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Teaching Vocabulary Through Weekly Spelling Lessons: An Efficacy Study

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TEACHING VOCABULARY THROUGH WEEKLY SPELLING LESSONS: AN EFFICACY
STUDY

by

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Bachelor of Arts, University of North Dakota, 2012

A Thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master of Science

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2014

This thesis, submitted by Elizabeth Joy Lindsey in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies at the University of North Dakota and is hereby approved.

Dr. Wayne Swisher
Dean of the School of Graduate Studies

Date

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Title Teaching Vocabulary through Weekly Spelling Lessons: An Efficacy Study

Department Speech Language Pathology

Degree Master of Science

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Elizabeth Joy Lindsey

5/17/14

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ABSTRACT

In recent years, research has proved that vocabulary knowledge is highly correlated with reading comprehension and academic success. Despite the importance of vocabulary instruction, teachers are lacking a cohesive approach. Teachers are concerned about the quality and quantity of vocabulary instruction in the classroom. The purpose of this study was to determine if students in the Grand Forks Public Schools were learning their vocabulary words through indirect instruction using the Scott Foresman's *Reading Street* program. Twenty-seven fourth grade students were given clinical vocabulary assessments, as well as a researcher-designed assessment to determine percentage of vocabulary words known. Results indicated that students were learning their vocabulary words in the classroom. When comparing the results from the researcher-designed assessment and clinical vocabulary measures, no significant correlation was found. This indicates that knowledge of vocabulary words was not an artifact of the students' general vocabulary abilities, but learning in the classroom.

CHAPTER I

INTRODUCTION

Vocabulary knowledge is highly correlated with reading comprehension and general academic success. Oxford Dictionaries defines vocabulary as “the body of words used in a particular language” (Oxford Dictionaries, 2013, para. 1).

Vocabulary knowledge can be demonstrated in two ways: receptively or expressively. Knowledge of the words we see and hear would be described as the individual’s receptive vocabulary. Expressive vocabulary consists of the words that are used to convey information, by either writing or speaking. Typically, receptive vocabulary is larger than expressive vocabulary. Although individuals may understand the general idea of a word in their receptive vocabulary, they might lack the knowledge of the true definition that would be needed in order to use the word in their expressive vocabulary (Kamil & Hiebert, in press).

Vocabulary development is important for a variety of reasons.

Children’s vocabulary development is important from an early age. Studies have shown that children who are regularly read to have larger vocabularies and better success at decoding words when reading (Burgess, Hecht, & Lonigan, 2002). Children’s vocabulary at age three is a strong predictor of their language and reading comprehension in third grade (Hart & Risley, 1995). Further, it has been

shown that children with poor vocabulary skills struggle with reading comprehension.

Not only does vocabulary play a crucial role in reading comprehension, it is also highly correlated with academic success (Lehr et al., 2004). As students progress through the grades, the vocabulary necessary to succeed in higher grades becomes more extensive. Typically, academic vocabulary demands appear in children's 3rd and 4th grade books (Chall, Jacobs, & Baldwin, 1990; Chall & Conard, 1991). Academic vocabulary is the vocabulary that is used in textbooks, lectures, and on tests. Without the knowledge of the academic language, it is very difficult to understand the concepts or apply what is being taught. Often, students who have trouble with academic vocabulary fail to comprehend classroom vocabulary, which negatively impacts their academic success.

Bishop, Yopp, & Yopp (2009) emphasize that vocabulary instruction needs to be implemented early and in all areas of the curriculum. When children enter elementary school, they have differing levels of vocabulary. The gap between large vocabularies and small vocabularies only continue to grow over time, leaving children with small vocabularies further behind (Biemiller & Slonim, 2001). It is crucial for teachers to begin vocabulary instruction at an early age in an attempt to bridge the gap. Despite this emphasis in the literature, vocabulary is not systematically taught in many schools.

According to a survey of classroom teachers (Berne & Blachowicz, 2008), there are many concerns surrounding the techniques and approaches of teaching

vocabulary in the classroom. Concerns include not having a consistent approach to vocabulary learning, not being aware of the best strategies for teaching vocabulary, and not having access to the best materials to support vocabulary knowledge.

In the Grand Forks public schools, general vocabulary is taught within the context of reading and spelling instruction. Teachers use Scott Foresman's reading program, *Reading Street* (Foresman, 2011). For each academic grade, there are 6 units that contain reading material in the form of several books. Each unit has activities that target phonemic awareness and phonics, vocabulary, comprehension, writing, and spelling. The vocabulary instruction includes activities such as sentence completion, matching definition, identifying antonyms, and crossword puzzles. There are also many practice activities for the spelling words that pertain to each unit. These activities include phrase completion, identifying misspelled words, adding prefixes, adding suffixes, and sentence completion.

Purpose

The purpose of this study is to investigate whether the students are increasing their vocabulary through the current methods used in the classroom. Students' vocabulary knowledge will be assessed through expressive knowledge of current vocabulary words. Those results will be compared to standardized vocabulary measures to determine the relationship to overall vocabulary ability.

CHAPTER II

REVIEW OF LITERATURE

Emphasis on Vocabulary Instruction

Interest in vocabulary has ebbed and flowed throughout the last decade, despite the literature that indicates the importance of vocabulary's impact on reading comprehension and academic success. Studies have shown that children who are regularly read to have larger vocabularies and better success at decoding words when reading (Burgess, Hecht, & Lonigan, 2002). Children's vocabulary at age three is a strong predictor of their language and reading comprehension in third grade (Hart & Risley, 1995). Further, it has been shown that children with poor vocabulary skills struggle with reading comprehension. Not only does vocabulary play a crucial role in reading comprehension, it is also highly correlated with academic success (Lehr et al., 2004). As students progress through the grades, the vocabulary necessary to succeed in higher grades becomes more extensive. Typically, academic vocabulary demands appear in children's 3rd and 4th grade books (Chall, Jacobs, & Baldwin, 1990; Chall & Conard, 1991).

The International Reading Association (IRA) annually administers a survey about trending areas of reading instruction as well as areas that are deemed "not hot." Over the years, vocabulary has fluctuated between "hot" and "not," despite

the consensus every year stating that it “should be hot.” As recently as 2010, the survey stated that vocabulary was a topic that was cooling (Cassidy & Cassidy, 2010).

Selecting Words for Instruction: Tiered Vocabulary Approach

Due to the importance of vocabulary instruction in the classroom, it is critical that teachers know which words are relevant to teach. A tiered vocabulary approach was developed by Isabel Beck, Margaret McKeown, and Richard Omanson in the 1980s, but only recently did it gain recognition with the publication of the book “*Bringing Words to Life, Second Edition: Robust Vocabulary Instruction*” (Beck, McKeown, & Kucan, 2013). Some words are simple words that children should learn without instruction in school. These words are known as tier one vocabulary words. Examples include *baby, orange, and sit*.

The next tier includes the words that are most likely to be targeted with vocabulary instruction. These words often occur in mature language situations. They occur across many domains, so it is important for children to know the meaning. Tier two words often contain multiple meanings and are important for reading comprehension. Examples of these words include *masterpiece* and *measure*.

Tier three vocabulary is taught within the context of a specific subject. These vocabulary words are not typically encountered in fiction reading or through typical conversation. For example, the word *entomology* is specifically

taught in a science course. It is not a word that a student would typically learn on their own without direct instruction and explanation.

By process of elimination, classroom teachers should not target tier one and tier three words. Tier one words are simple words that rarely require additional instruction in order to learn the meaning. Because tier three words are specific to a certain topic, it is best to learn those words when needed for that topic. Therefore, tier two words should be the area of focus when teachers are deciding what words to teach in the classroom. A quick test to determine if a term is a tier two word is to think whether the student can associate that word with a word that is already represented in their repertoire. For example, if the student is trying to determine the meaning of the word *demonstrate*, it is important for the child to associate that word with one that is already in their lexicon, such as the word *show*. Associating the term with one already in their lexicon broadens their vocabulary and increases the depth of the meaning of those vocabulary words (Beck, McKeown, & Kucan, 2008).

Although tier two words are great targets for vocabulary instruction, not all tier two words are of equal importance in a student's vocabulary. A few guidelines for choosing tier two target words are needed. The words that are chosen should have importance and utility, which means that they enhance the student's vocabulary greatly because they are seen across a variety of domains. The target words should be able to be presented in a variety of contexts so that the student will build a stronger representation of that word. The student must also be able to have a conceptual understanding of that word, meaning that they are able to

explain the general concept, but with the addition of these new words, they are able to define terms with much more precision (Beck, McKeown, & Kucan, 2008).

Vocabulary Instruction Approaches

According to results from current research, there seems to be an absence of instructional consistency. Wright (2012) studied instructional methods of kindergarten teachers with regard to quantity and quality of vocabulary instruction. Researchers spent 660 hours in kindergarten classrooms, recording episodes of vocabulary instruction. These episodes included any interaction in which the teacher discussed the meaning of the word with students. The data were analyzed for content and quality by analyzing the number of vocabulary episodes provided each day, the number of vocabulary words that teachers address per day, the difficulty level of vocabulary words, the length of vocabulary episodes (i.e., number of teacher utterances), and the number of vocabulary episodes per minute across content areas. The results revealed that although some teachers do provide some level of vocabulary instruction, many do not provide any. Further, the study showed that of the teachers who did introduce vocabulary, many did not discuss the word meanings. This research indicates that although there is a strong focus on vocabulary instruction, there is not a lot of follow-through in the classroom.

Several researchers have examined the best techniques to use for vocabulary instruction; however a cohesive and uniform approach does not seem to exist. In a recent study completed by Berne & Blachowicz (2008), seventy-two classroom teachers and reading educators were surveyed to obtain information

about the practices they used in their classrooms as well as the concerns and questions they might have regarding vocabulary instruction. Respondents taught in grade levels from pre-K to college, with slightly over half teaching in the elementary grades. Overwhelmingly, the educators were most concerned about a lack of district-wide or building-wide approach to teaching vocabulary, a shortcoming that caused inconsistencies and variability in the way teachers approach and teach vocabulary. Many did not feel that they were doing a good job of vocabulary instruction and felt that they were not approaching instruction in a uniform manner (Berne & Blachowicz, 2008). Teachers' concerns in the area of vocabulary instruction indicate that a consistent approach for teaching vocabulary in classrooms is needed.

According to the National Reading Panel (2000), vocabulary should involve both indirect and direct instruction. Direct instruction involves the teaching of specific words, such as providing the student with a worksheet or pre-teaching the vocabulary words before the student is asked to read the story. Although direct instruction is important, it is impossible to teach students all of the words they need to know. Therefore, indirect instruction is important for a student's vocabulary development. The teacher should expose the students to many different vocabulary words and encourage them to read in order to expand their vocabulary knowledge.

Indirect vocabulary instruction is employed when students are able to derive the meaning of the word from the context surrounding it. Students need to be taught strategies, such as context clues and semantic gradients in order to

develop vocabulary knowledge from the context (Greenwood & Flanigan, 2007). Context clues, such as other words in the sentence, can help the student derive the meaning of the word when the meaning is unknown. For example, in the sentence, “Martha was gregarious, unlike her sister who is quiet and shy,” the context allows the student to infer the definition of the word *gregarious*. A semantic gradient is multiple related words, placed on a continuum. The continuum helps students differentiate between shades of meaning. For example, the students can place *gigantic, big, average, small and tiny* along a continuum (Greenwood & Flanigan, 2007).

Indirect vocabulary instruction is effective in two different ways. It requires less instruction time for the teacher because the students are working independently. Also, this technique can be generalized and used for all texts, unlike direct instruction, which relies on words that are pre-taught in order to make comprehension easier.

To determine the amount of words learned through incidental or indirect vocabulary instruction, Swanborn & de Glopper conducted an experiment that included 223 sixth-grade students. Students were randomly assigned to one of four conditions. Administration of a standardized reading comprehension test revealed no initial differences between the groups. In the first condition, students were told to free read. In the second condition, students were asked to learn as much of the topic as possible. Students in the third condition were asked to read for text comprehension, and students in the fourth condition were the control group who read a different text with no reading purpose. Each specific reading

purpose was written down on the first page of their individual booklets. Each student was asked to read a text and write definitions for target vocabulary words, as well as complete a reading comprehension test. When students were given the definition task, they were asked to give a correct definition, use the target word in a sentence, or provide a synonym. Scoring of the definitions followed a four-point scale.

0 points: wrong answer, doesn't comply with the content

1 point: indicates some association with the target word's meaning, student understands partial meaning of the word (ex. *tired* is a result of *restless*)

2 points: indicates reasonably complete word knowledge (ex. define "to overpower" as "that the wolf wins the fight with the other animals")

3 points: decontextualized word knowledge, comprehension depends significantly on knowledge of the word (ex. define "to overpower" as "to win")

The results of this study revealed that 6 out of every 100 unknown words were learned when the students were asked to just read the text, 8 out of every 100 unknown words when students were asked to read for text comprehension, and 10 out of every 100 unknown words were learned when the students were asked to learn about the topic of the text. Results indicate that incidental word learning as a result of one reading of a text is not sufficient for rapid vocabulary growth. This research reveals that indirect vocabulary instruction is not the best approach when building a robust vocabulary (Swanborn & de Glopper, 2002).

Educational researcher, Robert J. Marzano (2005) has developed a six-step process to directly teaching vocabulary. These steps include the following:

1. Provide a description, explanation, or example of the new term.
2. Ask students to restate the description, explanation, or example in their own words.
3. Ask students to construct a picture, pictograph, or symbolic representation of the term.
4. Engage students periodically in activities that help them add to their knowledge of the terms in their vocabulary notebooks.
5. Periodically ask students to discuss the terms with one another.
6. Involve students periodically in games that enable them to play with the terms. (p. 14-15)

The first three steps are used when the teacher is introducing a new term. The teacher provides the definition for the term first, providing the basis for learning the word. In the next two steps, the student then defines the new term in their own words and thinks of a way to represent that word. The last three steps can be presented in any order. They are used to solidify the student's knowledge of the word.

A study was conducted by Meghen Sanders (2008) to determine the effectiveness of Marzano's six-step process on vocabulary comprehension and retention for students who attend an urban, low-income high school. Forty-five students were included in the study and data collection included first and second semester vocabulary quizzes, first and second semester bi-weekly essays, and a

student response survey. After comparing the vocabulary quiz scores, a t value of 3.893 and positive r correlation of .557 was found, indicating direct vocabulary instruction had a positive impact on the students' vocabulary. When comparing the essays, similar results were found, including a t value of 3.999 and positive r correlation of .9076. Results indicate that Marzano's six-step process "had a positive impact on the retention, comprehension and utilization of new vocabulary terms" (Sanders, 2008).

Assessment of Vocabulary Knowledge

With strong emphasis on vocabulary instruction in the classrooms, educators need to have a way to assess vocabulary knowledge. Many standardized test only include a limited number of set words, many of them being concrete words that can be represented in picture form (Kearns & Biemiller, 2010). Administration of standardized tests to every child is not a feasible task for educators due to time constrictions. Lastly, standardized tests have limited focus on knowledge of academic vocabulary learned in the classroom, giving the teachers little information in regards to course of vocabulary instruction (Kearns & Biemiller, 2010).

According to Nagy and Scott (2000), one important characteristic of vocabulary acquisition that has implications for vocabulary assessment is incremental learning. Although some children may acquire new vocabulary in an all-or nothing fashion, many learn words in incremental fashion. Therefore, many assessment tools do not provide information about the child's development of understanding. More recent research has shown researcher-designed tasks have

been used to measure progress (Nash & Snowling, 2006; Silverman & Hines, 2009; Coyne, McCoach, & Kapp, 2007; Leung, 2008).

Assessment of vocabulary knowledge in classrooms usually involves multiple choice, fill in the blank, and matching tasks (Dougherty Stahl & Bravo, 2010). These tasks don't give an accurate picture of the students' vocabulary knowledge. A variety of classroom assessment instruments are available to assess students' knowledge of targeted vocabulary words, including the Vocabulary Recognition Task (VRT), the Vocabulary Knowledge Scale (VKS), and the Vocabulary Assessment Magazine (VAM). These classroom assessments are used in the primary grades and designed to follow the pre-posttest assessment model, including pre-assessment, instruction, and post-assessment. Information gathered from classroom assessments can be used to document vocabulary knowledge following instruction.

The Vocabulary Recognition Task (VRT) is a teacher constructed yes-no task that assesses students' knowledge of a certain curriculum topic presented in class, such as insects. This assessment includes a list of 25 words, 18 of which are words that will be or have been targeted in a curriculum unit. The other 7 words are unrelated to the topic. The students are asked to circle the words associated with the unit discussed in class and their responses are graded by correct "hits" versus "false alarms." This assessment was developed to be used as a pretest before the unit to assess students' prior knowledge of terms, as well as a posttest to assess students' knowledge of terms after direct instruction. The pre- and

posttests allow for comparison of previous knowledge and acquired knowledge (Dougherty Stahl & Bravo, 2010).

There are many disadvantages when using VRT in classroom vocabulary assessment. One drawback is that it is more difficult for students to generate a definition from a word list when compared to learning definitions within a context (Stubbe, Stewart, & Pritchard, 2010). Therefore, when the students are looking at the words and foils, it may be difficult for them to associate the vocabulary definition with the word. The majority of vocabulary assessments are administered with the intent of measuring receptive vocabulary knowledge. This indicates that the recognition tasks only tap into a small part of the individuals' vocabulary knowledge.

Another pitfall of the VRT is a lack of research done on the efficacy of this assessment method. Studies examining the use of VRT or comparing it to other assessment methods are not easily found in scholarly journals or articles. Lastly, another drawback to ongoing vocabulary assessments such as VRT is that the tests are somewhat reliant on the student's ability to read and write. This makes the assessment limited to students who are of an older age and can demonstrate vocabulary knowledge at a more advanced level. Children in kindergarten or first grade may have more difficulty with this task, especially in the beginning of the school year. The element of reading and writing at a sophisticated level also makes the task inappropriate for students with learning disorders or language disorders (Kearns & Biemiller, 2010).

The Vocabulary Knowledge Scale (VKS) is an assessment tool that allows for assessment of incremental knowledge of vocabulary terms. The scoring guide includes five categories:

1. I don't remember having seen this word before. (1 point)
2. I have seen this word before, but I don't think I know what it means. (2 points)
3. I have seen this word before, and I think it means _____. (Synonym or translation; 3 points)
4. I know this word. It means _____. (Synonym or translation; 4 points)
5. I can use this word in a sentence: _____. (If you do this section, please also do category 4; 5 points)

The VKS scoring system reflects the idea that vocabulary learning occurs in increments, rather than in an all-or-nothing fashion (Nagy & Scott, 2000).

Many limitations for the VKS are apparent, including the fact that the assessment only tests written and reading vocabulary. The assessment does not mention oral or aural vocabulary. Consequently, the assessment does not address the child's ability to use the word or demonstrate their level of understanding. The variation of the words used may also prove to be confusing for the students, including "have seen", "know", and "can use." Scales that use consistent wording (I don't know this word, I know this word a little, I know this word quite well, I know this word very well) may provide better results.

There are significant limitations when interpreting the results from this scale. The pre-test and posttest scores are totaled and averaged, but the

interpretation of the difference in the scores can be difficult to understand. If there is a small difference between the pre- and posttest, it is more difficult to determine if there was vocabulary progress. Also, student scores may look quite different, while the average is the same (Waring, 2002).

The Vocabulary Assessment Magazine (VAM) was created to assess students' science knowledge, comprehension strategy use, and reading comprehension. There are two components to the VAM. The first requires the student to read a passage and answer open-ended comprehension questions (inferencing, summarizing, making predictions, etc.) regarding the text. The following is an example of an open-ended comprehension question that a student might encounter.

This book is called *Life in the Forest*. What do you think the book will be about? The second component of the assessment involves drawing, labeling, and writing sentences about their drawings.

Draw and label two different types of roots. Write a sentence under your drawings to describe the two types of roots.

A consideration when using VAM to assess student's vocabulary knowledge is there needs to be enough focus on a core set of vocabulary words that are taught extensively, to the point that the students would use those vocabulary words in their open ended questions. Prompting students to use the targeted vocabulary is also something to consider (Dougherty Stahl & Bravo, 2010).

Scott Foresman's *Reading Street*

Research stating that vocabulary growth happens as a result of learning from context while reading has been met with mixed results (Nagy et al.,1987; Sternberg,1987; Swanborn & de Glopper, 2002; NICHD, 2000). Scott Foresman's reading curriculum, *Reading Street*, teaches vocabulary according to this principle.

Reading Street is “designed to help teachers build readers through motivating and engaging literature, scientifically research-based instruction, and a wealth of reliable teaching tools” (Pearson, 2010). *Reading Street* is structured, with a strong emphasis on continual progress monitoring, prioritizing the appropriate skills for each grade level. These skills include the five essential reading components of reading programs: phonemic awareness, phonics, fluency, vocabulary, and reading comprehension strategies (Pearson, 2010)

The program consists of a teacher edition that outlines the systematic nature of the program, a student edition that includes literature and writing assignments, an assessment plan to ensure students make adequate yearly progress, leveled readers to practice learned skills, trade books that enhance oral vocabulary, decodable readers focused on phonic skills, phonics and word study including sounds spelling cards, materials for English Language Learners, as well as online and CD resources (Pearson, 2008). *Reading Street* includes a variety of texts, including fiction, biographies, poems, and online reading.

Weekly reading units provide the foundation for spelling/vocabulary words. The weekly spelling/vocabulary words are presented within the context of the reading texts. On day one, students are given a spelling pretest. The next three

days includes instruction in three forms; teach, guided practice, and independent practice. The last day of the week, the spelling post-test is administered.

Independent work accompanies each lesson, targeting phonemic awareness and phonics, vocabulary, comprehension, writing, and spelling. The vocabulary instruction includes activities such as sentence completion, matching definition, identifying antonyms, and crossword puzzles. There are also many practice activities for the spelling words that pertain to each unit. These activities include phrase completion, identifying misspelled words, adding prefixes, adding suffixes, and sentence completion.

Reading Street can be flexible and provides the students with online resources. These resources are engaging and work on expanding vocabulary, comprehension, and concepts. Instruction is centered on fiction and nonfiction literature and provides opportunities that promote critical thinking, cultural awareness, new skills, and strategies.

Several research studies have been conducted by consulting firms contracted by Pearson, proving the effectiveness of Scott Foresman's *Reading Street* program. Until 2010, no independent research studies had been conducted to determine the efficacy of *Reading Street*, making apparent a need for non-commissioned research (Ladnier-Hicks, McNeese, & Johnson, 2010).

Aware of the need for independent research, Ladnier-Hicks, McNeese, & Johnson created a study with multiple purposes. The focus of the study was to determine if third grade students' reading performance, measure by the *Stanford Achievement Test-10* (SAT-10), improved after the first year of using *Reading*

Street. The researchers were also concerned about teacher satisfaction and ways to identify predictors that would help to improve future student performance (Ladnier-Hicks, McNeese, & Johnson, 2010). The study included 712 students from six elementary schools, with about 68.5% of the participants receiving free/reduced lunch. The groups included students who were instructed with *Reading Street* and a control group. Results based on comparison of SAT-10 scores between 2007 pretest and 2008 posttest indicated that there was a slight increase in scores following a year of instruction guided by *Reading Street*. However, based on an Analysis of Covariance (ANCOVA), no statistical significance between the *Reading Street* group and control group were noted. Results from analysis of teachers' attitudes toward the *Reading Street* program revealed that teachers had more positive ratings than neutral or negative ratings, regardless of years of experience or level of education.

Statement of the Problem

The purpose of this study is to investigate whether the students are increasing their vocabulary through the current methods used in the classroom. Students' vocabulary knowledge will be assessed through expressive knowledge of current vocabulary words. Those results will be compared to standardized vocabulary measures to determine the relationship to overall vocabulary ability. The following questions will be explored:

1. Are 4th grade students in Grand Forks public schools learning vocabulary using the Reading Street curriculum??

2. What is the relationship between students' vocabulary knowledge of weekly spelling words and general vocabulary ability as measured by the PPVT-4 and EVT-2?

CHAPTER III

METHOD

Participants

Twenty-seven participants (17 males, 10 females) were recruited from fourth grade classrooms in the Grand Forks, North Dakota Public School district. Participants ranged from 9;7 to 10;8 years of age, with a mean of 10;3. All participants were native English speakers. Individuals were neither included nor excluded based on socio-economic status. Because the focus of the study is on vocabulary abilities in typically developing children or those with a language-based impairment, individuals who had been diagnosed with Autism Spectrum Disorder, cognitive deficits, or hearing impairments were excluded from the study. Individuals with language disorders, however, were included. All participants received \$20 cash for their participation.

Procedure

Fourth grade students were recruited through flyers distributed to classrooms and from an advertisement published in *Kids Connections*, a monthly newsletter sent to all parents/guardians of students in the GFPS district. The advertisement contained the purpose of study, methodology, compensation details, and instructions on who to contact if interested (Refer to Appendix A).

Interested parents/guardians were instructed to contact the primary investigator via phone or email. The study was explained further and the parents/guardians were given an opportunity to ask questions. This initial contact also served as a screening to determine participant eligibility (e.g. age, native language, any existing medical or educational diagnosis). A member of the research team later contacted the parents/guardians to schedule a time for participant testing. Research was conducted at one of two locations, at the participant's school, either before or after school hours or during weekend or evening hours on the University of North Dakota campus.

A research team consisting of three graduate assistants administered the research protocol to all participants. Prior to the participant's arrival on site, the researcher set up the materials necessary to carry out the assessment by arranging the tests, manuals, informed consent form, writing utensils, and a video recorder in a quiet room with minimal distractions.

At the beginning of each testing session, the researcher obtained the parent/guardian's signature on a consent form (See Appendix B) and the participant's signature on an assent form (see Appendix C). Through the assent form, the purpose of the study was explained and the participant was assured that he/she did not need to participate in the study and could cease participation at any time. The participants were encouraged to do their best and to expect that some questions would be easy and some would be difficult. As needed, the participant could take breaks. Parents/guardians were given the option to stay in the testing room, or a nearby waiting area, whatever the participant was most

comfortable with. Each testing session was video recorded for the purpose of obtaining inter-rater reliability.

The testing protocol was a part of a larger research study and consisted of the Gray Oral Reading Test—5th ed. (GORT-5), the Peabody Picture Vocabulary Test—4th ed. (PPVT-4), the Expressive One-Word Vocabulary Test—2 ed. (EVT-2), and a researcher-designed vocabulary assessment based on the student's current weekly spelling list. The participants completed MAP testing at their school, as part of a district-wide requirement. The order of test administration was counterbalanced to control for any order effects according to a pre-determined schedule. The testing session took about one hour to complete. For a complete description of GORT-5 test administration and scoring, refer to the materials section.

The administered tests were scored online according to the procedures in their test manuals. The data was entered into a password-protected spreadsheet, kept on the primary investigator's computer, and later transferred into the Statistical Package for the Social Sciences (SPSS) program for analysis.

Videos and test protocols were coded with a subject number to ensure participant privacy. All hand-written data sheets, test protocols, and videos (on a flash drive) were stored in a locked file cabinet and kept separate from the consent forms. All research materials will be kept for a period of three years before being destroyed according to University of North Dakota policy. The primary investigator and the members of the IRB audit team will be the only individuals with access to the filing cabinet.

Materials

Standardized Vocabulary Measures

To gain an overall measure of expressive and receptive vocabulary, *The Peabody Picture Vocabulary Test (PPVT-III)* (1997) and the *Expressive Vocabulary Test- Second Edition (EVT-2)* (2007) were administered. The *Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4; Dunn & Dunn, 2007)* is a standardized test, norm-referenced for children and adults ages 2;6 through 90 years and above. This test measures receptive vocabulary abilities and takes approximately 10-20 minutes to complete. Colored and enlarged picture stimuli are presented to the examinee through the use of a stimulus book, containing 228 test items. The entry point is determined based on the examinee's age. For each item the researcher says a word to the examinee, and he or she is then told to name the number, or point to, the picture that best represents the meaning of the word stated. A field of four choices is given for each word. Scoring is completed throughout the administration by circling given responses on the test protocol. The test is discontinued after a specified ceiling is reached. The total number of errors are summed and converted to standard scores. Responses were recorded on the test protocol.

The *Expressive Vocabulary Test, Second Edition (EVT-2; Williams, 2007)* is also a standardized test, norm-referenced for children and adults ages 2;5 through 90 years and above. This test measures expressive vocabulary and word retrieval. The EVT-2 takes approximately 10-20 minutes to complete. Enlarged and colored stimuli are presented to the examinee through the use of the stimulus book,

containing 190 test items, with the entry point based on the examinee's age. Test items are arranged in increasing levels of difficulty. The examinee is required to verbally answer a question (e.g. "What is this?") corresponding to each picture presented. Answers are scored as a 1 for correct and 0 for incorrect.

Administration of items is continued until a ceiling is reached. The total number of errors are summed and converted to standard scores. Responses were recorded on the test protocol.

Expressive Vocabulary Measure

To measure participants' knowledge of weekly spelling words, they were asked to define each of their spelling words for that week, and use each in a sentence. Participants were presented with words from their most recent weekly spelling word list. The words were read aloud and presented in written form. Participants were first asked to provide a definition for each word. They were told to guess if they are unsure. After the participant provided their definition, the researcher determined the accuracy, based on the ZOT Vocabulary Scoring System. If the participant had no knowledge of the target word, the researcher scored the response as a 0. If the participant was able to give a superficial definition, meaning that it was correct but may not reflect knowledge of the whole meaning, he/she received a score of 1. If the response was correct and reflects knowledge of the entirety of the word, his/her response was scored as a 2. This scoring system reflects the fact that vocabulary learning occurs in increments, rather than in an all-or-nothing fashion (Nagy & Scott, 2000). Next, participants were asked to use the vocabulary word in a sentence. If they were not sure,

participants were instructed to guess. After the participant provided a sentence, the researcher determined the accuracy, based on the ZOT Vocabulary Scoring System. If the participant was unable to use the target word in a sentence, the researcher scored his/her response as a 0. If the participant was able to generally use the word in a sentence, meaning that it was correct but may not reflect knowledge of the whole meaning, he/she received a score of 1. If the response was correct and reflects knowledge of the entirety of the word within the sentence, his/her response was scored as a 2. A participant was given credit for “knowing” a word if they received a combined score of 3 or 4. The reliability of ZOT Vocabulary Scoring System has been established in a pilot study using college-aged students (Robinson, 2013).

Data Analysis

Two types of statistical procedures were used to analyze the data. Descriptive statistics, including mean, standard deviation, and range were collected for all variables of interest.

To determine the percentage of vocabulary words known from weekly spelling lists, the number of correct responses were converted to a percentage. Analysis also included percentage of correct usage. These figures were calculated for definitions of the targeted words and the sentences generated. This percentage determined the student’s knowledge of the targeted vocabulary words.

These variables were also subject to a correlation coefficient analysis that consisted of the Pearson-r test to determine the degree of relationship between the ZOT Vocabulary Scoring System and the PPVT and EVT. This analysis was used to determine if their responses were due to learning in the classroom or the students' own vocabulary lexicon. Inter-rater reliability was also calculated. The data is presented in narrative form as well as in tables and graphs in Chapter Four.

CHAPTER IV

RESULTS

Description of Variables

Descriptive statistics were generated through the use of the Statistical Package for the Social Sciences (SPSS) program, version 21, for all variables of interest. The mean, standard deviation, and range of spelling words known were calculated and are presented in Table 1.

Table 1

Percentage of Spelling Words Known by the Participants (N=27)

	Range	Mean	Std. Deviation
Words Known	35-100	75.34	20.38

Twenty-eight participants from seven Grand Forks Public Schools completed the study; however, one student was excluded from the results because the participant used a different spelling program.

The ZOT (Robinson, 2013), a researcher-designed vocabulary measure, was administered to all participants using their weekly spelling lists as test items. The participants were required to define each word, and use it in a sentence. Each word was scored on a 0-4 point scale. Two points are possible for the definition

and two points are possible for the sentence portion. A score of three or four points was determined to be a “correct score,” meaning the student knew the meaning of the word. The number of words scored as correct were added together and converted to a percentage (see Figure 1). The percentage of words known ranged from 35-100, meaning that some students were able to define all of their spelling words, while others were able to define only a few spelling words. Although students demonstrated variability in the accuracy of vocabulary knowledge, the average score was 75.34%, meaning they were able to define or use 75% of their weekly spelling words correctly as can be seen in Figure 1. Five out of twenty-seven students knew all of their spelling words and five out of twenty-seven students knew the meaning of less than 50% of their spelling words.

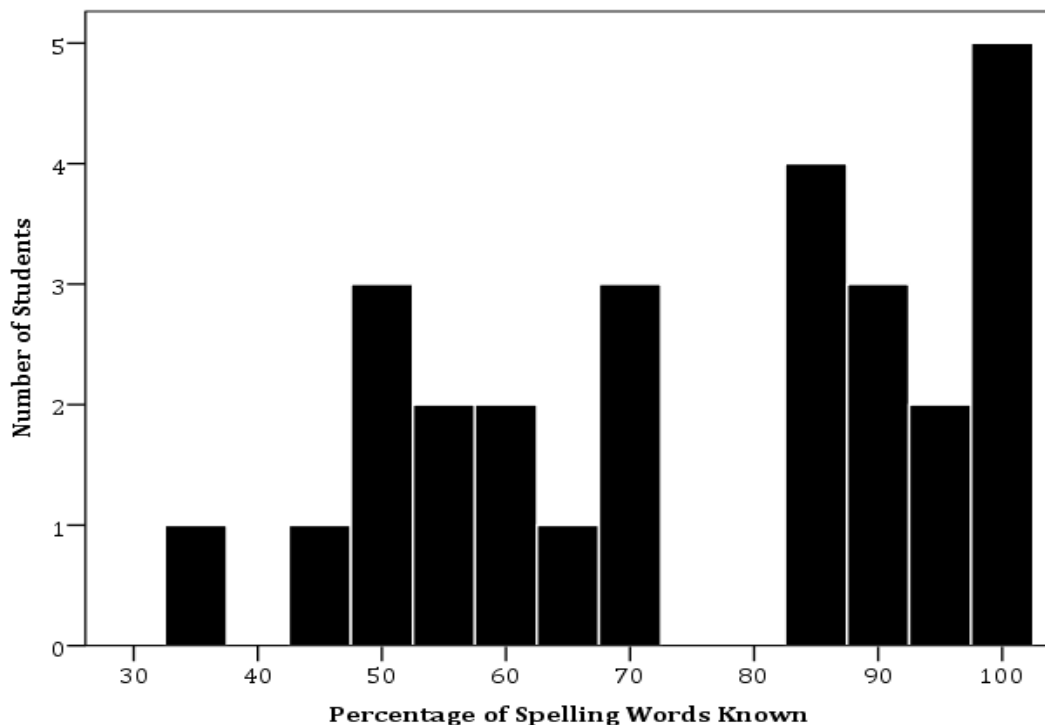


Figure 1. A Histogram of Percentage of Spelling Words Known by Participants

Inter-rater reliability for the ZOT was calculated on 52% of the sample. The first rater scored the responses online during the initial testing session. A second rater scored responses while viewing the recorded video. The second rater was blind to the first rater's score. The total vocabulary score for each subject was summed and compared. A correlational analysis of inter-rater reliability yielded a Pearson $r = .98$.

The range, mean, and standard deviation of standardized test scores (PPVT-4 and EVT-2) were also calculated and are presented in Table 2. Raw scores were calculated for each standardized measures and converted to standard scores, according to the PPVT-4 and EVT-2 test manuals. Standard scores between 85-115 are considered to be within the average range (PPVT-4; Dunn & Dunn, 2007; EVT-2; Williams, 2007). The range of scores for participants in this study was 90-132 on the EVT-2 and 91-149 on the PPVT-4. These scores are slightly higher than the published norms. The mean score, however, fell within average for both standardized tests.

Table 2

Descriptive Statistics from Standardized Measures (N= 27)

	Range	Mean	Std. Deviation
EVT-2	90-132	112.22	12.04
PPVT-4	91-149	115.67	15.45

Students' Overall Vocabulary Knowledge Compared to Spelling Word Knowledge

In an effort to determine if spelling word knowledge was an artifact of the students' vocabulary or if indirect word learning had occurred, students' percentage of known spelling words was compared to standardized vocabulary scores. When comparing students' ZOT scores (measure of known spelling words) to standardized vocabulary scores on the PPVT-4 and EVT-2, the correlations were not significant for either measure. Correlations are presented in Table 3.

Table 3

Correlation of Spelling Words Known to Overall Vocabulary Knowledge

	N	Pearson r	r ²
EVT-2	27	.32	.10
PPVT-4	27	.34	.12

Since the correlation was not significant, results would suggest that the students' score on the ZOT reflects learned vocabulary and is not simply an artifact of their general vocabulary abilities. Table 4 illustrates these findings by showing the performance of selected students. For example, Student A scored above average on the PPVT-4 and EVT-2, but performed poorly when asked to define and use his spelling words. On the other hand, Student D scored lower than Student A on the PPVT-4 and EVT-2, but was able to define and use 100% of his spelling words. The scores indicate variability.

Table 4

Exemplars of Student Scores

	PPVT-4	EVT-2	Percentage of Spelling Words Known
Student A	123	128	45%
Student B	95	99	55%
Student C	118	124	100%
Student D	108	94	100%

CHAPTER V

DISCUSSION

Reading Street teaches vocabulary in two ways. First, vocabulary is taught indirectly within the context of literary lessons, which includes a variety of texts, including fiction, biographies, poems, and online reading. Second, it is taught in an explicit way through independent worksheets targeting the specific words. This approach is debated by researchers, but supported by the current findings. In this study, students were able to define, or use in the correct context, 75% of their weekly spelling words. This was measured across different spelling lists. The percentage was higher than expected, given the fact that previous research has showed that vocabulary learning was context dependent (Nagy et al., 1987). According to the findings of this study, students' knew a high percentage of the meaning of their spelling words. These findings indicate that introducing vocabulary within a context and independent worksheets appear to help expand students' vocabulary.

One could argue that increased vocabulary scores are simply a reflection of overall vocabulary ability. This study demonstrated that vocabulary knowledge was not simply an artifact of the students' general vocabulary abilities. Standardized scores were compared to ZOT scores and found to be non-

significant, indicating that the percentage of words known reflect student learning. Although the range of standardized scores was high, a pattern of high ZOT scores and high standardized scores did not emerge. These findings indicate that although the students who participated in the study achieved high standardized scores (PPVT-4 and EVT-2), their scores did not always correlated to percentage of spelling words known. Students who scored above the average range on standardized measures did not always know all of the definitions to their spelling words.

The study also had limitations, which should be considered when interpreting results. Although research was focused on the students' knowledge of their spelling words, the students' ability to spell the word was not considered. It is possible that a third variable, the amount of time spent studying words, had an effect on vocabulary knowledge.

The study was completed with a sample of students, all of relatively high vocabulary abilities. Although variations of spelling word knowledge were noted despite the high overall vocabulary abilities, it would be beneficial to analyze the percentage of vocabulary words known with a representative sample, including students with lower than average scores on standardized measures. This study should be replicated with a larger sample that includes a wider range of abilities in order to determine if students know the meaning of their spelling words and the correlation between learned vocabulary and overall vocabulary knowledge.

Results of this study indicate that students are able to learn vocabulary through indirect teaching methods and independent worksheets. The clinical implications are not only important for classroom teachers, but speech pathologists as well. If children are able to learn vocabulary words in context and through independent work, students should be able to learn vocabulary without explicit instruction and guidance.

Future research in regards to *Reading Street* and the students' vocabulary knowledge may provide more insight into the effectiveness of *Reading Street* as current method of vocabulary instruction. Research stating that vocabulary growth happens as a result of learning from context while reading has been met with mixed results (Nagy et al.,1987; Sternberg,1987; Swanborn & de Glopper, 2002; NICHD, 2000). More research is needed to determine if the indirect context method is beneficial for all children learning in the classroom.

APPENDICES

APPENDIX A

RECRUITMENT LETTER

U N I V E R S I T Y O F  N O R T H D A K O T A

DEPARTMENT OF COMMUNICATION SCIENCES AND DISORDERS
SPEECH, LANGUAGE AND HEARING CLINIC
MONTGOMERY HALL ROOM 101
290 CENTENNIAL DRIVE STOP 8040
GRAND FORKS, NORTH DAKOTA 58202-8040
(701) 777-3232
FAX (701) 777-4578

Dear Parents/Guardians,

I am a speech-language pathologist and researcher at the University of North Dakota. My research team is conducting a study comparing scores on the MAP test to other clinically administered tests. The MAP test is a computer-based test that is administered by your child's school. If your child chooses to participate, I will need your permission to access these scores. The clinical tests will include one test of reading comprehension and three tests of vocabulary knowledge, one of which entails using your child's current weekly spelling list. For your convenience, my research team can schedule testing sessions at your child's school during after school hours. Weekend and evening sessions are available at UND, as well. Each testing session should last approximately 1 hour. Your child will be compensated with \$20 for their participation.

If your child is interested in participating in this study, please contact me via email: sarah.robinson@und.edu or by phone 701-777-1490.

Thank you,
Sarah Robinson, PhD, CCC-SLP

THE PROGRAM IN SPEECH-LANGUAGE PATHOLOGY IS ACCREDITED BY THE COUNCIL ON
ACADEMIC ACCREDITATION IN AUDIOLOGY AND SPEECH-LANGUAGE PATHOLOGY

UND is an equal opportunity/affirmative action institution

APPENDIX B

CONSENT FORM

PARENTAL CONSENT TO PARTICIPATE IN RESEARCH

TITLE: A comparison of students' reading and vocabulary performance on MAP testing to performance on clinical measures

PROJECT DIRECTOR: Sarah Robinson

PHONE # 777-3723

DEPARTMENT: Communication Sciences and Disorders

STATEMENT OF RESEARCH

A person who is to participate in the research must give his or her informed consent to such participation. This consent must be based on an understanding of the nature and risks of the research. This document provides information that is important for this understanding. Research projects include only subjects who choose to take part. Please take your time in making your decision as to whether to allow your child to participate. If you have questions at any time, please ask.

WHAT IS THE PURPOSE OF THIS STUDY?

We invite your child to take part in a research study conducted by Dr. Sarah Robinson from the Department of Communication Sciences and Disorders at the University of North Dakota. The purpose of the study is to compare your child's score on sections of the MAP test (which s/he takes at school) to tests we are going to give him/her today.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 80 fourth grade students will be selected to participate in this study. All of the students selected will need to complete the MAP testing in May (at school).

HOW LONG WILL MY CHILD BE IN THIS STUDY?

The testing session for this study will take approximately one hour. There will be only one testing session.

WHAT WILL HAPPEN DURING THIS STUDY?

There are two parts to the study.

1. The first part is the testing session. We will administer two standardized tests to evaluate your child's vocabulary abilities and one test to evaluate his/her reading abilities. This testing session will be video recorded.

2. The second part of the study is the MAP testing. The Grand Forks Public Schools administer the MAP testing to all students at school. With your permission, we will access your child's score for the May testing session.

WHAT ARE THE RISKS OF THE STUDY?

Participation in this study involves the following risks.

1. Your child may become uninterested, fatigued or frustrated during the testing session. We will offer appropriate breaks to use the restroom, get a drink of water, or walk around as needed. The tests that we are administering are routinely used by speech-language pathologists during assessments.
2. It is possible that your child may become embarrassed if s/he does not know some of the items being tested. All participants will be assured that the items increase in difficulty and they will not know some or many of the words. They will be encouraged to guess if they are not sure or they will be told to respond "I don't know."
3. Your child may feel uncomfortable being video recorded during the testing session. Students will be assured that only the researcher and the research assistants will have access to the video recordings. They will also be assured that we record sessions so that we can make sure that the evaluator has not made any mistakes.

WHAT ARE THE BENEFITS OF THIS STUDY?

Your child may benefit by knowing that s/he has helped in the research process. You will also have access to your child's vocabulary and reading comprehension scores. In the future, others may benefit by learning about what MAP scores tell educators.

ARE COSTS INVOLVED IN THIS STUDY?

You will not have any costs for allowing your child to participate in this research study. Upon completion of the testing session, your child will receive a \$20 gift card.

WHO IS FUNDING THE STUDY?

The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

CONFIDENTIALITY

Confidentiality will be maintained to the extent allowed by law. We will make every effort to ensure that a loss in confidentiality does not occur. We will store all written records in a locked cabinet. We will store computer files related to your child's data under password protection. When the research program is complete, we will write up the results of the study as a research report. Your child will not be identified in any way except as a subject number. Our research records may be reviewed by Government agencies and the University of North Dakota Institutional Review Board.

IS THIS STUDY VOLUNTARY?

Your child's participation is voluntary. You or your child may choose not to participate or to discontinue participation at any time without penalty. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota.

INJURY DUE TO PARTICIPATION

If your child is injured as a direct result of being in this study, neither the University of North Dakota nor the principal investigator, Sarah Robinson, will pay for any care, lost wages, or provide other financial compensation. Please refer to the “Risks of the Study” section above for a list of possible risks of participating in the study.

CONTACTS AND QUESTIONS?

Sarah Robinson is the researcher conducting this study. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research, please contact Sarah Robinson at 777-3723 during the day.

If you have questions regarding your rights as a research subject, or if you have any concerns or complaints about the research, you may contact the University of North Dakota Institutional Review Board at (701) 777-4279. Please call this number if you cannot reach research staff, or you wish to talk with someone else.

AGREEMENT

The University of North Dakota Institutional Review Board has approved this consent form as signified by the committee’s stamp. This consent form must be reviewed at least once each year and expires on the date indicated on the stamp. Your signature below indicates that you have read the information in this document and have had a chance to ask any questions you have about the study. Your signature also indicates that you have decided to let your child participate, and have been told that you can change your mind and withdraw your consent for your child's participation at any time. You have been given a copy of this consent form to keep. You have been told that by signing this consent form you are not giving up any of your child's legal rights.

NAME OF CHILD PARTICIPANT (please print) AGE DATE

SIGNATURE OF PARENT OR GUARDIAN DATE

SIGNATURE OF INVESTIGATOR DATE

APPENDIX C

ASSENT FORM

TITLE: A comparison of students' reading and vocabulary performance on MAP testing to performance on clinical measures

PROJECT DIRECTOR: Sarah Robinson

PHONE # 777-3723

DEPARTMENT: Communication Sciences and Disorders

I am doing a research study. A research study is a special way to find out about something. I want to find out if kids score the same or different on two tests. If you want to be in this study, you will have to take a vocabulary test where you will first point at pictures of the words that I say and then you will tell me what some words mean. It is OK if you don't know the answers. Some questions are very difficult and it is OK to guess if you aren't sure or just say "I don't know". Next we will talk about your spelling words. I will ask you to tell me what some of the words mean. You will also take a reading test. Some of the things that I ask you to read will be easy for you and other things will be hard. It is OK to guess or say that you don't know. Just try your best. We will video record the testing session so that I can make sure that we have scored your answers correctly.

I want to tell you about some things that may happen to you if you are in this study. You may get tired of answering my questions. Or you may get tired of sitting for a long time. We will take a break in between the tests so that you can stretch, walk around or get a drink of water. If you want to take a break at any other time, you can tell me.

Not everyone who is in this study will benefit. A benefit means that something good happens to you. If you decide to be in the study and take the tests, you will get \$20 cash. You will also be helping with research. I hope that other people will be able to learn something from what we find out in this study.

When we are done with the study, I will write a report about what we find out. I will not use your name in the report. You do not have to be in this study. It is up to you. If you want to be in the study, but change your mind later, you can stop being in the study.

If you want to be in this study, please sign your name.

Your name (printing is OK)

Date

I certify that this study and the procedures involved have been explained in terms the child could understand and that he/she freely assented to participate in the study.

Signature of person obtaining assent

Date

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