vaughn, S. (2021). Vocabulary and main idea reading intervention using text choice to improve content knowledge and reading comprehension of adolescents with autism spectrum disorder. *Behavior Modification*, *45*(1), 66-98.

Solís, M., Scammacca, N., Barth, A. E., & Roberts, G. J. (2017). Text-based vocabulary intervention training study: Supporting fourth graders with low reading comprehension and learning disabilities. *Learning Disabilities (Weston, Mass.)*, *15*(1), 103.

Swanson, E., Stewart, A. A., Stevens, E. A., Scammacca, N. K., Capin, P., Bhat, B. H., ... & Vaughn, S. (2024). The efficacy of two models of professional development mediated by fidelity on fourth grade student reading outcomes. *Journal of Research on Educational Effectiveness*, *17*(2), 288-317.

Vadasy, P. F., Sanders, E. A., & Logan Herrera, B. (2015). Efficacy of rich vocabulary instruction in fourth-and fifth-grade classrooms. *Journal of Research on Educational Effectiveness*, *8*(3), 325-365.

Van Orman, D. S., Ardasheva, Y., Carbonneau, K. J., & Firestone, J. B. (2021). Examining the impacts of extended vocabulary instruction in mixed-English-proficiency science classrooms. *The Journal of Educational Research*, *114*(1), 74-88.

VanUitert, V. J., Kennedy, M. J., Romig, J. E., & Carlisle, L. M. (2020). Enhancing science vocabulary knowledge of students with learning disabilities using explicit instruction and multimedia. *Learning Disabilities: A Contemporary Journal*, *18*(1), 3-25.

Yopp, H. K., Yopp, R. H., & Bishop, A. (2008). Vocabulary instruction for academic success. *Shell Education*.

Zeng, Y., Kuo, L. J., Chen, L., Lin, J. A., & Shen, H. (2025). Vocabulary instruction for English learners: A systematic review connecting theories, research, and practices. *Education Sciences*, *15*(3), 262.