Agenda

• Introduction to CRV project
• Basis for development and research study
• Features of the curriculum
• Implementation study design and findings
• Factors influencing implementation
• Student outcomes
• Questions
Grant from the Institute of Education Sciences (IES), U.S. Department of Education

Content-Rich Vocabulary (CRV) Development to Improve Reading Achievement of Struggling Adolescent Readers

Designed to Address a Critical Need

FACT: Middle school students have poor comprehension skills despite generally adequate word-recognition skills.

• Less than one-third of eighth graders read at a “proficient” or higher level.
• Many socioeconomically disadvantaged students and English learners in eighth grade don’t even read at a “basic” level:
  • Approx. 50% of African-Americans and Latinos
  • Less than 30% of English learners
Vocabulary Matters: A National Snapshot

- First graders from higher SES groups know about twice as many words as less-advantaged children.
- The gap grows throughout the school years: top high school seniors know about four times as many words as lower-performing schoolmates.
- High-knowledge third graders have vocabularies comparable to low-performing twelfth graders.
- Adequate reading comprehension depends upon the reader knowing 90–95% of the words in a text.

Sources: Graves, Slater, & Smith; Beck & Nagy
Crucial for English Learners

“Vocabulary knowledge is the single best predictor of second language learners’ academic achievement across subject matter domains.”

• Claude Goldenberg, Ph.D., principal investigator
  – Research focused on promoting academic achievement among language-minority students
• Additional guidance provided by:
  – Andrew Biemiller, Ph.D. (University of Ontario)
  – Michael Graves, Ph.D. (University of Minnesota)
  – Scott Baker, Ph.D. (University of Oregon)
• Responsible for all program evaluation
• Designed assessments: vocabulary pre-test and post-test; unique depth of vocabulary knowledge measure
• Conducted classroom observations to determine program fidelity
• Designed other measures including teacher questionnaires, weekly checklists, and interviews
• Developed and wrote all curriculum materials (with input from vocabulary research experts)
• Developed and wrote all curriculum-embedded assessments
• Provided training and ongoing coaching to all participating teachers
Five Years of Development and Testing

Phase 1 (Years 1 and 2)

- CORE worked on curriculum development with vocabulary experts Drs. Biemiller, Baker, and Graves, and Principal Investigator and Professor of Education Dr. Claude Goldenberg
- Formative evaluation: classroom piloting deeply informed development

Phase 2 (Years 3 and 4)

- Field test implementation and impact study (SRI)
- Curriculum further refined (CORE)

Phase 3 (Year 5)

- Continued data analysis (SRI)
- Finalized and completed curriculum materials (CORE)
Field Test Design

• Quasi-experimental design
• Treatment group vs. comparison group (“Business as Usual”)
• Study sample (Years 3 & 4) comprised almost 600 students in two districts with large minority and low SES populations
• Approximately 50% of students in each condition were ELLs
Curriculum Design Process

• Initial curriculum samples reviewed by team of vocabulary research experts, followed by extensive revisions
• Multiple rounds of review and revision
• Initial piloting by 7th and 8th grade teachers in Pasadena, CA
• Small-scale design studies used to test various curriculum design options
• Frequent meetings with pilot teachers
Content-Rich Vocabulary Instruction

• The curriculum has two editions, one with historical text passages from U.S. History, the other with passages from world history.

• Each passage is under 400 words in length and contains 10-15 target vocabulary words.

• Passages are designed for teacher read-aloud, followed by interactive partner activities using the text.

• The editions are not sequential and can be taught in either order.

• The curriculum was piloted and field-tested in grades 7 and 8, and is designed to augment instruction across grades 6–9.
CRV Now Published as *Word Intelligence™*

- U.S. Edition and World Edition
- Teacher Guides (print and iBook for iPad)
- Student Notebooks, Teacher Resources Disc, & Routines DVD
- Online Practice and Quizzes; Pinterest Boards

The National Reading Panel on Effective Vocabulary Instruction

• Intentional, explicit instruction of specific words
• Key independent word-learning strategies
• Opportunities to foster word consciousness
• Multiple exposures in multiple contexts
• Restructuring of vocabulary tasks to make them more comprehensible
• Intentionally designed opportunities to acquire vocabulary incidentally from rich texts
• Active engagement in learning tasks
• Dependence on a single instructional method will not result in optimal vocabulary learning
What Do Teachers Want?

• Clear, explicit, detailed directions (some scripting)
• Lots of engaging activities
• Tests that are easy to grade
• All-inclusive programs: no photocopying
• Mixed opinions on homework
# Small-Scale Design Study: How Many Words to Teach?

<table>
<thead>
<tr>
<th>Condition 1: “Thick” Treatment</th>
<th>Condition 2: “Medium” Treatment</th>
<th>Condition 3: “Thin” Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 words per week</td>
<td>24 words per week</td>
<td>30 words per week</td>
</tr>
<tr>
<td>One grade 7 class (38 students)</td>
<td>Two grade 7 classes (66 students)</td>
<td>Three grade 7 classes (67 students)</td>
</tr>
<tr>
<td>Two grade 8 classes (53 students)</td>
<td>One grade 8 class (38 students)</td>
<td>Two grade 8 classes (68 students)</td>
</tr>
<tr>
<td>Total of 91 students</td>
<td>Total of 104 students</td>
<td>Total of 135 students</td>
</tr>
</tbody>
</table>

Paired Conversations

• What would be the advantages and disadvantages of teaching more words per week?

• All students read the same passages and were given pre-tests and post-tests on 30 vocabulary words contained in the passages. Which condition do you think resulted in the greatest amount of student learning: 12, 24, or 30 words per week? Why?
Design of CRV Program

• 13 total units: 1 orientation unit, 9 content units, and 3 review units

• Each unit: 2 weeks (8–10 daily lessons)

• Daily lessons: 45–55 minutes

• New words taught each week:
  – Units 2–4: 20 words
  – Units 6–8: 25 words
  – Units 10–12: 30 words
Designed for Rigor

• **450 words** taught in each edition; **900 total**
• **Orientation**: 9 prefixes, 2 suffixes, and 4 roots
• Plus **25 additional** affixes and roots
• **Consistent, repeated practice** with strategies using context clues, morphemic analysis, dictionary use, and word families
• **Review units** after every three units
• Activities to build **word consciousness**
Orientation Unit: Word-Learning Strategies

• **Dictionary use:** Students learn how to read dictionary entries and decide which entry fits the usage of the text containing the target word. Students use dictionaries to confirm or clarify word knowledge.

• **Morphemic analysis:** Students learn a method of breaking words down into roots, suffixes, and prefixes to derive the meanings of words. Students learn meanings of high-incidence affixes.

• **Contextual analysis:** Students learn to infer the meanings of words in texts by examining meanings and functions of the surrounding words.
Word Selection

• 60% of the words are drawn from Biemiller’s list of teachable vocabulary for students in the middle grades: reliable, deliberate.

• 20% of the words are selected as key academic words in the social studies/history content area: drought, density.

• 20% of the words have highly specialized meanings but are necessary for understanding the passages: sulfur, stragglers.
Small-Scale Design Study: Supports for English Learners

• Year 2 of curriculum pilot
• Various supports for English learners were added to selected units, including:
  – Structured sentence frames
  – Spanish translations of target words and context sentences
  – Increased opportunities for oral language development
• Paired conversations: Which supports do you think are most effective for English Learners?
Primary Language Support

• Stand-alone lessons support Spanish speakers.
• Spanish translations provided of every target word, definition, and context sentence.
• Students determine whether the Spanish translation of each word is a cognate or a related word.
• Non-Spanish speakers review prior lessons, read independently, or complete extra credit work.
Primary Language Support
Active Engagement with Words: a Wide Variety of Activities

• Process the Words

• Relating Meaning (Four Squares, Word Associations)

• Reviewing Word Meanings:
  – Speed Reviews (Beat the Clock, True or False?)
  – Continuum Activities
Teacher Resource 7.10: Importance Continuum

How important is it for you to . . .

_______ always buy domestic goods?
_______ have a feeling of tranquility before going to bed?
_______ be tolerant of others?
_______ practice pacifist ideas?
_______ compromise when you disagree with friends?
_______ know the specific day of your birthday this year?
_______ have the option of walking to school?
_______ feel satisfied with your homework before turning it in?
_______ use proper table manners in the lunchroom?
Process the Words
Review and Assessment

• **HomeStudy:** Daily informal assessment

• **End-of-Unit Tests:** Every two weeks, 20–25 multiple-choice identification items per test

• **Review:** Units 5, 9, and 13 with a variety of required and optional team project choices plus review games

• **Post-Tests:** Words from prior three units in Units tests 5, 9, and 13

Why Study Implementation?

“Over the past decade, the science related to developing and identifying ‘evidence-based practices and programs’ has improved—however the science related to implementing these programs with fidelity and good outcomes for consumers lags far behind. As a field, we have discovered that all the paper in file cabinets plus all the manuals on the shelves do not equal real world transformation of human service systems through innovative practice.”

CRV Implementation Fidelity Questions

• Was the Content-Rich Vocabulary program implemented with high-fidelity in the treatment classrooms?
  – What variations were there in the fidelity of implementation among the treatment classrooms?
  – What factors facilitated high-fidelity implementation and what obstacles were there to high-fidelity implementation of the CRV curriculum?
## Two-Year Implementation and Efficacy Study

<table>
<thead>
<tr>
<th></th>
<th>Year 3 Participants</th>
<th>Year 4 Participants</th>
<th>Total Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment Group:</strong></td>
<td>7 teachers and 177 students</td>
<td>8 teachers and 172 students</td>
<td>349 students</td>
</tr>
<tr>
<td></td>
<td>4 grade 7 classrooms</td>
<td>5 grade 7 classrooms</td>
<td>9 grade 7 classrooms</td>
</tr>
<tr>
<td></td>
<td>3 grade 8 classrooms</td>
<td>3 grade 8 classrooms</td>
<td>6 grade 8 classrooms</td>
</tr>
<tr>
<td><strong>Comparison Group</strong></td>
<td>4 teachers and 114 students</td>
<td>6 teachers and 170 students</td>
<td>284 students</td>
</tr>
<tr>
<td></td>
<td>2 grade 7 classrooms</td>
<td>4 grade 7 classrooms</td>
<td>6 grade 7 classrooms</td>
</tr>
<tr>
<td></td>
<td>2 grade 8 classrooms</td>
<td>3 grade 8 classrooms</td>
<td>5 grade 8 classrooms</td>
</tr>
</tbody>
</table>
CRV Years 3 and 4 Data Sources for Implementation Fidelity Study

• Three classroom observations in each of the treatment and control classrooms
  – January, March, and May in Year 3
  – December, February, and March/April in Year 4

• Debriefing interviews with each of the treatment and control classroom teachers following each observation

• Online teacher checklists/surveys of instructional activities completed at the end of each instructional unit by CRV teachers and every two weeks by comparison teachers
CRV Year 4 Implementation Findings: Comparing CRV to BAU

Observed Instructional Subjects

- a. Reading Comprehension Strategies
- b. Writing/Editing/Revision
- c. Explicit Vocabulary Instruction
- d. History/Social Studies
- e. Oral language development

Implementation Findings: Observed Teaching Activities

- Use dictionaries
- Explicitly targeted vocabulary
- Vocabulary in multiple contexts
- Word analysis
- Context clues
- Graphic organizers or word sorts
- Word games or riddles
- Vocabulary homework
- Visual aids
- Vocabulary displays on wall
Target Implementation Questions

• Was the Content-Rich Vocabulary program implemented with high fidelity in the treatment classrooms?

• What variations were there in the fidelity of implementation among the treatment classrooms?
CRV Years 3 & 4 Implementation Fidelity Findings

• Procedural fidelity in the delivery of CRV lessons was generally high, with high overall lesson fidelity ratings for 17 of the 19 CRV lessons observed in Year 3, and 17 of the 23 lessons observed in Year 4.

• Average ratings of activities within CRV lessons also indicated high fidelity delivery during both Years 3 and 4.
CRV Years 3 & 4 Implementation
Fidelity Findings

Mean Fidelity Ratings of CRV Lessons
(4 = High Fidelity; 3 = Good Fidelity;
2 = Low Fidelity; 1 = Poor Fidelity)

Observation # 1
Observation # 2
Observation # 3

CRV Year 4 Implementation Fidelity Findings

Mean Fidelity Ratings of CRV Within-Lesson Activities
(2 = High; 1 = Partial; 0 = No Fidelity)

Observation #1
- Year 3: 1.7
- Year 4: 1.6

Observation #2
- Year 3: 1.8
- Year 4: 1.4

Observation #3
- Year 3: 1.6
- Year 4: 1.6

What Factors Facilitated High-Fidelity Implementation?

In interviews, teacher noted the following as important facilitators:

• Structure, fast pace, and variety of lesson activities supports student engagement (Year 3)
• Primary language support (Year 3)
• Highly structured nature of the curriculum (Year 4)
• PD and ongoing support from CORE (Year 4)
What Obstacles Were There to High-Fidelity Implementation?

Teachers Report:

Year 3:
- Attendance (students missing too many lessons)
- Keeping up with the curriculum (pacing calendar) is difficult

Year 4:
- Lack of time (to complete lessons)
- Student absences/ low engagement (ungraded class)
- Adapting for low-level EL students
Factors Influencing Fidelity of Implementation: Research Findings

• Prior CRV teaching experience facilitated high-fidelity and complete delivery of the CRV lessons and curriculum.

• Slow-paced lesson delivery was associated with low fidelity and incomplete curriculum coverage.

• In the absence of prior CRV experience, the Grade 8 CRV curriculum seemed to be more difficult to teach with high fidelity than the Grade 7 curriculum.
Other Variables

• Time of day curriculum was taught
• English teachers vs. other content-area teachers
• Level of prior knowledge about teaching vocabulary
• Number of years of overall teaching experience
• Classroom management styles
Teacher Training and Ongoing Coaching

• Initial training: 10 hours (2 school days)
  – Build knowledge of vocabulary research and instructional best practices
  – Gain familiarity with program
  – Practice routines

• Mid-year training: 5 hours
  – Focus on weak areas of implementation
  – Review new material

• At least 3 coaching observations with individual follow-up conferences

• Group meetings at lunch or after school
Coaching Matters

• One-on-one coaching focused on observable behaviors (e.g., time spent on specific lesson segments, number of students giving responses).
• Open-ended coaching form was filled out jointly and given to each teacher on the same day. These forms were kept by coach but were NOT shared with site administration.
• It was very difficult to predict which teachers would be successful.
• Some teachers were much more receptive to coaching than others (some teachers improved tremendously).
Student Outcomes

Overall, was the CRV program associated with improved achievement for struggling middle school readers?

The CRV curriculum showed a statistically significant positive effect for researcher-developed CRV vocabulary and the depth of vocabulary knowledge tests.

CRV was equally effective for ELLs and non-ELLs.
Grade 7 RD Vocabulary Test (50 pts)
All Students

Grade 8 RD Vocabulary (50 pts)
All Students

RD voc pre
RD voc post

RD Voc Score

Statistically Significant Results

- Large effect sizes (1.25 and .85) associated with CRV on the curriculum-based vocabulary measure at both grades 7 and 8.
- Depth of vocabulary measure also had strong effect sizes (.83 and .56). Effects on DOVK smaller in grade 8 than in grade 7.
- Comprehension measure (CBM) had weaker effect size for 7th grade (.25), but met WWH minimum criteria necessary for an intervention to be substantively important (.25).
- No other positive effect sizes were greater than .16.
Researcher-developed Depth of Vocabulary Knowledge Test (DOVK)

Four Part Construct of Depth of Vocabulary Knowledge

• **Application** – ability to select situations in which a word is appropriately applied
• **Breadth** – ability to recall multiple meanings and uses of a word
• **Precision** – ability to recognize situations in which a particular meaning of word does or does not apply
• **Affixes** – knowledge of how affixes influence word meanings and usage
• INSTRUCTIONS: There are eight words in the two boxes (left and right boxes). The words on the left side may help to explain the meaning of "bright." The words on the right side are words that may come before or after "bright" in a phrase or sentence.

• From the two boxes, select 4 words that you think are relevant to the word above the boxes ("Bright" in this case). Bright can mean intelligent or intensely lit (as in strong sunlight), so the correct answers on the left side are "clever" and "shining." We often say "a bright color" or "a bright light," so "color" and "light" are correct answers because they are words that go with "bright." We do not normally say "a bright hand" or “running bright," so those choices are not correct.
DOVK: Breadth (multiple meanings) and Application (collocation)

1. **Bright**

<table>
<thead>
<tr>
<th>Meaning box (left)</th>
<th>Goes with box (right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>clever</td>
<td>famous</td>
</tr>
<tr>
<td>sensational</td>
<td>shining</td>
</tr>
</tbody>
</table>

DOVK: Application & Precision

Application (usage) Sample Item

**Enlightened**
- The load was too heavy and needed to be *enlightened* before it could be moved on to the ship.
- The people were *enlightened* by their leader’s speech.
- The pool was *enlightened* by the underwater light bulb.
- Manuel *enlightened* himself by exercising every day.

Precision Sample Item

The letter was *addressed* only to Sally and not the rest of her family.
- To take action to accomplish something.
- To label with directions for delivery.
- To speak or write directly to.
DOVK: Understanding Affixes

➢ Affixes Sample Item

The broken sound system made the speech sound like
__________.

☐ Insensitive
x Nonsense
☐ Sensibility
☐ Sensation
Implementation Take-Aways

• No program is “teacher-proof” – initial training and ongoing coaching are important factors

• Factors which support fidelity of implementation include:
  – Protected time
  – Brisk pacing
  – Experience teaching the program
  – Structured program with “just enough” scripting
  – Strong classroom management skills
  – Trust in the program
  – Ongoing coaching, observation and feedback
Thank You!

Any Questions?

• You may email us for questions about the CRV curriculum, now known as *Word Intelligence*, and the study directly at lgreenberg@corelearn.com or ldiamond@corelearn.com

• You can learn more about the published version of this curriculum at www.wordintelligence.net