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The Effects of Peer-tutoring Learning Disabled Students In A Resource Center Setting on Generalization of Skills

by
Patricia L. Grieves

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
of
The Graduate School
at
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Approved by _____
Dr. S. Jay Kuder

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ABSTRACT

Patricia L. Grieves

The Effects of Peer-tutoring Learning Disabled
Students In A Resource Center Setting
on Generalization of Skills

Dr. S. Jay Kuder, Advisor

Special Education Graduate Program

The purpose of this study was to investigate the effect of peer tutoring on the comprehension of science vocabulary and terms and determine if those study skills methods taught would generalize to the studying of social studies vocabulary and terms. A cross-age peer tutoring program pairing seven, seventh grade learning disabled students with seven, eighth grade regular education tutors was used. Tutors worked with tutees for an eight week program tutoring in science vocabulary and terms through two study skills methods, Self-testing Techniques, and Survey, Question, Read, Recite, Review. Two methods were used to determine results. The first was a survey on study skills beliefs and preferred methods students used prior to and after tutoring. The second was the collection of data on test and quiz grades in science and social studies for the tutees prior to, during, and after the tutoring.

Surveys were compared using a frequency distribution. Students science and social studies grades were compared by first finding individual mean scores for prior to tutoring, during tutoring and after tutoring. Next a group mean and standard deviation was calculated for both subjects and both academic areas.

When these were compared the results showed no major implications in academic areas or significant change in study skills preference.

MINI ABSTRACT

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Chapter 1

The Research Problem

Students and teachers today are met with a special set of new demands. We, as educators, are being asked to provide special education services to our students in an environment that allows the student to participate in the regular classroom as much as possible. Students are being asked to adhere to, as much as possible, the regular education curriculum in these classrooms.

Moreover, reflected in the 1997 amendments to the Individuals with Disabilities Education Act (IDEA) is the requirement that the learning results of students with significant disabilities be included in general state and district student assessment measures - that these students' educational outcomes are a part of school accountability, too.

As we struggle to prepare our students and ourselves to meet these standards we look for effective teaching methods that work. Peer-tutoring has demonstrated it's effectiveness. Peer- tutoring has been used successfully to promote social interactions between children with and without disabilities. (English, Goldstein, Shafer and Kaczmarek, 1997). Classwide peer-tutoring (CWPT) is a demonstrably effective, whole-

class approach to teaching and learning that, in addition to promoting learning among many children, has proved to be teacher friendly (Simmons, 1994). Numerous studies have demonstrated that systematic peer-tutoring can produce significant improvements in a variety of academic areas...(Canipbell, Brady, and Linehan, 1991).

Although much research has been done on peer-tutoring and it's effectiveness, little is known about generalization of peer-tutored skills. Transfer of learning is one of the most puzzling and important learning phenomena. It is important for students to be able to extend the effects of learning to new situations although it is impossible for schools to teach the management of all possible life situations. Behavioral and cognitive psychologists alike have commented on the difficulties in facilitating transfer in students with intellectual or cognitive disabilities. Thorndike (cited in Grose, and Birney, 1963) asserted on several occasions (e.g.1913) that transfer is only relevant when two different learning situations share the same elements. (Lucangeli, Galderisi, and Cornoldi, 1995).

Teachers in core content area classrooms incorporate various materials and methods to communicate concepts to students. Lecture, cooperative learning activities, projects, multi-media presentations, and textbook assignments are delivered at a volume and pace that can overwhelm included students. There is little time to absorb and become proficient in all the skills necessary to meet the curriculum assessment

standards. The success of mainstreamed and inclusion students lies in students ability to develop the study skills necessary to identify relevant information, commit it to memory and be able to retrieve it when called upon to do so.

The Research Question

This study will engage seventh-grade, learning disabled students in a cross-age peer-tutoring program with eighth-grade regular education students. The eighth-grade students will act as peer-tutors to the seventh-grade students. Tutors will work on a one-to-one basis with the tutee's by using study-skills methods, such as flash cards and drill, to teach science vocabulary. The purpose of this study is to investigate the effect of peer-tutoring on the comprehension of science vocabulary and the generalization of the study skills to social studies vocabulary.

Hypothesis

It has been suggested in the literature that peer tutoring is an effective technique for promoting academic gain among children with disabilities. (Fuchs, Fuchs, Mathes, and Simmons 1997). There is some question in the literature as to wether students with intellectual or cognitive disabilities will transfer learning to other academic areas. General transfer effects have been largely dismissed and considered to be a questionable area of research. (Lucangeli, Galderisi, and Cornoldi, 1995).

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In this study I will attempt to answer the question: "Will students who are taught study skills methods in a peer-tutored setting to improve comprehension of science vocabulary generalize those study-skills methods to improve comprehension of social studies vocabulary?"

Students placed in inclusive classrooms are in need of instructional strategies that are effective for improving academic achievement across settings, people, and materials. It is the goal of this research to examine the effect that peer-tutoring has on the acquisition of study skills used to learn science vocabulary and if those study skills will be generalized to learn social studies vocabulary. It is believed that, although the content areas are different, the skills needed to comprehend vocabulary across content areas are similar therefore, generalization of those skills will occur.

Definition of Terms

Peer-tutoring - Peer tutoring is an instructional method in which a more accomplished student aids a lower achieving classmate.

Classwide Peer Tutoring - (CWPT) is a version of peer tutoring that combines peer-mediated practice, teacher-orchestrated procedures, and whole class participation.

Cross-age tutoring - Cross-age tutoring is a teaching method in which an older student instructs a younger student.

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Purpose

Since the 1960's many studies have reported on the effectiveness of peer-tutoring. It has been said to promote academic gains, appropriate social interactions, and self-esteem.

Peer-tutoring in academic areas enables students to have individual practice time in basic skills while receiving immediate correction and positive feedback. Peer-tutoring requires a high rate of academic engagement, which has been linked to greater student learning. It allows teachers to monitor individual student performance, record progress, and adjust skill levels quickly and efficiently. It exposes students to various learning styles allowing them to decide what works best for them.

Classwide peer-tutoring can be used by teachers to reteach a skill that has been taught or practice a newly taught skill. Reciprocal peer-tutoring has been used by teachers to improve the reading fluency of poor oral readers. Cross-age peer-tutoring has been used to enhance self-esteem and promote social skills. Older students who are used as tutors bring the experience of having already "been there" into the equation.

This study will attempt to add to the body of knowledge that already shows the value of peer-tutoring by including the effect that it has on generalization of skills.

Overview

The use of peer tutors has been documented as far back as the late 18th and early 19th centuries. American educators rediscovered peer-tutoring in the late 1960's when concern about chronic underachievement among many poor and minority children brought about the re-use of peer-tutoring programs as an economical means of providing individualized, intensive instruction to academically needy pupils. (Fuchs, Fuchs, Mathes, and Simmons, 1997).

In chapter two of this thesis pertinent literature relating to peer-tutoring and its effects on special needs students will be reviewed. This material will be presented in a general to specific format. First, various peer-tutoring formats will be reviewed. Then, the benefits of peer-tutoring on academics will be presented. Next, results of studies pertaining to generalization of related skills will be examined. Finally, a summary of findings will be presented.

In chapter three the research design will be outlined. The outline will explain the important components of this study and how the study will be conducted.

Chapter four of this thesis will present the results of the study. Data collected will be shown and student outcomes will be compared. Results will substantiate or negate the hypothesis.

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Chapter five will summarize and conclude the thesis. Suggestions for further studies will be explored.

Chapter 2

The Research

The learning profiles of today's classrooms are as varied as the students who inhabit them. The academic heterogeneity in today's classrooms will not allow the type of conventional instructional methods that were used in the classrooms of the past. Whole-class instruction frequently fails to address the learning needs of many of our students. If instruction is aimed at the competent, the less competent are left bewildered and lost. If instruction is aimed at the lowest achieving students the competent are left to fend for themselves. Educators are faced with the challenge of finding methods that can work for classrooms where students performance levels can span as many as five grade levels.

This diversity and current policies that encourage large-scale inclusion of students with disabilities has led teachers to increasingly rely on collaborative learning methods such as classwide peer tutoring. Peer tutoring is typically defined as the pairing of a more accomplished student with a less accomplished student for the purpose of working on academic content. (D. Fuchs, L. Fuchs, P. Mathes and D. Simmons, 1997). With collaborative group work, students can work on different levels. Teachers can decenter

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the learning process to create simultaneous lessons that better address the range of learning needs in the classroom. (L. Fuchs, D. Fuchs, S. Kazdan, and S. Allen, 1999). Peer tutoring has proven to be effective across a variety of classroom settings, grade levels and student groups. Teachers have successfully used peer tutoring in urban, suburban, rural, and multi cultural settings. Peer tutoring engages all students involved in the activity and decreases off-task behavior. Students involved have increased opportunities to learn, are actively engaged in the learning process, have increased practice time and a direct interaction with the learning task, and have achieved greater gains in academic achievement. (Reddy, Utley, Delquadri, Mortweet, Greenwood, and Bowman, 1999). A higher rate of academic engagement has been linked to greater student learning. (Archer, Gleason, and Iassacson, 1995). A central purpose of peer tutoring is to "increase the proportion of instructional time that all students engage in academic behaviors and to provide pacing, feedback, immediate error correction, high mastery levels and content coverage."(Greenwood, Delquadri, and Hall, 1989).

During a typical peer tutoring session student tutees are paired with tutors. Each team works on a designated skill. Tutors follow a task procedure that has been modeled and practiced prior to the tutoring session. Tutors provide feedback on correct responses

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and correct errors as they occur. The teacher moves about the room monitoring each group during the session and instructs both tutors and tutees on correct tutoring behavior. Both tutors and the teacher award points to reward cooperative behavior and correct tutoring methods. Points earned are recognized by the class for all teams by applause, at the minimum level of recognition, and/or by non-tangible rewards such as lining up for lunch first.

In one variation of peer tutoring L. Fuchs, D. Fuchs, S. Kazdan, and S. Allen (1999) researched peer assisted learning strategies in reading with and without training in elaborated help giving (PALS and PALS-HG). In this study two groups, grades 2 - 4, were used to compare the effect elaborated help giving would have as a factor in student learning. The elaborated help giving consisted of a retelling of the sequence of events in the text, paragraph shrinking to develop comprehension and a prediction relay. Their findings show that grade level and treatment exerted statistically significant and practically sizable effects on the kinds of help students provided their peers. Among younger and older children students who had received the help-giving lessons performed higher than those who had not. The older students exhibited some spontaneous use of elaborated help giving and corrected over twice as many errors as their younger

counterparts who had not received the peer assisted learning strategies with help giving (PALS-HG) lessons.

Another study by Mathes, Grek, Howard, Babyak, and Allen (1999) took the success of PALS a step further and designed First-Grade PALS, a reading strategies program aimed at helping to prevent early reading failure. The PALS program is aimed at older students. Mathes and her associates incorporated critical content that has been identified through research for effective early literacy instruction into the PALS program. First-Grade PALS sessions include practice in phonological awareness and phonological recoding, applied in connected text, and prediction, multiple reading, and summarizing through retelling. Although this study only included three first grade students targeted at risk for being classified as learning disabled Mathes reported that once First-Grade PALS was in place, students began to make noticeable improvement in their reading ability. By the end of the school year the teacher classified these same three children as average performing and no longer at risk for special education referral. It was also noted in this study that First-Grade PALS contributes positively to reading achievement, enhances social skills, and increases reading self-confidence. It must also be noted that the program is only one piece of the total reading program and when used with other best practices and curricula could result in even bigger gains by most students.

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Another academic area where peer tutoring has been found effective is in math. In a study on the use of peer tutoring for the acquisition of functional math skills among students with moderate retardation Patrick J. Schloss, Sibyl A. Kobza, and Sandra Alper (1997) used peer tutoring to teach secondary students with moderate mental retardation the One-More-Than technique in a classroom setting and assessed generalization of that strategy to a community setting.

Students were taught to make purchases using one more dollar than asked for by the salesperson during recripricol peer tutoring sessions in the classroom. Community-based assessment of generalization of the skill was conducted one week after the final six week classroom training session. They found that upon exposure to the peer tutoring process, students in each dyad quickly used the correct response and watched for their partners to do the same. Two of the three dyads generalized the target skills into the community setting.

In a study conducted by Madrid, Terry, Greenwood, Whaley, and Webber (1998), three procedures used to teach spelling to at-risk students were compared: (a) Active Peer Tutoring, which required tutors to read a list of 10 spelling words to tutees. The tutees wrote each word and at the same time spelled the word out loud; (b) Passive Peer Tutoring, which required the tutee to observe and listen as the tutor wrote each spelling

word and spelled it out loud; and (c) teacher-mediated instruction, which required tutors

and tutees to follow teacher-developed spelling-lesson plans and which minimized all

overt peer interaction. The teacher procedure involved the use of an overhead projector

for class discussion followed by teacher assigned seat-work in a workbook. The results

indicated that: (a) both peer tutoring procedures produced superior spelling posttest

scores than the Teacher-Mediated Instruction; (b) Passive Peer Tutoring yielded levels of

spelling performance equivalent to Active Peer Tutoring; and (c) correct generalization

responses appeared to occur at an equal rate across the three instructional conditions.

In another study conducted by Susan L. Mortweet, C. A. Utley, D. Walker, H.L.

Dawson, J.C. Delquadri, S.S. Reddy, C.R. Greenwood, S. Hamilton, and D. Ledford

(1999), spelling instruction for students with mild mental retardation and their typical

peers in inclusive classrooms taught through classwide peer tutoring was compared to

traditional teacher led instruction in spelling. This study concluded that seven of the

eight target students spelled with more accuracy during CWPT when compared to

teacher-led instruction and all eight target students were engaged in higher rates of

academic responding during CWPT when compared to rates during teacher-led

instruction.

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In a study conducted by Shalini S. Reddy, C. A. Utley, J.C. Delquadri, S. L. Mortweet, C.R. Greenwood, and V. Bowman (1999), students with mild mental retardation in Grades 1 and 2, in an elementary self-contained classroom, were peer tutored their health and safety curriculum in an inclusive classroom. At the end of the study, Reddy found that the students with disabilities increased their knowledge, with an average gain of 90%-100% when compared to their level of knowledge of health and safety topics at the beginning of the study.

The inclusion of children with disabilities into the regular education classroom has created diversity of another dimension, a diversity of social abilities. Peer tutoring at the preschool level has been successful in allowing both disabled and non-disabled peers to learn and use social strategies such as establishing eye contact, asking a child to play or share a toy, suggesting play ideas, describing their own or other children's play and being responsive to the play of classmates. (English, Goldstein, Shafer and Kaczmarek, 1997). As children become adolescents the threat of social ostracism increases. Deficits in social skills result in poor integration into the school population, increased risk of academic failure and ultimately, for many disabled students, a high risk of dropping out of school. O'Reilly and Glynn (1995), examined the effectiveness of a process social skills training approach taught to two high school student with mild intellectual

disabilities who exhibited social skills deficits. In this study the experimenter and peer tutor would role-play a scripted social situation while the disabled student observed. The disabled student then took a turn at role-playing with the peer tutor. As the disabled student interacted in the role playing script he verbalized the process and performed the social behaviors. The experimenter would deliver verbal praise for each skill performed correctly by the participant. Errors were interrupted and modeled correctly by the experimenter. Role play was repeated until the participant performed all components of the role-play correctly on one trial. This protocol was then replicated for a second script. The role play simulated typical classroom interactions between the disabled students and their classmates. With the introduction of the intervention, both students rapidly increased their use of appropriate social skills during classroom probes. Both students also demonstrated increases in the number of social interactions with peers in the game room and school-yard once training was implemented. These results seem to suggest that the students learned a generative process for interacting socially and that this process can be transferred to functionally different social situations to those used in training.

Amy Wildman Longwill and Harold L. Kleinert (1998), describe a peer tutoring program at Danville High School in Kentucky. This program was initially set up to provide social interactions between students with and without disabilities. Students

without disabilities sign up to receive academic course credit. They are required to complete a series of self-study modules in such areas as beliefs and attitudes, legal rights of people with disabilities, educational programming needs, and family issues. They also receive grades for their daily work and their interactions with the students with moderate and severe disabilities for whom they act as tutors. Tutors and tutees work on projects together and also on a series of activities and assignments that allow peer tutors to learn about issues of concern to people with disabilities. The goal of the instructors is that, from these more formally structured interactions, friendships would develop. The benefits for students with disabilities are (a.) Opportunities for sustained, positive interactions and friendships, (b.) Increased opportunities to practice needed skills, (c.) Age-appropriate role models, (d.) Development of pro-social behaviors and communication skills, and (e.) Promotion of equity among students and the discovery of hidden strengths.

Longwill and Kleinert report that peer tutors frequently develop friendships with students with disabilities that go well beyond the classroom. Peers collaborate with students with disabilities within and outside of the school, in such activities as going to youth group, out for pizza on Saturday night, or to the movies; researching topics at the school and public libraries; and going Christmas shopping together.

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Despite the movement toward collaborative teaching methods and the proven feasibility of peer tutoring as a means of balancing the diversity of today's classroom there is little research in the effect peer tutoring has on the generalization of skills to other academic areas. Such effects are necessary to achieve if training effects from special or individualized settings are to lead to higher functioning in mainstream settings.

Beverly J. Canipbell, M. P. Brady, and S. Lineham (1991), note that there has not been as systematic a focus on learning disabilities, due to both acquisition and generalization. Many students with handicaps, for example, do not extend their skills and knowledge to academic areas or environments beyond the classroom. Canipbell and associates studied the effects of a peer teaching procedure, combined with student letter-writing activities, on the acquisition and generalization of capitalization skills. Peer teaching partners reviewed capitalization rules, quizzed student tutees on the rules, provided correct examples of each rule, and asked students for other examples. During the training session different worksheets were sent to each peer partner as a "letter" and contained sentences for which the students were instructed to identify all words that should be capitalized by encircling them. The peer partner then provided the target student with feedback on the various examples given and in the most recent letter sent by the student to the peer partner. To assess potential response generalization, the students

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produced written logs two to three times a week during composition class on open-ended assignments in which the students were asked to write about a recent interesting experience. The logs were examined weekly for how many types of capitals each student used. Both tutors and tutees were assessed (from their composition logs) to determine whether or not their skills improved as a result of the peer tutoring partnership.

The results of this study demonstrated that the three participants acquired capitalization skills through the use of the peer teaching and letter writing procedure. Also noted in this study was an aspect not expected, tutees not only sent daily letters to their peer partners, but also wrote letters to other peers who did not participate as teaching peers. These letters formed the bases of the partners' teaching and feedback sessions. These multiple practice opportunities resulted in across-peer generalization.

Limitations of this study that would preclude generalizability of these findings to all members of any particular category of children are the limited number of participants and the mixed classifications of students. Another limitation is that only one measure of response generalization - written logs - was assessed.

One other study conducted by Nancy L. Cooke and Richard M. Reichard (1996) focused on the acquisition and generalization of multiplication and division facts. In this study Cooke and Reichard used peer tutoring methods to teach basic facts through flash-

card drill and practice and interspersal of acquisition and maintenance facts. Data were collected on the mastery rate of either multiplication or division acquisition of facts and their generalization to timed written probes under each condition. The study found that four of the six students mastered acquisition facts at the fastest rate in the 70% acquisition - 30% maintenance rate as compared to 50% acquisition - 50% maintenance, and 30% acquisition - 70% maintenance. This advantage carried over to generalization probes for most students. Although two students could master facts verbally at a fast rate, both demonstrated highest generalization with a slower introduction of acquisition facts. The differences across students in mastery and generalization in this study suggest the importance of determining individualized ratios of acquisition to maintenance facts. As the researchers suggest the optimal ratio should be treated as fluid and modified until the student is working with the most challenging ratio without compromising generalization and maintenance. Since generalization rates were modest for three of the students in this study the experimenters suggest future research should include ways to have drill and practice exercises promote more rapid generalization of mastered facts.

While it its true that peer assisted learning strategies have been shown to be effective it is important to note that placing students into a cooperative learning arrangement will not, alone, assure success. Student learning in collaborative

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arrangements depends on the quality of student interactions. Careful planning and guidance in effective interaction during peer tutoring is a key factor to it's success. This would require that the teacher maintain an active monitoring system of tutoring procedures and academic gain for the tutees. It would also require that tutors would be trained in specific tutoring methods and closely monitored so that off-task behavior is minimal.

Another variable identified that could be considered problematic was the size of the peer tutoring group. If the study did not include enough subjects there was difficulty in researchers concluding that generalizing the results to larger groups would be feasible. If there were too many subjects the need for added adult supervision in the form of instructional assistants could become a variable to consider.

Most interesting to me were that the results of many researchers pointed to the need for studies that would assess generalization across school subjects in an attempt to determine the factors which enhance generalization from one academic subject to another. This line of research would expand the options that are available to assist children in helping other children and to increase instructional options available to teachers in the classroom.

Research done by Daniela Lucangeli, Doriana Galderisi, and Cesare Cornoldi (1995) proposes that failure to obtain generalization could simply be due to the fact that the training was focused on a specific context and did not include training to generalize. In their research they found that a program designed to increase children's metacognitive knowledge also increased their ability to reflect on their own mental functioning. A metacognition program is similar to programs in which children are taught to learn how to learn. It is possible that by enhancing mental skills, knowledge concerning mental functioning is also enhanced.

Conclusion

The success of the studies mentioned in this literature review establish that peer tutoring is a valid and reliable method that can be used to improve student learning. The research shows that students who participate in peer tutoring programs improve in academic and social skill areas. Teachers who have participated in the studies rate peer tutoring high on their list of effective strategies that they would continue to incorporate in their repertoire. Peer tutoring is effective across age groups studied and across curriculum. It increases the proportion of instructional time that students engage in academic behaviors, frees teachers to monitor and provide feedback on an individual

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basis, and is an effective way teachers can address the diversity of students in the classroom.

A weakness noticed in the studies were that most studies encompassed small groups. Several contained no more than two or three subjects. The small group size throws question on the reliability of the results. Another weakness mentioned by many researchers was the lack of emphasis on generalization of the skills being tutored. Difficulty in students ability to generalize skills was attributed, by some researchers, to the fact that the training was focused on a specific content and did not include training to generalize. It was felt that a program designed to increase children's metacognitive knowledge would result in generalization of the skill.

Metacognition has been defined as one's knowledge about cognitive processes and knowing. Metacognition involves at least two separate components which are: (a) knowing what to do (i.e., the skills, strategies, and resources needed to perform a task effectively) and (b) knowing how and when to do what (i.e., the ability to use self-regulating mechanisms to ensure the successful completion of the task) (Rafoth & Leal 1993).

Memory and study skills instruction can have a particularly powerful impact on middle school students' classroom performance. Cognitively, middle school students are

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in what Piaget called concrete operations. Students in this cognitive stage learn best with concrete demonstrations and find pictures and visual supports helpful. They should be exposed to many different learning strategies so they can eventually become competent enough to apply them spontaneously in appropriate situations.

It is my intention to focus this study on the peer-tutoring of study skills strategies with the intention of gathering data that will support the use of metacognitive strategies to improve generalization of skills.

Chapter 3

The Research Design

An intact group of seven students was used for the study. All students are in seventh grade and attend a regional middle school with grades 7-12. All of the seven students are classified Specific Learning Disabled (SLD). Students classified as SLD must have a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations.

The group includes four girls, three that are twelve years-old and one thirteen year old, and three boys, two that are thirteen years-old and one that turned thirteen during the program. One of the boys is African American, one is Hispanic while the rest of the subjects are Caucasians.

All students participate in science and social studies inclusion classes as an intact group. Four of the students receive English, math, and literature in the resource center. One student receives English and literature in the mainstream and math in the resource center. One student receives math in the mainstream, literature and English in the resource center. One student is mainstreamed for English, literature and math. All seven

students also participate in a resource center supplemental class that is structured as a small group, supported study hall. This class meets at the end of the day as an intact group.

Nine students were selected from a general, eighth-grade study hall to act as tutors, the two extra students acted as alternates. They were also selected from an intact group that meets during the same period as the supplemental class. Selection was made by recommendations from their Algebra teacher, who also monitors the eighth grade study hall. Selection was based on academic standing and dedication to their school success. Letters asking permission from parents and phone calls to parents to confirm their permission to participate in the program were also determining factors in their participation.

Students who met the criteria were trained by the experimenter during two thirty-minute sessions. Modeling of appropriate tutoring methods and role-playing was the method used to train the tutors. Tutors were trained in two study skills methods, flash card drill and SQ3R, (Survey, Question, Read, Recite, Review). They were assessed for readiness at the second session.

Once training was completed one eighth grade tutor was paired alphabetically with a 7th grade tutee by the experimenter. Tutoring sessions were held twice a week for thirty minutes per session. Tutors were rotated every week to control the reliability of the tutoring. The first study skills method used was flash card drill. Tutoring using this method lasted for four weeks, eight thirty minute sessions. At the end of the eight weeks tutors began using the SQ3R method for another four weeks.

Tutoring procedures for flash card drill were as follows: Tutors reviewed all flash cards to be studied with the tutee by showing and pronouncing the term and definition. Once all cards had been reviewed the drill began.

The first ten cards in the deck were selected for drill. Tutors were instructed to show the definition or the term and wait three seconds for a response. If the tutee did not know the answer the tutee was to supply it, place a red check on the face of the card, place the flash card on the "incorrect" space on the folder, then continue with the rest of the cards in the same manner. If the tutee knew the correct answer, the tutor was to place a green check on the face of the flash card and place the card on the "correct" box on the folder and continue with the rest of the cards. After going through all selected terms the tutor was to count the total number correct and incorrect and write them on the "tally card".

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Tutors were also instructed on positive reinforcement. If the tutee responded incorrectly they were asked to calmly and non-judge mentally say, "NO" or "That's Incorrect", if the tutee answered correctly they were asked to say, "Correct" or "Good" before moving to the next card. Cards that received three green checks in a row could be removed from the deck for the remainder of that session and be replaced by new cards. At the end of the session all cards were returned to the pile to be reviewed at the next session, those cards were removed before the tutoring for that session started, but were replaced at the next review. Tutors were assessed for readiness at the second training session.

At the end of the four weeks tutors began using the SQ3R method for another four weeks. Tutoring for SQ3R was as follows: Tutees were given photo copies of the chapter for study from the science textbook. Embedded questions were placed throughout the chapter. Questions were the main ideas necessary for understanding the vocabulary and terms presented by the chapter. Tutors were trained how to present the reading material to the tutees by first reading it through to the tutee, then reading the question to be answered. Tutees were to return to the text, read it to locate the answer, highlight the answer in the text, and both tutor and tutee were to formulate a written answer to the question. At the end of this session the experimenter checked and

redirected tutees with incorrect or incomplete answers. Tutors and tutees were to revise answers before moving on to the recite and review portion of the study session.

Once all answers were correct and complete, tutors and tutees reviewed the questions and answers until the tutee could recite the answer without benefit of the written work.

Data was collected from science and social studies tests and quizzes during the implementation of the program. Again, particular attention was paid to student performance on the vocabulary and terms sections of the tests and quizzes.

Prior to starting the peer-tutoring program a Likert Scale type survey was given on an individual interview basis to each student who participated as a tutee. The survey questioned students on the study methods they employ.

Also prior to the start of the tutoring data was collected on both science and social studies tests and quizzes. Particular scrutiny was given to vocabulary and terms sections on the tests and quizzes.

At the end of the experiment each tutee was given a Likert Scale type survey on an individual basis. Questions pertained to their method of study since participating in the program. Both pre and post surveys were assessed.

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Chapter 4

The Results

Data from the study skills survey that was given prior to starting the peer tutoring program were collected and analyzed. The first four questions on the survey asked questions about students general feelings toward studying.

Results showed that three of the seven students surveyed were taught to study through reading texts, one studied using in class lecture notes and one learned to study through modeling and practicing what was modeled. Two students did not choose any of the methods presented as the method they used to study. A large portion of the students surveyed, five of the seven, said that they spend 20-30 minutes studying before quitting for a bread. Two study for 5-10 minutes before quitting for a break. Four of seven said they quit studying altogether when they thought they knew the material, two said they quit when they had gone through the material at least once, one reported quitting when he felt tired. Five of the seven reported that they thought that studying for tests helps some while three said they felt it helps a lot.

The remaining questions focused on specific study skills methods and strategies . These methods and strategies were selected from research, (Rafoth and Leal, 1993), (White and Greenwood, 1984), or were selected because they were required by the

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school English curriculum for seventh grade. Students were asked to rate the methods and strategies on a Likert Scale from 0-4. 0 = Don't know this method; 1= Never Use; 2=Sometimes Use, 3=Use A lot, and 4=Always Use.

Methods with a preponderance of answers with a rating of 0, don't know this method, were: word identification procedures, SQ3R, first letter mnemonics, the Loci method, chunking and reciprocal reading. Methods with scattered results were: self-questioning techniques, visual imagery, learning strategies, self-testing techniques and use personal notes taken from lectures or textbooks. One question, number five, "Do you organize related materials and study them together?", resulted in a high rating. Five students listed that they sometimes use this method. One student chose don't know, and one chose use a lot.

These results were used by the experimenter to select two study methods for peer tutors to utilize during the tutoring sessions. Self testing was selected as the method to be used in the first four week tutoring session. SQ3R was selected for the second four week tutoring session.

During the time prior to the start of the tutoring the experimenter collected science and social studies grades on tests and quizzes and recorded them. This process

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continued for the time students were being tutored and continued for four weeks after tutoring ended.

At the end of the peer tutoring a second identical survey was given to the students. The second survey resulted in the following: Three of the seven students surveyed reported not using any of the methods listed when they study. Two reported they were taught to study by reading the text, one was taught to use class lecture notes, and one was taught through modeling and practice. One reported that he studied for one hour before quitting for a break, three studied for 20-30 minutes before quitting for a break, and three studied for 5-10 minutes before quitting for a break. Five students said they quit studying altogether when they think they know the material, while two said they quit when they are tired. Four reported that they think that studying for tests helps a lot, two said it helps some and one felt it did not help much at all.

The remaining Likert Scale questions resulted in the following findings: Study methods with a preponderance of the choice 0= Don't know this method were: SQ3R, first letter mnemonics, the loci method, and chunking. Methods that received a mixed rating were: organize related materials and study them together, self-questioning techniques, visual imagery, identification procedures, use learning strategies, reciprocal reading, self-testing, and use personal notes from text and lecture.

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Data on test and quiz scores collected prior to tutoring, during tutoring and after tutoring for both science and social studies was charted and a mean total for each student was calculated. This mean score was analyzed to determine an overall mean score and standard deviation for the group in each stage of the program. (See Table 1)

The table show that peer tutoring these students in science did not result in a major improvement in test and quiz scores for the group or on an individual basis and that the outcome is not large enough to be reliable. Social studies test and quiz scores did not reflect a gain during or after tutoring leading this experimenter to conclude that generalization of study skills taught did not occur in the group, nor did it occur on an individual basis.

Table 1

Summary of Test Scores

Science Test and Quiz Scores

	Mean	Standard Deviation
Prior to tutoring	82	7
During peer tutoring	68	12
After peer tutoring	76	7

Social Studies Test and Quiz Scores

	Mean	Standard Deviation
Prior to tutoring	77	5
During tutoring	70	8
After tutoring	70	7

Chapter 5

Analysis of Data

This study examined a cross-age peer tutoring program pairing seventh grade

learning disabled students with eighth grade regular education tutors. Tutors worked

with tutees for an eight week program tutoring in science vocabulary and terms through

two study skills methods, Self-testing Techniques (flash card drill), and Survey,

Question, Read, Recite, Review (SQ3R). The purpose of this study was to investigate the

effect of peer tutoring on the comprehension of science vocabulary and terms and

determine if those study skills methods taught would generalize to the studying of social

studies vocabulary and terms. Two variables were used to determine results. The first

was a survey on study skills beliefs and preferred methods students used prior to and

after tutoring. The second was the collection of data on grades of the tutees prior to the

peer tutoring, during the peer tutoring, and after the peer tutoring in both science and

social studies.

Results of the Survey

In comparing the frequency distribution of the two surveys some similarities were

noted. SQ3R, First Letter Mnemonics, the Loci Method, and Chunking received a high

preponderance of "Don't know this method" responses on both surveys. Regrettably,

SQ3R was one of the methods taught in the school English curriculum and taught during

the second tutoring session.

It was expected that the survey given after tutors taught SQ3R would have reflected that tutees would recognize the method and respond in a positive rating on the post tutoring survey. The post tutoring survey did not indicate that the tutees recognized SQ3R as a study method that they had been taught. It is possible that the question on the survey was unclear to them or that they did not understand that SQ3R was one method that they were taught. It is possible that tutors did not explain what method they were teaching frequently enough for tutees to recognize it on the survey, therefore, when they answered the post tutoring survey their responses did not reflect that it was a method that they knew or used.

Methods that received mixed ratings, (ones that had no rating distinguishing one particularly outstanding choice), were Self-Testing Techniques, Self Questioning Techniques, Visual Imagery, Learning Strategies, and Study personal notes from text and lecture. Self-Testing Techniques, flash card drill, was the other method used during the first four weeks of the tutoring. There was no remarkable shift noted in students rating of any of the survey questions.

When students test and quiz grades were analyzed it can be noted that group mean scores for science dropped fourteen points during tutoring. Social studies group

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mean scores dropped seven points during tutoring. These drops in mean scores indicate that the peer tutoring did not prove effective where test and quiz scores were concerned.

Tests and quizzes taken in in-class support science were textbook published tests. These were selected by the regular education teacher to reflect specific skills that students were required by the curriculum to know and were modified by the experimenter to enable students to be able to comprehend what was being asked and what their choices were (i.e. provide word banks, reduce the number of choices etc.). Students were not exposed to exact test questions during tutoring, only to terms and formulas, and could have had difficulty with the written wording of the test questions. These tests also require that students can not only identify and match terms but that they can apply formulas, such as the formula for mass, acceleration, and mechanical advantage, to sample mathematical questions.

When individual student test and quiz scores were examined there were no major implications found that would corroborate an individuals improvement during tutoring. Similar findings occurred in the post tutoring grades. There were no remarkable gains or losses in grade point averages of the individual student scores or in the group means. Since there was no gain in either individual or group scores this leads the experimenter to conclude that generalization of the study skills methods did not occur.

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This study did not concur with previous research. The research pertaining to peer tutoring in academic areas presented several successful studies. Studies in spelling a word list of ten words (Mortweet, 1999), health and safety training (Reddy, Utley, Delquadri, Mortweet, Greenwood, and Bowman, 1999), using the One More Than Method (Schloss, Kobza, and Alper, 1997), in teaching functional math skills, and several studies reporting on reading and social skills (Fuchs, Fuchs, Hamlett, Phillips, Karns, and Dutka, 1997), (Fuchs, Fuchs, Kazdan, and Allen, (1999), (Longwill, and Kleinert, 1998), and (Mathes, and Grek, 1999), all reported "marked improvements" when peer tutoring was used. The functional math skills study mentioned above also reported generalization of the One More Than Method to the community setting. The results reported in the research are not reflected in this study. As mentioned academic gains were not noted in either science test and quiz scores or in social studies test and quiz scores. Also, questions that focused on students overall feelings about studying, (numbers one through four on the survey), did not reflect a substantial change on the frequency distribution of the survey.

To use test scores as a predictor of success is questionable since tests are not always uniform in arrangement or in difficulty of skills being assessed. A better method

of assessing tutoring success would have been to assess students on the specific information taught during tutoring at the end of each study skills segment

The research has also suggested that generalization would not occur unless students were specifically instructed on how to use the skills learned in other academic areas. (Lucangeti, Galderisi, and Comoldi, 1995). This study corroborates that finding. Students were not taught to use the study methods in other academic areas. Social studies test and quiz grades were used as a control to determine if study skills methods were generalized to the study of social studies vocabulary and terms. Academic gains would have indicated that these skills were applied to the study of social studies, no such findings occurred. Although academic improvements were not noted by this study, other improvements accounted to peer tutoring that were mentioned in the research were also noted in this study. Longwill and Kleenhert (1998), report that peer tutors frequently develop friendships with students with disabilities that go well beyond the classroom. This experimenter observed that tutees and tutors quickly established friendships within the peer tutoring group. Students became comfortable with each other and tended to joke and talk with each other during sessions. Outside the tutoring environment tutors and tutees were observed socializing with each other during the changing of classes, scheduled locker times, and at after school functions.

Limitations

Socialization during the tutoring was a variable this experimenter had not controlled for that did present a problem. This could have had an affect on the success of the study. Tutees became competitive with each other, trying to outdo the number of terms each learned in a session of tutoring. Socialization, during the tutoring sessions, between tutors and tutees concerning mutual school team sports and middle school social gatherings had to be closely monitored. This presented a logistics problem for the experimenter The sheer number of students, tutors and tutees, working in a small space at the same time was difficult for one person to monitor. Keeping tutors and tutees on task for the entire thirty minute session was difficult. .

If this study were repeated it would result in more successful results if the size of the group being tutored were reduced to a more manageable size for one monitor to work with. Tutors and tutees could be broken into groups of two or three pairs per session sessions could be increased to meet five times per week, rotating tutors and tutees so that all received at least two thirty minute sessions of tutoring per week. Another way to control socialization would be to have at least two monitors observing the tutoring sessions.

Implications

This study suggests that the size of the group in relationship to the number of monitors is a factor that can affect the outcome. It also suggests that students must be taught to generalize learned skills to other academic areas.

Although this study found no significant results I believe it adds to the body of knowledge in that it corroborates that learning disabled students can form social relationships through a peer tutoring environment. It also corroborates that students need to be taught to generalize skills to other academic areas, and group size is a factor to consider when setting up similar studies.

Conclusions

This study looked at peer tutoring learning disabled students in science vocabulary and terms through the use of two study skills methods. Improvements in grades, tutees preference in their choice of study skills methods, and generalization of learned skills to other academic areas were expected. Survey's given prior to tutoring and after tutoring, pre tutoring, during tutoring, and post tutoring test and quiz scores were methods used to determine the success of the study.

The results of this survey showed no major implications. Future research should add controls to better monitor student engagement during the tutoring sessions by reducing tutoring group size and increasing the number of sessions per week or adding monitors. Another variable that experimenters would need to control for would be inclusion of training in generalization of skills to other academic areas. This would improve the chance that students would apply the newly learned skill to more than one setting.

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