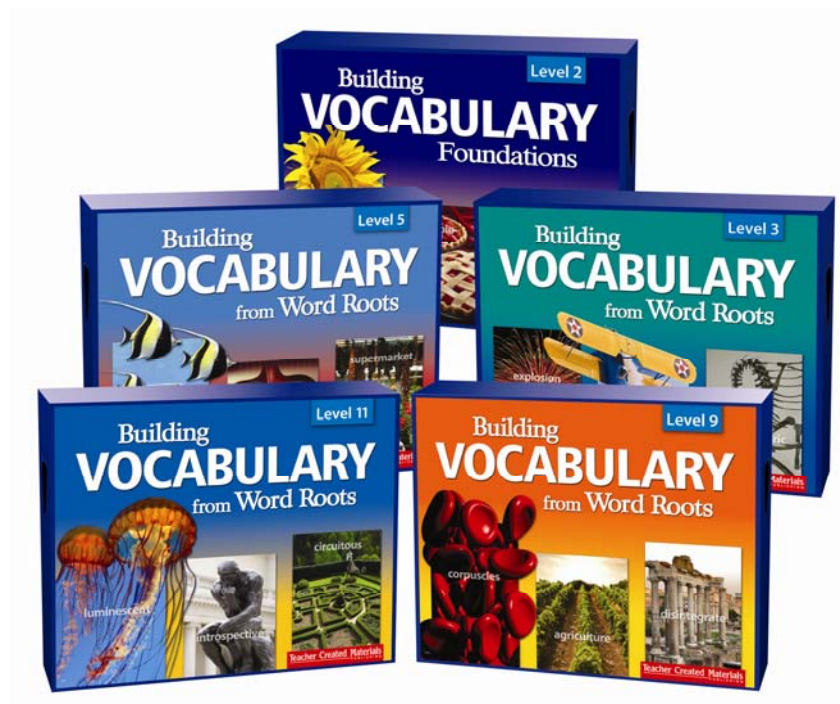


Building Vocabulary

Report for a Research Pilot Conducted in Euclid City Schools, Ohio



Building Vocabulary

A Study of a Commercial Product's Effectiveness

INTRODUCTION

Vocabulary development plays a key role in students' reading comprehension and development of content knowledge. The report by National Reading Panel (2001), *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications*, addressed the importance of teaching vocabulary when it outlined the five essential elements that must be part of all reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Based on the National Reading Panel's analysis of fifty vocabulary research studies, "The studies reviewed suggested that vocabulary instruction does lead to gains in comprehension, but that methods must be appropriate to the age and ability of the reader."

What is vocabulary? Vocabulary is knowledge of word meanings. We use our oral vocabulary to listen and speak, and our print vocabulary to read and write. Each of us have unique word schema consisting of active and passive vocabulary. Active vocabulary includes words we can quickly generate when we speak or write because we know them well. Passive vocabulary includes those words we recognize but don't regularly use. We only know them well enough to construct meaning when we encounter them.

Appropriate use of vocabulary is a key element of communication, which is why vocabulary instruction is critical to success in reading. In fact, decades of research have consistently found a deep connection between vocabulary knowledge, reading comprehension, and academic success (Baumann and Kame'enui 2002). Young readers who lack vocabulary knowledge cannot apply word recognition strategies efficiently. Baffled, they become frustrated and quickly fall behind those readers who do have adequate word knowledge. Reading comprehension is dependent upon a solid bank of conceptual knowledge. Meaning does not automatically follow successful decoding if the concept related to the decoded word is not part of a child's vocabulary. Hiebert and Kamil (2005) view vocabulary as a bridge that connects word-level process of phonics and the broader cognitive process of comprehension.

Vocabulary instruction is also important for success in acquiring mastery of content knowledge as well. Most researchers believe that children naturally add between 2,000 and 3,000 new words each year, yet by fifth grade they will meet 10,000 new words in their reading alone (Nagy and Anderson, 1984). Many of these words will present challenging and unfamiliar content-area concepts. An extensive vocabulary helps students access the content.

Until recently, most formal vocabulary instruction has been limited to the introduction of key words before reading a new text. Yet the National Reading Panel (2000) found that vocabulary is learned both directly and indirectly, and that dependence on only one instructional method does not result in optimal vocabulary growth. Direct teaching of

key words can be worthwhile, but research tells us that children can only learn eight to ten new words each lesson through direct instruction (Stahl and Fairbanks, 1986) because learning requires repetition and multiple exposures. Students require frequent opportunities to use new words in oral and print contexts in order to learn them on a deep level (Blachowicz and Fisher, 2002).

Students also need to study the structural and semantic nature of words. They should use the surrounding context and/or word parts (prefixes, suffixes, bases) to unlock meaning. Learning key word parts will enable students to master new words that are semantically connected. **Through systematic instruction, *Building Vocabulary* teaches students how to unlock the meaning of words using knowledge of Greek and Latin prefixes, suffixes, and bases.** “The English language has between 1,200,000 and 2,000,000 words! ...90 percent of English words with more than one syllable are Latin based.” (Rasinski et. al, 2008) By learning the structural and semantic nature of words, students are able to unlock the meaning of over 60% of the words they encounter.

Building Vocabulary

Teacher Created Material’s *Building Vocabulary* program integrates **research-based practices** of vocabulary instruction with **engaging, high-interest activities** that will **foster a love of word learning among students**. The program is currently designed for levels 1–8, with the release of levels 9–11 expected in January 2010. Each level, 3–8, introduces a new set of word roots, and Levels 1 and 2 introduce different word parts. The program can be used in a full-year implementation, as a summer school program, or as an intervention program. A new word root or word part is introduced in each lesson. The lessons develop strategies for using the root or part to discern meaning of new unfamiliar words encountered in reading. Levels 3–8 have the following five lesson parts—Part A: Meet the Root; Part B: Combine and Create; Part C: Read and Reason; Part D: Extend and Explore; Part E: Go for the Gold. The lessons develop **students’ understanding of a word root, build their skills at unlocking the meaning of words using that word root**, and introduce students to **many of the English words that a root generates**.

Students complete the parts of the lesson in the colorful and engaging Guided Practice Book. **In Part A: Meet the Root**, students “divide and conquer” a list of words by identifying the prefix, base, and suffix. Next, students compose English words built from the root in **Part B: Combine and Create**. Critical to vocabulary development is using the words in context; therefore **Part C: Read and Reason** provides students the opportunity to encounter the word parts in the context of a short poem or story. Then, in **Part D: Extend and Explore**, students work individually and in groups to create applications for the new vocabulary. Finally, students review the words and concepts by playing word games in **Part E: Go for the Gold**.

The Teacher’s Guide serves as both a professional learning tool and as a road map to the program. For many teachers, using the instructional strategy of unlocking the meaning of words using Greek and Latin word roots may be new to them. The *Teacher’s Guide* will support teachers’ implementation of the program, while developing their knowledge of

word roots. The Teacher’s Guide from the program includes a discussion of research-based practices for vocabulary instruction and suggestions for differentiation and meeting the needs of English language learners. It also includes an overview of how to implement the program. The lesson plans in the Teacher’s Guide provide background information on the word root, include steps for teaching the word root, and guide teachers through each part of the lessons.

Assessment is also an integral part of the program. The *Building Vocabulary from Word Roots* Pre-test and Post-test measure students’ growth over the course of the year. The Guided Practice Book activities serve as formative assessments for each lesson and give the teacher a snapshot of students’ progress. At the end of each unit, there is a lesson review to measure students’ knowledge of the roots in that unit. Additional activity pages on the Teacher Resource CD serve as a reteaching tool or can also be used as weekly assessments.

Purpose of the Research

TCM and Euclid City Schools partnered to conduct a research pilot of *Building Vocabulary* in six, fifth-grade classrooms during the 2007–2008 school year. The teachers in the experimental group were directed to use the program a minimum of four days a week, 15 minutes a day. The primary purpose of the pilot was to measure the effectiveness of *Building Vocabulary* in improving the vocabulary of targeted Grade 5, Euclid City Schools’ students.

Through the implementation of *Building Vocabulary from Word Roots*, TCM and Euclid City Schools investigated the research question, “How will the *Building Vocabulary* program affect the vocabulary development of Grade 5 students in Euclid City Schools?” Both parties hypothesized that the targeted students in the experimental group would demonstrate a greater increase than the control group on the *Building Vocabulary* Pre-test and Post-test, after participating in the *Building Vocabulary* curriculum.

METHODS

Euclid City Schools selected three schools with similar student populations to participate in the pilot: School A had three experimental Grade 5 classrooms; School B had two experimental Grade 5 classrooms; and School C had two control Grade 5 classrooms.

Student Population

Euclid, Ohio is a suburb located directly east of Cleveland. As reflected on the *Euclid City School District, 2007–2008 School Year Report Card* (www.reportcard.ohio.gov), the average daily student enrollment was 6,042. There are seven elementary schools with a total enrollment of 2,052 students. 58.8% of those students are considered economically disadvantaged.

The percentages of students for specific populations are listed below.

- 74.9% Black, non-Hispanic
- .3% Asian or Pacific Islander;
- .6% Hispanic
- 4.7% Multi-racial
- 58.8% Economically Disadvantaged
- .3% Limited English Proficient
- 18.3% Students with Disabilities

During the 2007–2008 school year, the district was designated as needing? “continuous improvement.” The district met 7 out of 30 indicators, had a performance indicator of 80 out of 120 points, and did not meet Adequate Yearly Progress. In the area of reading, 61.7% of fifth students in Euclid City Schools were considered at the proficient level. Fifth grade performed below expected growth.

Table 1 presents the specific student population information for each school participating in the pilot. For purposes of anonymity, the experimental schools are given pseudo names of School A and School B, and the control school will be referred to as School C. All information provided is gathered reflects data provided, *Euclid City School District 2007–2008 School Year Report Card*, published by the Ohio State Department of Education.

Table 1

	School A	School B	School C
Average Daily Student Enrollment	277	398	449
Economically Disadvantaged	72.3%	70.6%	66.8%
Limited English Proficient	NC	NC	NC
Students with Disabilities	20.7%	27.2%	27.8%
Race/Ethnicity			
Black non-Hispanic	90%	73.2%	72.1%
Asian or Pacific Islander	NC	NC	NC
Hispanic	NC	NC	NC
Multi-Racial	NC	5.4%	7.1%
White, non-Hispanic	5.8%	20.9%	19.4%

Table 2 shows student achievement data for each of the three schools, as stated on the 2007–2008 School Year Report Card, released by the Ohio Department of Education.

Table 2

	School A	School B	School C
School’s Designation	Academic Watch	Continuous Improvement	Continuous Improvement
Number of State Indicators Met out of 10	1	2	3
Performance Index Score (out of 120 points)	71	84.4	81.5
Adequate Yearly Progress	Not Met	Not Met	Not Met
Years in Improvement	4 years	1 year	7 years
5 th Grade Achievement Reading (Percentage of Students at Proficient Level)	64.9%	67.3%	67.3%

Teacher Training

To ensure proper implementation of *Building Vocabulary* and to prepare the experimental group teachers for the expectations and responsibilities of the pilot, a teacher training was conducted on October 18, 2007. During this training, the experimental class teachers were introduced to the product and provided strategies and methods for implementing the product. Part of the product training included an overview of methods for developing students' vocabulary. In addition, experimental teachers were introduced to the pilot parameters and the participation expectations, as well as given directions for administering the pre and post assessments. Periodic follow-up training sessions were provided in December, 2007 and April, 2008. The goal of the periodic trainings were to answer questions related to the product, check lesson logs, and observe teachers using the program. Feedback and suggestions for more effective implementation of the program were provided to the experimental teachers.

Measures and Data Collection

A quasi-experimental design was used to carry out the research for this pilot. Both quantitative and qualitative evaluation tools were used to measure the efficacy of *Building Vocabulary*. To measure students' vocabulary development and their use of word roots to determine meanings of words, the *Building Vocabulary* Pre-test and *Building Vocabulary* Post-test were administered. The Pre-test was administered in November of 2007 and Post-test was administered in May of 2008. The students were not given a time limit in which to complete the assessment. The items were cloze statements. Students were to read the statement and determine which word or definition best completed it. They had four distracters from which to choose.

An outside team evaluated the assessments and compiled the data for the *Building Vocabulary* assessments. The evaluators used the answer keys provided for both assessments and followed standard protocols for scoring the assessments, giving the number of correct items out of the number possible.

Three qualitative tools were also used to gather anecdotal information from teachers and students. Teachers were asked to record each usage of *Building Vocabulary* in a lesson log. The purpose of the lessons logs were to measure frequency of usage and to gather anecdotal feedback regarding specific lessons. At the end of the pilot, teachers completed a survey that provided them an opportunity to share information about their experiences with the program. Teachers responded to questions for the following topics:

- ease of use of the program
- professional growth as a result of participating in the pilot
- student use of the program
- appropriateness of the content
- students' vocabulary growth

Students also completed a survey regarding their experiences with the *Building Vocabulary* program. The survey measured how well they liked the activities in the program and their self-perceptions about their vocabulary development.

Data Analysis Procedures

Students in each class were assigned alphanumeric designations. Data was entered into spreadsheets, organized by class, and students' alphanumeric designation. Classes were identified as part of the experimental or control groups. To measure vocabulary development, students' Pre-test and Post-test scores were compared, and an overall increase or decrease was determined. The mean scores on the Pre-test and Post-test for *Building Vocabulary* were then calculated for each class, followed by an analysis of the data for the experimental and control groups, separately. Mean increases or decreases between the Pre-test and Post-test for *Building Vocabulary* were also calculated for each class, as well as the experimental and control groups.

Finally an item analysis for the *Building Vocabulary* assessments was conducted by class. The sum and percentage of students who had each the item correct on both the Pre-test and Post-test was tabulated. This data was utilized to determine students' overall level of mastery on specific word roots.

Analysis of the teachers' lesson logs and surveys provided a picture of each teacher's usage of the program. Each experimental teacher was categorized into high, medium, and low usage groups based on the information shared on their lesson logs and surveys. Each class's mean *Building Vocabulary* Pre-test and Post-test scores were aligned with each teacher's high, medium, or low usage of the program. The overall student growth in each class was compared to the category of usage by the classroom teacher to determine if a correlation exists between teacher usage of *Building Vocabulary* and students' overall growth on the *Building Vocabulary* assessments. The teacher and student questionnaires were tallied and reviewed. Relevant anecdotal data from these questionnaires has been selected for inclusion in this report and will be used to support TCM in future product development.

RESULTS

***Building Vocabulary* Pre-test and Post-test**

The data from the *Building Vocabulary* Pre-test and Post-test provide evidence that during the course of the pilot, experimental group (Classes 1E–5E) students' vocabulary increased more than students' vocabulary in the control group (Classes 1C–2C). The experimental group's scores from the Pre-test to the Post-test increased on average by 9.52 percentage points, where the control group's scores increased on average of 3.57 percentage points. The experimental group increased 5.95 percentage points more than the control group. *Figure A* shows the mean Pre-test and Post-test scores for the experimental and control groups. *Figure B* shows the mean change in percentage points for the experimental and control groups on the Pre-test and Post-test.

Figure A

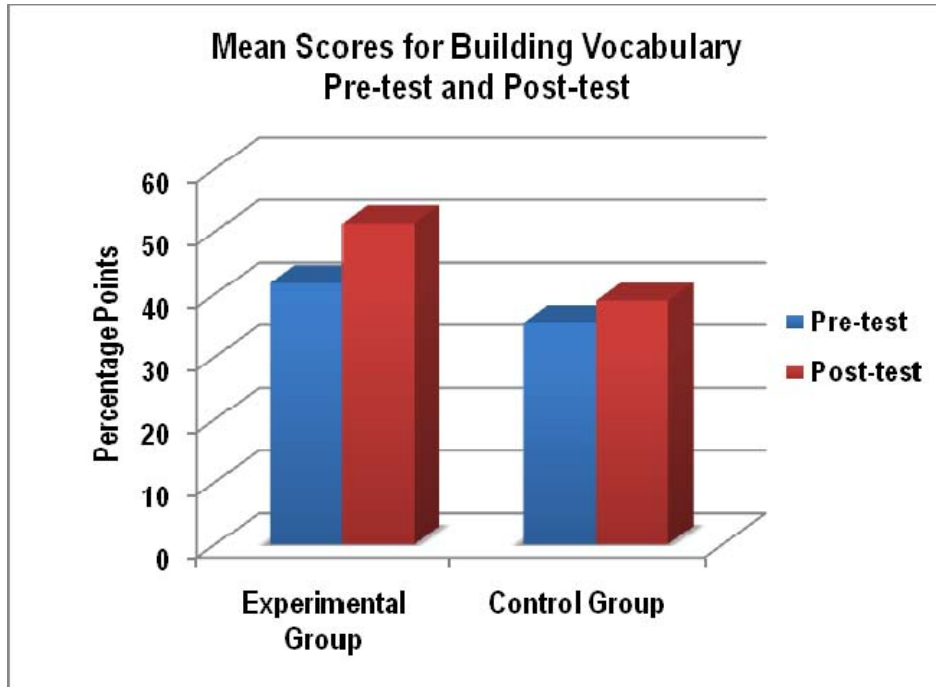


Figure B

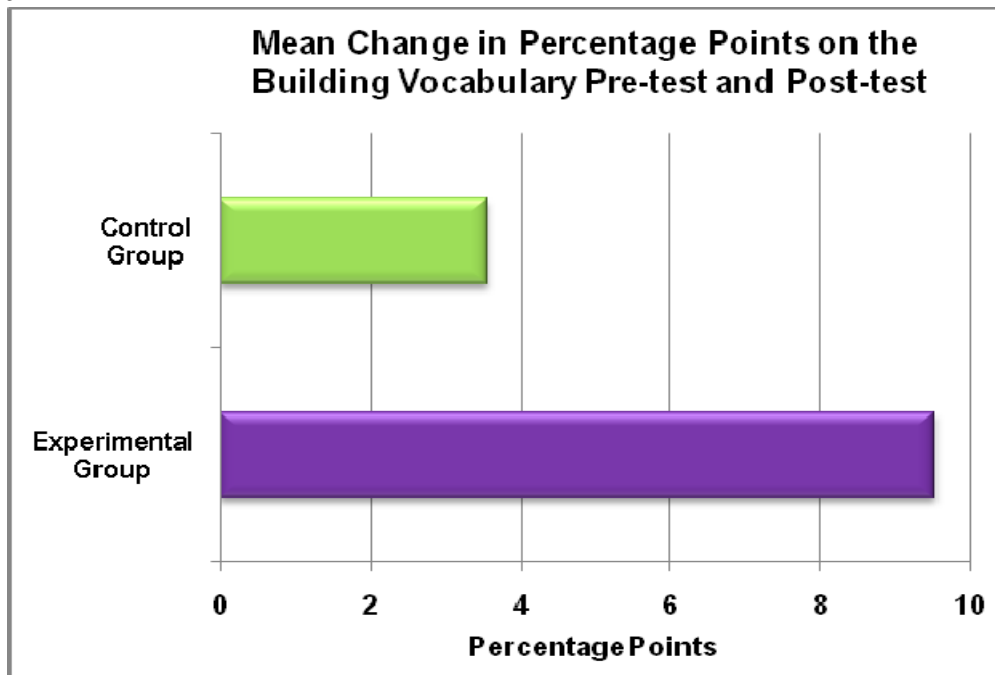


Table 3 below shows the mean number of points students scored out of 20 possible points (1 point per item) on the *Building Vocabulary* Pre-test and Post-test for each teacher in the experimental and control groups. The first column is the assigned reference code for each class. The second column indicates each teacher’s usage of the program. Teacher usage was categorized into high, medium, and low groups. Teachers who used the program three times per week or more are considered to be in the high usage category. Teachers who used the program one to two times per week are considered in the medium usage category. Teachers who used the program once or twice a month were in the low usage category. The third and fourth columns indicate the mean Pre-test and Post-test scores for each class. The last column shows the mean difference between the Pre-test and Post-test scores.

Table 3
Mean Points Scored on the *Building Vocabulary* Pre-test and Post-test

Experimental Group				
5 th Grade Classes	Usage Category	Mean Pretest Scores*	Mean Post-Test Scores*	Mean Difference in Points Scored
Class 1E	High	7.95	8.74	0.79
Class 2E	High	8.64	11.64	3.00
Class 3E	High	8.88	9.60	0.72
Class 4E	High	8.22	10.00	1.78
Class 5E	High	8.64	11.57	2.93
Mean Scores*	High	8.47	10.31	1.8
Control Group				
Class 1C		6.80	6.73	-0.07
Class 2C		7.35	8.84	2.11
Mean Scores*		7.08	7.79	0.71

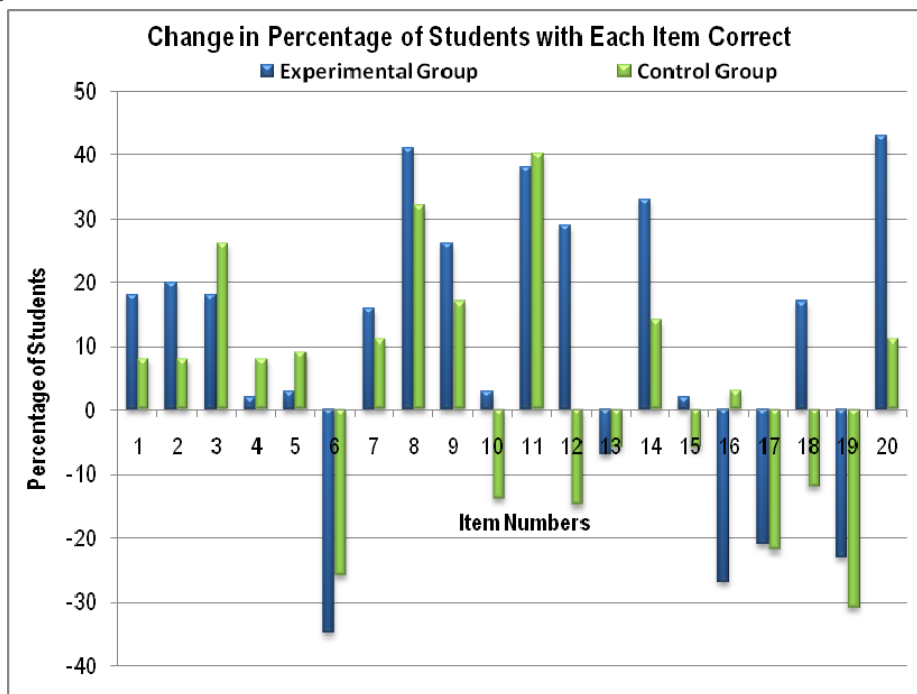
*Mean number of points out of 20. One point was assigned for each question.

The experimental group also showed greater growth overall on the individual items on from the *Building Vocabulary* Pre-test to the Post-test . Table 4 reflects students’ performance on these items. The data is categorized by experimental and control groups. The percentage of students that correctly answered each item was calculated for the Pre-test and Post-test. The difference in the percentage of students was then calculated for both the control and experimental groups, reflecting an overall increase or decrease in students’ growth from the Pre-test to the Post-test for each item. Figure C compares the experimental group’s and control group’s increases and decreases in the percentage of students that answered each item correctly. Overall, the experimental group showed a greater increase than the control group in the percentage of students who correctly answered each item.

Table 4

Experimental Group: Percentage of Students with Each Item Correct on the Pre-test and Post-test																				
Item Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Pre-test Percentages	42	6	40	56	51	78	10	26	46	69	51	38	21	17	40	65	56	21	72	26
Post-test Percentages	60	26	58	58	54	43	26	67	72	72	89	67	14	50	42	38	35	38	49	69
Differences	18	20	18	2	3	-35	16	41	26	3	38	29	-7	33	2	-27	-21	17	-23	43
Control Group: Percentage of Students with Each Post-test Item Correct																				
Pre-test Percentages	26	23	23	49	31	63	20	34	29	43	40	49	26	17	40	40	51	23	57	29
Post-test Percentages	34	31	49	57	40	37	31	66	46	29	80	34	20	31	34	43	29	11	26	40
Differences	8	8	26	8	9	-26	11	32	17	-14	40	-15	-6	14	-6	3	-22	-12	-31	11

Figure C



The complexity and difficulty between parallel items on the Pre-test and Post-test may vary, which could account for some of the differences in the percentage of students that answered the items correctly between the Pre-test and Post-test. There are other variables that could have played a role in the data collected from the *Building Vocabulary* Pre-test and Post-test. The control group may have inadvertently received instruction for specific vocabulary words in their language arts program or in other content-area curricula that were also included on the *Building Vocabulary* Pre-test and Post-test. Some of vocabulary terms may have been prior knowledge or linked to students' experiences. Students in the control and experimental groups may have been taught common roots before participating in this pilot. Even when considering these variables, one can conclude that the data from the *Building Vocabulary* assessments reflects the positive outcomes the program had on students' vocabulary development.

Teacher Surveys

Teacher surveys were administered to the teachers in the experimental group at the conclusion of the research pilot. Teachers responded to questions for the following topics:

- ease of use of the program
- professional growth as a result of participating in the pilot
- student use of the program
- appropriateness of the content
- students' vocabulary growth

The overall responses from the fifth-grade teachers in each of the above areas were positive. Over 60% of the teachers' responses to the survey items, which were based on a Likert scale, were strongly agree or agree. One teacher commented, "I liked that the students were introduced to Greek and Latin bases on a weekly basis. Also, I enjoyed the resources provided." Another wrote, "It was a good intro to how words can make more sense if you know the root and the prefix/suffix that goes with it."

For the teachers participating in this pilot, implementing *Building Vocabulary* was a pedagogical shift and teaching vocabulary using word roots was a new method of vocabulary instruction. As one teacher stated on her survey, "First I needed to change my thinking..." As with all new approaches to teaching, the teachers also had to acquire knowledge of both content and methods. The same teacher as quoted above wrote, "I liked it that 'I learned' my root words and I am able to help the class understand how word parts go together." All the teachers felt that through the lessons in the program, they developed an understanding of word roots and learned strategies for teaching their students how to use word roots to unlock the meaning of other words encountered in reading. Professional development and site visits provided by Teacher Created Materials Publishing also supported teachers in transitioning from more traditional ways of teaching vocabulary to teaching vocabulary using word roots. As teachers used *Building Vocabulary*, the majority felt that their comfort level with the content and strategies in the program increased.

"I am a better teacher because I realized how important it is for me to understand and convey this to the class."

Like the teachers, the students who participated in the *Building Vocabulary* pilot had to make a transition in how they learned vocabulary. The scope and sequence of *Building Vocabulary* begins in grade 1 and continues through grade 8. The research pilot was implemented in Grade 5 with Level 5 resources. Because Level 5 of *Building Vocabulary* builds upon knowledge of word roots introduced in the previous levels, teachers felt that the transition would have been easier for students if they had used a lower level of the program. One teacher stated on her survey, "It is a great concept, but too high of a level." Another teacher commented, "Difficult program as an intro into 5th

grade. Would have liked a younger version (grade level) to start with — the transition may have been smoother.”

The teachers also recommended that the program be implemented starting in grade one, so the students’ knowledge of word roots could build with the scope and sequence of the program.

Even with the transition from memorizing word meanings to utilizing word parts, the teachers expressed that the students enjoyed many of the engaging activities that the program had to offer. “My students became excited immediately with all the fun and engaging activities provided. Most seemed to look forward to vocabulary work daily, not even realizing they were working on vocabulary skills.” All the teachers, who participated in the pilot, agreed that the “Extend and Explore” and “Read and Reason” activities were most engaging for their students. Many of the teachers also utilized additional research-based practices that were recommended by the authors during professional development. They conducted the activities with hands-on materials, created classroom word walls, modeled Guided Practice book pages on the overhead, started with words that were recognizable to students, provided additional practice, and selected or utilized a word of the day.

Most importantly, the teachers shared how they witnessed students’ vocabulary grow as a result of using the program, which is also evident in the Pre-test and Post-test data. All the teachers agreed that as a result of using the program, students’ knowledge of word roots increased and the majority of them felt that students’ vocabulary increased. It was concluded that as a result of using the program, “Students did develop a basic understanding of prefixes and suffixes.”

“Building Vocabulary was beneficial for my students. It provided an opportunity for them to learn Latin & Greek bases that they come in contact with on a daily basis. Many of the students are able to utilize these bases in their writing.”

Student Surveys

At the conclusion of the pilot, students completed a survey about how they liked specific components of *Building Vocabulary* and their self-perception of their own vocabulary development. Overall, students’ self-perceptions as a result of using the program were positive. Students responded to survey items by marking “Yes, No, or Maybe.” The percentages of students that responded “Yes” to each of the items related to their vocabulary growth are listed below.

- ✓ **91% learned new words.**
- ✓ **83% learned the meanings of word roots.**
- ✓ **72% liked to learn new words.**
- ✓ **60.5% learned how to use word roots to figure out the meaning of new words.**
- ✓ **56% are better readers or writers because they can use new words.**

Students enjoyed many aspects of the program. Activities like WORDO, word puzzles, and word games were listed as favorites by the students. One student stated, “I liked the ‘Word Finder’ because the words are hard to find and I like a challenge.” Students also enjoyed the process of constructing the meanings of words from word roots and learning new words.

“I like putting together the roots and making the definitions.”

A student stated, “I liked learning about what the prefixes and root words really meant and just the whole word,” And another expressed, “I liked the ‘Divide and Conquer’ because I get to know more about words I don’t know.”

The rigor of the program was reflected in student survey responses, as well. A student commented, “The words are harder for me than our regular words.” One student wrote that the thing he or she liked most was, “That you have to think really hard.” Students specifically found the ‘Divide and Conquer’ activities challenging. “I least liked the words I did not understand until I figured them out.” Many students are accustomed to being given the meaning of words. *Building Vocabulary* takes the opposite approach. Students construct the meaning of the words from the word roots. This process can be uncomfortable for students. They need to utilize higher-level thinking skills, such as reasoning and problem-solving. Students felt a level of uncertainty that they didn’t normally feel when given the meaning of a word and simply memorizing it. But as a result of constructing meaning, many students felt a greater sense of accomplishment. A number of students also stated how the vocabulary they were learning was good preparation for middle school.

“The *Building Vocabulary* program is interesting, educational, and fun. It helps me become a better learner.”

The students also used the surveys to share some of their positive experiences with *Building Vocabulary*. Some of the quotes from *Building Vocabulary*'s biggest fans are provided below.

- **“I like getting together the roots and making the definitions...I learned a lot and I like it more than spelling.”**
- **“Working with a partner was fun to do in Building Vocabulary.”**
- **“I liked how Building Vocabulary brought my class closer together.”**
- **“This is a great book and I like it.”**
- **“I liked learning new words.”**
- **“I liked the words best.”**
- **“It was very fun.”**
- **“I liked most that I learned new words and the meaning of them.”**
- **“I loved everything that was in the *Building Vocabulary*.”**

CONCLUSIONS

The evidence resulting from this research pilot illustrates the power the program has to increase students' knowledge of word roots, their ability to construct meaning from word roots, and their overall vocabulary growth. The program was motivating and empowering for students. Teachers and students alike expressed how the program changed the way in which the taught and learned vocabulary.

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