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ABSTRACT

A study investigated the impact that a structured peer tutoring program had on improving the mathematics and reading achievement scores of academically disadvantaged, handicapped, and limited English proficient students enrolled in vocational classes, and on the mathematics and reading achievement scores of their tutors. It also assessed 10 selected administrative procedures unique to the program. The subjects were 180 randomly selected students in vocational education classes in two Chicago public high schools. Ninety students were in a control group, and 90 received tutoring in reading and mathematics as related to vocational education classes. Students in both groups and the tutors were classified as special needs. Tutors were 60 students, with 30 students in a control group. The study found that the peer tutoring program had limited impact on the improvement of students in mathematics. However, the program had a positive impact on reading, particularly for academically disadvantaged and handicapped students. Tutors increased their mathematics scores, whereas their reading scores decreased. The most useful administrative procedures for the program were orientation workshops for tutors, the selection criteria used for tutors, and the technical assistance and support provided for tutors. Recommendations were made for program improvement. (Includes 59 references and study questionnaires and forms.) (KC)

NORTHERN ILLINOIS UNIVERSITY

STRUCTURED PEER TUTORING IN CHICAGO'S VOCATIONAL EDUCATION PROGRAM

A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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BY

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OVERVIEW OF THE STUDY

Introduction

The purpose of this chapter is to define the problem to be studied. Background information, the purpose and significance of the study are presented. This chapter includes research questions and definitions of terms. The limitations and organization of the study are stated.

Background of the Study

The immediate concerns for excellence in education, dwindling financial resources, and the increasing number of students with special needs who are not succeeding in regular classrooms is a challenge to all educators to improve the effectiveness of their instruction. Some legislative enactments in recent years have focused on those learners with special needs that hinder their academic achievement in the classroom (Wells, 1984).

Federal legislative mandates popularly known as The Vocational Education Act of 1976, The Education for All Handicapped Children Act of 1975, and The Carl D. Perkins Vocational Education Act of 1984, have provided educators with the necessary framework for developing and delivering programs designed to meet the diversified requirements of

targeted special needs students. Neff (1987) states that intrinsic to this task is a need for the inclusion and expansion of alternative learning strategies for these special needs students.

Grossman (1985) reported on a peer tutoring program in a New York City high school that showed 76% of tutees passing an algebra class as compared to only 46% passing of those not receiving tutoring in the class. Grossman cites two reasons for the success of this tutoring program: (a) more time was made available to the tutee to review and to solve similar problems (communicating and practicing); and (b) there was sufficient time for student questions and more time for the teacher to explain concepts in ways appropriate to meet the tutee's learning styles (communicating and interacting).

A student classified as special needs (academically disadva taged, handicapped, and limited-English-proficient for this study) spends even less time interacting, communicating, and practicing in the classroom (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986). Limbrick, McNaughton, and Glynn (1985) state in a study on underachieving tutees that just allotting more time for instruction is not the answer. They indicated that instruction must also be provided to match the level and skills of the low-progress performer and actually doing this was more a problem than finding more time for instruction.

As teaching loads become heavier, class sizes increase, and greater numbers of special needs students are enrolled, it becomes more important to develop tutoring programs as one avenue for students who are having difficulty (Harris, Rosenthal, & Snodgrass, 1986). One way a teacher might increase the amount of time communicating, interacting, and practicing in the classroom is to utilize the expertise of peers. A peer tutoring system instituted within the classroom represents an alternative approach to attacking some of the problems of the special needs student (Delquadri, et al., 1986).

The Student Services Corporation, a peer tutoring program in the Chicago Public Schools, was initiated to assist special needs students in vocational classes. This peer tutorial program provides assistance to special needs students who are experiencing difficulties in reading and math in vocational education classes. Peer tutors assist vocational instructors in reinforcing the lessons taught in class to ensure the success of the students in vocational education classes. The peer tutors also provide assistance to the special needs students with the operation of complicated machinery and in any other area related directly to a student's individual needs. In addition, when necessary, peer tutors assist special needs students by repeating instruction in the native language of the student. A part-time, local school vocational advisor

coordinates the activities and delivery of this support service to special needs students.

Purpose of this Study

The purpose of this study consists of three components. First, the study investigated the impact that a highly structured peer tutoring program had on improving the mathematics and reading achievement scores of academically disadvantaged, handicapped, and limited-English-proficient students enrolled in vocational classes in two Chicago Public high schools. Second, the study analyzed the effect that the program had on the tutors based on their mathematics and reading achievement scores. Third, the study assessed selected administrative procedures unique to this program. Based on the purpose of this study, the following research questions were posed:

1. Does a structured peer tutoring program have an effect on the mathematics and reading achievement scores of academically disadvantaged, handicapped, and limited-English-proficient students in vocational classes?
2. Does a structured peer tutoring program in vocational classes have an effect on the mathematics and reading achievement scores of the tutors who assisted other students?

3. Are selected administrative procedures which include training sessions, a record-keeping system, and program evaluation, perceived to be useful by participants in the peer tutoring program?

Significance of the Study

Peer tutoring is a relatively common technique used in many large city schools the past 25 years to increase achievement levels (Fresko & Eisenberg, 1985). Researchers have studied peer tutoring as an instructional technique for more than two decades. Generally, they have shown that, properly utilized, peer tutoring benefits everyone: tutor, tutee, and teacher (Lehr, 1984). Tutees receive individual attention they would not otherwise get, and teachers have an opportunity to work with those most in need of help. An obvious benefit of tutoring is the individualization it can give learners of differing needs (Scruggs & Richter, 1986). Other benefits of peer tutoring are: increased exposure to the material, development of learning and teaching skills, motivational factors, academic achievement, and advantages of the teacher's being a peer (Cohen, 1986).

The impact of peer tutoring has demonstrated academic gains for tutees in a variety of subjects (Eisenberg, Fresko, & Carmeli, 1983). Cohen (1986) reported that

tutoring significantly contributed to academic growth for tutees but only in a well structured program. A structured peer tutoring program provides a learning structure for the tutee that involves modeling, communication, feedback, and a motivational system (Cohen, 1986). Cohen also states that the nature of peer tutoring can improve on the traditional classroom setting because of its constant attention, explanation, demonstration, and direct and immediate feedback.

Although research has generally indicated academic growth for the tutee as a result of peer tutoring, much of this research has focused on elementary students in a regular classroom. Research on tutoring at the high school level has mainly dealt with students in academic classes; and the emphasis here is usually focused on increasing specific math or reading skills and abilities only (Devin-Sheenan, Feldman, & Allen, 1976). Due to a lack of empirical evidence, a study exploring the benefits of structured peer tutoring in vocational classes at the high school level is needed.

In summary, this study was conducted to provide useful information for administrators to design and implement peer tutoring programs. The study also provided information to assess the effects of peer tutoring programs on mathematics and reading achievement scores presented in vocational content classes.

Educational administrators need to know how best to implement structured peer tutoring programs to help special needs students in vocational classes. Further, by determining certain characteristics of peer tutoring programs and their impact on program effectiveness, administrators are served by this study.

Definition of Terms

The following terms are defined as used in this study:

Academically Disadvantaged

A person who, based upon the results of standardized tests, is two grade levels below grade placement in reading skills, English skills, or math skills.

A student who is receiving a grade of D or below in a vocational class and needs support services to succeed in that class.

Handicap

A physical or mental impairment that substantially limits the perception of one or more major life activities.

Limited-English-Proficient

Limited-English-proficient means any student of a national origin minority who does not speak and understand the English language well enough in an instructional setting to benefit from vocational studies to the same extent as a student whose primary language is English. Moreover, limited-English-proficient students vary in the degree of

English proficiency in the areas of understanding, speaking, reading, and writing.

Peer Tutor

A student who instructs a fellow student in a particular subject area.

Tutee

A tutee is a student who is instructed by a fellow student (a peer tutor) to supplement classroom instruction in a particular vocational subject area.

Vocational Advisor

The Vocational Advisor is the Coordinator of the Student Services Corporation at the local site.

Vocational Education

Vocational or technical training or retraining is given in schools or classes (including field or laboratory work and remedial or related academic and technical instruction incident thereto) under public supervision and control or under contract with a state board or local education agency.

Vocational Educator

A person who has had training or occupational experience in his/her chosen area of specialization.

Vocational Special Needs Education

Vocational education for disadvantaged, handicapped, and limited-English-proficient persons supported with funds under The Carl Perkins Vocational Act of 1984 to

include special educational programs and services designed to enable disadvantaged, handicapped, and limited-English-proficient persons to achieve vocational education objectives that would otherwise be beyond their reach. These programs and services may take the form of modification of regular programs or be vocational special education programs designed for disadvantaged, handicapped, and limited-English-proficient persons. Examples of such special educational programs and services include the following: special remedial instruction; native language and English as a second language instruction, guidance, counseling and testing services; employability skills training; communications skills training; special transportation facilities and services; special educational equipment, services, and devices; and reader and interpreter services.

Limitations of the Study

The study was limited to students enrolled in vocational classes who were classified as academically disadvantaged, handicapped, and limited-English-proficient.

A second limitation of the study was that the achievement scores analyzed included only the subtests in reading and mathematics of the Test of Achievement and Proficiency administered to students attending the Chicago Public High Schools. These subtests measured

skills that the students who participated in the study needed to review for the vocational classes selected.

Organization of the Study

In Chapter Two, a review and examination of literature relating to the topic of the study is presented. In Chapter Three, the methodology is discussed. The findings of the study are presented in Chapter Four. Finally, a summary of this study, major conclusions, implications and recommendations are provided in Chapter Five.

Chapter Two

REVIEW OF THE LITERATURE

Introduction

This chapter contains the review of the literature related to the study. The topics include historical perspectives; studies in peer tutoring; plan, development, and implementation of peer tutoring programs. Also described are salient features of the Student Services Corporation, a peer tutorial program conducted in the Chicago Public Schools.

Peer Tutoring: A Definition

Peer tutoring has been defined, at its most basic level, as children teaching other children, usually on a one-to-one basis. The term "peer tutoring" has been used in the literature to describe situations in which a person provides instructional assistance and guidance to another person (Cohen, Kirk, & Dickson, 1972). Studies of peer tutoring often have reported on older students teaching some subject to younger students, a situation more accurately labeled cross-age tutoring. However, the term "peer tutoring" is used to describe both cross-and same-age tutoring arrangements.

According to Vassallo (1973), peer tutoring is

certainly not a new concept. Children have been helping and teaching each other for as long as people have banded together with common goals. The literature in anthropology mentions many societies which expect or demand the transmission of information and skill from older to younger children. More familiarly, early settlers in America had to rely on the more mature of their children to handle homemaking and caretaking chores and to teach these tasks to younger siblings, while the parents attended to matters outside of the household. When schooling became possible on a community level, children were sent to one-room school houses to receive their instruction. With one teacher to provide that instruction, older or more able students were given the responsibility of teaching younger or less gifted students on a part-time basis. The tutoring arrangements apparently worked. Children were able to learn their lessons even in a multi-grade classroom with only one teacher.

Recent parallels of earlier tutoring arrangements have been developed to ensure that greater attention is given to the needs of each student. Consequently, more time is made available to the teacher to work with students needing special attention. The teacher can make maximum use of the additional time to develop lesson plans or to meet with support staff regarding special problems and needs.

Many studies have been published on conducting peer tutoring programs in the schools. These studies have been very positive in their descriptions of the success of such programs. Various studies will be examined to clarify the advantages and limitations of the various forms of tutoring programs.

Historical Perspectives

The inception of peer tutoring can be traced to the developing needs of societies to educate their young in the necessary tasks that guarantee the continuation of the group. In ancient times, the concern of a group of individuals was with survival and the maintenance of physiological needs. In more recent history, with the development of formal systems devoted to the education of children and youth, emphasis has shifted to training students to meet the cognitive and affective demands of the larger society. Children teaching other children has occurred throughout the recorded history of mankind as demonstrated by older siblings asked to set the example for younger ones.

The first picture that comes to mind of children teaching other children is that of little red schoolhouses that were staffed by one dedicated teacher. As a result of having a variety of students to instruct, these

teachers frequently relied on the older or more intelligent students to work with the other children. The genesis of peer tutoring, however, lies farther in the past. Bateson (1972) has described several simple societies that emphasized the early involvement of children in adult roles, including acting as teachers of younger children in the family. In societies in which a prolonged childhood as we know it does not exist, there is an expectation that the older sibling can assume familial responsibilities.

Gartner, Kohler, and Riessman (1971), in a review of early references to children teaching other children, have noted several discussions of the topic in preceding centuries. Particularly fascinating is the reference to John Comenius, whose work was first published in 1849, who recommended that the student who wanted to make progress in the subject should arrange to give lessons to others in a regular basis. Comenius mentions the phrase "He who teaches others, teaches himself" as supporting his belief. The learning advantages for the tutor in a tutorial arrangement receive additional mention from Andrew Bell (1832) who stated that he who teaches learns.

Joseph Lancaster (1806) proposed the "monitoring system." Under his system, which was dictated by economic rather than educational factors, children were highly successful in teaching other children within

schools. This idea became popular for a time in the United States and set the stage for later, more ambitious, efforts in the area of peer tutoring.

William Bentley Fowle (1866) supported the educational theory to continue peer tutorial practices. Like Lancaster, Fowle utilized the monitorial approach to education in his school. He believed that children who taught were better able to learn materials, because they were learning by reviewing, not merely memorizing. He wrote that children can be better teachers than adults. Unlike adults, children are more likely to work democratically with their partners, constantly considering their partner's feelings and capacities. He labeled this teaching style as "learner-focused."

All of these ideas were heard by American educators who, in common with their European counterparts, did not have much money with which to hire teachers in great numbers.

When one teacher was hired to work with the children of an entire settlement or town, the teacher often would rely on certain students to teach others (Johnson, 1970). The arrangements seem to have been successful because many of our country's early leaders came from such schools. Modern day equivalents to these one-room experiments in learning have developed with many of the same justifications that motivated

these earlier classroom activities. These practices were effective because they were economical and educational.

Studies in Peer Tutoring

Peer tutoring programs have been conducted with possibly every combination of cross-grade and age pairings, and with innumerable variations of other factors. For example, some studies have varied tutor factors, such as whether the tutor volunteered or was required to participate in a program. Other studies have paid some students and not others.

Additional studies have investigated the effect of the tutor's achievement and intellectual level on the outcomes of tutoring sessions. On a cross-age level, college students have tutored other college students and students at lower educational levels (Etters, 1967). High school students have tutored elementary school students who have tutored younger students (Hagen & Moeller, 1971).

Gartner, et al., (1971) indicated that early tutorial projects that placed peer tutoring within a broader continuum of activities helped students in the classroom. His findings reported observations of one-to-one interactions between students in the classroom, students working as leaders of small groups, students acting as "big brother" or "big sister" to other students, and

assuming a variety of roles responsive to the academic and affective needs of their peers. These activities can be described as peer tutoring in intent.

The peer tutor can be considered an educational tool with great potential as an instructional agent. Thomas (1970) compared the behavior of college-age tutors and that of fifth and sixth grade tutors working with second graders in a reading program. Not only were the student tutors as effective as the college education majors in producing reading gains for the second-grade children, but the student tutors were more direct and business like in their interactions with the tutees. They tended to focus upon the tasks at hand, while the education majors were more likely to play with and to coax along with their charges. The student tutors were less likely than the college education majors to be distracted by the antics of their learning partners.

Educators benefit from the introduction of tutors in a variety of ways, as can be gleaned from references in the literature. The classroom teacher is freed to work as a manager of learning in the classroom, by assigning certain students the responsibility of directing instructional arrangements with other students. Gartner, et al. (1971) suggested that the teacher can use the extra time to plan lessons, to consult with other staff on instructional matters and to program materials for future tutorial sessions.

Same-Age Tutorial Programs

According to Ehly and Larsen (1980), programs that have utilized tutors who are the classmates of tutees are not cited in the literature as frequently as cross-age tutorial programs. Snapp, Oakland and Williams (1977), reported gains in word knowledge and reading comprehension by tutees taught solely by tutors working at an elementary school. The reading achievement outcomes of children receiving peer tutoring were not particularly different from those of children receiving instruction from the classroom teacher. The use of peer tutors to supplement teacher instruction produced better outcomes in learning for the tutees, although improvements were not statistically significant. Ellson, Barber, Engle, and Kampwerth (1965) also have mentioned the advantages of tutoring being designed to supplement classroom instruction.

Other studies that have reported on same-grade level peer tutorial programs include those of Ross (1972), with a college group of students in a remedial basic studies program, and of Vassallo (1973), with a high school peer tutoring program. Hamblin (1972) described a unique peer tutoring program developed for preschool-age children. Peer tutors were chosen from children in the group who could learn more rapidly than

others on some experimental reading materials. The authors reported substantial and significant improvement in the rate at which students learned to read following peer tutoring and rewards for reading.

Ehly and Larsen (1976) discussed the result of a peer tutoring program in which sixth graders tutored their classmates on experimental materials in spelling. Student pairs met for twenty sessions, each of which lasted thirty minutes. The effects of a variety of tutor and tutee characteristics on the learning of tutees were analyzed. The authors found that sex of tutor, sex of tutee, type of sex pairing (same-sex versus opposite-sex pairing), peer acceptance and peer rejection of the tutor and tutee, tutor liking for the tutee, and tutee liking for the tutor did not affect at a significant level the outcome learning scores of the students being tutored. Examination of the data revealed that the only significant predictor of the amount learned by the tutee was that student's pretutorial spelling score on a test which assessed the tutee's knowledge of the content of the program. None of the tutor and tutee characteristic factors listed above was found to predict the learning efficiency of tutorial pairs, that is, the speed with which the partners completed their daily assignments.

Peer tutoring programs have differed widely in the

structuring of the materials presented to the student being tutored. Many studies have encouraged the tutor to improvise activities on a particular subject. Inversely, some programs are highly structured as represented by programmed tutoring (White, 1971). In programmed tutoring, both the sequencing and content of instructional materials are prespecified by the classroom teacher or the project director. Ellson, Harris, and Barber (1968) have argued that all aspects of the operational program, including practice and review, are highly responsive to the learner's interactions with the materials under the tutorial arrangement. Programmed tutoring emphasizes the successes of the tutee by reinforcing correct responses with verbal praise. Failures are not responded to verbally, but rather result in repeated efforts directed at correcting errors.

Studies in peer tutoring whether they are same-grade or same-age tutoring programs are reported infrequently in the literature. More often mentioned are studies on cross-age tutoring. Benefits for tutors and tutees frequently follow participation in a tutorial program. These benefits can transfer to the regular classroom. Tutorial partners can work productively together regardless of their ages, sex, racial-ethnic status, and intelligence levels. Structuring of content and presentation of materials have varied widely across

studies. The more structured approaches have produced learning gains for the student being tutored.

Benefits for the Tutee and Tutor

Advantages for the tutor and tutee can be extensive within the context of most peer tutoring activities. In fact, certain educators believe that benefits for the tutor can outweigh in importance benefits for the child being tutored. For the tutee, the student receives increased individual attention, greater closeness and contact with the instructional agent, more immediate and frequent feedback on performance, and a peer model to emulate. This modeling factor may be one of the most powerful change-inducing factors in the peer tutorial model. Students are able to observe another student who remains focused on the academic materials, who approaches the learning of materials in a calm and competent manner, and who is interested in helping the tutee experience greater academic success.

The fact that a tutee may be more relaxed with a peer tutor, and thus better able to concentrate on learning materials, is supported by a number of studies. Geiser (1969) and Fleming (1969) have reported increases in learning outcomes by tutees following a tutorial program. In these studies, student tutors have come from elementary, secondary, and college grade levels. Snapp

(1970) and Snapp, et al., (1977) reported improvements in tutee reading development following cross-age and same-age tutorial programs. The tutoring sessions were conducted before the start of the school day.

Gains in self-concept also have been reported for tutees who have recently completed a tutorial program. Ross (1972), in a program that required students labeled "disadvantaged" to tutor similarly classified students, reported that gains in reading scores and self-concept followed a semester-long program of peer tutoring. The tutors were second-semester students in a compensatory basic studies program, while tutees were in their first semester in the program. Greatest gains were experienced by tutors who had themselves been tutees in previous semesters and by their tutees. Overall, students made better reading and self-concept gains when acting as tutors than when acting as tutees.

Other studies have reported on learning gains for tutors, while a few studies have failed to discover significant and measurable changes. McWhorter and Levy (1970), reporting on low-reading-ability tutors and low-reading-ability tutees, noted gains of 2.4 years in reading ability for tutors. Tutees have been reported to gain also in scores on reading achievement tests (Cloward, 1967). Lederman (1974) proposed that tutoring experiences sharpen the abilities of the tutor

in the subject area taught. Geiser (1969) and Fleming (1969) made the same claims of tutor benefits for students.

Engel (1974) presented evidence favoring tutor gains in class attitude and behavior. Such changes in the tutor's behavior are likely to carry over to other areas of the child's performance. The student who feels more competent and better able to cope with the demands of teaching another student probably will maintain this heightened confidence in nontutorial academic settings.

Fleming (1969) conducted a study in which high school students tutored other students. Following a program of tutoring towards reading objectives, he found that tutors of the same sex as the tutee have greater influence on outcome scores in reading than do tutors of the opposite sex of the tutee. Children with same-sex tutors scored higher on reading post-test than did children in the cross-sex pairs. No similar effects were found for tutoring in arithmetic. Apparently, sex of tutorial partner can affect learning outcomes under certain conditions.

Planning a Peer-Tutoring Program

The usefulness of a peer tutoring program depends upon good planning. Planning includes those tasks and activities that describe how a program will be developed once approvals and funding are provided.

The Need

According to Ashley, Zahniser, Jones, and Inks (1986), the stimulus for planning usually grows out of a recognition that a segment of the student population is not meeting minimum school requirements or expectations. One or more individuals may need to take some preliminary actions to (1) bring attention to students' problems or deficiencies, (2) suggest tutoring assistance as a solution, and (3) secure administrative support and approval to begin exploring the feasibility of a peer tutoring program.

Once the planning process begins, it must be given top priority, with adequate time, staff, and financial support to ensure the development of complete and well thought-out plans. Planning time will vary depending upon the size of the intended program. A large, schoolwide program may take several months of planning, whereas a smaller program may be planned within a few weeks. Planning time must be available for staff to meet and discuss the many concerns that will need to be addressed.

According to Cloward (1967), planning activities should involve necessary representation from the administration, faculty, staff, and student body at appropriate times. As the planning progresses, ideas

that depend on the cooperation of school personnel or students should be submitted to the appropriate persons for their review, acceptance, and support.

It is important that initial approval be obtained from administrative or supervisory personnel and that an adequate level of support be given to the initial planning activities to encourage participation and interest on the part of school personnel.

The Planning Group

The initial awareness of and interest in starting a peer tutoring program may originate with one or more groups in a school, including teachers, students, administrators, and parents. For productive planning to follow from the initial interest, a group of individuals should be designated as an official planning group. The members may be appointed or volunteer. They should operate with the sanction of the local administration, although official approval and support for a program will probably not be given until a full plan has been developed and submitted.

The beginning of planning activities should be scheduled so a plan can be approved in time for program development and start-up to occur at the beginning of a quarter or semester. Holder and Lister (1982) indicate that a planning group will have the responsibility for compiling information, collecting suggestions and

opinions from students and faculty, and investigating alternative ideas. They will also be responsible for preparing written descriptions of program components and developing budget estimates. In carrying out these activities, they will need to be sensitive to the political environment of the institution and follow established protocol in communications with others.

The Assessment of Needs

The initial task of a planning group is to determine the nature and extent of student needs that might be served by a peer tutoring group. Lehr (1984) states that a needs assessment is typically conducted as an information-gathering process that provides evidence of the true problem or need and its causes. The results of the assessment should be used to determine if a perceived problem exists and if there are alternative solutions that might be appropriate. Information-gathering activities may include surveys or discussions with faculty, counselors, and students; reviews of files and records; and discussions with special aides and paraprofessionals in the schools. Types of information and data that can be collected and reviewed are retention/dropout data, course failure rates, standardized test scores, student grade point averages, and course completion and placement rates. An assessment might focus on a known specific problem,

such as poor math and reading performance or declining participation or placement rates in a vocational course requiring math or science skills. Roueche and Snow (1976) emphasize that an alternative approach in assessing needs is to focus exclusively on special student groups that need a specific type of academic or vocational assistance, such as language or cultural adjustment tutoring for recent immigrants. Examples of other groups that might be targeted are the following:

Academically or economically disadvantaged

Limited-English-proficient

Learning disabled

Handicapped

Still another alternative is to target the assessment of specific courses in which students have high rates of failure or low passing grades. Students having difficulty with such courses would be a target group for specific assessment and testing.

In summary, a needs assessment should provide information and data that will allow the planning group to answer the following questions:

What educational problems exist?

Which students are experiencing problems?

What are the symptoms and causes of the problem?

When and where are the problems most severe?

What changes might alleviate the problem and its causes?

After relevant data are gathered, a careful review should be conducted to determine if a tutoring program is a viable solution to the problems that have been identified.

The Development of Program Goals and Objectives

Lehr (1984) indicates that the goals of a tutoring program should be consistent with and supportive of the general educational and social goals of the school and should reflect the results of the student needs assessment. Examples of program goals are to increase student knowledge and skill in specific content areas to enhance self-image and motivation, and to improve student study skills. The specific objectives developed for the program should place time and quantity limits on the expected outcomes. Objectives should be limited to specific target groups and content areas. They should be specifically stated so that program accomplishments can be evaluated against measurable expectations. Jenkins and Jenkins (1982) states that when goals and objectives are being developed, the involvement of students, faculty, administration, and staff should be sought to ensure their future acceptance and support of the program.

Personnel Requirements

A crucial element of a tutoring program is the

personnel who will develop, coordinate, and supervise the program. Planning for personnel needs is a major task that must be done with consideration to the overall program design. If the tutoring program is to be offered on a schoolwide basis, a coordinator will be needed to carry out developmental and operational duties. In general, faculty members should not be overloaded with program operation and coordination responsibilities. Their proper role is to use the time gained through tutor assistance to provide more individualized assistance to students. Faculty should be involved in the process of recruiting and selecting a coordinator.

According to Harrison and Cohen (1969), the role of the coordinator is central to the success of a program. That person should be knowledgeable about the teaching-learning process, learning difficulties, and tutoring strategies and techniques, and should be sensitive to tutor and tutee needs.

The planning group should give attention to the number of tutors and support personnel that may be needed to operate the program. Based on the projected number of students to be served, estimates of the number of tutors can be developed. Limitations on the number of students a tutor can serve and total hours spent should be discussed and resolved. The type of tutoring service, subject matter, and length of tutoring sessions will affect the

number of tutors needed. If tutors are to be paid, cost estimates should be determined and projected in the program budget.

The need for an availability of special aides, professional staff, and clerical staff should be reviewed.

In summary, Cloward (1967) indicates that program planning should address the following:

The problem and the need for the program

Students to be served

Benefits to be gained

Savings to be accrued

Financial and other resources required.

Developing and Implementing a Peer Tutoring Program

Introduction

The development and implementation of a peer tutoring program requires the inclusion of certain procedures that have proven beneficial in order to implement a successful peer tutoring program. A review of many tutoring programs addresses several components which include: orientation for students, faculty, and parents; an inservice component for faculty and staff; tutor recruitment and selection procedures; a training program for tutors; student intake and respond; and guidelines for matching and assigning tutor and tutees.

Orientation

The first component to be delivered in program development will be one or more orientation sessions, which are typically used to disseminate timely and accurate information to the total school community and provide an opportunity for generating interest in the tutoring program. Harrison and Cohen (1969) indicate that orientation sessions are generally designed to familiarize faculty, students, and others with the philosophy, purpose, and operation of the peer tutoring program. Sessions are generally broad in scope, highlighting the who, how, why, where, and when elements of the program.

Arkin and Sholla (1982) indicate that in a secondary school setting, faculty orientation should be held prior to student and parent orientation. Students and parents may have many questions concerning the program and will expect teachers to have answers. Members of the faculty should be prepared to provide answers and serve as advocates for the program. The program coordinator should meet with faculty at regular staff meetings or visit with faculty groups in departmental meetings to conduct orientation briefings.

Holder and Lister (1982) indicate that orientation should stress the importance of faculty involvement and cooperation and that the peer tutoring program will not

replace the teacher's role in the instructional process.

Asselin and Vasa (1981) stress that it is important to schedule student orientation soon after classes begin. Entry-level vocational students from feeder schools sometimes experience difficulty adjusting to the vocational setting. Early orientation to the peer tutoring program can serve to decrease these initial problems by offering planned support from the beginning. If a school has planned to offer credit to students who serve as tutors, it may be necessary to hold an orientation session prior to the actual class registration period.

Parents of secondary-level students need to be informed about the peer tutoring program before any tutoring actually begins. Devin-Sheenan, Feldman, and Allen (1976) stated:

> Parents are likely to have concerns related to the basis of their child's being selected or not selected for the program. This can be avoided if parents of participating students are informed in advance about the program and its rationale. It can usually be made clear to parents that a tutor is not "doing the teacher's work for him," and that a child can learn from another student. The student's classroom teacher can explain best why the child is not included in the particular program, and describe what other projects he is participating in. (p. 261)

Faculty Inservice Training

The purpose of inservice training is to prepare faculty members for their program role within the

classroom or the resource center. Inservice training is typically scheduled for flexible delivery to meet the learning needs and time commitments of the members of the faculty.

Niedermeyer (1977) indicates that whereas the orientation program is broad in scope and addresses the total school community, an inservice training session should be narrowed to focus on the needs of faculty and support staff who will participate in the peer tutoring program. Counselors, secretaries, receptionists, and clerks are often the first line of contact for students. If staff are knowledgeable about the program, they can encourage student participation.

In order not to waste the participants' time, present only necessary and valuable information during inservice sessions. Teachers will be seeking strategies that work with the target population and information about what their roles should be in the program. A well-organized agenda containing useful information is important in preparing the participants to help get the program off to a successful start. Teachers' roles will vary depending upon the program delivery model. Teachers participating in a program with in-class tutoring typically assume more varied and broader responsibilities than do teachers participating in a program with tutoring done in a central location.

The responsibilities of teachers participating in classroom peer tutoring models are diverse and vary among programs, depending on such variables as the number of additionally hired program staff and program coordination. Asselin and Vasa (1981) indicate the responsibilities most often assigned to the classroom teacher include, but are not limited to, identifying and referring prospective tutees, identifying special needs students, recommending potential tutors, and monitoring and assessing tutoring sessions.

Arkin and Sholla (1982) explain that participating teachers are often responsible for identifying prospective tutees and initiating their referrals. Recognizing the importance of this task, the inservice training program should provide teachers with guidelines that will enable them objectively to identify students who can benefit from tutoring assistance, especially those who lack adequate math skills, and those who are working below grade level. When identifying such students, it is helpful to delineate their areas of deficiency by noting such characteristics as the inability to follow written directions or difficulty in expressing themselves verbally or in writing.

After identifying a potential tutee, a teacher may be requested to complete a tutee referral form to get

the student officially enrolled in the tutoring system. Teachers should be given handouts containing lists of established program criteria and available tests to be used in the selection of tutees.

In preparing teachers to identify tutees, Asselin and Vasa (1981) state that particular attention should be given to the student with special needs. Although most special needs students have been identified prior to beginning upper-level vocational courses, there may be some individuals who are having difficulty in succeeding in the vocational program because of the effects of an unrecognized disability, disadvantage, or dysfunction. Guidelines should be provided that will enable teachers to identify characteristics that are indicative of special needs students. Guidelines should identify a student who is hearing impaired, visually impaired, or learning disabled, or who needs language-related assistance. If basic skills specialists, special education teachers, and/or vocational or special education coordinators are available, it is prudent to involve them in the inservice training sessions. They are typically involved in preparing the individual education plan (IEP), which must be developed for each handicapped student, according to Public Law 94-142. These special staff members can help provide guidelines and relevant special materials.

Harrison and Cohen (1969) emphasize that inservice

sessions held after the program has begun need to be used as brainstorming sessions, thus allowing faculty time to communicate classroom tutoring experiences and offer solutions to problems that may have been encountered.

A well-planned, systematic inservice program should prepare participating teachers and staff to carry out their program responsibilities in a professional manner. It should maintain their interest and make them strong advocates for the peer tutoring program.

Tutor Recruitment and Selection

Tutor recruitment and selection procedures are perhaps the most important elements of a tutoring program. An adequate supply of qualified tutors is essential to the start-up and long-term success of a program. According to Ford and Russell (1983), recruitment efforts should begin as early as possible to allow potential tutors time to learn about the program, consider the benefits of participating, and obtain answers to questions they may have about their involvement. Also, adequate time should be allowed for staff to review the applicants carefully and make selections based on specific criteria and needs.

In large-scale programs, the coordinator of the tutoring program often assumes full responsibility for the selection of tutors based on recommendations of teachers. The type of selection procedure used depends upon how

tutoring will be delivered and the time and commitment that teachers are able to provide.

Typically, two different bases for the selection of tutors are used: (1) identifying academically superior students as a source for tutors and (2) selecting students who are less than superior academically but who possess special vocational skills and/or will likely benefit from being in the program. Major criteria used to select peer tutors typically include desire to tutor, ability to relate to the tutee, demonstrated competence in the subject to be tutored, and an awareness and understanding of the tutee's problems (Reed, 1974).

Generally, selection criteria reflect considerations of good attendance, mastery of a specific skill, grades, cumulative grade point average, ability to relate to other students, desire to tutor, and level of maturity. Other considerations include the ability to follow task directions and adhere to safety rules and regulations. This is especially important when selecting a tutor to assist tutees in the operation of equipment or machinery. For tutor recruitment and selection to be successful and to ensure that program objectives are met, all participants including teachers and students should be fully aware of the selection criteria.

Tutor Training

Preparing a student to tutor does not require an overly long training program. Long, formal training can discourage students from being involved and can stifle one of the most valuable assets a tutor has--creativity. Tutor training programs can be adapted to meet the unique needs and scheduling of any school. According to Niedermeyer (1977),

> the training component of a tutorial system should contain at least two characteristics: It should inform the person being trained as the tutor precisely how to administer the instructional materials or activities, and it should provide direct practice (role playing) on such general tutorial skills as how to handle various kinds of responses from the learner and how to maintain a positive, friendly manner. Training of this type, when referenced to specific outcomes and materials, can be completed satisfactorily in less than half a day. Most schools will find it difficult to justify longer periods of time to the training of the tutors. (p. 185)

In many tutoring programs, the program coordinator is responsible for training tutors. The coordinator typically plans and organizes the training sessions, using the expertise of content specialists and classroom teachers when appropriate. Other resource people, such as reading specialists and special education or vocational education specialists, can also be a part of the tutor training program. Harrison and Cohen (1969) indicate that tutors should not be expected to diagnose special needs problems, but they should be trained to be alert for

special needs by following proper guidelines and examples. When group tutoring sessions are planned, training should provide group dynamics information to prepare tutors to work effectively with more than one student at a time. Training should also prepare tutors to deal with behaviors and emergencies.

Asselin and Vasa (1981) emphasize that in order to serve special needs students well, it is necessary to train tutors to work with special populations. Because the learning styles of special needs students are as diverse as those of other tutees, it is difficult to suggest different tutoring methods to incorporate into a training program. Techniques using individualized approaches tend to be successful with students who need special help.

A study done by Harrison and Cohen (1969) indicates that peer tutoring techniques using a great deal of repetition of content and emphasizing short, sequential learning steps are especially effective with special needs students. Training tutors to use these techniques should enable them to work more effectively with tutees' diverse needs.

Tutor training programs should train students to work effectively with any student needing tutoring and to apply the most appropriate methods. Training tutors to use only one method or skill will limit their tutoring

effectiveness. They can help meet program goals and objectives if they are prepared to meet the diverse needs of tutees.

Tutee Intake

There should be a formal procedure governing student referral to and intake by the tutoring program. The system should be as simple as possible and should generate student interest and prevent students from getting lost in the shuffle (Cloward, 1967).

In determining the criteria for selecting tutees from the applicants, consideration must be given to the outstanding needs of the targeted population. Needs vary from one setting to another and even from year to year within the same setting. Students lacking basic skills or other fundamentals may be selected over those with less serious deficiencies. Another approach may focus on students with the least amount of school time to recover from poor academic or vocational performance. Both approaches address those most in need.

The selection criteria should reflect the program objectives and the availability of tutors with the interest and content knowledge to serve the target population. The wishes and interests of faculty and parents should also be considered in establishing criteria.

Matching and Assignment

Student selection procedures are planned and implemented to help identify students who best meet program criteria for becoming tutors and tutees. After these participants have been identified, guidelines must be developed for matching tutee and tutors.

Compatibility is a major factor to be considered in matching tutors and tutees. Reed (1974) indicates that the most important consideration in matching tutors and tutees is selecting students who can work well together, which involves more than social compatibility. Other characteristics to consider include tutor competency in the subject or skill area, the tutee's preference, cultural differences that may impede tutoring, and different learning styles. It is also a good idea to use tutors who are older than tutees whenever possible, as some students resent help from a same-age peer.

According to Devin-Sheenan, Feldman, and Allen (1976),

> In matching tutors with tutees, several factors frequently are taken into account, such as: sex, race (some programs deliberately use cross-race pairs and others do the opposite), intelligence, achievement level, socioeconomic background, and personality or behavioral variables. Since there are no clear guidelines from research, matching procedures must be based on the tutoring coordinator's best judgement and the requirements of the school. (pp. 257-258)

The Student Services Corporation: Salient Features

Introduction

The peer tutoring program in Chicago's public schools is one of several support services available for vocational students. The program is directed by a Student Services Corporation for the Disadvantaged housed in the Central Office of the city's school system. The Corporation is one of seven program service areas administered by the Bureau of Vocational Support Services that was established in 1982 with a grant from the Illinois State Board of Education. Other program components include vocational assessment, vocational education for the handicapped, vocational education for the limited-English-proficient, vocational education for the disadvantaged, vocational academic resource centers and vocational articulation.

The peer tutoring program was established to serve Chicago schools with high dropout and low attendance rates. Part-time vocational advisors in the high schools provide supervision and guidance to the peer tutors who provide tutorial help and support to disadvantaged, handicapped, and limited-English-proficient students in vocational education.

The program has two major components that may be employed individually or jointly in a school, depending on the needs of instructors and students. The basic

component is in-class, one-on-one peer tutoring in any aspect of vocational classes. The second component is a drop-in tutorial center to assist students with their academic classes.

Program Administration

The peer tutoring program was initiated to help vocational instructors provide more attention and individualize instruction for academically disadvantaged, handicapped, or limited-English-proficient students and to offer support and reinforcement to students needing specialized academic assistance. The program operates in 52 school sites and is coordinated from the central administrative office. Some elements of each school's program are standardized; such as record-keeping, staffing, and overall program objectives. Other elements are unique, depending upon the school's instructional environment, administrators, instructors, student populations, and equipment and resources.

Program planning tasks occur at both the central office and the individual school. Staff from the central office coordinate and monitor the program in schools where it already exists and plan and develop new programs.

The staff in the central office perform the following tasks:

- Control the budget and allocated resources.

- Plan and provide inservice training for the vocational advisors, administrators, tutors, and other staff.
- Develop reporting forms, manuals, and training materials for program activities.
- Plan for and provide ongoing technical assistance for administrators and program staff.
- Monitor program efforts and provide problem-solving assistance.
- Implement major decisions and policy.
- Assist vocational advisors and school administrators with public relations.

The individual school administrator works with the staff in selecting a vocational advisor, who spends about one hour per day coordinating program activities and supervising student tutors. The advisor is paid extra for these duties, which are in addition to regular teaching duties. The advisor's tasks and responsibilities include the following:

- Coordinates with the principal and central office staff on program planning and implementation.
- Publicizes the program among school staff and instructors to build up enthusiasm and recognition.

- Serves as liaison and troubleshooter for vocational instructors who utilize tutors
- Recruits, selects, and hires tutors.
- Provides ongoing technical assistance and training for tutors.
- Manages paperwork and reporting required by the central office.
- Conducts periodic evaluation of tutors, teacher satisfaction, and program effectiveness.

The program is funded under The Vocational Education Carl Perkins Act of 1985. Program costs covers wages and inservice training for the vocational advisors and the tutors, orientation and training materials, and periodic meetings for the tutors throughout the school year on special interest topics. Schools with drop-in centers are provided with computer equipment and software support. For the actual tutoring, classroom texts and teacher handouts are used with occasional expenditures for special equipment.

Program Operation

There is substantial emphasis on selecting and hiring tutors and on building positive, effective relationships with instructors, who have a major role in recruiting and selecting the tutors who will work in their classrooms.

Students who wish to become peer tutors usually must have completed the course in which they will be tutoring

with at least a B and have a recommendation from an instructor in the content area. Each student must also complete an application form and be interviewed by both the vocational advisor and the classroom instructor. During the interview, the advisor considers the following:

- Speaking clearly.
- Attitudes toward tutoring.
- Attitudes toward limited-English-proficient, handicapped, and academically disadvantaged individuals.
- Appearance and neatness.
- Punctuality.
- Cooperative relationships with teachers and advisors.
- Ability to hold friendly, informal conversations with teachers and supervisors.
- Ability to accept constructive criticism, follow directions, and work without direct supervision.
- Ability to relate to fellow students.

After final selections are made, tutors meet as a group with the vocational advisor and the content area teachers for an informal orientation workshop that may include the following activities:

- The vocational advisor provides in-depth information about the program's purpose and objectives.

- Teachers outline what they expect from the tutors.
- Student tutors discuss the expertise they can provide.

The vocational advisor also explains procedures, answers teachers' and students' questions, and generates enthusiasm for the program.

For the in-class tutoring, the instructor is instrumental in ensuring a compatible match between tutor and tutee. An effort is made to match tutors and tutees on the basis of personality, schedules, and subject matter; and, when limited-English-proficient or handicapped students are involved, to ensure sensitivity to cultural, ethnic, and language differences, and awareness of particular handicapping conditions. Frequently, tutors who work with limited-English-proficient or handicapped individuals come from similar backgrounds. If problems develop with a tutor-tutee match, both the instructor and the vocational advisor are available to help resolve the problem or create a new tutor-tutee match.

Peer tutors typically meet with a tutee once each day for one hour. The length of time a tutee receives assistance is flexible. The tutee, with the content area instructor and the tutor, determines when tutorial help will be discontinued. At the drop-in centers, where

tutees frequently refer themselves for tutoring, the tutee is the one who usually decides how long to remain in the tutorial program.

Although tutoring typically occurs on a one-to-one basis, small groups of three to five tutees are occasionally used, especially for limited-English-proficient tutees, when several students experience similar problems or when introductory material is being examined. The tutor provides reinforcement for the instructor's explanations, supplements classroom work, supports students having difficulty mastering a concept, or offers reassurance. These objectives may be accomplished by reading materials to the students, providing feedback and encouragement on class work and performance, reviewing the instructor's explanations, and assisting with the performance of related tasks.

Peer tutors utilize class texts and instructor handouts and may prepare special materials for the tutee. Most instructors review accomplishments and discuss the material and instructional approaches daily with their tutors. Tutors also meet weekly with the vocational advisor to discuss the tutee's progress, explore alternative strategies, review potential problems, or develop further special methods for working with special students.

Program Evaluation

The Student Services Corporation has a concentrated monitoring and evaluation component. An extensive series of reporting and evaluation forms and procedures enables the vocational advisor to identify problems as they arise and to have a strong information base to use when making changes. The following forms are used for program implementation:

- Peer Tutor Recommendation Form (Appendix A).
- Peer Tutor Information (Appendix B).
- Student Services Corporation Site Visitation Report (Appendix C).
- Peer Tutoring Contract (Appendix D).
- Student Services Corporation Peer Tutor Observation Report (Appendix E).
- Parent Notification (Appendix F).
- Evaluation of Peer Tutor Form (Appendix G).
- Peer Tutoring Cooperating Teacher (Appendix H).
- Student Services Corporation Termination Form (Appendix I).
- Assessment Form Peer Tutoring Questionnaire NO. 1 (Appendix J).
- Assessment Form Peer Tutoring Questionnaire NO. 2 (Appendix K).
- Peer Tutoring Program Survey (Appendix L).

The observations and evaluations by staff indicate that the peer tutoring program benefits and satisfies most participants, including administrators, instructors, tutors, and tutees. Administrators indicated that regular classroom instructors can spend more time individually with all students in a class because they do not have to focus exclusively on the special needs student. With a tutor, the special needs student receives more instructional help and is able to participate more completely in the learning process. Also, tutees are able to receive more hands-on practice in their particular occupation.

Tutors reported an improvement in their own skills as a result of teaching someone else, the development of better work habits, an increased sense of responsibility, and heightened self-esteem and prestige among their peers. Instructors indicated that the tutors helped them to understand special needs students more easily and provided guidance to them in interacting with the students.

Summary of Related Literature

The literature review has included a historical background of peer tutoring arrangements that have been recorded since their inception. A summary of peer tutoring programs conducted with combinations of cross-

grade and same-age pairings with variations of other factors has been provided. Benefits for tutors and tutees frequently follow participation in a tutorial program. Cross-age tutoring arrangements are more often mentioned in the literature. The more structured approaches have produced learning gains for the student being tutored. Several studies that presented evidence favoring tutor gains were cited. Literature relating to planning, developing, and implementing a tutoring program was summarized. Important characteristics of structured peer tutoring programs such as needs assessment, program goals and objectives, faculty inservice training, tutor recruitment and selection, tutor training, and tutee intake have been reviewed. Salient features of a peer tutoring program in vocational context classes in the Chicago Public Schools have been examined. The administration, operation, and evaluation of this program have been summarized.

It appears that a structured peer tutoring system instituted to meet the diverse requirements of disadvantaged students is an alternative approach to address their learning needs. The impact of peer tutoring has demonstrated academic gains in a variety of subjects for tutors and tutees. Current research explaining the benefits of structured peer tutoring in vocational classes at the high school level is needed.

Chapter Three

METHODOLOGY OF THE STUDY

Introduction

The chapter begins with a description of the research design. Null hypotheses used in testing the research questions are stated. A description of the participants is provided. The chapter also includes a description of measures, data collection procedures, and data analysis.

Research Design

This study investigated the impact that a highly structured peer tutoring program had on improving the mathematics and reading achievement scores of special needs students in vocational classes. The study assessed also the effect the program had on the mathematics and reading achievement scores of the tutors. Another purpose of the study was designed to provide useful information for administrators to design and implement peer tutoring programs. Based on the review of the literature, the administrative components that make this program unique were identified. A survey analyzing the usefulness of these selected administrative procedures on program implementation was distributed to vocational advisors. (Appendix M)

The specific research design utilized for the study outlined above was a quasi-experimental design. Issac and Michael (1981) stated:

> The purpose of a quasi-experimental is to approximate the conditions of the true experiment in a setting which does not allow the control and/or manipulation of all relevant variables. The research must clearly understand what compromises exist in the internal and external validity of his design and proceed with these limitations. (p. 42)

The study set out to compare the achievement scores in mathematics and reading of a tutored and nontutored group of high school students enrolled in vocational education classes. The study also compared the mathematics and reading achievement scores of the tutors who provided the tutoring services and a control group of students who met the requirements to become tutors but were unable to participate as tutors.

The tutees were randomly assigned to the tutored group. The students in the nontutored group were also randomly assigned based on the fact that they were special needs students who qualified to receive peer tutoring services. The tutors in the experimental group were not randomly assigned based on the fact that they represented all of the tutors who worked in the program. The students in the control group were randomly assigned because these students met the criteria in order to become peer tutors

but did not engage in tutoring. The groups were measured on pre-tutoring and post-tutoring achievement scores on the subtests of reading and mathematics of the Test of Achievement and Proficiency. The study also assessed administrative procedures perceived to be useful for program implementation.

Research Questions and Null Hypotheses

Three research questions were formulated to guide the study as stated in Chapter One. For the purpose of statistical testing, eight null hypotheses were developed which were directly related to the first and second research questions. The first research question investigated the effects of structured peer tutoring on the mathematics and reading achievement scores of academically disadvantaged, handicapped, and limited-English-proficient students in vocational classes. The second research question investigated the effect the program had on the mathematics and reading achievement scores of the tutors who provided tutorial services. For all of the null hypotheses an ALPHA LEVEL of .05 was selected to determine whether statistical differences existed. The hypotheses were:

1a. There are no significant differences in the mathematics achievement scores between academically disadvantaged students who received

tutoring services to improve their mathematics skills in vocational content classes and those students who did not receive tutoring services.

1b. There are no significant differences in the reading achievement scores between academically disadvantaged students who received tutoring services to improve their reading skills in vocational content classes and those students who did not receive tutoring services.

1c. There are no significant differences in the mathematics achievement scores between handicapped students who received tutoring services to improve their mathematics skills in vocational content classes and those students who did not receive tutoring services.

1d. There are no significant differences in the reading achievement scores between handicapped students who received tutoring services to improve their reading skills in vocational content classes and those students who did not receive tutoring services.

1e. There are no significant differences in the mathematics achievement scores between limited-English-proficient students who received tutoring services to improve their mathematics skills in vocational content classes and those

students who did not receive tutoring services.

1f. There are no significant differences in the reading achievement scores between limited-English-proficient students who received tutoring services to improve their reading skills in vocational content classes and those students who did not receive tutoring services.

2a. There are no significant differences in the mathematics achievement scores between the tutors who provided tutoring services in mathematics to special needs students in vocational content classes and those students who qualified as tutors but did not participate in the program.

2b. There are no significant differences in the reading achievement scores between the tutors who provided tutoring services in reading to special needs students in vocational content classes and those students who qualified as tutors but did not participate in the program.

The third research question assessed the selected administrative procedures perceived to be useful by participants in the peer tutoring program. The method of analysis used with the survey data was a Rasch calibration.

Selection of Participants

One hundred-eighty students enrolled in different vocational classes in two metropolitan Chicago Public High Schools were randomly selected. The sample for this study consisted of students who were freshmen, sophomores, and juniors taking several vocational classes. The sex and age of participants were not considered in the selection of subjects. All students who participated in the study were selected anonymously. Ninety students received tutoring 60 minutes a day for 20 weeks. Another 90 students enrolled in one of the above vocational classes served as the control group and did not receive tutoring. The assignment of students to either the tutored group or nontutored group was based solely on whether a peer tutor was assigned to the student. Thirty tutors were assigned to the treatment group. These students were selected as tutors after completing the vocational class in which tutees needed assistance with a grade of B or better. These students were recommended by the vocational instructors. They provided tutorial assistance in mathematics and reading related to the vocational content of the class. Tutors were paid $3.35 per hour. They agreed to work five hours per week. Another 30 students who met the same criteria to become tutors served as the control group. They did not provide tutoring services. All tutors and non-tutors were juniors. Most tutors were

economically disadvantaged students. They did not have to meet the criteria of being identified as handicapped, academically disadvantaged, or limited-English-proficient. Students in each group had to meet specific guidelines and criteria mandated by the Illinois State Board of Education (Department of Adult, Vocational and Technical Education) and its contract with the Student Services Corporation (Peer Tutoring Program) of the Bureau of Vocational Support Services of the Chicago Public Schools. Each student, whether in the tutored or nontutored group, had to meet one of three criteria used to identify special needs students: handicapped, disadvantaged, and limited-English-proficient.

Handicapped students participate in special education programs after being identified through multidisciplinary staffings as having a physical or mental impairment. Academically disadvantaged students are two or more grade levels below grade placement in reading and/or math skills. Limited-English-proficient students do not speak and understand the English language well enough in an instructional setting to benefit from vocational studies to the same extent as a student whose primary language is English.

Description of Measures

The effects of peer tutoring on the improvement in

the achievement scores of subtests in math and reading of the Test of Achievement and Proficiency were assessed for the tutees who participated in the study. The study also assessed the effect that the program had on the scores of the tutors as a result of their involvement in the program. An additional purpose of the study was to assess selected administrative procedures that were perceived as useful for program implementation.

The Test of Achievement and Proficiency Form T (TAP) of the test is a nationally standardized norm-referenced achievement test, one whose primary function is to compare a student's achievement with that of a nationwide sample of students in the same grade. It is in a sense a continuation of the Iowa Tests of Basic Skills that are given to elementary school students as part of the citywide testing program. The TAP consists of 6 subtests of 40 minutes in length: Reading Comprehension, Mathematics, Written Expression, Using Sources of Information, Science and Social Studies. Each subtest has between 60 and 69 multiple choice items, except for Mathematics, which has 48 items. The test is normally given over a two- or three-day interval during the fall citywide testing period. Each test in the battery is constructed according to specifications reflecting currently accepted curricular procedures and then is reviewed by curriculum specialists. To determine the

appropriateness of a test for a particular system, educators should make a careful comparison of test content to curriculum guides and local objectives. Regarding statistical relationship, only the local school can assess whether the test scores are being used effectively to improve the educational experiences provided to youth in that school.

One important aspect of test evaluation is its validity. The process of validation is the collection and integration of evidence about a test. The purpose of validation is to provide a sound basis for the interpretation made by test users. The Test of Achievement and Proficiency was developed to reflect the most common curricular goals and content in secondary schools and the most pervasive trends in secondary school programs. To accomplish this goal, prior to the development of test items, the authors carefully reviewed the most widely used textbooks in the areas covered by the tests, courses of study, opinions of subject matter and curriculum experts, opinions and concerns published in both professionals and popular magazines, and the topics included in state competency testing programs. Items for the Test of Achievement and Proficiency were studied in several experimental programs to ascertain whether they were consistent with specifications and effective in measuring important areas of achievement. Pilot studies

were conducted on new and revised formats, including directions for students, while other studies were conducted to obtain the information needed to establish appropriate test lengths.

Although the most important aspect of validity for an achievement test is the correspondence of the content of the tests to the local curriculum, the relationship between scores on the tests and other measures of ability and achievement provides assurance that the test yield reasonable measures of the level of student development. As part of the standardization program and from studies conducted after standardization, data were collected to obtain estimates of concurrent and predictive validity of the tests. One measure of concurrent validity was the correlation between grade 12 test scores and high school grade-point average. This data showed a correlation of .47 in reading comprehension and .55 in mathematics. These correlations were low.

Another correlation was done between test scores and grades. The correlations were obtained for a random sample of approximately 300 students per grade from the standardization population. These correlations were .60, .62, .67, and .63 for Grades 9 to 12, respectively. The values obtained are consistent with typical relationships found between objective standardized tests and more subjective grade

point averages. The reading and mathematics sections of the Test of Achievement and Proficiency were examined by the researcher in order to assess the correlation of the tests to what is being taught in vocational education classes. It was found that there was no high correlation between them.

Another important aspect of test evaluation is how accurately and consistently the score measures the trait, the test purports to measure. This is known as the reliability of the test scores. Several statistical analyses were used by the publisher to obtain reliability estimates. The reliability coefficients were computed using the Kuder-Richardson Formula 20. These reliability coefficients were then used to calculate the standard errors of measurement for each test. A Kuder-Richardson correlation coefficient of .93 was obtained for reading comprehension and .90 for mathematics.

A survey was developed by the researcher to assess the perceived usefulness of selected administrative practices in the implementation of the program. The survey was developed based on administrative practices reviewed in the literature. These practices were formulated into Likert scale questions ranging from most useful to not useful. The survey was pilot tested

with a group of vocational advisors and revised accordingly.

Data Collection Procedures

Scores in the subtests of mathematics and reading of the Test of Achievement and Proficiency were collected anonymously for the tutored and non-tutored groups for school years 1986-87 and 1987-88. The tests were administered during the month of November to Chicago Public High School students. The tutoring program was implemented during the 1987-88 school year. The scores of the tutors were also collected for school years 1986-87 and 1987-88. The tutors provided peer tutoring services during the 1987-88 school year.

A survey was administered at a staff development session to vocational advisors. The responses were anonymous. The survey was not administered by the researcher so participants would respond freely and openly.

Data Analysis

An analysis of covariance was performed on the mathematics and reading achievement test scores. The statistical package employed was SPSS. Analysis of covariance compares and adjusts for initial differences between groups. In this study, mathematics and reading

pre-test scores (Fall, 1986) were used as the covariate. Mathematics and reading post-test scores (Fall, 1987) provided the dependent variable for the analysis of covariance.

The survey was analyzed descriptively using a Rasch calibration. The Rasch calibration model depends on whether or not certain assumptions are met. Unidimensionality assumes that items can be arranged in order of importance along a single continuum. Independence of items assumes that a response to one item is independent of a response to any other item. A Rasch calibration analyzes a latent trait in terms of its relative importance or difficulty. For this study, the latent trait was the effectiveness of key elements of a structured approach to the implementation of a peer tutoring program. The relative importance as perceived by program advisors was analyzed through the Rasch calibration.

Summary

This chapter provided a description of the research design. Null hypotheses to be used in testing the research questions have been stated. A description of the participants has been provided. The chapter also included a description of measures, data collection procedures, and data analysis.

Chapter Four

FINDINGS OF THE STUDY

Introduction

This chapter is organized according to the three research questions cited in Chapter One. Eight null hypotheses, which are directly related to research questions one and two, are stated. The data and analysis of the mathematics and reading achievement scores for the two groups of vocational students are described. The third research question related to a survey concerning the effectiveness of key elements of a structured approach to the implementation of a peer tutoring program. The results of the survey and Rasch calibration scores are presented. A summary concludes this chapter.

Research Question One: Effects of Peer Tutoring on the Mathematics and Reading Achievement Scores of Academically Disadvantaged, Handicapped, and Limited-English-Proficient

Research question one of this study asked: Does a structured peer tutoring program have an effect on the mathematics and reading achievement scores of academically disadvantaged, handicapped, and limited-English-proficient students in vocational classes? The results of the

analyses are described for each of the eight null hypotheses.

Null hypothesis 1A stated: There are no significant differences in the mathematics achievement scores between academically disadvantaged students who received tutoring services to improve their mathematics skills in vocational content classes and those students who did not receive tutoring services.

Although the tutees displayed a higher adjusted mean score (17.12) compared to the non-tutees (15.34), results of the analysis of covariance indicate that there was not a significant difference ($p = .06$) in the mathematics scores of academically disadvantaged tutees when compared to the non-tutees. The null hypothesis was not rejected. (See Table 1)

Null hypothesis 1B stated: There are no significant differences in the reading achievement scores between academically disadvantaged students who received tutoring services to improve their reading skills in vocational content classes and those students who did not receive tutoring services.

Results of the analysis of covariance indicate that there was a significant difference ($p = .00$) in reading achievement scores for academically disadvantaged students who were tutored from those who were not tutored. The adjusted mean scores demonstrated that the tutees improved

Table 1

Analysis of Covariance of Mathematics Scores for Academically Disadvantaged Students Analyzed by Tutees and Non-Tutees

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	829.3	2	414.6	31.6	.00
Treatment	47.7	1	47.7	3.6	.06
Pre-Test Covariate	794.0	1	794.0	60.5	.00
Explained Variance	829.3	2	414.6	31.2	.00
Residual Variance	747.3	57	13.1		
Total	1,576.7	59	26.7		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutees	30	17.1
Non-Tutees	30	15.3

significantly (28.0~) more in reading achievement scores when compared to the non-tutees (24.49). The null hypothesis was rejected. (See Table 2)

Null hypothesis 1C stated: There are no significant differences in the mathematics achievement scores between handicapped students who received tutoring services to improve their mathematics skills in vocational content classes and those students who did not receive tutoring services.

Although the tutees displayed a higher adjusted mean score (19.53) compared to the non-tutees (18.23), results of the analysis of covariance indicate that there was no significant difference ($p = .22$) in mathematics achievement scores for handicapped students who were tutored compared to those who were not tutored. The null hypothesis was not rejected. (See Table 3).

Null hypothesis 1D stated: There are no significant differences in the reading achievement scores between handicapped students who received tutoring services to improve their reading skills in vocational content classes and those students who did not receive tutoring services.

Results of the analysis of covariance indicate that there was a significant difference in reading achievement scores ($p = .00$) for handicapped students who were tutored. The adjusted mean scores demonstrated that the tutees (21.20) improved in reading achievement scores when

Table 2

Analysis of Covariance of Reading Scores for Academically Disadvantaged Students Analyzed by Tutees and Non-Tutees

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	3,771.5	2	1,885.7	78.1	.00
Treatment	184.6	1	184.6	7.6	.00
Pre-Test Covariate	3,289.8	1	3,289.8	136.2	.00
Explained Variance	3,771.5	2	1,885.7	78.1	.00
Residual Variance	1,376.1	57	24.1		
Total	5,147.7	59	87.2		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutees	30	28.0
Non-Tutees	30	24.4

Table 3

Analysis of Covariance of Mathematics Scores for Handicapped Students Analyzed by Tutees and Non-Tutees

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	2,810.4	2	1,405.2	88.8	.00
Treatment	24.3	1	24.3	1.5	.22
Pre-Test Covariate	2,772.0	1	2,772.0	175.3	.00
Explained Variance	2,810.4	2	1,405.2	88.8	.00
Residual Variance	901.1	57	15.8		
Total	3,711.6	59	62.9		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutees	30	19.5
Non-Tutees	30	18.2

compared to the non-tutees (18.76). The null hypothesis was rejected. (See Table 4).

Null hypothesis 1E stated: There are no significant differences in the mathematics achievement scores between limited-English-proficient students who received tutoring services to improve their mathematics skills in vocational content classes and those students who did not receive tutoring services.

Results of the analysis of covariance indicate that there was a significant difference ($p = .02$) in mathematics achievement scores for limited-English-proficient students. The adjusted mean scores did demonstrate that the non-tutees (19.69) improved significantly more in math achievement scores when compared to the tutees (18.43). The null hypothesis was rejected. (See Table 5).

Null hypothesis 1F stated: There are no significant differences in the reading achievement scores between limited-English-proficient students who received tutoring services to improve their reading skills in vocational content classes and those students who did not receive tutoring services.

Although the tutees displayed a higher adjusted mean score (24.26) when compared to the non-tutees (17.90), results of the analysis of covariance indicate that there was not a significant difference ($p = .11$) in the reading

Table 4

Analysis of Covariance of Reading Scores for Handicapped Students Analyzed by Tutees and Non-Tutees

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	3,671.2	2	1,835.6	180.4	.00
Treatment	88.5	1	88.5	8.7	.00
Pre-Test Covariate	3,600.8	1	3,600.6	354.0	.00
Explained Variance	3,671.2	2	1,835.6	180.4	.00
Residual Variance	579.7	57	10.1		
Total	4,250.9	59	72.0		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutees	30	21.2
Non-Tutees	30	18.7

Table 5

Analysis of Covariance of Mathematics Scores for Limited-English-Proficient Students Analyzed by Tutees and Non-Tutees

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	1,642.5	2	821.2	78.3	.00
Treatment	53.6	1	53.6	5.1	.02
Pre-Test Covariate	1,618.4	1	1,618.4	154.4	.00
Explained Variance	1,642.5	2	821.2	78.3	.00
Residual Variance	597.2	57	10.4		
Total					

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutees	30	18.4
Non-Tutees	30	19.6

achievement scores of limited-English-proficient tutees as compared to the non-tutees. The null hypothesis was not rejected. (See Table 6).

Research Question Two: Effects of Peer Tutoring on the Mathematics and Reading Achievement Scores of the Tutors

Research question two of this study asked. Does a structured peer tutoring program in vocational classes have an effect on the mathematics and reading achievement scores of the tutors who assisted other students?

Null hypothesis 2A stated: There are no significant differences in the mathematics achievement scores between the tutors who provided tutoring services in mathematics to special needs students in vocational content classes and those students who qualified as tutors but did not participate in the program.

Results of the analysis of covariance indicate that there was a significant difference ($p = .05$) in the mathematics achievement scores of students who provided tutoring services in mathematics to special needs students and those students who qualified as tutors but did not participate in the program. The adjusted mean score demonstrated that the tutors (27.80) improved in mathematics achievement scores when compared to the

Table 6

Analysis of Covariance of Reading Scores for Limited-English-Proficient Students Analyzed by Tutees and Non-Tutees

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	3,013.3	2	1,506.6	85.4	.00
Treatment	44.1	1	44.1	2.5	.11
Pre-Test Covariate	2,727.2	1	2,727.2	154.6	.00
Explained Variance	3,013.3	2	1,506.6	85.4	.00
Residual Variance	1,005.2	57	17.6		
Total	4,018.5	59	68.1		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutees	30	24.2
Non-Tutees	30	17.9

non-tutors (26.10). The null hypothesis was rejected. (See Table 7).

Null hypothesis 2B stated: There are no significant differences in the reading achievement scores between the tutors who provided tutoring services in reading to special needs students in vocational content classes and those students who qualified as tutors but did not participate in the program.

Results of the analysis of covariance indicate that there was a significant difference ($p = .00$) in the reading achievement scores of students who provided tutoring services in reading to special needs students and those students who qualified as tutors but did not participate in the program. The adjusted mean scores did demonstrate that the non-tutors (35.27) improved more in reading achievement when compared to the tutors (30.75). The null hypothesis was rejected. (See Table 8).

Research Question Three: Selected Administration Procedures Perceived to be Useful by Participants in the Peer Tutoring Program

Research question three of this study asked: Are selected administrative procedures which include training sessions, a record-keeping system, and program evaluation,

Table 7

Analysis of Covariance of Mathematics Scores Analyzed by Tutors and Non-Tutors

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	1,092.1	2	951.0	111.3	.00
Treatment	32.5	1	32.5	3.8	.05
Pre-Test Covariate	1,633.3	1	1,633.3	191.2	.00
Explained Variance	1,902.1	2	951.0	111.3	.00
Residual Variance	486.6	57	8.5		
Total	2,388.8	59	40.4		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutors	30	27.8
Non-Tutors	30	26.1

Table 8

Analysis of Covariance of Reading Scores Analyzed by Tutors and Non-Tutors

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Main Effects	1,151.4	2	575.7	66.2	.00
Treatment	126.0	1	126.0	14.4	.00
Pre-Test Covariate	1,081.0	1	1,081.0	124.3	.00
Explained Variance	1,151.4	2	575.7	66.2	.00
Residual Variance	495.5	57	8.6		
Total	1,646.9	59	27.9		

Adjusted Mean Math Scores

	N	Adjusted Mean Score
Tutors	30	30.7
Non-Tutors	30	35.2

perceived to be useful by participants in the peer tutoring programs?

There were 10 questions related to the key administrative elements of a structured approach to the successful implementation of a peer tutoring program. The respondents were 35 vocational advisors who coordinated the peer tutoring program at local school sites. Table 9 shows the frequency counts for each question. The survey was analyzed by using the Rasch calibration to determine if the relative order of importance of 10 key administrative elements were perceived to be important to the success of the program.

Table 10 lists the 10 key elements of the survey described in terms of their relative importance to the success of the program as perceived by 35 vocational advisors. The 10 key elements were ordered from most useful to least useful. The orientation workshop provided for tutors was identified as the most important element for program success. All tutors participated in this workshop prior to the implementation of the program. The criteria used to select tutors, the technical assistance provided by central office staff, the record-keeping system for tutors and the importance of giving publicity to the program in the school were identified as other elements that were next in order of importance. The record-keeping system for advisors, monthly evaluation

Table 9.

Summary of Advisors Responses
to Survey Questions

Descriptors	Responses			
	1	2	3	4
Criteria	0	2	7	26
Workshop	0	1	5	29
Principals	5	6	8	16
Administrators	2	0	9	24
Advisors	2	2	15	16
Records	1	1	14	19
Contract	7	11	10	7
Publicity	2	2	4	27
Evaluation	2	6	12	15
Parents	3	8	9	15

Table 10

A Rasch Calibration of the Key Elements of a Structured Approach to the Successful Implementation of a Peer Tutoring Program

Name	Score	Responses	Mean	Calibration	
1. Workshop	63	35	3.8	0	Cluster 1
2. Criteria	59	35	3.6	.46	
3. Administrators	57	35	3.5	.54	
4. Records	86	35	3.4	.60	Cluster 2
5. Publicity	93	35	3.6	.61	
6. Advisors	78	35	3.2	1.07	
7. Evaluation	75	35	3.1	1.15	
8. Parents	69	35	2.9	1.41	Cluster 3
9. Principals	70	35	3.0	1.49	
10. Contract	48	35	2.3	2.45	Cluster 4

questionnaires, parent notification, and the principal's involvement in the program were perceived less important when compared to the other elements. The Rasch calibration scores indicated that the key element of establishing a peer tutoring contract with the tutees was 2.45 times less important when compared to an orientation workshop provided for tutors. (Appendix A)

Summary

The findings for the three research questions of the study have been presented in Chapter Four. For research questions one and two, the null hypotheses were discussed. Chapter Five contains a summary of the study, conclusions, discussion, and recommendations developed from the conduct of this study.

Chapter Five

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Introduction

This chapter contains a summary of the study. Conclusions and discussion are provided based on the interpretation of findings. Observations for further research and recommendations to school administrators are also posited by the writer.

Summary of the Study

The purpose of this study consisted of three components. First, the study investigated the impact that a structured peer tutoring program had on improving the mathematics and reading achievement scores of academically disadvantaged, handicapped, and limited-English-proficient students enrolled in vocational classes. Second, the study analyzed the effect that the program had on the tutors based on their mathematics and reading achievement scores. Third, the study assessed 10 selected administrative procedures unique to this program.

The subjects for this study were 180 randomly selected students in vocational education classes from two Chicago Public High Schools. Ninety students were assigned to a control group and 90 were assigned to the

group of students who were to receive tutoring. The tutoring was in the area of reading and mathematics as related to vocational education classes. Each student, whether in the tutored or nontutored group, met one of these criteria needed to identify special needs students: handicapped, disadvantaged, and limited-English-proficient. The criteria used for identification were mandates of the Illinois State Board of Education. The tutors were 60 students identified as such and 30 were assigned tutoring and 30 were used as control group persons for this study.

The remainder of this summary is organized by utilizing the three research questions posed for the study. Each research question is restated along with relevant findings, conclusions, and discussion.

Research Question One

For the first research question, this study investigated the impact that a structured peer tutoring program had on improving the mathematics and reading achievement scores of special needs students in vocational classes who received peer tutoring services.

Findings. In the area of mathematics, statistical differences were not found for academically disadvantaged students who received tutoring services. Further, the data demonstrated that there was not a significant difference in the mathematics achievement scores for

handicapped students who were tutored when compared to the control group who were not tutored. However, the data did show that the nontutored limited-English group scored significantly higher than the tutored group of limited English proficient students.

In the area of reading, the data demonstrated that significant differences were found for academically disadvantaged students who were tutored in the area of reading achievement. Further, handicapped students who were tutored in the area of reading scored significantly higher than non-tutored students. However, the limited-English-proficient students who were tutored in reading had higher mean scores but not statistically significant.

Conclusion. It was concluded that the peer tutoring program had limited impact on the improvement of students in mathematics. However, the peer tutoring program had a positive impact in the area of reading, particularly for academically disadvantaged and handicapped students. These same two groups had higher scores in mathematics but these were not statistically significant. The program also demonstrated a potential negative effect in the area of mathematics for limited-English-proficient students.

Discussion. The results of this study show a positive impact for disadvantaged and handicapped tutees in the area of reading. However, some results show conflicting evidence. Non-tutees of limited-English

proficiency scored higher in the area of mathematics. Reed (1974) indicates that the major criteria to select peer tutors typically include the desire to tutor, ability to relate to the tutee, demonstrated competence in the subject to be tutored, and awareness and understanding of tutee problems. Many limited-English-proficient students could have benefited from a bilingual peer tutor. A tutor with bilingual skills might not have been available. Non-tutees might have had a bilingual instructor in mathematics. Even though national origin or ethnicity were not considered in the selection of students, one of the schools had a large number of Asian students who could have been part of the non-tutee group. These students could have had a high level of motivation and support in the area of mathematics. A very important consideration for this study could have been the relationship between the content reviewed by the tutor and the skills that were needed to perform successfully in test items. The tutors might not have been trained effectively to meet the needs of tutees in the area of mathematics or might have preferred to tutor in another area. A lack of sensitivity to the needs of the tutee could have hindered the success of the tutoring session. Another aspect to be considered involves the mathematics classes taken by non-tutees when compared to tutees. Many tutees might not have been enrolled in any mathematics class during the weeks that

the tutoring session was in operation. Another important aspect to be considered has to do with the instructor. Instructors might have preferred to emphasize mathematics in their lessons with the non-tutees. Tutees were referred by instructors for peer tutoring services and did not monitor their progress effectively.

Research Question Two

Research question two investigated the effect the program had on the mathematics and reading achievement scores of the tutors who provided tutorial services to special needs students.

Findings. Significant differences were demonstrated by higher scores in mathematics for students who provided tutoring services compared to students who qualified as tutors, but did not engage in tutoring. However, the opposite effect was found in the area of reading. The students who did not engage in tutoring scored significantly higher than those students who did tutoring.

Conclusion. It was concluded that students who provided tutoring had a positive effect in their improvement in the area of mathematics. The program also demonstrated a potential negative effect in the area of reading.

Discussion. This study shows positive gains for tutors in mathematics achievement scores. However, some results show conflicting evidence. Non-tutors scored

higher in reading than tutors. Many students who became tutors were economically disadvantaged students. They also had other job experiences after school. In contrast, students who did not become tutors had a higher academic load than tutors because they were enrolled in additional classes. They also spent more time doing homework. Additional hours of work affect the tutor's academic load as well as the amount of time spent in homework. These variables may be detrimental to their academic performance when compared to non-tutors.

Tutor selection could have been an important variable in this finding. Tutors might have preferred to teach mathematics than reading. The training sessions provided for the tutors could have been better in mathematics. Tutoring techniques applied to reading might not have received enough emphasis. The pairing of tutors and tutees could have been another aspect of program implementation that led to this result. Reed (1974) emphasized the importance of selecting students who can work well together. Tutees who were academically disadvantaged, handicapped, or limited-English-proficient had different needs that might have required a special sensitivity from the tutor. Another important variable which influenced this finding could have been the role that the vocational advisor played in the implementation of the program. Vocational advisors

meet periodically with the tutors to assess program effectiveness. This procedure might not have taken place as frequently according to the needs of the students. It is also a possibility that the reading skills measured by the dependent variable were different from the content that was reviewed by the tutor for the vocational class.

Research Question Three

Research question three investigated the usefulness of selected administrative procedures perceived to be useful by participants in the peer tutoring program.

Findings. Based on their relative importance to the success of the peer tutoring program, the 10 elements of the survey were organized into clusters. The most useful elements included the orientation workshops provided for tutors, the selection criteria utilized for tutors and the technical assistance and support provided from the central office as shown in cluster one. The next cluster includes other useful elements to the success of the program which were the record keeping system for tutors, the publicity disseminated throughout the school, the record keeping system for advisors, and the monthly evaluation questionnaires given to tutors. In cluster three, the notification to parents regarding the participation of students in the program as well as the involvement of the principal as an essential element for program

implementation were less useful. The contract signed by the tutee in order to participate in the program was regarded as least useful.

Conclusion. It was concluded that a structured program for the administration of a peer tutoring program was deemed valuable by vocational advisors. These teacher coordinated the program at the local sites.

Discussion. On the basis of this study, some key elements were highlighted regarding the successful administration of a peer tutoring program. For example, the review of the literature indicates that structured approaches to peer tutoring produce positive results. Cohen (1986) reported that tutoring significantly contributed to academic growth for tutees but only in a well structured program. Cohen (1986) emphasizes that a structured peer tutoring program provides a learning structure for the tutee that involves modeling, communication, feedback, and a motivational system. It is recommended that providing orientation workshops for tutors and developing a criteria to select tutors are very important. Reed (1974) indicated that in structured approaches to peer tutoring, the major criteria to select peer tutors must include the desire to tutor and demonstrated competence in the subject to be tutored. It is also important to emphasize that tutors have an awareness and understanding of the needs of tutees.

Niedermeyer (1977) stated that tutor training programs have to be adapted to meet the unique needs and scheduling of any school. Orientation and training should inform the person being trained precisely how to administer the instructional activities and should provide practice by using role playing. Technical assistance and support provided at the local level is beneficial for program implementation. Topping (1988) indicates that other resource people should bring their expertise to support the coordinator who typically organizes the training session and different aspects of program implementation. A record-keeping system for tutors and vocational advisors provide a formative evaluation system for the program. Information disseminated among school staff adds to program success.

From this study, it appears that the implementation of a peer tutoring program requires structure. Such an approach should be designed to improve the skills of the tutor and meet the specific educational needs of tutees. Finally, peer tutoring needs continuous evaluation as programs are conceived, implemented, and maintained.

Observations of the Researcher

Additional research studies about peer tutoring should consider several program issues that became apparent from the conduct of this study. Lehr (1984)

indicated that the objectives of a peer tutoring program should be limited to target groups and content areas. These objectives should be specifically stated so that program accomplishments can be evaluated against measurable expectations. There should be a strong emphasis for program outcomes when specific measures are delineated. A higher correlation should exist between the treatment that is being studied in relation to the measures utilized to assess the effectiveness of the program. The researcher had originally intended to use gain scores on selected competencies related to vocational education. However, this could not be accomplished with nationally standardized test scores.

The selection and training of the tutors is of utmost importance. Tutors should be selected on the basis of demonstrated competence in the content areas selected. Reed (1974) emphasized the importance of the tutor's desire to participate in the program as well as the awareness and understanding of the tutee's problems.

The training of tutors should include guidelines for tutors in developing strategies for special population groups. Harrison and Cohen (1969) noted that the training of tutors should include sequential learning steps that will enable them to work with the tutee's diverse needs.

The selection, training, and assignment of tutors should be based on the above considerations.

Another important element in the implementation of a peer tutoring program involves the role of the advisor. Harrison and Cohen (1969) indicated that the role of the program coordinator is central to the success of the program. The coordination should be knowledgeable about the teaching learning process in the areas of identified, learning difficulties of tutees, tutoring strategies, and techniques sensitive to the needs of tutor and tutees. The relationship between the advisor and the vocational instructors must be on a continuous basis in order to assess program effectiveness. Finally, structured peer tutoring must include a strong monitoring and evaluation component with input from the tutor, tutee and instructors to determine if program outcomes are met.

Recommendations

On the basis of this study, some recommendations can be made to administrators regarding the implementation of peer tutoring programs. This study also identified other areas that need further research to assess the effectiveness of peer tutoring programs. Valuable suggestions related to the implementation of structured peer tutoring in Chicago's vocational education program become apparent. The assignment of tutors according to

skills and needs of tutees should be carefully considered. The content areas identified for tutors must be clearly defined. Cloward (1967) indicated that structured peer tutoring must begin with planning activities which emphasize the need for the tutoring program. This activity should involve necessary representation from the administration, staff, and students. Orientation and training for tutors must be tailored to the particular needs of tutees. Selection criteria must be clearly delineated to maximize the tutors' areas of strength as well as the identification of the weaknesses of tutees. Technical assistance and support from administrators must be provided in order to enhance the effectiveness of the program. Such assistance could be provided through a cooperative approach in the development of guidelines, allocation of additional resources, and evaluation of program. The administrator plays a leading role in the success of a vocational education program for special needs students within a school. Kolde (1987) stated that where successful programs exist; an administrator saw the need for such a program, felt a professional commitment toward establishing or perpetuating such a program, give support and encouragement to the staff as the program is initiated and ensure that there were financial and human resources to provide and maintain quality program. The role of the administrator includes creating a positive

attitude toward the vocational special needs program, and establishing and maintaining open communication channels between all staff members. Further, it is the administrator's responsibility to support and encourage continuous communication among vocational instructors in order to provide the means for any and all program adaptations in vocational classes. The adaptation must include the modification of the vocational program, teaching techniques, and instructional materials. The program must also include individual and small group instruction for both vocational and academic classes. The administrator should also arrange to provide support services on a continuing basis in order to allow both the instructor and student to function successfully. Instructional support services should include assistance to the instructor in modifying materials or strategies, monitoring of programs, and direct one-on-one or small group tutorial assistance for the student. Vocational education programs for special needs students requires a team effort comprised of the administrator, instructors, support service staff, students, and parents. Meers (1987) emphasized that administrators can be the catalyst within the school for providing opportunity for success for special needs students.

Further studies should include different measures such as elements in the affective domain, grades, and

competencies required among the variables considered. Ross (1972) reported in a study of peer tutoring programs of increased gains in self-concept for tutors and tutees. Other studies should assess the effectiveness of the training program provided to the tutor based on the particular needs of the students receiving tutoring services. For example, many disadvantaged tudents often participate in remedial academic classes that do not relate to content areas. Therefore, further studies might consider the interrelations of programs that provide remedial help and academic assistance in vocational content classes. This information is presented in applied situations in which the students see the relevance of the academic content that they are learning in a vocational class which they have selected.

The results of this study of Chicago's tutoring program clearly demonstrate that tutoring must focus on the educational needs of the tutees identified by the achievement scores. Training for tutors must emphasize particular techniques to address the learning needs of students. The selection criteria utilized to select tutors must be based on the academic strengths of students in content areas. A delivery system which provides continuous assistance and support to local school efforts should be provided in order to enhance program effectiveness.

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APPENDICES

APPENDIX A

PEER TUTOR RECOMMENDATION FORM

Department of Vocational and Technological Education

SSC 106
Student Services Corporation

PEER TUTOR RECOMMENDATION FORM

To: Vocational Advisor: _____ School _____

I HEREBY RECOMMEND THE FOLLOWING STUDENT TO SERVE AS A PEER TUTOR IN _____. She/He has
(Vocational Subject Area)
demonstrated competency in this area and has the ability to assist another student in learning this subject and/or developing this skill.

Name of Student _____

Grade Level _____ Junior Division no. _____

_____ Senior Grade Average __A__B__C

Distribution
Original: Central Office - S.S.C. SUBMITTED BY _____
Copy: Student File

Room_____ Date_____

APPENDIX B

PEER TUTOR INFORMATION

SSC 101-1

Department of Vocational and
Technological Education

PEER TUTOR INFORMATION

Personal Information:

1. Name_____ School_____

Home Address_____ Apt. #_____

Chicago, Illinois 606____ Phone No._____

Soc. Sec. #_____-_____-_____

Schedule:	Subject	Teacher
1st Period		
2nd Period		
3rd Period		
4th Period		
5th Period		
6th Period		
7th Period		
8th Period		
9th Period		
10th Period		

Division NO._____

( ) Junior

( ) Senior

Grade Average____

Vocational Background:
List courses you are presently taking in Vocational Education Program or have taken.

	Subject	Teacher	Grade Average
Freshman Year:			
Sophomore Year:			
Junior Year:			
Senior Year:			

Other outside jobs or related experiences that would indicate that you could do well as a Peer Tutor.

_____

_____

_____

SSC 101-2

Department of Vocational and
Technological Education

I agree to work (that is, provide help to students who are having difficulty learning vocational education classes/shop).

I understand that I must be available to work for 300 minutes per week, before or after school/during my free or study periods.

_____
Signature

Interviewed on_____ Approved _____

Referred by_____

Distribution:
Original: Central Office - S.S.C.
Copy: Student File

APPENDIX C

STUDENT SERVICES CORPORATION SITE VISITATION REPORT

Department of Vocational and Technological Education

SSC 116
Student Services Corporation

STUDENT SERVICES CORPORATION
SITE VISITATION REPORT

SCHOOL: _____ DATE: _____

ADVISOR: _____

	COMPLIANCE CONCERNS	
PAYROLL DOCUMENTS	YES	NO
Pay Period # ____ ____ ____		
Time Sheets		
Supplemental Attendance Report		
LOGBOOKS		
Pay Period # ____ ____ ____		
PERSONNEL DOCUMENTS		
Recommendation Form		
Employment Request		
Peer Tutor Information		

COMMENTS _____

_____

_____

_____

_____

Distribution:
Original: Central Office - S.S.C.
Copy: Advisor's File

APPENDIX D

PEER TUTORING CONTRACT

Department of Vocational and
Technological Education

SSC 113
Student Services
Corporation

PEER TUTORING CONTRACT

WELCOME to our Peer Tutoring Program,

Selected students in vocational classes at our school are being provided with tutors to insure the success of all students. As a participant in our program, we expect to you:

1. Be on time.
2. Pay attention.
3. Come prepared with proper study materials.
4. Ask questions.
5. Cooperate.
6. Study at home as needed.

I have read the above requirements and agree to what is required of me as a participant.

_____
Tutee's Signature

_____
Vocational Advisor's Signature

_____
Date

Distribution:
Original: Student file at local site.

APPENDIX E

STUDENT SERVICES CORPORATION PEER TUTOR OBSERVATION REPORT

SSC 117

Department of Vocational and Technological Education

Student Services Corporation

STUDENT SERVICES CORPORATION
PEER TUTOR OBSERVATION REPORT

SCHOOL: _____ DATE: _____

TUTOR: _____

COOPERATING TEACHER: _____

COURSE TITLE: _____

	EXCELLENT	GOOD	FAIR	POOR
1. Exhibits a positive attitude				
2. Exhibits rapport with tutee				
3. Involves tutee in the learning process				
4. Sets realistic, sequential goals for tutee				
5. Conducts session in a professional manner				
6. Maintains daily logbook				
7. Maintains neat, accurate timesheets				

COMMENTS: _____

_____

_____

_____

Distribution:
Original: Central Office - S.S.C.
Copy: Student's File

APPENDIX F

PARENT NOTIFICATION

Department of Vocational and
Technological Education

SSC 103
Student Services
Corporation

PARENT NOTIFICATION

Dear Parent/Guardian:

Selected students in vocational classes at our school are being provided with tutors to insure the success of all students. Your son/daughter, _____, has been recommended to participate in the Peer Tutoring Program. He/She will be receiving tutoring assistance in the following vocational subject:

_____ _____ _____
Subject Period Teacher

This service is being provided by the Student Services Corporation from the Vocational Department of the Chicago Board of Education. If you have any questions, please feel free to contact me at _____.
School Phone Number

Sincerely yours,

_____
Date

Vocational Advisor

APPENDIX G

EVALUATION OF PEER TUTOR FORM

SSC 105

Department of Vocational and
Technological Education

EVALUATION OF PEER TUTOR FORM

Name of Peer Tutor _____ School _____

Assigned to Job Station _____ Rm. _____
(Vocational Subject Area)

Please evaluate the job performance on the above named peer tutor who provided support services to students with special needs in your classroom/shop.

	Always	Usually	Seldom
1. Arrives on time	_____	_____	_____
2. Cooperates with instructor	_____	_____	_____
3. Interacts well with other students	_____	_____	_____
4. Provides appropriate support services as directed by instructor	_____	_____	_____
5. Completes all tasks assigned by supervisor (Voc. Ed. Teacher)	_____	_____	_____
6. Works independently after duties are explained	_____	_____	_____
7. Fills out time sheet properly	_____	_____	_____

8. Comments you may have:

_____

_____

_____ _____
Date Signature of Voc. Ed. Teacher

Distribution:
Original: Central Office - S.S.C.
Copy: Student File

TO BE DONE ON MONTHLY BASIS

APPENDIX H

PEER TUTORING COOPERATING TEACHER

Department of Vocational and Technological Education

SSC 111
Student Services Corporation

PEER TUTORING COOPERATING TEACHER

Thank you for supervising the peer tutor(s). You have recommended outstanding students and I am sure you are as pleased as I am. Since I do not have the time to chat about our Peer Tutoring Program with you very often, please answer the following questions:

1. Have you noticed an improvement in the attitude of the students toward each other?
   Tutor(s): Yes ___ No ___ Tutee(s): Yes ___ No___
   Comment: _____

2. Have you observed an improvement in the students' attitudes about themselves (i.e., more verbal, better appearance, improved self-confidence)?
   Tutor(s): Yes ___ No ___ Tutee(s): Yes ___ No___
   Comment: _____

3. Have you seen an improvement in the student's attitudes towards our school and his/her fellow students?
   Tutor(s): Yes ___ No ___ Tutee(s): Yes ___ No___

4. Have you observed a change (if any) in your relationship with the students?
   Tutor(s): Yes ___ No ___ Tutee(s): Yes ___ No___
   Comment: _____

5. Do you feel that peer tutoring is necessary to your classroom?
   Comment: _____

6. What type of help would be needed to conduct a better peer tutoring program at your school?
   _____

7. How do you think the Student Services Corporation (or V.S.S.T.) can be of more help in the Vocational Education of your students?
   _____

Any other comment: _____
_____

Thank You

Distribution:
Original: Central Office - S.S.C.

APPENDIX I

STUDENT SERVICES CORPORATION TERMINATION FORM

SSC 107

Department of Vocational and Technological Education

Student Services Corporation

STUDENT SERVICES CORPORATION
TERMINATION FORM

SCHOOL _____

NAME OF TUTOR _____
LAST FIRST MI

SOCIAL SECURITY NUMBER _____ - _____ - _____

ASSIGNMENT _____ (AREA-WOOD, BUSINESS, ETC.)

DATE _____ 1ST WARNING

REASON (PLEASE SPECIFY) _____

_____

_____ _____

DATE _____ 2ND WARNING

REASON (PLEASE SPECIFY) _____

_____

_____

DATE _____ TERMINATION

REASON (PLEASE SPECIFY) _____

_____

_____

_____
SIGNATURE OF ADVISOR

Distribution:
Original: Central Office - S.S.C.
Copy: Student's Folder at Local Site

APPENDIX J

ASSESSMENT FORM PEER TUTORING QUESTIONNAIRE NO. 1

Department of Vocational and Technological Education

SSC 109
Student Services Corporation

ASSESSMENT FORM PEER TUTORING QUESTIONNAIRE NO. 1
(To be completed at end of first 10 weeks)

NAME _____ DIV. _____

Peer Tutoring period _____

How many students do you tutor? _____

What do you like about your job? _____

_____

_____

What do you not like? _____

_____

_____

How can we improve this situation? _____

_____

_____

How do you think you can improve your tutoring skills? ___

_____

_____

Additional Comments: _____

_____

Did you receive any helpful advice from your advisor? ____

_____

REMEMBER
YOU ARE NOT ONLY HELPING FELLOW STUDENTS,
BUT IMPROVING YOURSELF!

Distribution:
Original: Central Office - S.S.C.

APPENDIX K

ASSESSMENT FORM PEER TUTORING QUESTIONNAIRE NO. 2

SSC 110

Department of Vocational and Technological Education

Student Services Corporation

ASSESSMENT FORM PEER TUTORING QUESTIONNAIRE NO. 2
(To be completed at end of first 10 weeks)

Hi! You are now in your fourth month of peer tutoring. Please take time to think about the following questions and answer then exactly the way you feel.

NAME _____ DIV. _____

1. Do you feel you have improved your skills as a tutor?
   Yes ____ No ____ Why? _____

2. Have you noticed it easier to work with other students?
   Yes ____ No ____ Why? _____

3. Do you feel better about yourself now as compared to last November?
   Yes ____ No ____ Why? _____

4. Has tutoring helped you in working with your brothers, sisters, or other family members?
   Yes ____ No ____ Why? _____

5. Are you comfortable about asking adults in school for help in schoolwork or any problem you may have?
   Yes ____ No ____ Why? _____

6. How do you feel about your school?
   _____
   _____

7. How do you feel about the students you are helping?
   _____
   _____

8. How has being a peer tutor changed you?
   _____
   _____

PLEASE

Keep a list of students you are tutoring, so I can ask them to fill out a questionnaire in May.

Thank you for your cooperation.

Distribution:
Original: Central Office - S.S.C.

APPENDIX L

PEER TUTORING PROGRAM SURVEY

Department of Vocational and Technological Education

SSC 112
Student Services Corporation

PEER TUTORING PROGRAM SURVEY
(To be completed by student who was tutored.)

NAME _____ DIV. _____

CLASS _____ PERIOD _____ DATE _____

Please answer the following questions:

1. What is the name of your tutor? _____
2. Is he/she your friend? _____
3. Is he/she nice? _____
4. Dose your tutor explain things to you clearly? _____
5. Do you like working with your tutor? _____
6. Do you want to keep working with your tutor? _____
   Why? _____
7. Do you think tutoring has helped you learn more? _____
   Why? _____
8. Does your tutor care if you learn? _____
9. Do you think you would like to be a tutor? _____
10. Do you feel you are able to ask the teacher questions about your work? _____

Any other comment: _____

_____

_____

_____

Distribution:
Original: Central Office - S.S.C.

(To be completed at end of tutoring or at end of school year.)

APPENDIX M

SURVEY

Survey

1. Do you perceive that the criteria used to select tutors is appropriate?

__1_____2_____3_____4__
Not at all — Absolutely so

2. Does the orientation workshop for tutors provide sufficient information to initiate program?

__1_____2_____3_____4__
Not at all — Absolutely so

3. Do you perceive that the principal's involvement is essential for the program?

__1_____2_____3_____4__
Not at all — Absolutely so

4. Do you perceive that the administrators from the central office provide essential technical assistance and support to implementation of the program?

__1_____2_____3_____4__
Not at all — Absolutely so

5. Is the record keeping system for vocational advisors appropriate?

__1_____2_____3_____4__
Not at all — Absolutely so

6. Is the record keeping system for tutors appropriate?

__1_____2_____3_____4__
Not at all — Absolutely so

7. Should there be a formal tutee contract?

__1_____2_____3_____4__
Not at all — Absolutely so

8. Is it important to publicize the program among school staff and instructors?

1	2	3	4
Not at all			Absolutely so

9. Are monthly evaluation questionnaires appropriate?

1	2	3	4
Not at all			Absolutely so

10. Should parents of tutees be notified of student's participation?

1	2	3	4
Not at all			Absolutely so