IES Institute of Education Sciences

World of Words

Intervention Report | *Preparing Young Children for School*

WHAT WORKS CLEARINGHOUSE™
AUGUST 2023

WWC 2023-007
U.S. DEPARTMENT OF EDUCATION

A Publication of the National Center for Education Evaluation at IES

Children who know fewer words in preschool typically continue to have lower levels of vocabulary knowledge in higher grades than their peers who know more words. In fact, this difference continues to be pronounced and even widens as these children reach higher grade levels.[1] Interventions that support vocabulary development and reading comprehension in early childhood have the potential to improve student language development, narrowing this gap.[2] *World of Words* is a supplementary curriculum used to help young children in prekindergarten develop vocabulary knowledge,[3] concept knowledge, and content knowledge in science. The curriculum includes intentional conversations and shared book readings of texts focused on science topics.

Goal: *World of Words* aims to accelerate the development of children's vocabulary knowledge, concept knowledge, and content knowledge in science through topic-centered conversations and shared book readings.

The What Works Clearinghouse (WWC) reviews existing research on educational interventions to identify evidence-based programs and practices. This WWC intervention report summarizes the available evidence on the effects of *World of Words* on student outcomes.

Did *World of Words* improve student outcomes?

Four studies of the *World of Words* program conducted in Head Start and state-funded preschool sites meet WWC standards. Findings from these studies are summarized in Table 1. The table includes a row for the outcome domain—a group of related outcome measures—studied in the research. The *World of Words* studies included language outcome measures that fit within the language domain.[4] The effects of the program on other outcomes are unknown.

The WWC effectiveness rating indicates whether the *World of Words* program resulted in improved outcomes for children assigned to receive the program compared with children who were not. The table also indicates whether the evidence reviewed satisfies the Department of Education's requirements for strong, moderate, or promising tiers of evidence at the time this report was written. More information about these ratings and requirements is provided on the next page. Findings and conclusions could change as new research becomes available.

Table 1. Summary of findings on *World of Words* program from four studies that meet WWC standards

Outcome domain	Effectiveness rating	Sample Size	Evidence tier	Summary
Language	Positive effects	992	TIER 1 STRONG	The research provides strong evidence that *World of Words* improved student language. This assessment is based on four studies that meet WWC standards.

CHARACTERISTICS OF THE STUDY SETTING AND PARTICIPANTS

Settings: Head Start and state-funded preschool sites in the United States.

Race:

Hispanic/Latino: 18%

Female: 52%

Families with incomes below the federal poverty guidelines: 94%

HOW THE WWC REVIEWS AND DESCRIBES EVIDENCE

The WWC conducted a systematic review of interventions designed to improve children's level of preparation for school and selected and prioritized studies for review using the version 4.1 Review Protocol for *Preparing Young Children for School*. The WWC evaluated the quality and results of the selected studies using the criteria outlined in the version 4.1 Procedures and Standards Handbooks and the accompanying Review Protocol for *Preparing Young Children for School*.

The WWC considers each study's research design, whether findings were statistically significant and positive, and the number of studies contributing to this report. The WWC synthesizes evidence across studies—using a weighted average—to determine the effectiveness rating for each outcome domain. The WWC defines outcome domains in the Review Protocol for *Preparing Young Children for School*.

Effectiveness rating	Description of the evidence
Positive (or negative) effects	The evidence base primarily includes the strongest research designs, and the average effect across all high-quality research is statistically significant and positive (or negative).
Potentially positive (or negative) effects	The evidence base primarily includes research with some limitations, and the average effect across all high-quality research is statistically significant and positive (or negative).
Uncertain effects	The average effect across all high-quality research is not statistically significant, so the WWC does not classify it as a positive or a negative effect.

The WWC considers the effectiveness rating, the sample size, and the number of educational sites (states, districts, local education agencies, schools, postsecondary campuses) across studies to determine the evidence tier for each outcome domain. When the effectiveness rating is *uncertain*, *potentially negative*, or *negative effects*, there is no evidence tier.

Evidence tier		Criteria based on evidence synthesis
Strong evidence of effectiveness	TIER 1 STRONG	• Receives an effectiveness rating of positive effects, and • Includes at least 350 students from at least two educational sites
Moderate evidence of effectiveness	TIER 2 MODERATE	• Receives an effectiveness rating of potentially positive effects, and • Includes at least 350 students from at least two educational sites
Promising evidence of effectiveness	TIER 3 PROMISING	• Receives an effectiveness rating of potentially positive effects or positive effects, and • Includes fewer than 350 students or two educational sites

How was *World of Words* implemented?

This section provides details of how Head Start and state-funded preschool sites implemented *World of Words* in the four studies that contribute to this intervention report. This information can help educators identify the requirements for implementing *World of Words* and determine whether implementing this program would be feasible in their districts, schools, or early childhood education centers.

World of Words aims to accelerate the development of children's vocabulary knowledge, concept knowledge, and content knowledge in science through topic-centered conversations and shared book readings. Teachers implementing *World of Words* in their classrooms received initial training, ongoing coaching, and sets of materials provided by the developer. Then, teachers implemented the 12- to 15-minute *World of Words* sessions during whole-group circle time. The sessions were implemented over 12 to 24 weeks, depending on the number of science topics covered. Teachers using *World of Words* covered between 4 and 8 science topics. For each topic, sessions took place 3–5 days a week across 2–3 weeks. Table 2 describes the components and implementation of *World of Words* in more detail.

Comparison condition: In the four studies that contribute to this intervention report, children in the comparison group were taught by teachers who did not implement *World of Words*. Instead, teachers in the comparison condition selected their own texts and engaged in their typical reading strategies consistent with their core curriculum or another supplemental curriculum.

WWC standards assess the quality of the research, not the quality of the implementation. Studies that meet WWC standards vary in quality of implementation. However, a study must describe the relevant components of the intervention and how each was implemented with adequate detail to be included in an intervention report.

Table 2. Implementation of components of *World of Words*

Component	Description of the component	How it was implemented
"Talk together" (Initial conversation)	The initial conversation is intended to build young children's background knowledge on a particular science topic.	Teachers began by introducing the science topic and vocabulary words, using video clips or picture cards with clear photographic examples of the words. The teachers provided explicit definitions of vocabulary words related to the science topic. During the conversation, teachers connected the words to the science topic and previously learned concepts.
"Read together" (Shared book reading)	The shared book reading is intended to engage young children in listening to a reading of a book about the science topic.	Each set of books on a science topic consists of three types of text that include the vocabulary words and concepts on which the lesson focuses. *Predictable* texts include rhyming structure and repetition to help children recall the words they are learning; *narrative* texts are storybooks that include characters, their traits and mental states, and temporal connections; *informational* texts are written with the purpose of providing scientific information about the topic. During the shared book reading, teachers read the texts provided in an engaging manner, using statements or questions that encourage conversation and are specific to the type of text being read. For example, following the reading of a predictable text, the teachers asked questions that encouraged the children to use the words they are learning. For the narrative text, the teachers stopped to highlight a word, link a word to a concept in the book, or give more information about a word. For informational books, the teachers read a few pages at a time, stopping at various points to connect the content to other books that have been read.
"Reflect together" (Reflection conversation)	The reflection conversation is intended to help young children connect what they learned across topics.	Teachers asked children open-ended questions to encourage them to think about the text and apply their new vocabulary knowledge. Teachers used the question prompts provided by the developer or developed their own. Teachers encouraged children to provide a rationale for their answers using the words they had learned. Teachers referred the children back to the picture cards when they needed support in remembering the new words or their meanings. The teachers also asked challenging questions to provide the children with opportunities to think about words in new contexts.

Note: The descriptive information for this intervention comes from the program website, https://www.worldofwordswow.com/, the four studies that meet WWC standards, and from correspondence with the developer. The WWC requests that developers review the program description sections for accuracy from their perspective. The WWC provided the developer with the program description in December 2022, and the WWC incorporated feedback from the developer.

What resources are needed to implement *World of Words*?

This section provides educators with an overview of the resources needed to implement *World of Words*. Table 3 describes the major resources needed for implementation and approximate costs.

Table 3. Resources needed to implement *World of Words*

Resource	Description
Initial training	According to the developer, teachers need a minimum of a half-day of professional development prior to implementing *World of Words*. The developer offers a range of professional development options, from one-on-one web-based sessions to large on-site training. As of December 2022, this training was provided by the developer at no cost.
Ongoing coaching	According to the developer, teachers need ongoing coaching (e.g., biweekly). The developer offers coaching options, ranging from one-on-one web-based sessions to onsite observations and demonstrations. As of December 2022, coaching was provided by the developer at no cost.
Facilities	*World of Words* is typically implemented in children's classrooms during regular instruction time. Internet access and separate meeting spaces may be required for web-based consultations or on-site training.
Whole-class instructional time and teacher planning time	Teachers implementing *World of Words* dedicate approximately 12–15 minutes each day to intervention activities, plus additional planning time that may be needed to refer to *World of Words* lesson-planning tools.
Materials and equipment	The developer provides six sets of materials for implementing the program. Each set focuses on a science topic and includes five texts (including predictable, informational, and narrative texts), a scripted teacher's guide, 15 picture cards, and a topic poster. Classrooms implementing *World of Words* may also need media-equipped devices for playing audio and video portions of *World of Words* lessons. As of December 2021, the program was available for $450.00 ($75.00 per text set).
Additional resources	Additional resources include assessments, home connections, extension activities, and lesson strategy notes.

For More Information:

About *World of Words*

Address: 239 Greene Street, New York, NY 10003
Email: info@ReadWithWOW.com
Web: https://www.worldofwordswow.com/
Phone: (917) 275-7113

To request more information about *World of Words* costs and components

Web: https://www.worldofwordswow.com/contact/

What research did the WWC review about *World of Words*?

This section provides details about the studies of *World of Words* that the WWC examined in its systematic review, including (1) the WWC's ratings of the quality of the available research, (2) the findings from the four studies that meet WWC standards, and (3) the characteristics of the studies that meet WWC standards.

The quality of evidence in the available research about *World of Words*

The WWC identified eight studies that investigated the effectiveness of *World of Words* from a literature search in the Education Resources Information Center (ERIC) and other databases of research studies from January 2005 to January 2022. Of these eight studies, four meet WWC standards and contribute to the summary of evidence in this intervention report. Studies that either do not meet WWC standards or are ineligible for review do not contribute to this intervention report

- **Two studies meet WWC standards without reservations.** Two studies were cluster randomized controlled trials with low cluster-level attrition and low individual-level non-response.
- **Two studies meet WWC standards with reservations.** One study was a cluster randomized controlled trial with compromised random assignment, but the study provides evidence of effects on individuals by satisfying the baseline equivalence requirement for the individuals in the analytic intervention and comparison groups. One study uses a cluster quasi-experimental design that provides evidence of effects on individuals by satisfying the baseline equivalence requirement for the individuals in the analytic intervention and comparison groups.
- **Two studies do not meet WWC standards.** One cluster randomized controlled study does not satisfy the baseline equivalence requirement for the individuals in the analytic intervention and comparison groups. One quasi-experimental study included a confounding factor so that the measures of effectiveness cannot be attributed solely to the introduction of *World of Words*.
- **Two studies are ineligible for review.** One study did not use an eligible design to study the impact of the program. One study did not include an eligible measure of the effectiveness of the program.

The citations for these four groups of studies are included in the references. For information on how the WWC determines study ratings, see the *WWC Procedures and Standards Handbooks, Version 4.1*, WWC Standards Briefs, and the Review Protocol for *Preparing Young Children for School*, available on the WWC website.

More details about the four studies of World of Words that meet WWC standards

The four studies that meet WWC standards examined the effects of *World of Words* on six measures of language. Table 4 lists, for each outcome measure, the name of the measure and the study in which the measure was administered, when it was assessed, the sample and setting, the means and standard deviations in the *World of Words* and comparison groups, the effect size, the improvement index, and whether the WWC determined the finding to be statistically significant.

World of Words had *positive effects* on language development because the average effect across all outcomes and studies was statistically significant and positive for measures in the language domain. *World of Words* had statistically significant and positive effects on four measures of language. Findings for the two additional measures of language were not statistically significant.

Table 5 describes characteristics of the four studies of *World of Words* that meet WWC standards, including the study setting and participants.

What is an effect size? The effect size is a standardized measure of the impact of an intervention that can be synthesized across outcome measures and studies. A positive effect size favors the intervention group and a negative effect size favors the comparison group. Effect sizes further away from 0 mean there was a larger difference between the groups.

What is an improvement index? The improvement index is another measure of the intervention's impact on an outcome. The improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +5 means that a comparison group student at the 50th percentile would have scored at the 55th percentile if they had received the intervention. The effect size and improvement index measure the same concept in different units, similar to meters and feet for distance.

What is statistical significance? A finding is statistically significant if the difference between the intervention and comparison group means was large enough that it is unlikely to have been obtained for an intervention without a true impact. The WWC considers *p* values less than 0.05 to be statistically significant.

Table 4. Findings by outcome domain from four studies of *World of Words* that meet WWC standards

Outcome	Timing of measurement	Sample	Setting	Unadjusted means (standard deviations)		Findings		
				Intervention group	Comparison group	Effect size	Improvement index	Statistically significant (*p* value)
Language outcome domain								
World of Words Sorting task - not taught words (Neuman & Dwyer, 2011)	End of 16 weeks of implementation	178 children	2 preschool sites in the United States	7.46 (1.11)	6.34 (1.22)	0.94	+33	Yes ($p < 0.01$)
Researcher-developed vocabulary inductive reasoning test (Neuman et al., 2011)	End of 24 weeks of implementation	460 children	12 preschool sites in the United States	0.67 (0.21)	0.53 (0.20)	0.66	+25	Yes ($p < 0.01$)
Woodcock-Johnson Picture Vocabulary Subtest (Forms A and B) (Neuman et al., 2011)	End of 24 weeks of implementation	331 children	12 preschool sites in the United States	99.10 (13.81)	98.40 (12.46)	0.05	+2	No ($p = 0.76$)
Comprehension composite measure (Neuman et al., 2015)	End of 12 weeks of implementation	143 children	5 preschool sites in the United States	0.35 (0.15)	0.27 (0.14)	0.54	+21	Yes ($p < 0.01$)
Peabody Picture Vocabulary Test IV (PPVT) (Neuman et al., 2015)	End of 12 weeks of implementation	143 children	5 preschool sites in the United States	101.47 (14.18)	99.96 (13.33)	0.06	+3	No ($p = 0.66$)
Expressive One-Word Picture Vocabulary Test – 4th Edition (Neuman et al., 2021)	End of 21 weeks of implementation	211 children	12 preschool sites in the United States	90.50 (15.26)	82.50 (14.63)	0.43	+17	Yes ($p < 0.01$)
Summary for language: positive effects						**0.43**	**+16**	**Yes ($p < 0.01$)**

Table 5. Characteristics of the four studies of *World of Words* that meet WWC standards

What was the study design?	All four studies used cluster randomized controlled trial designs. One study (Neuman et al., 2011) randomly assigned schools to implement the *World of Words* sessions or to continue with business as usual, while the other three studies (Neuman & Dwyer, 2011; Neuman et al., 2015; Neuman et al., 2021) randomly assigned classrooms to implement the *World of Words* sessions or to continue with business as usual.
What was the WWC study rating?	**Neuman & Dwyer (2011)** • This study is rated **Meets WWC Group Design Standards With Reservations** because it uses a cluster quasi-experimental design that provides evidence of effects on individuals by satisfying the baseline equivalence requirement for the individuals in the analytic intervention and comparison groups. **Neuman et al. (2011)** • This study is rated **Meets WWC Group Design Standards Without Reservations** because it is a cluster randomized controlled trial with low cluster-level attrition and individual-level non-response. **Neuman et al. (2015)** • This study is rated **Meets WWC Group Design Standards Without Reservations** because it is a cluster randomized controlled trial with low cluster-level attrition and individual-level non-response. **Neuman et al. (2021)** • This study is rated **Meets WWC Group Design Standards With Reservations** because it is a cluster randomized controlled trial with compromised random assignment, but the study provides evidence of effects on individuals by satisfying the baseline equivalence requirement for the individuals in the analytic intervention and comparison groups.
Where did the study occur?	**Neuman & Dwyer (2011)** • The study took place in 12 classrooms in 2 Head Start preschool sites in the United States. **Neuman et al. (2011)** • The study took place in 28 classrooms in 12 Head Start preschool sites located in an urban area of the United States. **Neuman et al. (2015)** • The study took place in 10 classrooms in 5 state-funded preschool sites located in an urban fringe area of the United States. **Neuman et al. (2021)** • The study took place in 24 classrooms in 12 state-funded preschool sites located in a large metropolitan area of the United States.
Who participated in the study?	**Neuman & Dwyer (2011)** • The intervention group included children in 6 classrooms. The comparison group included children in 6 classrooms. The total number of children in the intervention and comparison groups was 178 children. • Approximately 56% in the sample were White, 28% were Black, and 17% were Middle Eastern. The mean age of the children in the sample was 51 months. All families of the children earned incomes below the poverty threshold for Head Start. **Neuman et al. (2011)** • The intervention group included children in 14 classrooms. The comparison group included children in 14 classrooms. The total number of children in the intervention and comparison groups was 460 children. • Approximately 53% of the children were female and 96% spoke English as their primary language at home. Fifty percent of the children in the sample were Black, 25% were White, 9% were Asian, 10% were of two or more races, and 6% were Middle Eastern. Approximately 1% of the children were Hispanic. The mean age of children in the sample was 47 months. All families of the children earned incomes below the poverty threshold for Head Start. **Neuman et al. (2015)** • The intervention group included children in 5 classrooms. The comparison group included children in 5 classrooms. The total number of children in the intervention and comparison groups was 143 children. • Approximately 49% of the children were female and almost all (99%) spoke English as their primary language at home. Fifty-four percent of the children were White, 31% were Black, 1% were Asian, and 14% were another race. Seven percent of the children were Hispanic. The mean age of children in the sample was 52 months. Sixty-six percent of the families of the children earned incomes below the poverty threshold for free or reduced-price lunch. **Neuman et al. (2021)** • The intervention group included children in 13 classrooms. The comparison group included children in 11 classrooms. The total number of children in the intervention and comparison groups was 211 children. • Approximately 52% of the children were female. Thirty-six percent of the children were Black, 1% were White, and 63% were another race. Sixty-one percent of the children were Hispanic. Approximately 15% of children had an identified disability. The mean age of the children in the sample was 57 months. Ninety-five percent of the families of the children earned incomes below the poverty threshold for free or reduced-price lunch.

References

Studies that meet WWC standards without reservations

Neuman, S. B., Newman, E. H., & Dwyer, J. (2011). Educational effects of a vocabulary intervention on preschoolers' word knowledge and conceptual development: A cluster-randomized trial. *Reading Research Quarterly*, *46*(3), 249-272. https://eric.ed.gov/?id=EJ935112

Neuman, S. B., Pinkham, A., & Kaefer, T. (2015). Supporting vocabulary teaching and learning in prekindergarten: The role of educative curriculum materials. *Early Education and Development*, *26*(7), 988-1011. https://eric.ed.gov/?id=EJ1070888

Studies that meet WWC standards with reservations

Neuman, S. B., & Dwyer, J. (2011). Developing vocabulary and conceptual knowledge for low-income preschoolers: A design experiment. *Journal of Literacy Research*, *43*(2), 103-129. https://eric.ed.gov/?id=EJ950695

Neuman, S. B., Samudra, P., & Danielson, K. (2021). Effectiveness of scaling up a vocabulary intervention for low-income children, pre-K through first grade. *The Elementary School Journal*, *121*(3), 385-409. https://eric.ed.gov/?id=EJ1296957

Studies that do not meet WWC standards

Neuman, S. B., Kaefer, T., & Pinkham, A. M. (2016). Improving low-income preschoolers' word and world knowledge: The effects of content-rich instruction. *The Elementary School Journal*, *116*(4), 652-674. https://eric.ed.gov/?id=EJ1103949

Neuman, S. B., & Kaefer, T. (2018). Developing low-income children's vocabulary and content knowledge through a shared book reading program. *Contemporary Educational Psychology*, *52*, 15-24. https://doi.org/10.1016/j.cedpsych.2017.12.001

Studies that are ineligible for review under the study review protocol

Neuman, S. B., & Kaefer, T. (2013). Enhancing the intensity of vocabulary instruction for preschoolers at risk: The effects of group size on word knowledge and conceptual development. *The Elementary School Journal*, *113*(4), 589-608. https://eric.ed.gov/?id=EJ1013955

Neuman, S. B., & Danielson, K. (2021). Enacting content-rich curriculum in early childhood: The role of teacher knowledge and pedagogy. *Early Education and Development*, *32*(3), 443-458. https://eric.ed.gov/?id=EJ1289102

Additional sources

The WWC examined additional sources (such as preliminary reports, working papers, or other associated publications) related to the citations in the references to complete its review of these studies. The additional sources are listed on the WWC pages for each study review.

How possible conflicts of interests were addressed when preparing this report

Neuman led and/or contributed to the development of the *World of Words* program, as well as one of the measures used to assess the program's impacts. She co-authored articles that were reviewed and used for evidence for this intervention report. She is one of the instructors for the *World of Words* training. Because Neuman is the developer of the intervention, the lead author of each study, and the developer of the measures used in those studies, the research included in this intervention report is not based on independent evaluations of the program.

The intervention report was prepared by Instructional Research Group (IRG), under contract to the Institute of Education Sciences. The WWC team was not involved in developing the program or studying its effectiveness and has no financial interest in the program. All studies that meet WWC standards and the synthesis of their findings were checked and verified through a peer-review process. The Statistics, Website, and Training (SWAT) team conducted an independent review of the evidence to ensure that the WWC's findings are accurate.

Recommended Citation

What Works Clearinghouse, Institute of Education Sciences, U.S. Department of Education. (2023, August). *World of Words*. https://whatworks.ed.gov

---

[1] Fernald, A., Marchman, V. A., & Weisleder, A. (2013). SES differences in language processing skill and vocabulary are evident at 18 months. *Developmental Science*, *16*(2), 234–248. https://doi.org/10.1111/desc.12019; Scarborough, H. S., Neuman, S., & Dickinson, D. (2009). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In F. Fletcher-Campbell, J. Soler, & G. Reid (Eds.). *Approaching difficulties in literacy development: Assessment, pedagogy and programmes* (pp. 23–38). Sage Publishing; Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology*, *38*(6), 934–947. https://doi.org/10.1037/0012-1649.38.6.934

[2] Marulis, L. M., & Neuman, S. B. (2010). The effects of vocabulary intervention on young children's word learning: A meta-analysis. *Review of Educational Research*, *80*(3), 300–335. https://doi.org/10.3102/00346543103770

[3] The *World of Words* program is designed for use in prekindergarten through grade 2. However, this intervention report provides evidence of its effectiveness only in prekindergarten.

[4] The language domain includes measures that assess receptive and expressive language, vocabulary knowledge, grammar, morphology, and listening comprehension.