1999

Collaboration versus Pull-Out Intervention: Effects on Vocabulary Acquisition and Classroom Communication

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COLLABORATION VERSUS PULL OUT INTERVENTION:

EFFECTS ON VOCABULARY ACQUISITION AND CLASSROOM COMMUNICATION

(TITLE)

BY

JENNIFER J. STURM

1972 -

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF SCIENCE

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1999
YEAR

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COLLABORATION VERSUS PULL-OUT INTERVENTION: EFFECTS ON VOCABULARY ACQUISITION AND CLASSROOM COMMUNICATION

BY JENNIFER J. STURM

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Running Head: COLLABORATION VERSUS PULL-OUT

COLLABORATION VERSUS PULL-OUT INTERVENTION: EFFECTS ON VOCABULARY ACQUISITION AND CLASSROOM COMMUNICATION

By Jennifer J. Sturm

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Abstract

This study investigated improvement in curricular vocabulary in school-aged children grades kindergarten through third at two different elementary schools. One school received collaborative classroom-based language lessons from the teacher and speech-language pathologist (Collaborative School). The other school received regular instruction from the classroom teacher without the input of the speech-language pathologist (Traditional School). The speech-language pathologist provided services to the children with speech or language IEP goals at the Collaborative School primarily in the classroom through these language lessons. The students who received speech or language therapy at the Traditional School received services solely through the pull-out model of intervention. Results revealed that the collaborative classroom-based language lessons fostered greater gains on a curricular vocabulary test than pull-out therapy for children who qualified for speech or language services. Results also indicated that the collaborative classroom-based language lessons were more effective in increasing curricular vocabulary knowledge than regular instruction provided by the teacher alone for subjects who did not qualify for speech or language services. The gains made by the students at the Collaborative School were significantly greater than the improvement demonstrated by subjects at the Traditional School across all four grades and regardless of special services received.

ACKNOWLEDGMENTS

I would like to thank everyone who made this project the success that it was. This project would not have been possible without the support and dedication of the Lincoln and Lerna Elementary School administration and staff. I am very grateful to all of the teachers who went out of their way to fill out all of our paperwork and allow us to finish our testing in a timely manner. I would also like to thank the administration at both elementary schools for being so supportive and allowing us to conduct this research in their schools. I would like to voice my appreciation and admiration for Mrs. Pam Paul, the speech-language pathologist who served both Lincoln and Lerna Elementary Schools at the time of this project. She is not only a wonderful speech therapist, but also a phenomenal teacher, and this project would not have happened if it wasn't for her dedication and sense of humor.

Thank you to all of the graduate and undergraduate students from the CDS Department at Eastern Illinois University who helped with the test administration, especially Kim Wait and Tricia Hardiek for all of the time they committed to the development of the vocabulary test. I also extend my sincere gratitude to Alexis Paramboukas for all of the hard work she put forth not only for her own thesis, but for mine as well.

I extend heartfelt thanks to my committee members, Dr. Mary Anne Hanner and Dr. Robert Augustine for donating their time and wisdom to the organization and writing of this thesis. I owe more than my gratitude to Dr. Rebecca Throneburg and Mrs. Lynn Calvert for being such helpful and supportive professionals as my thesis supervisors. From their example, I learned how wonderful it is to work with other professionals as a team.

I would like to thank my family, my faithful cheering section regardless of what I attempt. Finally, to my husband and best friend, Jonathan, "How sweet it is to be loved by you." Thank you again to everyone.

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CHAPTER I

Introduction

Child language disorders are prevalent in this country, although the extent of the prevalence is difficult to determine because of the overlap with other conditions. According to Goldstein (1996), four and one-half million children with various disabilities were served through the public schools in the 1991-92 school year, 22.2% of whom received speech and language services. Of these children receiving speech and language services, 78.9% were mainstreamed into the regular classroom.

Children spend more of their waking hours in school than almost any other setting between the ages of five and eighteen years (Nelson, 1989). Research has documented that a child's success or failure in school is related to the child's ability to use language to share and create meaning (King, 1984). Children with language disorders are ultimately at risk for dropping out of school and low achievement in general due to limited abilities to succeed in school (Goldstein, 1996).

The focus of speech-language intervention in the school setting has evolved over the last three decades from drill of discreet, isolated skills to functional language for social and academic achievement. Not only has therapy content changed, but the context of intervention has also been altered. The Regular Education Initiative (REI), as well as other legislation, questioned the way in which special education services were delivered (Will, 1986). Traditional service delivery models employed a pull-out method in which the child was removed from the classroom to receive special services. Many authors have proposed that the traditional pull-out model be abandoned in favor of alternative models in the

classroom (Block, 1995; Bruckdorfer, 1995; Cirrin & Penner, 1995; Ferguson, 1991; Miller, 1989; Nelson, 1989; Simon, 1987).

The purpose of delivering services in the classroom is to address communication difficulties within the context of occurrence (Bruckdorfer, 1995). The reported advantages of classroom-based intervention include greater generalization of skills to the classroom and other settings, greater opportunity to practice new skills in the classroom, increased coordination between speech-language and classroom goals, and fewer instances of missed classroom instruction due to special services (Block, 1995; Cirrin & Penner, 1995; Ferguson, 1991; Miller, 1989; Nelson, 1989).

The content of therapy also needs to be considered. Nelson (1989) reported that curriculum-based intervention is ideal because goals are related to the curriculum that the child is already being exposed to in the classroom. The speech-language pathologist avoids imposing an additional set of vocabulary on a speech-language student who may already be struggling with semantic knowledge needed in the classroom.

Treating children for language disorders can be a difficult process, especially since there is little agreement or research on the most effective method of delivering services. Considering the prevalence of children with language disorders in the public schools and the negative impact that even a mild language impairment can have on a child, efficacy research in the area of intervention is needed (Vetter, 1991).

Roberts, Prizant, and McWilliam (1995) investigated the interactions of young children in pull-out versus classroom-based intervention, but did not attempt to demonstrate the efficacy of either therapy setting in their study. In a study by Wilcox,

Kouri, and Caswell (1991), the difference between pull-out and classroom-based treatment data was not significant, but generalization to the home setting following therapy was superior in the preschool children who experienced the classroom-based approach. Valdez and Montgomery (1997) investigated basic concept intervention for preschoolers in Head Start. They also found no differences between classroom-based and pull-out therapy. Ellis, Schlaudecker, and Regimbal (1995), however, offered support for the collaborative consultation approach as the intervention model of choice in the public schools in their study with kindergarten children learning basic concepts through a collaborative effort.

The studies by Roberts, et al. (1995), Wilcox, et al. (1991), Valdez and Montgomery (1997), and Ellis, et al. (1995) are the only research-based investigations that have evaluated different settings of intervention. Comparisons were limited by the scope of children's ages (only preschool and kindergarten students). In addition, only one of these studies investigated the effects of collaboration on the students who did not qualify for speech or language services (Ellis, Schlaudecker, & Regimbal, 1995).

The primary purpose of the present study was to investigate the improvement of vocabulary skills of children who received speech and language services through collaborative classroom-based intervention versus children who received speech and language services through traditional pull-out therapy. The study also examined the difference between the improvement of vocabulary skills of children who did not qualify for speech or language services but participated in collaborative classroom-based language lessons versus children who received instruction provided by the teacher without the involvement of the speech-language pathologist. A secondary purpose of this study was to

examine the difference between the improvement of functional classroom communication skills of children who received collaborative classroom-based language lessons from the teacher and speech-language pathologist versus children who received instruction by the teacher without participation from the speech-language pathologist.

CHAPTER II

Review of Literature

In reviewing the literature for the present study, several areas of research were considered. This chapter begins with a review of general child language intervention to demonstrate the need for efficacy research in this area (Vetter, 1991). A discussion of school-age vocabulary acquisition follows to examine the lexical growth of children and the roles of context and content in learning language (Beck, McKeown, & McCaslin, 1983; Johnson & Anglin, 1995; Nelson, 1989; Oetting, Rice, & Swank, 1995). The review then focuses on the two important variables in creating a service delivery model: the setting in which services are delivered and the role that the providers assume in the intervention. The advantages and disadvantages of two service delivery models are discussed (pull-out and collaboration). Because a specific goal of this study was to compare the collaborative model of intervention with the pull-out model, the remainder of the chapter is devoted to survey results that report the perceptions of speech-language pathologists and teachers using various therapy settings, as well as the few research studies concerning service delivery models.

Language Intervention

Words are concepts that form part of a network of lexical knowledge (Winitz, 1995). The process of learning word meanings begins the day a child is born and continues throughout his or her lifetime (Elshout-Mohr & Van Daalen-Kapteijns, 1987). Vocabulary has been proposed to be the best single indicator of a person's overall level of intelligence, as well as level of reading comprehension (Johnson & Anglin, 1995;

Sternberg, 1987).

Although semantic knowledge may have a large influence in a child's life, relatively little is known about effective intervention methods to increase it. In fact, according to Goldstein (1996), more treatment efficacy studies in the area of childhood language intervention are needed in general. Current language intervention techniques are assumed to be effective because they are based on theories of language acquisition, as well as the nature of the various language disorders (Vetter, 1991).

Goldstein and Hockenberger (1991) noted that 47% of child language intervention studies were conducted with children exhibiting mental retardation and another 26% were conducted with other low incidence disorders, such as autism. Most of the language intervention research has targeted only rudimentary language skills with children under five years of age (Goldstein, 1996). Many other children, such as those with specific language impairment (SLI), are under-represented in the literature.

Vocabulary Acquisition

Semantic vocabulary has been a research interest of psychologists and educational researchers for decades. Studies investigating vocabulary acquisition during the school years have been primarily conducted on word learning through reading/print material (Beck, Perfetti, & McKeown, 1982; Jenkins & Dixon, 1983; Nagy & Herman, 1987).

Johnson and Anglin (1995) focused on the qualitative developments in children's definitions, specifically in content and form. The subjects included 96 children in grades one, three, and five from two elementary schools in Ontario. The 434 words used in the study were systematically selected from Webster's Third New International Dictionary

(1981). The children performed three tasks to demonstrate knowledge of the word in decreasing difficulty: (a) defining the word verbally, (b) using the word in a sentence, and (c) recognizing the meaning given choices. If the child demonstrated knowledge of the meaning of the word at the highest level, the interviewer proceeded to the next word. If the child's response required clarification, a task considered to be less difficult was attempted. Johnson and Anglin found that children demonstrated considerable lexical growth from first to fifth grade. The total word knowledge was estimated by multiplying the total words judged to be in the dictionary by the proportion of the 434 sample words known. Estimates for "high-quality" definitions (generalized expressed knowledge with precise content and form) increased from an estimated 259 words in first grade to over 5,600 words in fifth grade. For all levels of expressed word knowledge, estimates ranged from 6,145 to over 25,000 words. These findings replicate and extend earlier findings of significant growth in vocabulary acquisition in the early school years (e.g. Miller, 1977, 1991; Miller & Gildea, 1987; Nagy & Herman, 1987; Templin, 1957).

There are opposing arguments for the most effective method of vocabulary acquisition. Some researchers suggested that direct instruction was efficient in fostering the acquisition of vocabulary (Anderson, et al., 1985; Beck, Perfetti & McKeown, 1982; Chall, 1983; Gray & Holmes, 1938), whereas others argued that learning word meanings from context was the primary method of vocabulary acquisition (Chomsky, 1972; Herman, et al., 1985; Nagy, et al., 1985). Nagy and Herman (1987) stated that many of the arguments for learning from context are "default arguments" (Jenkins & Dixon, 1983) because it is assumed to be the method for new vocabulary acquisition since no one can

determine how else children might be learning so many new words.

Beck, McKeown, and McCaslin (1983) evaluated the contexts for facilitating vocabulary development in grade school basal readers. They differentiated between two types of contexts: pedagogical and natural. Pedagogical contexts were designed specifically to teach unknown words because they provided cues from which the meanings could be inferred. Natural contexts, on the other hand, referred to any of the contexts that may surround the designated unknown word. This type of context did not intend to convey the word's meaning. These authors found that natural contexts made up the majority of the materials used for vocabulary development in basal readers. In reviewing two programs of basal readers, investigators developed a continuum in which each target word could be classified according to the effectiveness of its natural context. The four categories included: misdirective contexts in which an incorrect meaning may be inferred; nondirective contexts in which no assistance is provided in learning the meaning of the word; general contexts which allow the reader to place the word in a general category of meaning; and directive contexts which are likely to lead the reader to the correct meaning. Beck, McKeown, and McCaslin (1983) evaluated the continuum by selecting two stories, categorizing the contexts surrounding the target words, and then blacking out all of the target words. The selections were subsequently given to 13 adult subjects, who filled in the blanks with missing words. The adults were able to identify 11 out of 13 words classified as directive, but correct identification dropped significantly for the general contexts and even further for the nondirective category. Only one adult was able to identify any word in the misdirective category.

These findings suggest that the natural contexts alone were not sufficient to convey the meaning of the words to the adult reader. Children, therefore, would also require supplemental information to acquire the word meanings. Pedagogical contexts may help facilitate vocabulary development for children by providing the cues needed to infer the meanings of unknown words.

Oetting, Rice, and Swank (1995) stated that the ability to learn words in oral contexts should be viewed as critical for vocabulary development even after children are able to read. Results from several studies suggest that prior exposure to new words increased the likelihood that children learned the words when reading (Jenkins, Stein, & Wysocki, 1984; Nagy, et al., 1987; Nagy, Herman, & Anderson, 1985). The study by Oetting, et al. (1995) examined quick incidental learning (QUIL) of words by children ages six to eight with and without specific language impairment. The subjects consisted of 88 children from one school district in central Kansas. Sixty of the children were identified as developing language normally, whereas the other 28 were classified as SLI. The subjects were divided into three groups. The normally-developing children were randomly assigned to two groups: experimental or control. The SLI children all viewed the experimental stimuli. Two 12 minute video segments were developed, one containing 20 experimental words (novel words), and the second containing 20 control words (familiar words). Children viewed the experimental or control video segments three times. A picture comprehension test similar to the PPVT-R in format was used as a pretest and post-test measure to assess knowledge of the experimental words. Results indicated that quick and incidental learning of new words remained high throughout the early school

years, as evidenced by significant post-test scores and high gains of the novel words. The SLI group scored significantly lower than the normally-developing experimental group, but made greater gains than the normally-developing control group. Object labels showed the greatest gains with respect to patterns of word effects. This finding was also evident in a similar preschool study by Rice and Woodsmall (1988). One difference was noted between the two experimental groups: the SLI group's gains were not significant for the attribute category, and a negative gain was found for the action class.

While Oetting, Rice and Swank's research with quick and incidental learning of words addressed the context of learning language, other authors have suggested that the content of language intervention is also crucial in treating school-age children (Cirrin & Penner, 1995; Miller, 1989; Nelson, 1989). The focus of speech and language therapy has evolved from drill of discreet, isolated skills to functional language for learning and living. Children must be able to achieve curriculum goals to be successful in school. These goals are dependent on effective speech and language skills.

Curriculum-based intervention focuses on functional changes that are relevant to the child's communicative needs in the classroom setting (Nelson, 1989). Speech-language pathologists are able to integrate the communication and curriculum goals more efficiently by utilizing the child's academic program (textbooks, homework assignments, and classroom language) as the content for intervention (Cirrin & Penner, 1995; Miller, 1989).

The effectiveness of curriculum-based intervention depends not only on the targets chosen, but also on the context in which therapy is provided. Therefore, it is important

that an appropriate service delivery model is selected. Two important variables of service delivery models include the setting(s) in which services are delivered and the role(s) that the providers assume in the intervention.

Varying the Setting of Service Delivery

In traditional service delivery, the setting is a separate room such as a therapy room. These "pull-out rooms" are separated from the regular or special education classrooms requiring the child to leave the classroom to receive services. In this highly structured environment, the speech-language pathologist has control over the communication contexts. Distractions can be controlled and opportunities for the child to produce the specific targets can be maximized (Cirrin & Penner, 1995). This model, however, is based on a medical model and evolved from the "speech clinic," in which patients were seen one at a time outside of the natural environment (Miller, 1989).

There are obviously disadvantages to the pull-out model, including: students miss classroom instruction while they are receiving services, there may be little or no coordination between speech-language goals and goals in the classroom, there may be little opportunity to practice new skills in the classroom, and there is a typical lack of generalization of speech-language skills to other settings (Block, 1995; Cirrin & Penner, 1995; Ferguson, 1991; Miller, 1989; Nelson, 1989). Use of this model also neglects the powerful relationship between language success and academic and social success in school (Miller, 1989).

By varying the setting in which services are delivered, a suspected problem can be addressed within the context of occurrence (Bruckdorfer, 1995). Therefore, if children are

experiencing difficulties in the classroom, services should be provided in that setting. There are a number of ways by which this goal can be accomplished. In each of the following models, the setting (classroom) will remain constant. However, the provider role will vary.

Varying Provider Roles in Service Delivery

There has been much confusion over the definitions concerning the provider role in service delivery. There are different approaches in implementing a collaborative model that will also affect the provider role. Various roles within a collaborative model are presented in Appendix A.

Much support for and interest in alternate roles for providers of services has emerged from the regular education initiative (REI), associated with Madeleine Will, former Assistant U.S. Secretary of Education. Will (1986) investigated files from the Office of Special Education and Rehabilitation Services (OSERS) and reported the declining graduation and employment rates for children from special programs. She challenged states to renew their commitment to assist these children in the regular classroom and suggested partnerships be formed by special education, compensatory programs and regular/general education.

In addition to Will's task force study, others have questioned the effectiveness of segregated service delivery (Greer, 1988; Lilly, 1988; Lipsky & Gartner, 1987; Wang, Reynolds, & Wallberg, 1988). Simon (1987) proposed a classroom-based intervention. She stated that language disorders persist and that many times if a child does not have a blatant communication problem, the speech-language pathologist is not contacted. Many

authors have offered support for the use of traditional speech-language service delivery together with a classroom-based or collaborative approach (Eger, 1992; Graden, Casey & Christenson, 1985; Hoskins, 1992; Huffman, 1992; Nelson & Kinnucan-Welsch, 1992). This combination of service delivery options may allow the speech-language pathologist more flexibility in adapting to the needs of the student.

Obstacles to Alternate Provider Roles

Despite the praises for a collaborative model, many speech-language pathologists in the public schools continue to rely solely on the traditional service delivery model, the pull-out session. Many authors have written about the various obstacles to overcome when attempting to implement a collaborative service delivery model.

Block (1995) outlined the problems frequently encountered implementing the collaborative model of service delivery: maintaining familiar roles, not only for the speech-language pathologist, but for the teachers and administrators involved in the process as well; continuing familiar service delivery models because although it may not be the most efficient, it is the most comfortable; time, space, and resources; training and support; and time to feel comfortable with the whole process and feelings of frustration and anxiety that accompany any major change in a routine. Other authors have also discussed similar difficulties in the implementation of the collaborative model (Achilles, Yates, & Freese, 1991; Gutkin, 1993; Magnotta, 1991; Miller, 1989; Russell & Kaderavek, 1993).

Despite the obstacles to implementing the collaborative model, this type of intervention is still believed by many authors to be more effective than traditional pull-out therapy (Block, 1995; Cirrin & Penner, 1995; Ferguson, 1991; Miller, 1989; Nelson, 1989). According to Hoskins (1992), many school speech-language pathologists are now

using an alternative model and collaborating with classroom teachers to help children become more effective communicators in school. Several researchers have surveyed school speech-language pathologists to determine the effects and degree of the implementation of these models.

Survey Results

Some recent surveys have addressed the issue of collaboration as a service delivery model. Elksnin and Capilouto (1994) surveyed speech-language pathologists who had already adopted or were considering adopting an integrated service delivery model. They found that speech-language pathologists most commonly noted their expertise to be language development, while the classroom teacher brought knowledge about curriculum and classroom management. Only 16.7% and 5.6% of those who have adopted the integrated service delivery model reported using this type of intervention to service children with fluency or voice disorders, respectively. Speech-language pathologists were much more likely to use the integrated model to provide language services than any other disorder area. Those who had already adopted the integrated model reported using it primarily with preschoolers and elementary-aged students. Few reported use of the model with adolescents. The factors identified as most important for an effective integrated model were knowledge and skills of the speech-language pathologist and classroom teacher, time to plan, and administrative support. The advantages of this model perceived by the speech-language pathologists included carryover of speech and language skills, and increased knowledge of the relationship between language and academics. Disadvantages perceived by those surveyed included extra planning time required, and difficulty

incorporating IEP goals.

Another survey by Beck and Dennis (1997) studied the perceptions of speech-language pathologists and classroom teachers regarding classroom-based intervention. While they found that there were many areas of agreement between these two groups of professionals, differences between ratings were found in the area of classroom management and data collection. The authors suggested that these differences may be attributed to the varying skills of the members of the two groups. Many other items were rated similarly by speech-language pathologists and teachers. They agreed on the primary advantages of classroom-based intervention including enhanced turntaking skills exhibited in the classroom, as well as increased attention and listening skills. Both groups also identified problems in coordinating planning time for the intervention. Finally, the two groups similarly ranked the models of classroom-based intervention according to appropriateness and effectiveness. An interesting finding was that while there was agreement on the most effective model to be used, it was not the model reported as most frequently used. Many reported that they employ the "one teach, one drift" model, but described it as less effective than the team teaching approach which places the greatest emphasis on working as a team.

Research on Different Service Delivery Models

Many speech-language pathologists report using some type of collaborative model, and public laws have declared the necessity of an integrated approach to service delivery. Still, studies that have investigated the effectiveness of collaboration are sparse. A few studies have been conducted with preschool-aged children to determine the effects of

individual or direct therapy as compared to classroom-based or indirect therapy.

Roberts, Prizant, and McWilliam (1995) focused on pull-out versus classroom language intervention to determine the effects on communication skills in young children. The subjects included 15 children ages one to five years, with disabilities who attended a mainstreamed daycare program at a university. The children had mild or moderate cognitive and developmental delays. Children were assigned to classrooms by age, and each classroom included children with disabilities as well as normally-developing children. The ABILITIES Index (Simmeonson & Bailey, 1980) and Battelle Developmental Inventory (Newborg, Stock, Wneck, Guidubaldi, & Svinicke, 1984) were used to match children with disabilities according to their developmental profiles. Prior to the treatment, several parameters of the groups were compared using t-tests. The groups did not differ significantly in chronological age, the 10 areas of the profile on the ABILITIES Index, developmental age or standard scores on the Battelle (receptive, expressive and overall), and developmental or standard scores on the Sequenced Inventory of Communication Disorders - Revised (SICD-R). Children received two 25 minute sessions of language therapy a week in either the classroom or pull-out setting. Pull-out services were defined as: (a) treatment received away from the classroom in a treatment room, (b) a one-to-one setting was used, and (c) the classroom teacher was not present during treatment. Classroom services were defined as: (a) treatment sessions occurred in the classroom where other children were playing, (b) peers were present during the session 80% of the time, and (c) the teacher was involved in the session (observing, consulting, leading or jointly working with speech-language pathologist) 80% of the time. The intervention

procedures in both groups were similar with a common curriculum and consistent schedule. Two consecutive sessions for each child were videotaped and analyzed using the Systematic Analysis of Language Transcripts (SALT). Turn taking skills were also evaluated.

Roberts, Prizant, and McWilliam (1995) found that speech-language pathologists took significantly more turns in the pull-out model than during the classroom sessions. However, the style of interaction did not differ in the two types of sessions, and aspects of conversation considered to be nurturing or facilitating were similar in both. Likewise, children complied more in the pull-out group than in the classroom group. This description is validated by the investigators stating that the children were probably more distracted in the classroom where they were surrounded by other children than in the one-on-one treatment room situation. In addition, no significant differences in the number of turns or language functions existed between the two groups of children. This finding is encouraging because often speech-language pathologists express concern about the opportunities to practice treatment targets during classroom sessions. The data in this study did not answer treatment efficacy questions. However, they do describe differences in the interactions between speech-language pathologists and children due to the characteristics of the setting.

Wilcox, Kouri, and Caswell (1991) also studied the effects of the setting in which services are delivered. They evaluated the effectiveness of pull-out versus classroom treatment with preschool children diagnosed with language delays. The subjects consisted of 20 preschoolers, ages 20 to 47 months. These children scored at least 1.5 standard

deviations below the mean for their chronological age on the receptive and expressive sections of the Sequenced Inventory of Communication Development (SICD) or the communication portion of the Battelle Developmental Inventory. The children's language abilities were limited to single-word utterances with productive expressive vocabularies estimated between two to 21 words as evidenced by parental reports and mother-child language sampling. The investigators operationally defined the children's productive words as: (a) those with phonetically consistent form, (b) those that included at least one consonant found in the adult form of the word, and (c) those used in at least three different contexts across the sampling session. Services were provided twice a week for a total of 24 pull-out and classroom sessions. Pull-out sessions were scheduled for 45 minutes, while classroom sessions spanned an entire morning (9:00 to 12:00). Interactive modeling techniques were used as the intervention strategy in which the clinician followed the child's lead and provided intensive modeling of target words. All children received at least 10 models of each of their target words during each session.

Wilcox, Kouri, and Caswell (1991) found that the children who had received the classroom-based intervention showed superior generalization to the home. The results also demonstrated that the children used the target words according to criteria for productive use more often in the treatment setting than at home. This finding was true for both treatment groups. Finally, the authors discovered variation in the subjects. Three children displayed very little learning despite intervention. This study demonstrated that, when evaluating the treatment data alone, classroom-based lexical training with preschool children was just as effective as individual treatment in a pull-out setting.

A recent study by Valdez and Montgomery (1997) reported findings similar to those presented by Wilcox, Kouri, and Caswell (1995). Valdez and Montgomery were interested in outcomes for preschool children with language deficits in two different treatment approaches. Forty subjects out of 160 students placed in Head Start were determined to have language disorders based on the Clinical Evaluation of Language Fundamentals (CELF - Preschool) (Wiig, Secord, & Semel, 1991). The evaluation results were used to stratify students according to severity of language disorders to utilize a randomized block design. This design ensured that equal numbers of children from each severity level (mild, moderate, and severe) were placed in either the classroom-based or the pull-out setting at the onset of the study. There were two groups for each treatment approach. Treatment targeting basic concepts was provided by two certified speech-language pathologists for 90 minutes one day each week over a six month period for a total of 36 hours of intervention. Basic concept activities were the same from the classroom-based and pull-out settings. Following the six month intervention period, the CELF-Preschool was re-administered to determine improvement in language skills as evidenced by gains made on this measure. Children in the pull-out setting demonstrated slightly higher mean gains in receptive and expressive language scores than subjects in the classroom-based intervention. However, the authors concluded that these differences were not clinically significant, and statistical analysis was not applied. Greater mean gains were reported in one subtest related to the targeted material (basic concepts) than in the other five subtests of the CELF - Preschool for both the classroom-based and pull-out groups.

Ellis, Schlaudecker, and Regimbal (1995) were interested in the effects of

collaborative consultation on basic concept instruction with kindergarten children. Forty kindergarten children participated in the study with ages ranging from 5:4 to 7:2. The subjects were randomly placed into one of two kindergarten classes at the beginning of the school year. One kindergarten class served as the experimental group, and the other class was the control group. During collaboration, the school speech-language pathologist, the university physical education faculty member, the kindergarten teacher, and the grade school physical education teacher met to plan the intervention and select the list of concepts to be taught. Nine concepts were chosen as targets for the duration of the study and were taught for eight consecutive weeks. The teacher of the control class was not aware of the study and continued to teach the class from the regular curriculum. Both groups were tested with the Boehm Test of Basic Concepts-Revised upon conclusion of the intervention. The authors found a significant difference between the experimental and control groups, with the experimental group scoring higher on the nine target concepts. This study offers empirical support for the effectiveness of collaborative consultation as a service delivery model of choice in the public schools for the classroom as a whole, but did not differentiate the progress of the children with speech and language IEP goals from the "normal" children.

Summary and Statement of Objectives

Many authors have suggested using collaborative classroom-based intervention in addition to pull-out services for children with speech and language IEP goals in the public schools (Eger, 1992; Graden, Casey & Christenson, 1985; Hoskins, 1992; Huffman, 1992; Nelson & Kinnucan-Welsch, 1992). The advantages to this approach include: coordination

between speech-language goals and goals in the classroom, treatment of the problem within the context it occurs, and greater generalization of speech-language skills to other settings. Providing services in the classroom also allows the speech-language pathologist to work with children who may be "at risk" for communication difficulties, but have not been identified with speech and language IEP goals. Surveys have shown that teachers and speech-language pathologists believe that classroom-based intervention enhances turntaking skills and overall communication skills in the classroom and that collaborative services are most frequently implemented to target language skills (Beck & Dennis, 1997).

The few research studies on collaboration or some alternate service delivery model have offered support for this type of model, suggesting that it is at least comparable to the traditional pull-out model, but limitations to these studies exist. The investigations have been done only with young children, preschoolers or kindergartners. In addition, the targets chosen in many cases are limited. For example, in the study by Wilcox, Kouri, and Caswell (1991), a small core of 10 words was chosen for each child, and only nine concepts were targeted in the study by Ellis, Schlaudecker, and Regimbal (1995).

There has not been a study investigating the effects of the collaborative service delivery model on different age groups of school-aged children. In addition, no study has targeted the curriculum in the intervention, probably due to the young ages of the subjects. Another area of interest that is lacking in the literature is an indication of changes in classroom performance as evidenced by communicative skills in the classroom following collaborative curriculum-based intervention.

The purpose of the present investigation was to compare the pull-out model of

service delivery with collaborative intervention provided in the classroom for children in grades kindergarten through third. It will specifically address the following questions:

1. Is there a significant difference between the improvement of vocabulary skills of children who received speech and language services through collaborative classroom-based intervention and children who received speech and language services through traditional pull-out intervention?
2. For children who did not qualify for speech or language services, is there a significant difference between the improvement of vocabulary skills of those who participated in collaborative classroom-based language lessons and those who received instruction provided by the teacher without involvement of the speech-language pathologist?
3. Is there a significant difference in improvement of functional classroom communication skills between children who received collaborative classroom-based language lessons and children who received instruction provided by the teacher without involvement of the speech-language pathologist?

CHAPTER III

Methods

Overview

The primary purpose of this study was to compare the pull-out model of speech and language service delivery with collaborative intervention provided in the classroom. Another purpose was to compare the collaborative approach with traditional instruction provided by the classroom teacher without participation from the speech-language pathologist. The effects of the intervention were measured using a test of curricular vocabulary knowledge administered before and after intervention. Additional information regarding effects of the intervention was collected through teacher ratings of students' functional classroom communication skills at the beginning and end of the Spring Semester, 1998 using the Student Rating Scale (Hoskins, 1990).

Subjects

Subjects were children with signed parental permission slips (see Appendix B) enrolled in kindergarten through third grades at Lerna Elementary School (referred to as the Collaborative School in this study) and Lincoln Elementary School (referred to as the Traditional School in this study), located in east central Illinois. Mean ages and ranges for subjects in each grade at both schools are included in Table 1.

The mean ages for the subjects in each grade level are similar between the two schools. The outliers from these means were either retained one year or transferred from another state with different school entrance age requirements.

Table 1

Age Means and Ranges for Subjects in Years and Months as well as the Number of Children in Each Classroom who Participated in the Study

Grade		Collaborative School	Traditional School
K	mean age	5.79	5.70
	age range	5.08 - 6.11	5.09 - 6.10
	n	19	11
1st	mean age	6.93	6.79
	age range	6.09 - 8.00	6.08 - 7.11
	n	16	11
2nd	mean age	7.85	7.62
	age range	7.08 - 8.06	7.08 - 8.06
	n	16	9
3rd	mean age	8.63	8.58
	age range	8.07 - 10.03	8.08 - 9.10
	n	23	12

Table 2 contains information regarding special services received by subjects from the Collaborative and Traditional Schools in this study. The categories included language-based therapy provided by the speech-language pathologist; services provided by the speech-language pathologist that were not language-based, such as articulation and voice therapy; academic assistance that was not provided by the speech-language pathologist; and no special services received .

Table 2

Number of Subjects Receiving Special Services at the Collaborative and Traditional Schools

Type of Service	n at Collaborative	n at Traditional
language therapy from SLP	5	6
speech therapy from SLP	7	3
academic assistance without the SLP	12	7
no special services	50	27
TOTALS	74	43

The criterion for identifying children who are appropriate for language intervention at both elementary schools was scoring one standard deviation or more below the mean on two different language tests. The criterion for a child to be identified as being appropriate for articulation intervention at both elementary schools was scoring one standard deviation or more below the mean on one test of articulation. Children who received both language and articulation or voice therapy were placed in the language-based therapy category.

The category of special services, additional academic assistance, included subjects receiving services for learning disabilities in reading and/or math, children placed in Reading Recovery, and children who qualified for Title I services. Children at both schools included in this study who qualified for learning disability services were determined according to eligibility criteria established by the Illinois State Board of Education. The criteria require a significant discrepancy between ability and achievement as evidenced by

formal evaluation that demonstrates average intelligence with deficits apparent in learning processing skills. Reading Recovery is a special program for students in first grade only. It is an intensive one to one program designed to help young children who are at risk for reading difficulties before the problem escalates. Criteria for Reading Recovery is based on a class ranking according to reading scores from the Iowa Test of Basic Skills (ITBS). Children in Title I are placed according to standardized achievement tests scores, including the ITBS math and reading subtests. Classroom performance and teacher recommendations are also considered when determining Title I and learning disability status.

If the children included in this study received speech or language services as well as another special service that did not involve the speech-language pathologist, they were placed in the appropriate speech or language group. For example, if a child received language therapy from the speech-language pathologist and was also eligible for learning disability services, the child was categorized in the language group.

Intervention

All children in each grade at each school were exposed to the same curricular units during the time that the study was conducted. Prior to the 1998 Spring Semester the speech-language pathologist who served both elementary schools met with the classroom teachers individually to discuss the curriculum for that semester to ensure that the specific curricular units targeted in the intervention at the Collaborative School during the 1998 Spring Semester were consistent with those taught by the regular education teachers at the Traditional School.

The students at the two elementary schools participating in the study were exposed to one of the two types of intervention models investigated. The subjects were grouped as depicted in Table 3. For each group, the role of the speech-language pathologist is also described in this table.

Table 3

Groups of Subjects and Intervention Models

Collaborative School K - 3		Traditional School K - 3	
Group:	not qualifying for SLP services	Group:	not qualifying for SLP services
SLP role:	collaborating and in the classroom	SLP role:	not involved (control for group1A)
Group:	receiving SLP services	Group:	receiving SLP services
SLP role:	provides services primarily in the classroom with collaboration	SLP role:	provides services in pull-out therapy only

Collaborative School (Collaborative Intervention)

Children in each of the four classes participating at the Collaborative School received instruction in the classroom from the classroom teacher, the speech-language pathologist, and two graduate students in the Department of Communication Disorders & Sciences from Eastern Illinois University. This instruction targeted vocabulary from the curriculum for each grade in language activities provided for 40 minutes per week for 12 weeks during the 1998 Spring Semester.

The teachers and speech-language pathologist met at the beginning of the semester to generally plan the collaborative activities for the semester. They also collaborated

during regularly scheduled meetings throughout the semester to specifically plan the intervention and activities that were implemented to target the vocabulary words from the curriculum and to share materials, data, and knowledge. The collaboration meetings were scheduled for 40 minutes every week for each of the four classroom teachers (a total planning time of 160 minutes for the speech-language pathologist). The graduate students were included in the collaborative meetings.

Each week the language activity, referred to as language labs, targeted a minimum of five vocabulary words from the curricular units that were targeted at both schools during the Spring Semester, 1998. A total of over 60 words were targeted in each grade over the course of the semester. Appendix C contains a list of the vocabulary words specifically targeted for each grade. Additionally, the language activities included the specific speech and language goals of the children with IEPs and general classroom communication skills such as listening and verbal expression.

The language activities began with an introduction of the vocabulary words to the class. The entire class received instruction on the curriculum unit from the teacher, speech-language pathologist, and graduate students. The students then engaged in a participatory activity based on the topic discussed. For selected activities the children were divided into groups to complete the required work because some activities demanded more space than was allowed in the classroom. For these activities, one adult (teacher, speech-language pathologist, or graduate student) worked with one to three groups depending on the size and number of groups.

In addition to this intervention in the classroom, the children at the Collaborative

School with speech and language IEP goals received 15 minutes of pull-out therapy a week to meet the number of minutes per week recorded on the IEP. The pull-out therapy also implemented vocabulary from the curriculum to target each student's goals.

Traditional School (Pull-out and Control Conditions)

The children at the Traditional School with speech and language IEP goals (Group 2B) received curriculum-based intervention in two 25-minute periods per week to meet the number of minutes per week recorded on the IEP. The number of minutes per week recorded on the IEP was equivalent for students receiving speech and language services at both elementary schools. The intervention was provided to children individually or in small groups in a traditional pull-out model of therapy, away from the classroom environment. The therapy targeted the speech and language goals while using material from the curriculum. The materials used in the pull-out sessions at the Traditional School were the same as those used in the classroom and pull-out sessions at the Collaborative School.

Four classes of children, grades kindergarten through third at the Traditional School served as the control group. They were exposed to vocabulary from the curriculum in the classroom setting with instruction from the teacher. The speech-language pathologist provided no vocabulary instruction in the classroom to this group.

Test of Curricular Vocabulary

Assessment of vocabulary words from the curriculum was performed using a test specially designed for each of the four grades assessed. Testing was completed on every child in each classroom with a signed permission slip (71 children at Lerna and 48 children at Lincoln) at the beginning and end of the Spring Semester, 1998.

Twenty words from each grade level were randomly selected for the test from the pool of over 60 words targeted for each grade level. All words in the test were included in the curriculum at both schools during the Spring Semester, 1998. The teachers did not assist in testing and were not aware of which words were included in the test instrument. Appendix D contains a copy of the vocabulary test for each grade. A pilot test was administered to five children at each grade level in December 1997. As a result of the pilot test, modifications of this original word list were made to remove words that were determined to be too difficult or too easily defined. If none of the five students received points for the definition or sentence tasks and only half responded correctly for the multiple choice task for any of the test items, the word was determined to be too difficult for that grade level. If four of the five students responded to the most difficult task with a complete definition for any of the test items, the word was determined to be too easy for that grade level.

Examiners

Testing was completed by two certified speech-language pathologists employed at a university, four undergraduate and three graduate students in Communication Disorders and Sciences at Eastern Illinois University. All examiners met prior to testing to train on testing procedures.

Test Procedure

All 20 vocabulary test items were administered to each child. The format of the test was intended to be sensitive to different levels of understanding of the vocabulary through a hierarchical earning of points, similar to that used by Johnson and Anglin

(1995). The child was asked to demonstrate knowledge of each word in up to three tasks including (a) defining the word verbally, (b) using the word in a sentence, and (c) recognizing the word's meaning from two choices.

For each word the child was first asked, "What does the word _(test item)_ mean?" If the child's response indicated sufficient knowledge of the word, the examiner then asked about the next word on the list. If the child's response required clarification, the prompt, "Tell me more about the word _(test item)_" was used. This prompt was used no more than once for each definition. If the child was still not able to produce a complete, accurate definition, the examiner progressed to the next task for the same word and stated, "Use the word _(test item)_ in a sentence?" If the child was able to produce a complete and accurate sentence using the word, the examiner advanced to the next word on the list. If not, the child was given the opportunity to choose the word's meaning from two definitions provided verbally by the examiner. The examiner asked, "Does _(test item)_ mean _(definition A)_ or _(definition B)_?" These carrier phrases were used with every task for every word.

In addition to the carrier phrases used, an example was given for each task when the child was first required to complete that task. The example for each task was given no more than three times throughout the 20 item test for each child.

Scoring

Definitions

The verbal definitions were scored as correct using guidelines similar to criteria in the oral vocabulary subtest of the Test of Language Development - Primary (Newcomer &

Hammill, 1988). Six points were awarded for a correct definition (e.g., "frozen water" to define "ice") or two less-descriptive characteristics of the word such as attributes, function, or location (e.g., "it's very cold and you skate on it" to define "ice"). Guidelines for acceptable and unacceptable responses were developed by two investigators to ensure consistency while scoring the pre-tests from the audiotapes as well as the post-tests. These guidelines are included in Appendix E. If the child was unable to produce either the precise definition or two less-descriptive characteristics of the word, no points were awarded for the definition, but the child had an opportunity to earn points with the next task.

Sentences

Four categories of responses for the sentence task were possible: precise sentence, vague sentence, incorrect sentence, or no response. A precise sentence was operationally defined as a complete sentence that offered evidence of the child's knowledge of the word's meaning (e.g., "I need ice to make my drink cold."). A vague sentence was operationally defined as a sentence that was complete and displayed that the child had an understanding of the correct part of speech for the word (noun, verb, etc.), but did not demonstrate the child's knowledge of the word's meaning (e.g., "I have some ice."). An incorrect sentence was one that demonstrates the child had the wrong meaning for the word or used it incorrectly in the sentence (e.g., "The ice is too hot," or "I ice you."). Finally, the last category was no response from the child. If the child did not respond or responded with an incorrect sentence, no points were awarded. The child received three points for the precise or vague sentence. If no points were awarded for the sentence task,

the child still had an opportunity to earn a point for the multiple choice task.

Multiple Choice

The child was asked to identify the correct meaning from two choices. Therefore, the child received one point for the correct answer and no points for an incorrect answer. The total score for the test was calculated for each subject. A maximum score of 120 points was possible.

Recording

The nine examiners recorded a plus/minus tally for correct/incorrect responses for each task performed by each subject during testing. All testing was audiotaped.

Two examiners scored 87% of the vocabulary pre-tests from the audiotapes. Thirteen percent of the pre-tests could not be scored from the audiotapes due to poor tape quality or incomplete recordings. In these situations, the judgements of the initial examiner were accepted as correct. Two examiners each re-scored 10% of the tests to calculate inter- and intrajudge reliability. A Pearson Product Moment Correlation determined the intrajudge reliability of the first investigator was .99, the intrajudge reliability of the second investigator was .99, and the interjudge reliability between the two investigators was .97.

An additional training session was held prior to post-testing due to the addition of two inexperienced examiners, both of which were graduate students. Guidelines of acceptable and unacceptable responses were distributed to all examiners (Appendix D). All testing following the 12 week treatment period was audiotaped. The two primary investigators scored 100% of the post-tests either in the live testing environment or via the audiotapes.

Rating Scale of Functional Classroom Communication Skills

In addition to the vocabulary test, teachers were asked to judge each student's communication performance in the classroom at the beginning and end of Spring Semester, 1998 using a 10 item rating scale (see Appendix F). This Lickert scale allowed teachers to rate their students' classroom communicative skills (Hoskins, 1990). The Student Rating Scale focused on the teachers' perceptions of students' abilities to understand the vocabulary used in the classroom, formulate clear descriptions, and attend to classroom discussions. In addition, the teachers were asked to rate each student's overall classroom communication using a 1 through 10 scale.

CHAPTER IV

Results

Vocabulary Test Results

Subjects Receiving Speech or Language Services

Results were obtained by comparing the difference between mean pre- and post-vocabulary test scores. Group means for the vocabulary pre- and post-tests were first calculated for subjects who received speech or language services. The means for the pre- and post-vocabulary tests as well as the test gain are presented in Table 4.

Table 4

Group Means and Standard Deviations for Vocabulary Scores for Subjects According to Speech-Language Services Received in Two Types of Service Delivery Models

School	Type of Service	Vocabulary Pre-Test	Vocabulary Post-Test	Test Gain
Collaborative	speech	60.43 (16.28)	101.29 (13.33)	40.86 (16.30)
	n = 7			
	language	37.60 (20.14)	89.60 (27.73)	52.00 (14.61)
	n = 5			
Traditional	speech	66.67 (5.03)	98.33 (9.45)	31.67 (14.19)
	n = 3			
	language	38.00 (22.47)	62.33 (25.62)	24.33 (5.85)
	n = 6			

Note. Subjects who received both speech and language therapy were included with the language group. Standard deviations reported in parenthesis.

Vocabulary pretest group means were higher for subjects who received speech services than for the subjects who received language therapy from the speech-language pathologist in either of the two settings. Subjects who received speech therapy earned vocabulary pretest means in the lower to middle sixties (M = 60.43 and 66.67 for Collaborative and Traditional Schools, respectively) while those who required language services scored in the upper thirties (M = 37 and 38 for Collaborative and Traditional Schools, respectively). However, patterns of scores were similar between schools prior to intervention for subjects who received speech or language services.

Following the 12 weeks of intervention, subjects who received therapy for speech or language primarily in the collaborative setting made greater mean gains on the vocabulary test than the subjects at the Traditional School who received speech or language service in pull-out therapy alone. The average gains made by subjects who received speech or language services primarily in the collaborative setting was approximately 45 points. The average gains made by subjects receiving speech or language services exclusively through pull-out therapy were substantially lower at approximately 28 points.

The students who required language services were a primary concern to this investigation since the study focused on semantic knowledge. The subjects who received language therapy primarily in the classroom through collaboration demonstrated the greatest mean gain of the four groups of subjects who received speech or language therapy and more than doubled their vocabulary pre-test means. Although the language subgroups at both schools produced the lowest vocabulary scores initially, this subgroup

of subjects at the Collaborative School made such significant gains on the vocabulary test that their scores were very similar to all other subgroups considered previously at the Collaborative School, including subjects in regular education (M = 89.60, 96.36 on post-test for language and regular education subjects, respectively).

The difference between test score gains was evaluated for subjects who received speech or language services in the collaborative classroom-based setting and the subjects who received pull-out therapy at the Traditional School. A one-way analysis of variance (ANOVA) revealed a statistically significant difference between these two groups, with more significant gains made in collaborative intervention than pull-out therapy, F (1,19) = 9.8068; p = .0055.

Subjects Not Qualifying for Speech or Language Services

In the second step of data summary, group means for the vocabulary pre- and post-tests were calculated for the subjects who did not qualify for speech or language services from the speech-language pathologist. In addition, the means for the difference between the pre- and post-vocabulary tests were determined and are presented in Table 6. The mean vocabulary post-test scores following 12 weeks of instruction for subjects who did not qualify for speech or language services are presented in the second column of Table 5. Mean vocabulary test gains were calculated by determining the difference between pre- and post-test scores and are presented in the third column of Table 5.

Table 5

Group Means and Standard Deviations for Vocabulary Scores for Subjects Not Qualifying for Speech or Language Services

grade	School	Vocabulary Pre-Test	Vocabulary Post-Test	Test Gain
K	Collaborative	54.76 (17.50)	83.65 (15.98)	28.88 (11.38)
	n = 17			
	Traditional	47.80 (20.41)	57.60 (19.41)	9.80 (10.23)
	n = 5			
1st	Collaborative	74.36 (14.57)	94.64 (12.90)	20.29 (13.45)
	n = 14			
	Traditional	73.27 (17.20)	82.27 (18.31)	9.00 (15.01)
	n = 11			
2nd	Collaborative	74.08 (14.98)	107.75 (6.82)	33.67 (11.63)
	n = 12			
	Traditional	78.00 (16.98)	89.63 (14.24)	11.63 (14.53)
	n = 8			
3rd	Collaborative	71.21 (13.46)	101.58 (14.56)	30.37 (13.20)
	n = 19			
	Traditional	71.00 (14.72)	82.10 (15.31)	11.10 (9.23)
	n = 10			

Note. Standard deviations are reported in parenthesis.

All group means at both schools improved to some degree following the intervention period. The subjects who did not qualify for speech or language services but

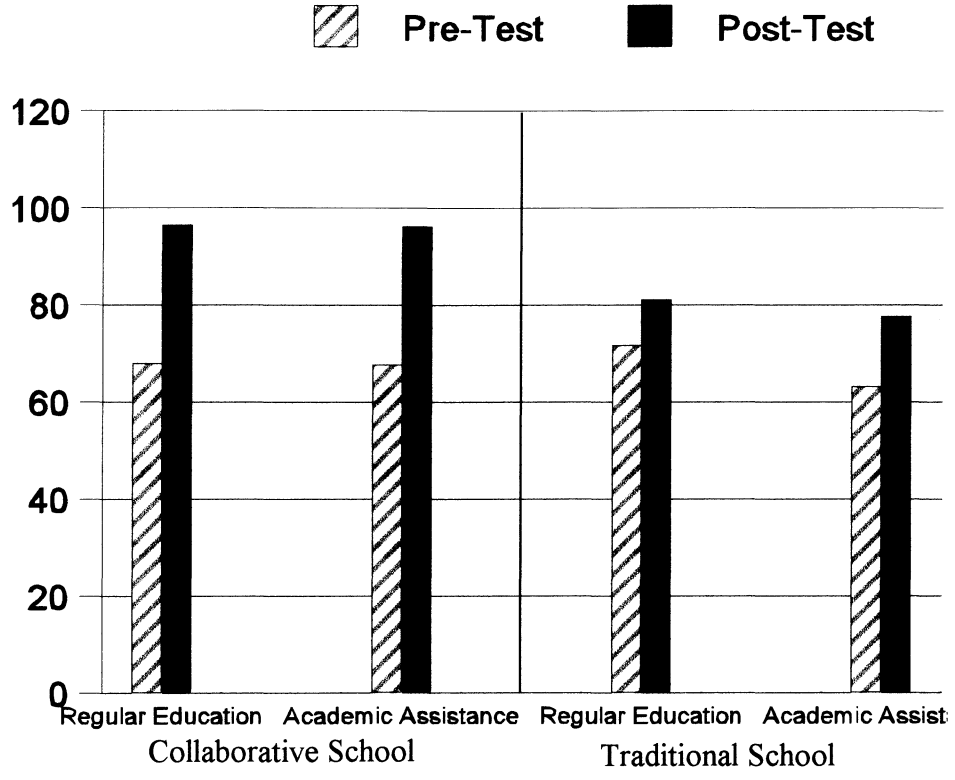
participated in the language labs at the Collaborative School demonstrated greater group means in vocabulary test gain across all four grades than the children who received regular instruction from the classroom teacher at the Traditional School. The mean gains made at the Collaborative School ranged from 20 to 33 points, which is two to three times greater than the mean gains demonstrated by subjects at the Traditional School who did not receive speech or language services (range = 9 to 11 points). Once again, a similar pattern of gains was evidenced at each grade level within the two schools. However, substantial differences were noted between the two schools in the mean gains earned by the subjects who did not qualify for speech or language services.

The difference between pre- and post vocabulary test scores was evaluated for the subjects who did not qualify for speech or language services at both schools. A one-way ANOVA revealed a statistically significant difference in the mean vocabulary test gains between the students who participated in the collaborative language lessons at the Collaborative School and the students who received instruction exclusively from the classroom teacher at the Traditional School, $\underline{F}$ (1, 94) = 43.4624; $\underline{p}$ = .0000.

Since the literature has suggested that one of the advantages to implementing collaboration is that some children considered "at risk" for academic difficulties can benefit from the intervention in the classroom, a subgroup of children who did not qualify for speech or language services needed to be considered in analysis. Therefore, the data from the children who did not qualify for speech or language therapy were subdivided into those who received regular education services only and those who received other academic assistance (e.g., learning disability services, Reading Recovery, or Title I).

Figure 1 represents the group means according to the services received. For further explanation of subgroups, refer to criteria discussed in chapter three (p. 25).

Figure 1. Group vocabulary pre-test and post-test score means for subgroups of subjects not qualifying for speech or language services.



As stated above, vocabulary pretest means were similar between the two schools for subgroups of subjects who did not qualify for speech or language services. Following the 12 weeks of instruction, the two subgroups of subjects who participated in the language labs in the collaborative setting but did not qualify for speech or language services demonstrated greater gains than the subjects who received regular instruction from the classroom teacher at the Traditional School. The regular education subjects at

the Collaborative School showed vocabulary test gains that were three times greater than those of their Traditional School counterparts (M = 28.34 and 9.34, respectively). Likewise, the subjects who required academic assistance at the Collaborative School demonstrated twice as much vocabulary test gain as their Traditional School counterparts (M = 28.25 and 14.28, respectively).

Student Rating Scale

The second measure incorporated in this study was a rating scale to determine the classroom teachers' perceptions of improvement in functional classroom communication (Hoskins, 1990). The rating scale was completed pre- and post-intervention. The means for the pre- and post-rating, as well as the rating gain is included in Table 6. The means were determined by the school attended (Collaborative or Traditional) and speech-language IEP status (not receiving speech-language services or receiving speech-language services).

The means are based on a possible rating of 100. The mean ratings at the beginning of the 12 week intervention period were somewhat similar between the two schools. At both schools, the subjects who received speech or language services were rated slightly lower than students who did not qualify for speech-language therapy with groups mean ratings in the lower sixties (M = 64.25 and 63.11). Mean ratings for subjects who did not qualify for speech or language services were in the seventies (M = 78.59 and 71.41).

no statistically significant differences were found in the interactions between these two effects, F (1) = .562; p = .455.

The most pertinent item from the 10 item rating scale evaluated the teachers' perceptions of how well the student understands the vocabulary used in class. The item was analyzed in isolation to determine if trends would reveal any interesting findings. These means and standard deviations are found in Table 7.

The patterns found from the means found in Table 7 parallel those found in Table 6. Prior to the 12-week intervention period, the students at both schools who received speech or language services were rated lower on this item than the subjects who did not receive speech or language services. The subjects with speech-language IEP goals at both schools received a rating of six (out of a possible 10) on this one item, while subjects who did not receive services for speech or language received slightly higher ratings of seven or eight.

Table 7

Group Means and Standard Deviations on Most Pertinent Item From the Student Rating Scale for Subjects According to School and IEP Status

School	IEP Status	Rating 1	Rating 2	Difference
Collaborative	no speech/language IEP	8.03 (1.39)	8.37 (1.47)	.34 (1.19)
	speech/language IEP	6.42 (2.11)	6.50 (1.62)	.08 (1.31)
Traditional	no speech/language IEP	7.32 (2.24)	7.82 (2.11)	.50 (.90)
	speech/language IEP	6.44 (1.59)	7.67 (1.50)	1.22 (.83)

Note. Standard deviations reported in parenthesis.

Following the 12 weeks of instruction, the students who received pull-out therapy for speech or language at the Traditional School were considered to have made the greatest gains of these four subgroups including students who did not qualify for speech or language services at both of the schools as well as the subjects with speech-language IEP goals at the Collaborative School. However, the mean gains of the speech-language IEP group at the Traditional School was just over one point on the rating scale ($\underline{M}$ = 1.22). The subjects who did not qualify for speech or language services at both schools and the children who received these services through collaboration made very similar but minimal mean gains ($\underline{M}$ = .34, .50, .08 for each group, respectively).

CHAPTER V

Discussion

The primary purpose of the present study was to compare the pull-out model of speech and language service delivery with collaborative intervention provided in the classroom. Another purpose was to compare the collaborative approach to teaching in the classroom with instruction provided by the classroom teacher without participation from the speech-language pathologist.

According to results obtained from the vocabulary test, the collaborative classroom-based model fostered significantly greater gains in curricular vocabulary than the regular instruction from the classroom teacher or pull-out therapy alone. Collaboration was the most effective approach for all subjects included in the study, regardless of the services for which they qualified. All subgroups of subjects at the Collaborative School demonstrated substantially greater vocabulary test gains than their Traditional School counterparts across all four grades.

The second measure was the Student Rating Scale (Hoskins, 1990). Teachers' perceptions indicated only minor improvements occurred in functional classroom communication skills across both schools studied. The subjects who received pull-out therapy from the speech-language pathologist at the Traditional School demonstrated greater improvement than all other groups in the skills rated by the teachers. However, there was not a statistically significant difference between the two approaches in improving classroom communication according to the teachers' ratings.

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The two measures incorporated in this study yielded somewhat contradictory

results. The teachers' ratings of functional classroom communication did not agree with the significant mean gains demonstrated on the vocabulary test for Collaborative School subjects. This disagreement may have occurred for one of two reasons: either the classroom teachers did not notice the improvement in the classroom that was evidenced on the vocabulary test, or the rating scale was not sensitive to the teachers' perceptions. In an open-ended survey that the teachers completed at the conclusion of the study, the teachers at the Collaborative School remarked that they believed the language labs benefitted many of the students that typically demonstrated difficulty attending to classroom presentations and discussions. In addition, the teachers believed that the language labs reinforced what they were teaching in the classroom and provided fun and concrete ways for the students to remember the vocabulary. Since the teachers responded to open-ended questions with many observations of the benefits of the collaborative experience, the low gains in ratings are less conceivably due to the fact that the teachers did not notice changes in the students' skills (see Appendix E for survey questions).

Therefore, the strengths and weaknesses of the measures included in the present study need to be evaluated to account for the discrepancy found in the results from these two instruments. There were many weaknesses found in the rating scale of functional classroom communication. First of all, no instruction was given to the teachers regarding the Student Rating Scale other than the general information provided on the form. A group meeting with all eight participating teachers would have been beneficial at the beginning and end of the intervention period. The meeting would have allowed the investigators to review the instructions for completion of the rating scale verbally, answer

any questions, and provide more concrete examples for each of the ten points on the scale in an attempt to ensure more consistency in ratings. Second, the teachers' reliability was not checked after the first rating to determine consistency in the beginning and determine the need for some further instruction or guidance. Third, the Student Rating Scale was a subjective measure. With eight different teachers completing the ratings, the criteria on which each teacher based the ratings was impossible to determine. For example, some teachers may have judged the students' performance according to test scores received in the classroom, while others may have determined the ratings from observations of behavior.

Improvements in classroom communication were likely noted for the classroom as a whole, as evidenced by teachers' responses to open-ended survey questions. However, these improvements were not reflected in the individual ratings. One confounding factor was that the differences between each of the ten points on the rating scale were minimal. For example, a rating of four denoted that the child performed the skill 40% of the time, five increased only to 50%, and six stated that the child performed the skill 60% of the time. With such small differences between the points, the teachers may have arbitrarily chosen a number within perhaps a three point range that represented the child's approximate level of performance. Realistically, the teachers were not able to calculate percentages for these ten skills for every child in their classroom. Therefore, a rating scale with fewer points might have more adequately reflected the teachers' perceptions.

In order to avoid biases, the teachers did not have access to their initial ratings of the students when they completed the final rating scales. This method did not allow the

teachers to make comparisons. Therefore, the teachers may have inadvertently assigned lower ratings for subjects on skills for which they actually noticed improvement because they could not remember the initial ratings after three months had passed. Recall of the initial ratings was also complicated by the minimal difference between each of the points on the rating scale.

Finally, the accuracy of teacher ratings of semantic knowledge is somewhat questionable. A recent investigation by Botting, Conti-Ramsden, and Crutchley (1997) attempted to correlate teacher opinions of various speech-language impairments with standardized tests. They found that teachers were fairly competent at identifying difficulties within articulation, phonology, and syntax/morphology. However, there was poor agreement between teacher opinions and all standardized tests included in the study for the area of semantics. The authors concluded that while teachers may be fairly accurate at identifying other disorder areas within speech or language, semantics is an area in which objective measures are more valid and reliable.

Conversely, the vocabulary test was believed to be a more valid measure of progress following the 12 weeks of intervention because of the many strengths apparent in the implementation of this measure. First, training was provided for all graduate and undergraduate students who administered the vocabulary test. The training session was required for all testers and covered the administration of the vocabulary test as well as guidelines for acceptable and unacceptable responses. Second, unlike the greater number of individuals who completed the ratings, all vocabulary tests were scored by only two investigators to increase consistency in scoring. These investigators demonstrated high

inter- and intra-judge reliability (approximately .99 on a Pearson Product Moment Correlation). Third, the curricular vocabulary test was primarily an objective measure that quantified the vocabulary knowledge of the students. A pilot test was administered to ensure that the vocabulary test items were appropriate and to allow the authors to make necessary changes on the test items. Finally, previous research supported the use of the vocabulary test incorporated in this study (Johnson & Anglin, 1995).

The Student Rating Scale contained many weaknesses that diminished the usefulness of the results taken from the measure. However, the curricular vocabulary test embodied many strengths in test structure and procedure. For these reasons, the results from the vocabulary test were considered to be a more valid measure of progress than the teacher ratings of students' skills.

When examining the results obtained from the vocabulary test alone, the collaborative classroom-based model of service delivery fostered significantly greater gains in learning vocabulary than the exclusive use of traditional pull-out therapy although the treatment time, as well as the materials and targets of the speech-language pathologist were the same in both settings. The subjects with language goals in their IEPs at the Collaborative School made the most significant gains and doubled their vocabulary pre-test means after only 12 weeks of intervention provided primarily in the classroom.

The collaborative approach to teaching curricular vocabulary was also found to be more effective than regular instruction from the classroom teacher alone according to the vocabulary test results for students who did not qualify for speech or language services. The students classified as regular education in this study who participated in the

collaborative language labs were more successful on the curricular vocabulary test after the 12 week intervention than those who received regular instruction from the classroom teacher at the Traditional School. The same was true for students who required some type of academic assistance but did not qualify for speech or language services. In fact, the students who required academic assistance at the Collaborative School made more substantial gains than the regular education students at the Traditional School.

The results yielded from the vocabulary test incorporated in this study supported and extended the applications of alternative service delivery models as found in earlier investigations. These results support the conclusion that classroom-based intervention is effective with a variety of ages of children. Previous studies investigated models of service delivery with preschool- and kindergarten-aged subjects only (Ellis, Schlaudecker, & Regimbal, 1995; Roberts, Prizant, & McWilliam, 1995; Valdez & Montgomery, 1997; Wilcox, Kouri, & Caswell, 1991). However, in the present study, all four grade levels (kindergarten through third) demonstrated substantially greater vocabulary growth with the collaborative classroom-based approach than with pull-out therapy or regular instruction alone.

Previous research focused primarily on the children who received services from the speech-language pathologist (Roberts, Prizant, & McWilliam, 1995; Valdez & Montgomery, 1997; Wilcox, Kouri, & Caswell, 1991). The one study that did include subjects who were not receiving speech-language services did not differentiate between improvements made by subjects who qualified for speech-language services and those who did not (Ellis, Schlaudecker, & Regimbal, 1995). Therefore, the results from the present

study extended the results regarding the usefulness of the collaborative classroom-based approach to children who did not require speech or language services. In fact, collaboration was determined to be the most effective approach for all subgroups of subjects in the present study, regardless of the services for which they qualified.

Two previous studies indicated that classroom-based services and pull-out therapy were equally effective with preschool-aged subjects (Valdez & Montgomery, 1997; Wilcox, Kouri, & Caswell, 1991). However, in the study by Valdez and Montgomery, statistical analysis was not completed on group means and standard deviations were not reported for review. Wilcox, Kouri, and Caswell (1991) also found similar gains between the two treatment settings, but the treatment sessions were not comparable in length. Classroom sessions were actually three times as long as the pull-out therapy. The present study found that with equal treatment time a collaborative classroom-based approach to intervention was significantly more effective in increasing curricular vocabulary knowledge than pull-out services alone.

Despite the lack of scientific validation, theoretical literature has stated that collaboration may be beneficial not only to speech or language impaired students, but to all students who participate in the experience (Simon, 1987). The results from the present study confirm this theory. All groups considered at the Collaborative School, including regular education students, those receiving academic assistance, and those receiving speech or language services made more substantial mean gains than their Traditional School counterparts.

The results from the vocabulary test incorporated in this investigation also support

the theoretical belief that curriculum materials are beneficial when incorporated in therapy, regardless of the setting in which services are provided (Nelson, 1989; Nelson & Kinnucan-Welsch, 1992). Proof of this theory was evidenced in the impressive mean gains in curricular vocabulary made by all of the subjects who received speech or language services. The children who received speech or language services through collaboration made more significant gains than the children in the pull-out setting. However, both groups made substantial mean gains in curricular vocabulary from the additional exposure to the words used in their classes. By using the students' curricular vocabulary words as therapy targets, the speech-language pathologist effectively increased the children's knowledge of those words and further, is likely to facilitate their success in the classroom.

A practical implication demonstrated by this study is that the direct approach to vocabulary instruction supported by Beck, McKeown, and McCaslin (1983) was found to be advantageous not only for children with language deficits, but also for the rest of the students in the classroom. The language labs utilized at the Collaborative School were an opportunity to explicitly teach the meaning of words to the students. The subjects in the collaborative setting were not required to decipher the words' meanings from vague contexts alone. Rather, the definitions were clearly stated, and the context was then provided in interactive language lab activities to clarify the word meanings.

Professionals may protest to implementing collaborative services because of the planning time required. Previous surveys concerning various service delivery models found that scheduling planning time was a major obstacle to collaboration (Beck & Dennis, 1997; Elksnin & Capilouto, 1994). The classroom teachers who participated in this study

were asked to complete an open-ended survey at the conclusion of the study to determine their perceptions of the language labs and suggestions for improvement. In general, the perceptions of the teachers at the Collaborative School indicated that meeting with the speech-language pathologist was difficult in the beginning, but that the planning became less effortful each time and would be easier should collaboration continue in subsequent years. Many of the teachers did not like leaving their classroom to attend the scheduled planning period. For the present study, a Regular Education Initiative (REI) grant funded substitute teachers to allow the regular classroom teachers to attend the collaborative meetings during the school day. Therefore, administration required all professionals involved to attend these meetings during the scheduled time. Without this funding and without the administrative support at each school, collaboration would have had to occur outside of regular school hours which would be difficult for many professionals. The only disadvantage reported by any of the teachers concerning collaboration was scheduling regular meeting times. However, this inconvenience of scheduling difficulties seems to be offset by the significant vocabulary growth as evidenced by the vocabulary test in this study.

These significant gains made by the subjects at the Collaborative School on the vocabulary test may be attributed to several factors, including the explicit teaching, the contribution of the classroom teachers, and the interactive activities provided by the language labs. First, explicit teaching was incorporated into every language lesson. The weekly words were introduced along with the definition. Therefore, the students were not required to decipher the words' meanings from context alone.

Second, the teachers at the Collaborative School supported the project and incorporated many carry-over activities from the language lessons into the regular classroom instruction time throughout the remainder of the week. The kindergarten teacher incorporated activities that were introduced in the language lab in the regular classroom centers for the rest of the week. The second grade teacher at the Collaborative School placed the "weekly words" on a vocabulary software program that the children had access to throughout the week. All of the teachers used examples from activities introduced in the language labs to expand on ideas and introduce new concepts.

Finally, the language labs incorporated interactive activities to assist the children in understanding the targeted vocabulary words. Many times the children remembered the activity that went along with the word, which facilitated recall of the definition. For example, the third graders completed an experiment with erosion in the language labs. In the experiment, the children were able to make erosion occur, which was more effective in conveying the meaning of the word than examples and pictures would have been alone.

The erosion experiment probably would not be possible in the regular classroom without the assistance of additional adults. Questions were raised by some of the teachers about the fact that the classrooms in the collaborative experience had a smaller student to teacher ratio with the additional adults in the room. Children are typically more successful when they have more one-to-one contact time with an adult. This variable should be controlled for in future research to determine if a classroom with the same amount of aids to assist would experience similar mean gains as classrooms with collaborative professionals.

Future research should also focus on the amount of time required to experience significant gains. In this study, the language labs were provided for 40 minutes weekly, and collaboration meetings were conducted for 40 minutes weekly. However, many teachers and speech-language pathologists might argue that their schedules will not allow as much time. Subsequent studies may be able to prove that significant gains are possible with less time devoted to the program.

Future research should also examine the roles of the professionals within the classroom. This study primarily implemented team teaching with episodes of station teaching when the activity deemed a smaller student-to-teacher ratio. Future research should attempt to isolate the roles of the professionals to determine which models of collaboration are most effective. Various models may be more effective at different age levels.

The vocabulary test proved to be an objective measure of the vocabulary knowledge of the students in grades kindergarten through third. No attempt was made, however, to measure progress demonstrated by subjects who received speech or language services on their individual goals. Future research should incorporate an additional measure to investigate any differences in progress on individual IEP goals.

Collaboration was found to be an effective service delivery model for curricular vocabulary instruction with children in grades kindergarten through third. The results from the present study, however, must be replicated and expanded upon in future research. First, collaboration was found to be effective as a service delivery model regardless of the teacher variables, since eight different classroom teachers participated in this study and

consistent patterns were evidenced. However, only one speech-language pathologist was involved in the intervention in this study. The present study needs to be replicated in future research with a different speech-language pathologist participating in the intervention to account for speech-language pathologist variables. Finally, the focus in the public school system continues to shift towards functional outcomes. Therefore, future studies should determine if collaboration can be as effective in teaching other skills needed for classroom success. If the results from the present study can be substantiated through replication, they will have strong implications for the best method for servicing students in the public schools.

APPENDIX A

Approaches in Implementing a Collaborative Model

Approach	Explanation
One teach, one observe	Either the SLP or teacher observes, while the other assumes primary instructional responsibility
One teach, one "drift"	The SLP or teacher assumes primary instructional responsibility while the other assists students with their work, monitors behavior, corrects assignments, etc.
Station teaching	The SLP and teacher divide instructional content into two parts (e.g., vocabulary and content, new concepts and review). Groups are switched so that all students receive instruction from each teacher.
Parallel teaching	The SLP and teacher each instructs half the group, each addressing the same instructional objectives.
Remedial teaching	The SLP or teacher instructs students who have mastered the material to be learned while the other reteaches those who have not mastered the material.
Supplemental teaching	The SLP or teacher presents the lesson using a standard format. The other adopts the lesson for those students who cannot master the material.
Team teaching	Both the SLP and teacher present the lesson to all students. This may include shared lecturing or having one teacher begin the lesson while the other takes over when appropriate.

Note. Adapted from Elksnin, L., & Capilouto, G. (1994). Speech-language pathologists' perceptions of integrated service delivery in school settings. Language, Speech, and Hearing Services in the Schools, 25, 258 - 267.

APPENDIX B

Research Participation Authorization

RESEARCH PARTICIPATION AUTHORIZATION

Mrs. Pam Paul, the speech-language pathologist at your child's school, is collaborating with your child's classroom teacher. Together with an Eastern Illinois University student, Mrs. Paul and the teacher are presenting language lessons once per week for 40 minutes, to increase your child's knowledge of vocabulary used in curricular materials. Mrs. Paul is also working with two assistant professors from Eastern Illinois University, Lynn Calvert & Rebecca Throneburg to assess the effectiveness of these lessons. I authorize permission for _____,

(child's name)

_____,who is my _____ to participate in this project.
(birthday) (relationship)

I understand that the research procedures will be conducted by Mrs. Pam Paul, Mrs. Lynn Calvert, and Dr. Rebecca Throneburg. I give my permission for the researchers to have access to my child's school records, and to use all data collected during the research, including video and audio recordings for teaching and publications. I understand that my child's name will not be used in any descriptions or reports of data.

_____ _____
(parent signature) (parent names)

_____ _____
(address)

_____ _____
(city) (state) (zip) (phone)

_____
(date)

RESEARCH PARTICIPATION AUTHORIZATION

Mrs. Pam Paul, the speech-language pathologist at your child's school, is working with two assistant professors from Eastern Illinois University, Lynn Calvert & Rebecca Throneburg to assess the effectiveness of lessons provided by the classroom teacher to be compared with lessons provided in the classroom by the speech-language pathologist. I authorize permission for_____, _____, who is my

(child's name) (birthday)

_____ to participate in this project. I understand that the

(relationship)

research procedures will be conducted by Mrs. Pam Paul, Mrs. Lynn Calvert, and Dr. Rebecca Throneburg. I give my permission for the researchers to have access to my child's school records, and to use all data collected during the research, including video and audio recordings for teaching and publications. I understand that my child's name will not be used in any descriptions or reports of data.

_____ _____

(parent signature)

_____ _____

(address) (parent names)

_____ _____

(city) (state) (zip) (phone)

_____

(date)

APPENDIX C

Targeted Weekly Words from the Curriculum by Grade Level

Date	Kindergarten	First	Second	Third
02/05/98	hear, sight taste smell touch light, heavy six, seven	groundhog shadow burrow migrate hibernate	matter properties solid liquid gas evaporates	organ brain joints hinge joints ball and socket joints
02/12/98	loud, soft light, heat eight, nine, ten	president log cabin honest storyteller ax	valley peninsula island desert mountain	muscle involuntary voluntary pulse heart
02/19/98	windy, rainy, sunny eleven twelve more, less	farm house arithmetic soldier war freedom	members president vice president rules invited allowed	Washington, D.C. monument memorial cemetery capitol
02/26/98	happy sad angry scared numbers:0-10	baby teeth permanent teeth crown, gum, root, pulp, dentin, enamel	oxygen heart muscle brain nerves	president constitution Congress White House Capitol
03/05/98	real make-believe pretend first, next, last	plaque, cavity decay brush floss dentist	colonies settlement history pioneers settler	A. Carnegie Pittsburgh factory pollution product map
03/12/98	litter recycle environment pollution opinion	healthy well groomed exercise rest disease	lobster confused ordinary enormous eager harbor	magnetic magnetism conductor current electromagnetic circuit

Date	Kindergarten	First	Second	Third
03/26/98	dime penny money coin edge	diet serving food groups food pyramid nutritious	museum village quilt wagon train Oregon Trail	fog hurricane drizzle shower weather (n.)
04/02/98	winter spring summer fall library	country state city, town neighborhood neighbor village	light sound volume vibrate ear drum	forecast hail funnel tornado storms
04/09/98	4th of July flag parade eagle fireworks	plains hills mountains river ocean	heat energy temperature thermometer conduct	pitch echo vibrate vocal cords volume
04/16/98	recipe ingredients subtracting adding mix	environment recycle pollution litter Earth Day	throne apartment therapy braces hammock	erosion volcano earthquake weather (adj.) magma
04/23/98	zebra elephant hippopotamus kangaroo giraffe	trees twigs trunk seeds root	flood soggy hauled swirled scrubbed	asphalt highway barrio municipal neighborhood playground
04/30/98	seed roots trunk branches twig	globe map north south east west	eons shifted howled crumble gouged	clouds: cirrus cumulus stratus water cycle condensation

APPENDIX D

Vocabulary Tests

Student's Name_____ School_____

Multiple Choice Questions for Kindergarten

Definition: "What does the word _____ mean?"
-if response requires clarification:
"Can you tell me anything more about the word _____?"

Sentence: "Can you use the word _____ in a sentence?"

Multiple Choice: "Does _____ mean _____ or _____?"

Only use neutral reinforcement after the child's response, such as "You are really trying," or "You sure are working hard." DO NOT use reinforcement such as "Good job," or "Way to go."

Examples: An example may be given no more than three times throughout the 25 item test for each task. Only provide the following examples:

definition: "What does the word ice mean?"
answer: "frozen water" or
"It's very cold and you skate on it."
sentence: "Can you use the word ice in a sentence?"
answer: "I need ice to make my drink cold."
multiple choice: "Does ice mean frozen water or hot water?
answer: frozen water."

1. happy
   A. feeling good
   B. feeling bad

   Definitions= Sentence= Multiple Choice=

2. winter
   A. when it's cold and snowy
   B. when it's warm and rainy

   Definitions= Sentence= Multiple Choice=

3. zebra
   A. a fish
   B. black and white striped animal

   Definitions= Sentence= Multiple Choice=

4. penny
   A. money worth twenty-five cents
   B. money worth one cent

   Definitions= Sentence= Multiple Choice=

5. scared
   A. feeling mad
   B. feeling afraid

   Definitions= Sentence= Multiple Choice=

6. heavy
   A. weighs a little bit
   B. weighs a lot

   Definition= Sentence= Multiple Choice=

7. hearing
   A. to listen with the ears
   B. To use the nose

   Definitions= Sentence= Multiple Choice=

8. library
   A. has a lot of books
   B. has a lot of toys

   Definitions= Sentence= Multiple Choice=

9. fall/autumn
   A. season where leaves change color
   B. when it's cold and snowy

   Definitions= Sentence= Multiple Choice=

10. hippopotamus
    A. big animal that lives in water
    B. small animal that flies

    Definitions= Sentence= Multiple Choice=

11. sight
    A. to see with the eyes
    B. to feel with a part of the body

    Definitions= Sentence= Multiple Choice=

12. make-believe
    A. pretend
    B. real

    Definitions= Sentence= Multiple Choice=

13. dime
    A. money worth twenty-five cents
    B. money worth ten cents

Definitions= Sentence= Multiple Choice=

14. eagle
    A. little animal
    B. A big bird

Definitions= Sentence= Multiple Choice=

15. fireworks
    A. something that tells time
    B. lights in the sky on the fourth of July

Definitions= Sentence= Multiple Choice=

16. Subtraction
    A. to take away
    B. to add

Definitions= Sentence= Multiple Choice=

17. Monday
    A. first day of the school week
    B. last day of the school week

Definitions= Sentence= Multiple Choice=

18. recipe
    A. how to make food
    B. menu

Definitions= Sentence= Multiple Choice=

19. opinion
    A. a way to get somewhere
    B. what someone thinks about something

Definitions= Sentence= Multiple Choice=

20. litter
    A. trash
    B. cars

Definitions= Sentence= Multiple Choice=

Student's Name_____ School_____

Multiple Choice Questions for First Grade

Definition: "What does the word _____ mean?"
-if response requires clarification:
"Can you tell me anything more about the word _____?"

Sentence: "Can you use the word _____ in a sentence?"

Multiple Choice: "Does _____ mean _____ or _____?"

Only use neutral reinforcement after the child's response, such as "You are really trying," or "You sure are working hard." DO NOT use reinforcement such as "Good job," or "Way to go."

Examples: An example may be given no more than three times throughout the 25 item test for each task. Only provide the following examples:

definition: "What does the word ice mean?"
answer: "frozen water" or
"it's very cold and you skate on it."
sentence: "Can you use the word ice in a sentence?"
answer: "I need ice to make my drink cold."
multiple choice: "Does ice mean frozen water or hot water?
answer: frozen water."

1. neighbor
   A. someone who lives next door or nearby
   B. someone who lives in the next country

   Definitions= Sentence= Multiple Choice=

2. seeds
   A. things you plant to grow
   B. a kind of wood

   Definitions= Sentence= Multiple Choice=

3. rest
   A. to lay down and take a nap
   B. to exercise

   Definitions= Sentence= Multiple Choice=

4. exercise
   A. to work out in a gym
   B. to eat

5. ax
   A. something sharp to cut wood
   B. something sharp to cut meat

Definitions= Sentence= Multiple Choice=

6. honest
   A. to lie
   B. to tell the truth

Definitions= Sentence= Multiple Choice=

7. president
   A. someone who lives in a town
   B. leader of a group/a boss

Definitions= Sentence= Multiple Choice=

8. twigs
   A. big logs
   B. tiny branches from a tree

Definitions= Sentence= Multiple Choice=

9. river
   A. big stream of moving water
   B. dry land

Definitions= Sentence= Multiple Choice=

10. log cabin
   A. house made of wood
   B. house made of bricks

Definitions= Sentence= Multiple Choice=

11. disease
   A. feeling sick
   B. feeling good

Definitions= Sentence= Multiple Choice=

12. pollution
   A. dirty air, land, or water
   B. clean air, land, or water

Definitions= Sentence= Multiple Choice=

13. groundhog
    A. small, furry animal
    B. large pig

    Definitions= Sentence= Multiple Choice=

14. map
    A. tells you where to go
    B. something you watch on t.v.

    Definition= Sentence= Multiple Choice=

15. war
    A. fighting
    B. peace

    Definitions= Sentence= Multiple Choice=

16. litter
    A. trash
    B. cars

    Definitions= Sentence= Multiple Choice=

17. globe
    A. round ball of the world
    B. map on paper

    Definition= Sentence= Multiple Choice=

18. hibernate
    A. to sleep in the winter
    B. to stay awake

    Definitions= Sentence= Multiple Choice=

19. healthy
    A. being sick
    B. not being sick

    Definitions= Sentence= Multiple Choice=

20. nutritious
    A. food good for you
    B. to exercise

    Definitions= Sentence= Multiple Choice=

Student's Name_____ School_____

Definition: "What does the word _____ mean?"
-if response requires clarification:
"Can you tell me anything more about the word _____?"

Sentence: "Can you use the word _____ in a sentence?"

Multiple choice: "Does _____ mean _____ or _____?"

Only use neutral reinforcement after the child's response, such as "You are really trying," or "You sure are working hard." DO NOT use reinforcement such as "Good job," or "Way to go."

Examples: An example may be given no more than three times throughout the 25 item test for each task. Only provide the following examples:

definition: "What does the word ice mean:"
answer: "frozen water"
sentence: "Can you use the word ice in a sentence?"
answer: "I need ice to make my drink cold."
multiple choice: "Does ice mean frozen water or hot water
answer: frozen water."

1. thermometer
   A. what we use to measure temperature
   B. what we use to measure time

   definition= sentence= multiple choice=

2. soggy
   A. wet
   B. dry

   definition= sentence= multiple choice=

3. flood
   A. lots of water that covers the land
   B. a small river

   definition= sentence= multiple choice=

4. lobster
   A. a sea animal which may be eaten
   B. a place to unload things from boats

   definition= sentence= multiple choice=

5. oxygen
   A. part of a muscle
   B. air you breathe

definition= sentence= multiple choice=

6. island
   A. land with water on all sides of it
   B. land with water on three sides of it

definition= sentence= multiple choice=

7. vibrate
   A. something moving slowly
   B. shaking back and forth

definition= sentence= multiple choice=

8. confused
   A. you are sad
   B. you do not understand

definition= sentence= multiple choice=

9. ordinary
   A. small
   B. normal

definition= sentence= multiple choice=

10. throne
   A. a special seat for a king
   B. something a dog eats out of

definition= sentence= multiple choice=

11. desert
   A. a large chunk of ice
   B. A dry place with little rainfall

definition= sentence= multiple choice=

12. enormous
   A. very weird
   B. very big

definition= sentence= multiple choice=

13. evaporate
    A. change from liquid to gas
    B. change from solid to liquid

definition= sentence= multiple choice=

14. eager
    A. really want to do something
    B. very surprised

definition= sentence= multiple choice=

15. peninsula
    A. land with water all around it
    B. land with water on three sides of it

definition= sentence= multiple choice=

16. valley
    A. the top of a mountain
    B. A low part between mountains

definition= sentence= multiple choice=

17. president
    A. leader of a country
    B. person who lives in a town

definition= sentence= multiple choice=

18. pioneers
    A. person who explore new places
    B. place to show art

definition= sentence= multiple choice=

19. apartment
    A. a big store
    B. a place where people live

definition= sentence= multiple choice=

20. harbor
    A. a place between mountains
    B. a place where boats can park

definition= sentence= multiple choice=

Student's Name_____ School_____

Multiple Choice Questions for 3rd Grade

Definition: "What does the word _____ mean?"
-if response requires clarification:
"Can you tell me anything more about the word _____?"

Sentence: "Can you use the word _____ in a sentence?"

Multiple choice: "Does _____ mean _____ or _____?"

Only use neutral reinforcement after the child's response, such as "You are really trying," or "You sure are working hard." DO NOT use reinforcement such as "Good job," or "Way to go."

Examples: An example may be given no more than three times throughout the 25 item test for each task. Only provide the following examples:

definition: "What does the word ice mean?"
answer: "frozen water"
sentence: "Can you use the word ice in a sentence?"
answer: "I need ice to make my drink cold."
multiple choice: "Does ice mean frozen water or hot water
answer: frozen water."

1. earthquake
   A. funnel cloud that has strong winds
   B. something that makes the earth shake

   definition= sentence= multiple choice=

2. vibrates
   A. something that move slowly
   B. shake back and forth

   definition= sentence= multiple choice=

3. volcano
   A. shaking of the earth's crust
   B. mountain with lava, ashes, and rock coming out

   definition= sentence= multiple choice=

4. organs
   A. part of your body
   B. place where bones join together

   definition= sentence multiple choice=

5. volume
   A. how loud a sound is
   B. how high or low a sound is

   definition= sentence= multiple choice=

6. tornado
   A. mountain with lava, ashes, and rock coming out
   B. funnel cloud that has strong winds

   definition= sentence= multiple choice=

7. pitch
   A. loudness/softness of a sound
   B. the tone of a sound

   definition= sentence= multiple choice=

8. hurricane
   A. storm by the ocean that is like a tornado
   B. shaking of the earth's crust

   definition= sentence= multiple choice=

9. hail
   A. little balls of ice and snow
   B. storm with high winds

   definition= sentence= multiple choice=

10. echo
   A. a loud sound
   B. sound that repeats

   definition= sentence= multiple choice=

11. drizzle
   A. heavy rain
   B. slight rain

   definition= sentence= multiple choice=

12. fog
   A. storm with high winds and heavy rain
   B. cloud that comes down to earth that is hard to see in

   definition= sentence= multiple choice=

13. weather
    A. outside climate and temperature
    B. inside temperature

    definition= sentence= multiple choice=

14. joints
    A. Bending points of the body
    B. part of the body that performs a function (kidney, heart)

    definition= sentence= multiple choice=

15. pollution
    A. dirty things in the air, land, or water
    B. clean air, land, and water

    definition= sentence= multiple choice=

16. factory
    A. place where people make things
    B. place where things are sold

    definition= sentence= multiple choice=

17. magnetic
    A. something that can pull metal towards it
    B. path which electric currents move

    definition= sentence= multiple choice=

18. forecast
    A. predict weather in the future
    B. tell about weather in the past

    definition= sentence= multiple choice=

19. voluntary muscles
    A. muscle you can control
    B. muscle you cannot control

    definition= sentence= multiple choice=

20. erosion
    A. to wear away gradually
    B. to form over time

    definition= sentence= multiple choice=

APPENDIX E

Guidelines for Scoring Vocabulary Tests

Acceptable/Unacceptable Responses for Kindergarten Test Items

Test Item	Acceptable w/ just one:	Acceptable with any two:	Unacceptable
1. happy	-feeling good -real glad -not grumpy/sad	-when you're playing -get a surprise/present -have a smile -it's your birthday	-only one of 2nd column -being nice -you're really happy -funny
2. winter	-season when it's cold and snowy	-icy -cold -snowy -sledding -Christmas -make snowman - plants/flowers die -wear your coat -go ice skating	-only one of 2nd column -when you get presents/toys
3. zebra	-black & white striped animal	-like a horse -stripes -black & white (counts as one) -lives in zoo/jungle -animal/mammal -drinks water/eats grass/leaves	-only one of 2nd column -black or white alone -starts with "z" -runs -horse
4. penny	-money worth one cent	-money -one cent/one -brown -Abe Lincoln on it -can buy things with it/can spend it -change -get it from the bank	-only one of 2nd column -has eagle on it -find it on the ground -can flip it/toss it -shiny

Acceptable/Unacceptable Responses for Kindergarten Test Items			
5. scared	-feeling afraid -frightened	-afraid of dark, monster, etc. (any two, but only with afraid)	-only one of 2nd column -really scared -scared of something (dark, monster, etc.)
6. heavy	-weighs a lot	-can't lift it/mom has to carry it -lots of bricks -polar bear/elephant, etc. (examples of something heavy)	-only one of 2nd column -really heavy -fat -makes you fall -big
7. hearing	-to listen with your ears	-listen -use your ears	-only one from 2nd column -you hear something
8. library	-where you go to get books -has books	-movies -need a card	-only one from 2nd column we're in the library
9. fall/autumn	-season where leaves change colors -leaves fall from the trees	-season -cold -make scarecrow -rake leaves -play in the leaves	-only one from 2nd column -play -rainy -snow -tornado -winter
10.hippopotamus	-big animal that lives/swims in water	-animal -gray -swims/lives/likes water -eats leaves -have big teeth -weighs a lot/big -lives in zoo	-eats alligators

Acceptable/Unacceptable Responses for Kindergarten Test Items			
11. sight	-to see with the eyes	-use eyes -look	-only one from 2nd column -see something -get out of sight
12. make-believe	-pretend -not real -make things/story up -use imagination	-what you see in dreams -play	-only one from 2nd column -Mister Rogers
13. dime	-money worth 10 cents	-money -buy things with it -shiny -silver -change	-only one from 2nd column -like a penny/quarter -big -brown -find it on ground -on a ring -can flip it
14. eagle	-a big bird	-bird -big -flies -eats snakes/fish -claws -beak -feathers -eggs -sits in trees	-only one from 2nd column -hawk -lives in desert -black and white
15. fireworks	-lights/loud sounds in sky on the fourth of July -something you light that goes off in the sky and makes colors	-4th July -colors/lights -sounds -dangerous -light them/throw -pop/blows up/explodes -go off in the sky	-only one from 2nd column -fire -parade -buy them -have them -make things -have dots

Acceptable/Unacceptable Responses for Kindergarten Test Items			
16. subtraction	-to take away -take a number away -minus -take something out		
17. Monday	-first day of the school week	-day of week/day -have school	-only one from 2nd column -can play -the next day -tomorrow -weekend
18. recipe	-how to make food -how to cook -directions to make food -follow them to make something -look at it to cook something	-written down/piece of paper -make cookies/cake, etc -cook it/something	-only one from 2nd column -food -eating -put it in stuff -good -something you eat
19. opinion	-what someone thinks about something		-choice -thinking
20. litter	-trash -throw something/ garbage/trash/cup, etc. on ground/in neighbor's yard	-dirty -causes pollution -bad	-kitty litter -litter bug

Acceptable/Unacceptable Responses for First Grade Test Items

Test Item	Acceptable w/ just one:	Acceptable w/ any two:	Unacceptable:
1. neighbor	-someone who lives/is next door/nearby/across from you -lives by you/in next house	-next door -person/friend -know them well	-only one of 2nd column -can drive them places
2. seeds	-things you plant to grow	-put in garden/ground -plant/bury -grow/turn into flowers/trees, etc. -water/take care	-only one of 2nd column -eat them -bloom -make food
3. rest	-relax -lay down & take nap -take nap -not active	-lay on bed/sit down -sleep/go to bed -when you're tired -take break -be quiet/calm	-only one of 2nd column -sit & rest -rest on bed -watch TV
4. exercise	-to work out in a gym -go work out	-makes you strong/muscles -run, ride bike, etc. (any two examples) -move body -get in shape	-only one of 2nd column -play -grow -gain/lose weight -watch tape
5. ax	-something sharp to cut wood -use to chop down trees	-chop wood up -chop down trees -break into door -dangerous -firemen use them -sharp -use it - tool	-only one of 2nd column -chop something -make trees fall down -cut stuff

Acceptable/Unacceptable Responses for First Grade Test Items			
6. honest	-to tell the truth -never lie -truthful		-only one of 2nd column -promise -trust -feelings
7. president	-leader of a group/country -the boss	Washington/Lincoln/ Clinton (count as one) -U.S. has one -works for our country -tells people what to do/makes the rules -famous/rich -lives in D.C. -stands up & talks	-only one from 2nd column -owns the town/country -statue -take over world -president of the state
8. twigs	-small branches from a tree -sticks from a tree	-leaves grow on them -kind of wood -use in bird's nest -come from a tree -fall on ground -use in fire -sticks	-only one from 2nd column -food -knots in hair -toothpicks -hay -can eat with it
9. river	-big stream of moving water -water that moves to the sea/waterfall -flowing water	-swim/play/drown in -bunch of water -fish in it -put boat on it	-only one from 2nd column -lake, ocean, pond -beach -deep & wide -island -whales

Acceptable/Unacceptable Responses for First Grade Test Items			
10. log cabin	-house made of wood -wooden house	-Abe Lincoln lived in -can live in it -can camp in one -shelter -made of wood	-only one of 2nd column -Lincoln log cabin -cabin made of logs -house made of logs -people go in -go on trails -visit
11.disease	-feeling sick -very sick -contagious	-take pills -bad thing -don't want one -could die -can catch it -go to the doctor	-only one from 2nd column -germs, lice, cold, sneeze, pimples, fleas, poison, headache
12. pollution	-dirty air, land, water	-hurts the Earth -air gets bad -hard to breathe -can make you sick -garbage on ground/in air/ in water -littering -factories make it -smoky air	-only one from 2nd column
13. groundhog	-small furry animal animal that lives underground -animal that sees his shadow & tells when Spring is coming	-animal -digs/lives underground -sees shadow -tells when Spring will come -hibernates -woodchuck	-only one from 2nd column -hog/pig -eats insects -Groundhog's Day

Acceptable/Unacceptable Responses for First Grade Test Items			
14. map	-tell you where to go -tells how to get somewhere -shows directions	-paper -tells where you are -use to not get lost -use it to travel -shows streets to use -shows U.S./world/state, etc	-only one from 2nd column -treasure -pirates -fun to look at
15. war	-fighting -battle	-Civil War/ WWI etc -armies -bomb things -can get killed -guns/shooting	-only one from 2nd column -don't like it -tug-o-war
16. litter	-throw some garbage/trash/cup etc on ground/neighbor's yard/in park etc.	-dirty -causes pollution -not supposed to do it -trash	-only one of 2nd column -kitty litter -litterbug
17. globe	-round ball of the world/Earth	-circle -in classroom -can see/has whole world -can learn from it -can spin it	-only one from 2nd column -can take it w/ you -live on it -fun -a lot of people
18. hibernate	-to sleep in winter -sleep until Spring	-animals do it -sleep -go underground -until spring/through winter	-only one from 2nd column -people do it -go to another place -cold

Acceptable/Unacceptable Responses for First Grade Test Items			
19. healthy	-not being sick -feeling strong/good -being fit/in good shape	-eating food good for you -exercise -carrots/apples, etc. -makes body strong	-only one of 2nd column -skin is good -not fat -clean -teeth are clean/healthy
20. nutritious	-food that is good for you -healthy food	-carrots/apples, etc. -make body strong -help you grow	-only one of 2nd column -trying different food -yummy -snack -vitamins

Acceptable/Unacceptable Responses for Second Grade Test Items			
1. thermometer	- used to measure temp. - tells the temperature	- tells if it's hot or cold - use it if someone is sick	- only 1 from column 2 - it's hot or cold
2. soggy	- wet - really damp - moist	- smushy/squishy - soft	- only 1 from column 2 - cereal - waffles
3. flood	- water that covers the ground	- a lot of water - water that rises - water that's high	- only 1 from column 2 - water in it
4. lobster	- sea animal you can eat - seafood - animal w/ pinchers & antennae	- like a crab - red - you can eat it - lives in the water	- only 1 from column 2 - buy them at Wal-Mart
5. oxygen	- air you breathe - you breathe it		- air
6. island	- land w/ water around it	- in the ocean - covered w/ trees & sand	- only 1 from column 2 - birds go there - a place you go to in the middle of nowhere
7. vibrate	- shaking back & forth - shaking from side to side - shaking fast	- something moving - wiggles	- only 1 from column 2 - it goes like this– - breaks apart - moves a lot
8. confused	- you don't understand - you're not sure - mixed up	- don't know what to do - don't know what to think - don't know where you are	- only 1 from column 2 - don't know how to do something

Acceptable/Unacceptable Responses for Second Grade Test Items			
9. ordinary	- normal - like everyone else - like most other things		- only 1 from column 2 - very good - perfect - original - plain
10. throne	- a seat for a king		- what a king wears - anything related to throwing
11. desert	- dry place w/little rainfall - very hot & dry	- many different animals - cactus' live there - little rainfall - lots of sand	- only 1 from column 2 - nobody lives there
12. enormous	- very big huge gigantic		
13. evaporate	- change from liquid to gas - water goes back up to the sky	- water goes away - water dries up	- only 1 from column 2 - it goes up
14. eager	- really want to do something	- excited - want something	- only 1 from column 2 - you're mad - you eager someone - curious
15. peninsula	- land w/ water on 3 sides	- Florida - in the water - attached to land	- land w/ water around it - a park
16. valley	- part between mountains - ditch between mountains	- grassy area - flat - lots of trees - shaped like a V	- only 1 from column 2 - island

Acceptable/Unacceptable Responses for Second Grade Test Items			
17. president	- leader of a country/group - makes rules for people	- lives in the White House - Bill Clinton, etc. - boss - makes the laws	- only 1 from column 2 - leader of the state
18. pioneers	- explore new places - discovered new things	- sail on ships - climb mountains - travel a lot	- only 1 from column 2 - pirates - find out stuff
19. apartment	- place where people live	- building w/ lots of rooms - smaller than a house - like a hotel	- only 1 from column 2 - for poor people
20. harbor	- a place for boats to park - a place in water for boats	- where boats go - in the water - it has a shore	- only 1 from column 2 - place for airplanes

Acceptable/Unacceptable Responses for Third Grade Test Items			
1. earthquake	- it shakes the ground	- a bad storm - earth moves - ground cracks - destroys things	- only 1 from column 2 - strong winds
2. vibrates	- shakes back and forth - moves from side to side - something shakes	- something moving - wiggles	- only 1 from column 2 - it goes like this– - turns into a lot of pieces - moves a lot
3. volcano	- mountain w/ lava & rocks - mountain that erupts lava	- has hot stuff in it - magma in it - it erupts	- only 1 from column 2 - it explodes - there's a movie about it
4. organs	- part of your body - in your body	- 2 examples (heart, kidney, etc.)	- only 1 from column 2 - help you move - musical instrument
5. volume	- loudness/softness of a sound	- turn it up & down on your radio/tv	- only 1 from column 2 - how high/low a sound is - how heavy something is
6. tornado	- storm w/ strong winds - funnel cloud that destroys things	- storm w/ a lot of water - damages things - warm & cold air mix - twirls/spins around	- only 1 from column 2 - there's a movie about it
7. pitch	- tone of a sound - how high/low a sound is		- anything related to throwing - loudness of a sound

Acceptable/Unacceptable Responses for Third Grade Test Items			
8. hurricane	- storm like a tornado near water - storm in the water	- storm by the coast - tropical storm - has lots of water - destroys things - strong winds	- only 1 from column 2 - islands - shakes the earth
9. hail	- tiny balls of ice & snow - ice falling from the sky	- can damage your car - can happen when it rains - makes noise when it falls	- only 1 from column 2 - big ice cubes
10. echo	- sound that repeats - sound that bounces off & comes back	- hear it in the mountains - hear something again	- only 1 from column 2 - say something & it says it louder
11. drizzle	- slight/light rain - a little rain		- when it's raining - heavy rain
12. fog	- clouds near the ground - clouds you can't see through	- cloudy - can't see to drive - can't see outside	- only 1 from column 2 - you have a wreck
13. weather	- outside climate & temp. - what it's like outside	- 2 examples (hot & sunny; cold & snowy)	- only 1 from column 2 - part of the news
14. joints	- bending parts of your body	- in your body - your elbow/knee - help you move	- only 1 from column 2 - part of your muscle - in a robot
15. pollution	- dirty air, land, & water	- smoke in the air - trash /litter on the ground - factories make it	- only 1 from column 2 - it stinks

Acceptable/Unacceptable Responses for Third Grade Test Items			
16. factory	- place where people make things	- makes pollution - people work there - has big pipes on top	- only 1 from column 2 - a big store
17. magnetic	- something that pulls metal towards it - can grab metal	- sticks to the refrigerator - has a magnet in it	- only 1 from column 2 - pulls stuff to it
18. forecast	- tells what the weather will be - tells the weather for the week	- part of the weather - tells what will happen	- only 1 from column 2 - what the weather was on the news
19. voluntary muscles	- muscles you control	- in your body - 2 examples (in arm, leg)	- only 1 from column 2 - make you strong - muscles that volunteer - big muscles - heart
20. erosion	- to wear away gradually - rubs away	- movement of soil - water/wind does it - happens slowly	- only 1 from column 2 - like an explosion - what a volcano does - happens quick

APPENDIX F

Student Rating Scale

Student Name: _____ **School:** _____

Date (Initial/Follow-up): _____ **SLP:** _____

Student's Overall Classroom Communication: _____ **Teacher:** _____
(Rate the student using the 1 to 10 scale described under "instructions".)

Grade/Class: _____

Student Rating Scale

Instructions: *Please rate this student's current skills in the areas listed below. Rate him/her by circling 1 for Very weak skills (rarely performs), 2 for Only performs with maximum support, 3 for Performs approximately 30% of the time, 4 for Performs approximately 40% of the time, 5 for Emerging skills (can perform approximately 50% of the time), 6 for Performs approximately 60% of the time, 7 for Needs some support (can perform approximately 70% of the time), 8 for Performs well most of the time, 9 for Adequate skills, and 10 for Good skills.*

	Very Weak ← → Good Skills									
1. Student attends to classroom presentations and discussions.	1	2	3	4	5	6	7	8	9	10
2. Student understands the vocabulary used in class.	1	2	3	4	5	6	7	8	9	10
3. Student remembers verbal directions.	1	2	3	4	5	6	7	8	9	10
4. Student attends to what is important and knows where to begin.	1	2	3	4	5	6	7	8	9	10
5. Student is able to retrieve specific names, words, or facts (e.g., multiplication tables).	1	2	3	4	5	6	7	8	9	10
6. Student can formulate a clear explanation, description, or story.	1	2	3	4	5	6	7	8	9	10
7. Student volunteers in class and contributes to classroom discussions.	1	2	3	4	5	6	7	8	9	10
8. Student asks for help when he/she does not understand.	1	2	3	4	5	6	7	8	9	10
9. Student is able to correct his/her miscommunications.	1	2	3	4	5	6	7	8	9	10
10. Student makes use of classroom adaptations (e.g., prompts, cues, charts, resources, peer support).	1	2	3	4	5	6	7	8	9	10

Connect the circles to obtain a profile.

TOTAL: *Add up all the numbers you've circled above* = _____

What would you like to see change to increase this student's classroom success?

APPENDIX G

Teacher Survey

Teacher Survey - Collaborative Experience

1. Please provide feedback concerning the language labs this semester. Please include the advantages and disadvantages as they apply to you and your students.

2. In your opinion, how did the language labs benefit the students? Did some students seem to benefit more than others?

3. What changes, if any, would you like to see in the way future language labs are conducted?

4. What were the advantages and disadvantages of the regularly scheduled collaboration meetings?

5. Additional comments/concerns?

Teacher Survey - Control Group

1. Please provide feedback concerning your feelings about not being involved in language labs this semester. Please include the advantages and disadvantages as they apply to you and your students.

2. Do you think that not being involved in language labs this semester had any effect on the students? Please explain.

3. What changes, if any would you like to see in the way that future language labs are conducted?

4. How did you feel about not being involved in the language labs this semester after participating last semester?

5. Additional comments/concerns.

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