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The Use of High School Paraprofessional Tutors With Programmed Tutorial Materials to Instruct Elementary Learners with Handicaps

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THE USE OF HIGH SCHOOL PARAPROFESSIONAL TUTORS WITH PROGRAMMED TUTORIAL MATERIALS TO INSTRUCT ELEMENTARY LEARNERS WITH HANDICAPS

by

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ABSTRACT

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by

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This investigation focused on the examination of the effectiveness and costs of instructional delivery in using programmed tutorial materials by trained high school paraprofessionals to instruct learners attending the elementary self-contained and resource rooms. Forty tutees, divided equally into experimental and control groups, were administered two pre and posttest measures, the E-B Beginning Reading Placement Test and the Woodcock Reading Mastery Test (WRMT). Tutees in experimental groups received tutorial instruction from the paraprofessional tutors 25 minutes daily over the ten-week treatment period.

An analysis of covariance was computed on the two measures to compare the academic performance between the experimental and control groups. Though no statistical

differences were found between the groups on WRMT, statistical differences were indicated on the E-B Beginning Reading Placement Test for both School Districts A and B, favoring the groups receiving treatment. Significant increases in both Subtest A scores, one subtest of the E-B Placement Test, and the total reading scores of this measure were evidenced in the groups receiving treatment. Results also indicated that the percent of mastery for both School Districts A and B tutees that received treatment mastered at least 84% of all the skills taught by the high school paraprofessional tutors. These tutors mastered 77% of the instructional procedures used in the first part of the tutorial session and 47% in the second part of the session.

The investigation of costs indicated that total cost expenditures in the Maximum Cost Model were $2,418.69, a per learner cost of $60.46, and continuing costs per learner of $13.72. Total purchases using the Moderate Cost Model were $1,298.69, a per learner cost of $32.46, and a continuing cost per learner of $13.72. The Minimum Cost Model indicated total expenditures of $163.69, a per learner cost of $4.09, and continuing costs per learner of $1.35. These cost models provided evidence that the costs of using high school paraprofessional tutors with programmed tutorial materials to instruct handicapped learners can be minimal in return for academic gains in beginning reading skills.

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CHAPTER I

INTRODUCTION

With the increasing demand for services to children with handicaps, as mandated by the passage of Public Law 94-142, recent attention has been directed towards meeting their instructional needs effectively (Fafard, 1975). Effective instruction in basic academic skills has been noted with learners participating in tutorial instruction, in one-to-one learning situations.

The major responsibilities facing the special educator in meeting the learners instructional needs, have often been difficult to accomplish without assitance. One, the teacher has faced the demanding task of providing appropriate, and intensive, and individualized instruction to various handicapped learners. Second, the teacher must provide effective, individualized, simultaneous instruction to learners with various handicaps in a special education setting, an extremely difficult task without support personnel. The possibility of using high school students as nonprofessionals (referred to hereafter as the "paraprofessional") in a supportive instructional role has yet to be explored in a comprehensive manner.

In the early 1900s, paraprofessionals in education, usually adults or parents, provided assistance with out of

school activities, rather than activities during school hours (Cabot, 1914). Paraprofessionals typically participated in extra-curricular events such as sports activities and musical or theatrical productions. During the 1950s and 1960s, the role of the paraprofessional expanded to include various in school duties such as correcting papers, collecting lunch money, and recording attendance. Paraprofessionals, both volunteer adults and students, have also participated in listener programs, listening to learners read aloud for practice without direct instructional intervention. These uses of paraprofessionals have served to free teacher time for instructional duties (Hanson, 1969; Watson, 1971; Gartner & Riesman, 1974).

The role of the paraprofessionals in regular classroom settings has recently become controversial. Some educators have viewed the use of paraprofessionals in various instructional activities as an encroachment on the teacher's area of expertise. Both teaching associations, the National Education Association (NEA) and the American Federation of Teachers (AFT), have issued statements requesting that "protection against the direct act of teaching by noncertified personnel be assured" (The Education Professions, 1972, p. 24). Although this controversy continues among educators, recent studies involving paraprofessionals in tutorial roles have indicated positive academic benefits for learners (Paolitto, 1976; Devin-Sheehan, 1976).

Only recently has attention been focused on the utilization of paraprofessionals in the delivery of instruction to handicapped learners (Burke, 1976; Saettler, 1976; Tucker et al., 1976). The practice of assigning either adult or cross-age paraprofessionals instructional duties has been initiated in various special education settings. However, little research exists on the effectiveness of instructional delivery by paraprofessional tutors.

Instructional Costs in the Utilization of Paraprofessionals

Regardless of delivery method, instructional expenditures to educate handicapped children have been high (Flynn, 1975). The cost of instructional programs for the handicapped increased from one million dollars in 1950 to approximately 314 million dollars in 1973. This growth represented a 3,000% increase in special education costs (Kakalik, 1973).

As the costs have risen, the issue of cost effectiveness has become an increasingly important consideration in educational service delivery to the handicapped. Initiation and maintenance costs have varied among educational programs, with little variation in their effects on learning (Flynn, 1975). Likewise, despite tremendous costs to educate handicapped persons, the success of current special education programs has been questioned (Flynn, 1975; Rossmiller, et al., 1977). Furthermore, comparative cost information on

educational programs for the handicapped have been sparse. Flynn (1975) commented that

> Reports such as the Commission on Instructional Technology's To Improve Hearing and the Ford Foundation's An Inquiry Into the Uses of Instructional Technology not only have documented the lack of cost data necessary for making decisions about the effectiveness of using various educational programs, but have also demanded that such information be obtained. (Flynn, 1975, p. 1)

More specifically, little information is available on the cost effectiveness of paraprofessionals using programmed tutorial methods to deliver instruction to learners (Conant, 1971; McDaniels, 1976). Investigation into the cost effectiveness of special education programs for educating handicapped children would entail the following considerations. First, there are expenses in obtaining a wide variety of materials to identify, diagnose, and place handicapped learners in appropriate instructional sequences. Materials have often been consumable, resulting in annual purchase costs for material replacement. Special materials designed to meet the needs of individual handicapped learners (i.e., visually impaired, learning disabled) have often been more costly than regular classroom materials. A second cost factor would be the teacher time spent in imparting the necessary skills to learners.

For purpose of investigation, instructional program costs can be broken down into initiation costs, operational maintenance costs, and management costs (Thorkildsen, 1978).

Initiation costs- commonly referred to as start-up costs, include the financing of one-time only expense items or experiences. In-service workshops, transportation and specific equipment such as tape recorders, video tapes, and educational facilities are examples of initiation costs. Operation costs, the costs of program maintenance over-time, refer to ongoing financial expenses such as teacher and paraprofessional salaries, program materials necessary for instructors and learners, and items selected for reinforcement purposes. Management costs refer to administrative services necessary throughout the operation of the program.

Problem

Two problems, therefore, have emerged with respect to the delivery of instruction to handicapped learners by paraprofessionals. First, there has been a lack of information regarding the effectiveness of adult or cross-age paraprofessionals using programmed tutorial materials in the delivery of direct instruction to learners attending resource room or self-contained programs. Second, there has been a lack of information concerning the costs of delivering instruction to handicapped learners through the use of paraprofessionals and programmed tutorial materials.

Purpose and Objectives

The purpose of this study was to investigate the effectiveness of high school students as paraprofessional tutors using programmed materials with handicapped learners in the elementary school resource and self-contained classrooms. The investigation centered on the following objectives:

1. To examine the effectiveness of programmed tutorial materials used by high school paraprofessional tutors with learners attending self-contained and resource room programs in the elementary school.

2. To investigate the costs of instructional delivery to handicapped learners through the use of high school paraprofessional tutors and programmed tutorial materials.

Hypotheses and Guidelines for Objectives

With respect to Objective 1 of the study, the following hypotheses were tested:

Hypothesis 1

Basic skill inventory adjusted posttest mean scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest A in the groups receiving paraprofessional tutorial instruction will not be significantly different from the posttest mean scores of the groups not receiving paraprofessional tutorial instruction.

Hypothesis 2

Basic skill inventory adjusted posttest mean schores on the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest B in the groups receiving paraprofessional tutorial instruction will not be significantly different from the posttest mean scores of the groups not receiving paraprofessional tutorial instruction.

Hypothesis 3

Basic skill inventory adjusted posttest mean scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test in the groups receiving paraprofessional tutorial instruction will not be significantly different from the posttest mean scores of the groups not receiving paraprofessional tutorial instruction.

Hypothesis 4

Adjusted posttest mean scores measured by the Woodcock Reading Mastery Test (WRMT) will not be significantly different between the groups receiving paraprofessional tutorial instruction and those not receiving paraprofessional tutorial instruction.

With respect to Objective 2, the investigator examined resource specifications in terms of initiation (start-up), operational, and management costs. The validation component for resource specifications and cost estimation used by the Division of Research and Development (1976) within

the Utah State Board of Education was duplicated for this study. This procedure to determine cost effectiveness emphasized the estimation of costs and determination of possible adoption of the program. Resource specifications by category helped to determine both the cost effectiveness of the program as a whole and the cost per learner during a specified amount of time.

Definition of Terms

Paraprofessional. The term paraprofessional comprises various personnel such as aides, teacher assistants/ associates, students, adults, volunteers or parents. Paraprofessionals, often referred to as nonprofessionals, may be employed to facilitate learning either directly or indirectly. Although the paraprofessional has been most commonly utilized in the educational setting, others have been employed in homes to aid learners.

Traditional tutoring approach. Traditional tutoring pertains to learners (tutees) receiving help with regular classroom texts and materials rather than materials specifically designed for learners with learning problems. Volunteer adults, other students, or employed aides often perform the tutorial role with minimal if any, training in specific tutorial techniques.

Structured tutoring. A model which emphasizes tutorial training in use of specific instructional procedures,

materials, and monitoring procedures. Tutorial materials are arranged in a task-analyzed sequence, provide learner placement procedures and progress monitoring.

Programmed tutoring. Similar to the structured tutoring model, programmed tutoring utilizes both a task-analysis of the terminal objectives and use of specific instructional procedures, materials, and monitoring procedures. Programmed tutoring, however, is designed to control instructional interactions of tutors and tutees with tutor-tutee procedures and responses programmed directly, via script, into the tutorial materials.

Peer and cross-age tutoring. Peer tutoring refers to tutoring which involves tutors and tutees of the same age, whereas cross-age tutoring refers to tutors and tutees of different ages.

CHAPTER II

REVIEW OF LITERATURE

The literature review which follows is a summary of information about the utilization and training of paraprofessionals using programmed tutorial materials with exceptional children. An historical review of the utilization of paraprofessionals in educational settings is presented first followed by a review of paraprofessionals in peer and cross-age tutoring situations. In addition, general roles and training programs for paraprofessionals will be discussed.

The second portion of the review focuses on the literature concerning the use and training of paraprofessionals in special educational settings.

The third section of the review concerns tutorial approaches used by paraprofessionals. Literature relating to tutorial approaches will address both regular and special educational settings. The final section of the review presents a discussion of relative instructional costs, cost studies and cost effectiveness for special education instructional delivery approaches.

Paraprofessionals in Education

1900-1950: Utilization

Paraprofessionals provided services in educational settings over 90 years ago. Cabot (1914) indicated that the major role of paraprofessionals during the early 1900s was to assist teachers in extracurricular or out of school activities. At that time, educators believed that teachers were to be the sole providers or initiators of instructional activity within the school setting. Teachers were expected to take responsibility for the schools' clerical, custodial, and instructional activities. The paraprofessional, then, assisted in extracurricular activities such as recreational and other nonacademic tasks.

1900-1950: Training

Research regarding the training of paraprofessionals participating in extracurricular school settings appears to be virtually non-existent (Thiagarajan, 1975). Studies lacked evidence of provisions for training programs for paraprofessionals volunteering their services. Furthermore, the effectiveness of paraprofessional utilization in various extracurricular settings was not investigated (Cabot, 1914). This lack of research resulted in unanswered questions about paraprofessional effectiveness pertaining directly or indirectly to variables such as specific paraprofessional duties, the size and age of learner groups working with

paraprofessionals, or the paraprofessional competencies necessary for effective tutorial instruction.

1950-1978: Utilization

One of the first studies to document the utilization of paraprofessionals within the school system was completed by Cruickshank and Haring (1957). They found that "youngsters benefited greatly from the program through the additional teacher planning, increased availability of materials, and greater number of classroom activities made possible by the presence of a teacher assistant" (p. 40).

For several reasons, the paraprofessional movement gained momentum in the elementary and secondary school settings during the 1960s. First, school enrollments revealed substantial increase in enrollments compared to the 1950s (Gartner & Reissman, 1974; Thiagarajan, 1975). Second, with the pupil increase came a shortage of available teachers. Gartner and Reissman (1974) stated five additional reasons for the increased use of paraprofessionals:

> (a) Consumer awareness of the inadequacies of traditional service delivery, (b) recognition of the barriers preventing the poor from achieving professional status, (c) acceptance by professionals of paraprofessionals, in part to serve as bridges to minority communities, (d) the need for jobs, and (e) the shortage of personnel for human service work. (p. 291)

More recently, the literature regarding paraprofessionals in educational programs contains an abundance of information (Leggatt, 1969; Cruickshank & Haring, 1957; Gartner,

Kohler, & Reissman, 1971; Gartner & Riessman, 1974; Fafard, 1975). During the 1950s and 1960s paraprofessional roles and responsibilities continued, mainly in noninstructional areas within, rather than outside, the school setting. Duties performed by paraprofessionals included taking attendance, collecting lunch money, correcting papers and preparing materials. So the paraprofessional's role changed to within school clerical duties from out of school extra-curricular assistance.

Peer and Cross-Age Tutoring

During the mid and late 1960s, several studies were reported in which the effectiveness of using various para-professionals in instructional activities, primarily that of tutoring either individuals and/or small groups, was investigated. Utilization of paraprofessional tutors, both peer and cross-age, increased nationwide in regular educational settings (Newmark & Melaragno, 1968; Keele & Harrison, 1971; Robertson & Sharp, 1971; Tannenbaum, 1966; McCleary, 1960; Bradshaw, 1971; Rogers, 1969; Boyd, 1969; Paoni, 1971).

Throughout history, peer and cross-age tutoring has been viewed in three educational ideologies termed by Kohlberg and Mayer (1972) as: the cultural transmission ideology, the romantic ideology; the progressive ideology. The "cultural transmission ideology" referred to the use of paraprofessionals as tutors to increase student acceptance

of values and norms of cultural importance. Emphasis was placed on respectable citizenship for the tutor. As stated by Paolitto (1976),

> The "favorable" conclusions (from paraprofessional tutoring) were all based on school adjustment standards; tutors' grades improved, their own classwork became easier for them, the "trouble makers" became "serious students," and the "slobs" began to wash, and some even decided to become teachers! This all-too-familiar cultural bias today seems blatantly embarrassing. (p. 220)

Furthermore, studies showing overtones of the cultural ideology reported both tutor and tutee results in anecdotal rather than data-based reports (Cloward, 1967; Rasmussen, 1969; Bell, Barlock, & Colella, 1969; Costello & Martin, 1972; Moskowitz, 1972). Authors assumed that tutors must be trained to acquire the appropriate and accepted cultural norms and values (Paolitto, 1976).

Peer and cross-age tutoring was also viewed with a romantic ideology, developed during the 1960s. Emphasis shifted from attending to culturally desired standards to focusing on close tutor-tutee relationships. Tutorial programs based in romantic ideology stressed the tutor's procurement of affective or socio-emotional goals (Gartner, 1971; Thelen, 1967; 1968; 1969; Rasmussen, 1969; Lipitt & Lohman, 1965; Paolitto, 1976). For example, Gartner, Kohler, and Riessman (1971) noted that

> Not only does the child gain new interests, but he may become better adjusted, more adequate as a person, attain better character . . . the result may be to decrease the self-centered and materialistic

> orientation of the children and to change them from spectators (pupils) to participants (teachers). (p. 67)

Empirical documentation of increased attainment of tutor-tutee socio-emotional goals in cross-age tutoring is lacking. Often, instrumentation to measure affective skill acquisition was not validated, thereby confounding correlations between tutoring and increased tutor-tutee self-respect (Bloom, 1975; Greenspan, 1972; Atkins, 1972). Tables 1 and 2 present several tutorial studies summarizing changes in tutor-tutee attitudes toward self or school.

Progressivism, the combination of theory and practice pertaining to cross-age tutoring, grew out of the romantic ideology of the 1960s. Research based on romantic ideologies lacked specific, operational definitions to measure tutor-tutee affective change, ultimately leading to the development of a progressive ideology in the early 1970s. Progressivism, although infrequently mentioned in paraprofessional literature, emphasized descriptive and data based techniques in conducting, observing, and evaluating present cross-age tutorial programs (Paolitto, 1976).

A review of tutorial literature by Powell (1970) revealed that application of progressivism ideology is sparse at best; both coltural transmission and romantic ideologies still predominate the literature. From studies based on empirical research, however, neither Atkins (1972) nor Greenspan (1974) found significant changes in tutor ego development from cross-age tutoring.

Table 1

Effects of Tutoring on the Tutor[a]

Study	Grade level		Significant gains	
	Tutor	Tutee	Achievement	Attitude toward school or self-concept
Morita, 1972	4-6	1-4	yes	--
Robertson, 1971	5	1	no	yes
Waycheck, 1971	5	3	yes	--
Lakin, 1971	5-6	Pre-school	yes	--
Roussin, 1971	6	1	yes	no
Paoni, 1971	6	3	no	yes
Rogers, 1969	6	3	yes	--
Boyd, 1969	6	3	no	no
Sheretz, 1970	8	4-6	yes	yes
Brown, 1971	High school	4	yes	--
Hassinger, 1969	High school	4-6	yes	--
Cloward, 1967	High school	4-5	yes	no
Strodtbeck & Granick, 1972	High school	2-6	yes	no
Werth, 1968	2	9	no	yes
Dillner, 1972	High school	7-9	no	yes

[a]From Peer and Cross-age Tutoring in the Schools by S. Bloom; Copyright 1975 by The National Institute of Education (DHEW), Washington, D.C.

-- = No evidence.

Table 2

Effects of Tutoring on the Tutees[a]

Study	Grade level		Significant gains	
	Tutor	Tutee	Achievement	Attitude toward school or self-concept
Newmark & Melaragno, 1968	6	K	yes	--
Niedermeyer, 1971	5,6	K	yes	--
Keele & Harrison, 1971	Adults & High school	K,1	yes	--
Ellson, 1968	Adult	1	yes	--
Ellson, 1969	Adult	1	yes	--
McCleary, 1960	Adult	1	yes	--
Robertson & Sharp, 1971	5	1	yes	--
Tannenbaum, 1966	Parents	1	yes	--
Hartwig, 1972	Adult	1,2	no	--
Bradshaw, 1971	4,6	1,3	yes	--
Rogers, 1969	6	3	yes	--
Erickson, 1972	7	3	yes	--
Boyd, 1969	6	3	yes	--
Paoni, 1971	6	3	yes	--
Cloward, 1967	High school	4,5	yes	no
Strodtbeck & Granick, 1972	High school	2,6	yes	yes
Hogan, 1970	Adult	High school	no	yes

[a]From Peer and Cross-age Tutoring in the Schools by S. Bloom; Copyright 1975, by The National Institute of Education (DHEW), Washington, D. C.

-- = No evidence.

From the 1950s to the 1970s, a variety of procedures and participants in instruction (as tutors or tutees) were studied (Feldman & Allen, 1974; Frager & Stern, 1970; Blank et al., 1972; Boyd, 1969; Bremmer, 1972; Brown, 1971; Deering, 1966; Lakin, 1971). Tutees were elementary, junior and senior high students, or adult aides or parents (Liette, 1971; Mohan, 1972; Morita, 1972; Robertson, 1971; Robertson & Sharp, 1971). Various critics have pointed out the lack of systematic and theoretical development of research on peer and cross-age tutoring (Paolitto, 1976; Devin-Sheehan, 1976). Devin-Sheehan concluded,

> All too often hypotheses have apparently been formulated in an ad hoc fashion, with little regard for conceptualizing the problem in theoretical terms. Unless investigators in this area make a stronger attempt to draw more directly upon the mainstream of psychological and educational theory, it is likely that tutoring research will continue to be rather fragmented, inconclusive and noncumulative. The wider use of systematic theory should lead to the formulation of research problems of greater sophistication and significance, and thereby contribute directly toward the solution of the numerous practical problems encountered in devising tutoring programs for children. (p. 380)

Paraprofessional Movement in Special Education

Utilization

Generally, the use of paraprofessionals in Special Education settings parallels the paraprofessional movement in regular education (Fafard, 1977). Paraprofessionals in both settings were first documented in 1957 by Cruickshank and Haring. Even at that early date, Cruickshank and Haring

deliberated over the advantages of "mainstreaming" by using paraprofessionals to assist in the integration of handicapped learners into regular classes.

Also, similar to the paraprofessionals in regular education, paraprofessionals in special education have increasingly functioned in instructional rather than nonacademic activities. Practices which once seemed to focus on paraprofessional use to free teachers for instructional duties has recently shifted to using paraprofessionals to provide direct instructional services to learners (Reid & Reid, 1974). Fafard (1977) indicated that recent "emphasis has been on identifying skills that are necessary to work effectively with handicapped children regardless of professional status" (p. 6). The paraprofessional's role now appears to be to deliver instruction directly to learners in academic areas such as reading and math and in basic independent living skills such as eating, dressing, toileting, etc.

With respect to paraprofessional work with individuals having different handicaps, Blessing and Cook (1970) noted successful results using paraprofessional instruction with retarded children. Cowen et al. (1971) indicated similar instructional success with paraprofessionals teaching children classified as "emotionally disturbed." Furthermore, paraprofessionals have demonstrated their abilities to deliver effective instruction to children exhibiting learning

disabilities (Frelow, Charry & Freilich, 1974; Ellson, 1975), children with speech problems (Gray & Barker, 1977); and those with severe or profound handicapping conditions (Cortazzo et al., 1971; Turton, 1976).

Fafard (1974) conducted a study to determine both the number of paraprofessionals being used with children in special educational settings and the specific activities in which they were involved. The results of the study indicated that 46,000 paraprofessionals offered services in special educational settings within the public schools, an increase of 19,000 paraprofessionals from 1971 to 1974. Approximately 4,000 paraprofessionals are presently employed in state facilities such as day schools and residential centers for the handicapped (Fafard, 1974).

In terms of specific paraprofessional roles, numerous studies have documented the shift from indirect to direct paraprofessional instructional delivery to learners (Fafard, 1977). Table 3 indicates the trend of changing utilization and activities for paraprofessionals in special education.

Training

With the increased employment of paraprofessionals in special education instructional roles, the issue of training has also become increasingly important. Research has shown training procedures for paraprofessionals to be diverse, ranging from no training prior to employment, to 1-2 hour in-service training sessions, to in-depth 1-2 year training

Table 3

Activities of Paraprofessionals[a]

Nature of use	Number of facilities[b]	Percentage
Individual activities with children in classrooms	273	85.0
Outdoor activities	224	70.0
Lunch programs, rest periods, health needs	188	59.0
Clerical work	136	42.0
Audiovisual equipment	94	29.0

[a]From the Utilization & Training of Paraprofessionals in Special Education, Present Status and Future Prospects, 1974, p. 23.

[b]The total exceeds the 348 responding facilities as many utilized paraprofessionals in more than one way.

resulting in either an associate degree or a certificate of training (Mitchell, 1971; Reid & Reid, 1974; Fafard, 1977).

The most commonly reported form of training provided was a short period of in-service training. Forty-two states presently do not require certification of paraprofessionals in special education, nor do they require preservice training at the state level (Pickett, 1977). Also, the New Careers Training Laboratory conducted a nationwide survey to determine the present existence of paraprofessional training procedures. Questionnaires were sent to all directors of special education in all states, territories and the District of Columbia. From the 75% who responded, results

indicated that 12 states have specific certification procedures for paraprofessionals, and 13 states have guidelines used in sample selection for paraprofessional employment. The remaining 17 states, etc. have not implemented certification procedures or guidelines for using paraprofessionals in special education. The survey also indicated that a large portion of the United States still has no state procedures for training paraprofessionals. As stated by Pickett (1977), "most states report that the responsibilities for inservice training are the responsibility of the LEA's (Local Education Agencies)" (p. 10).

Local Paraprofessional Training

Information relative to the effects of training paraprofessionals via locally conducted preservice or inservice sessions was substantially lacking in the literature. The few studies reported in this area fell generally into one of two categories: (a) those studies comparing trained and untrained paraprofessionals (via preservice or in-service programs for paraprofessionals) and (b) those studies concerning paraprofessionals trained in different tutorial methods to determine effectiveness of a particular technique. Reports comparing trained or untrained paraprofessionals indicated that, unlike paraprofessionals without training, trained paraprofessionals displayed more appropriate behaviors such as praising tutees and helping tutees respond

appropriately (Niedermeyer, 1970; 1971; Harrison, 1969; Lippitt, 1968).

Harrison (1969) compared the behaviors of paraprofessionals trained in in-service workshops (in structured tutoring techniques) and untrained paraprofessionals. He reported that trained tutors consistently emitted behaviors such as making statements of praise, correcting feedback, and presenting appropriate stimuli to facilitate tutee academic success. Conversely, untrained tutors displayed behaviors that seemed to interfere with the tutees' learning (e.g., punishing behavior, extensive overcueing, little verbal praise, unfriendliness, non-instructional conversation, feedback given before tutee's response). Lippitt (1968) listed the twelve paraprofessional competencies that facilitate tutorial sessions, which are paraphrased below:

1. Require learner (tutee) to attend to task.
2. Require learner to make active responses.
3. Require learner to exhibit the response called for.
4. Orient learner to task.
5. Establish and maintain rapport.
6. Avoid punishing behavior.
7. Provide feedback.
8. Establish criteria for acceptable responses.
9. Provide remedial tutoring.
10. Skip redundant instruction.
11. Provide positive reinforcement.
12. Repeat prior instruction when necessary. (pp. 24-26)

The second limited group of studies pertaining to paraprofessional training was concerned with comparisons in effectiveness of training in different tutorial methods (Devin-Sheehan, 1976; Ellson et al., 1968; Harris, 1968). Both programmed and traditional tutorial techniques have been compared, and have demonstrated that specific tutorial techniques are related to tutee performance (Ellson et al., 1968; Harris, 1968). According to Ellson, paraprofessional training in programmed tutorial techniques resulted in superior tutee performance. A contradictory review of research by Frager and Stern (1970), however, indicated differences between structured and traditional paraprofessional tutorial methods in terms of tutee academic performance. Traditional tutorial techniques were identified as those focusing on helping learners with assignments, whereas structured tutorial methods were defined as those emphasizing goals, identifying problems, and selecting solutions to these problems.

Although training programs for paraprofessionals have shown positive results in terms of tutee performance, research does not yet clearly indicate training in a specific tutorial method to be superior to other methods. As concluded by Devin-Sheehan (1976),

> Clearly, what is needed is an experiment in which tutors, are used to teach tutees. . . . Only when these groups are compared together in one experiment can confident statements be made regarding the appropriateness of different types of training. (pp. 374-375)

Tutorial Methods Used by Paraprofessionals

Traditional Methods

Numerous studies of the utilization of traditional tutorial methods by paraprofessional tutors working with tutees have been reported in the literature (Rosner, 1970; Strodtbeck & Gramick, 1972; Thelen, 1969). Traditional methods, referring to the use of current classroom teaching methods and materials, were commonly used by paraprofessionals in tutorial settings during the 1960s.

The paraprofessional, whether an elementary or secondary student or volunteer adult, generally received no training in using appropriate instructional procedures. In addition, studies in the early 1960s indicated that paraprofessionals' effectiveness as tutors was measured in terms of self-concept, attitude changes toward learning, or socio-emotional growth for either the tutor or tutee (Gartner et al., 1971; Paolitto, 1976).

The interpretations of these findings, however, were often questionable. Studies often lacked sound research design; also, the subjective measures used often lacked data of their reliability or validity. Furthermore, findings were often stated in inconsistent, anecdotal reports (Paolitto, 1976; Devin-Sheehan, 1976). Comparison of traditional tutorial techniques with other methods, or comparison with other relative variables (e.g., training, age

differential), was lacking. These research weaknesses have raised questions as to the effectiveness of traditional tutorial methods.

Structured Tutorial Methods

Structured tutoring, as advocated by Harrison (1968; 1969; 1971; 1972) refers to a tutorial model emphasizing the training and use of specific teaching methods in tutorial settings. Structured tutoring emphasized the following four major tutoring components:

1. The relationship between the tutor and tutee. The tutor-tutee relationship refers to the rapport maintained between tutor and tutee, the appropriateness of responses emitted by the tutee, the appropriateness of feedback procedures, the use of materials, and the monitoring of the tutee's progress.

2. Specific characteristics of tutorial meterials. Specific behaviorally stated objectives are written, and materials are provided for teaching; these materials are arranged in a task-analyzed sequence to facilitate appropriate learner placement.

3. Training procedures and materials for tutors. Training procedures for tutors focus on the establishment of rapport with tutee, the use of materials and instructional procedures, and the use of record charts.

4. The management system. Although Harrison has stated that adults (15 years and older) require a minimum amount of supervision in using the structural tutorial model, he indicated that a management system involving adult supervisors should be established in overseeing the ongoing tutorial process. Supervisors administer pretests, record tutee's progress and mastery, select and train tutors, conduct in-service review sessions with tutors, and arrange scheduling for instruction.

Negative effects on tutee's academic performance resulting from paraprofessional structured tutoring techniques are not evident in the literature. Harrison's studies (1967; 1968; 1969; 1971; 1972) have indicated repeatedly that tutorial situations operating in a highly structured manner have a positive effect on tutee's academic achievement. However, it should be noted that according to Devin-Sheehan (1976), Harrison often excluded either use of control groups and/or statistical analyses in his examination of accumulated data.

The Southwest Regional Laboratory for Educational Research (SWRL, 1969) also reported the academic benefits of using a structured tutorial approach. Additionally, Niedermeyer and Ellis (1972) indicated positive findings from the Structured Tutoring Model. Bright and Colismo (1972) reported the effectiveness of structured tutoring in using the structured tutoring model, The Vanguard

Teaching Model. Five year olds who were tutored by sixth graders increased their Metropolitan Reading Readiness Test scores from the seventh to the 44th percentile within a six month period. Similarly, first graders, tutored by fifth graders using the Structured Tutoring approach, demonstrated a six month academic gain in reading during a six week treatment period.

Overall, research has consistently produced positive findings in paraprofessional use of structured tutoring techniques with handicapped or slow learners. It has been recommended that structured tutoring techniques be compared with other tutorial techniques to determine effectiveness of various methods in relation to each other (Devin-Sheehan, 1976).

Programmed Tutorial Approach

The programmed tutorial approach developed by Ellson (1970) at Indiana University is a technique of systematically providing instruction from paraprofessionals to tutees. Programmed tutoring, though similar to structured tutoring, controls the tutee's responses in a tightly structured manner resembling computer programs. Paraprofessionals, according to Ellson (1975), are able to utilize programmed tutoring techniques effectively despite their previous educational experience. Also, instructional activities, Ellson states, "are tightly prescribed (a) by detailed instructions (programs) which they follow to the letter, (b) by teaching

materials, and (c) not least important, by pattern of successes and failures of the children they tutor" (1975, p. 1).

Programmed tutorial techniques are based on a scientific theory of learning hierarchy integrates learning principles such as reinforcement and contiguity into designing instruction. Gagné, a proponent of the learning hierarchy theory, contends that a complex skill cannot be mastered by a learner unless the simpler prerequisite skills have been learned.

Programmed tutorial techniques incorporate the theory in learning hierarchy (Ellson, 1975; Gagné, 1970). First, programmed tutoring requires a task-analysis of the terminal objectives. Secondly, based on learning hierarchy theory, procedures in programmed tutoring help determine learner placement in the skill hierarchy followed by appropriate instruction.

Although the programmed tutorial model is a relatively recent development in educational systems, it has shown consistent positive academic benefits for tutees (Hofmeister, 1976; Ellson, 1969; 1971; 1975). The Programmed Tutorial Reading Project in the Indianapolis School District utilized paraprofessional tutors and programmed tutorial techniques with 1,200 lower elementary tutees. Compared to control group learners, tutees receiving programmed treatment made significant gains in reading.

Neidermeyer (1969) also investigated the training and utilization of parents as paraprofessionals for pupils at home. Use of programmed reading materials and techniques resulted in increased parental participation and tutee academic gains.

Hartwig (1972) investigated the effects of programmed tutoring on the reading achievement of second graders exhibiting reading difficulties. Paraprofessional volunteers with high school educations were trained in programmed tutorial techniques, and worked with learners for a seven month period. Again, tutees made highly significant gains in reading skills compared to those not receiving programmed tutoring.

In repeated studies, a variety of tutees and paraprofessional tutors such as adults, parents, and students have successfully used Ellson's programmed tutorial techniques (1968, 1969, 1970, 1971, 1975). In field sites involving 1,500 tutors and 15,000 tutees, the use of these techniques have been reported as successful. Ellson states, "it (Programmed Tutoring) has reduced the proportion of non-readers in a sample of disadvantaged children from approximately 10% to less than 1%, and it has reduced the proportion of first grade failures, i.e., retentions by as much as 66% and assignments to special education classes by as much as 75% (p. 3).

Recently, the field of Special Education has directed its attention to the technology of integrating programmed

tutorial techniques into instructional packages (Fredericks et al., 1975; Engelmann & Becker, 1975; Hofmeister & Atkinson, 1975; Hofmeister, 1976; Lent, 1975. Hosmeister (1976, 1977), Rosen (1975), Patten (1975), and Landeen (1975) have developed several programmed tutorial instructional packages in academic areas such as dressing, toileting, and basic language. Not only have these materials been successfully used by paraprofessionals in the educational setting, but these materials have also been used by parents, a paraprofessional resource, to instruct their handicapped children at home.

Lent (1975) has also developed programmed tutorial instructional packages through Project MORE (Mediated Operational Research for Education). Paraprofessionals with a minimal amount of training have effectively utilized these packages to teach daily living skills to severely handicapped learners. Like Hofmeister, Lent stresses the use of behavioral principles, systems analysis, mediation and dissemination.

Training procedures for paraprofessional tutors are also undergoing investigation. From the Teaching Research Infant and Child Center, Fredericks, Grove and Baldwin (1975) developed a system of training paraprofessionals in specific techniques to work effectively with handicapped children. Fredericks found the following guidelines effective considerations in training paraprofessionals:

1. Time must be taken to train volunteers.
2. Volunteers must be given teaching tasks in the classroom comparable to their level of training.
3. A system of feedback as to the adequacy of the volunteers' performance must exist.
4. A simplified system of communication, not requiring verbal instruction, between the teacher and the volunteer must exist.
5. A system of flexible scheduling of volunteers must be maintained. (p. 2)

Cost-Effectiveness in Special Education

Instructional Costs: Background

Instructional costs to educate children have been expensive (Flynn, 1975). In the past 30 years, instructional costs have comprised an increasing portion of the public budget. In 1973, for example, approximately 90 billion dollars, representing 8% of the gross national product, was spent to educate American children. In the past 20 years, total expenditures in both public and private elementary and secondary schools have increased from 18 billion dollars to approximately 75 billion dollars (Rossmiller, 1977). In 1973, the Education Commission of the States designated the area of special education as the most critical challenge presently facing the nation. Essigs and Engle (1976) supported this contention by pointinh out "the increasing frequency with which our courts are encountering civil cases questioning the responsibility of our schools to provide

appropriate educational programs for the handicapped (p. 1). In turn, compulsory instructional programs for the handicapped have been developed.

Accompanying the increase in mandatory programs for the handicapped has been an inflation of educational costs. Instructional programs for the handicapped increased in cost from one million dollars in 1950 to 314 million dollars in 1973, approximately a 3,000% increase in expenditures (Kakalik, 1973).

Cost Studies in Special Education

Current research related to cost-effectiveness in special education is sparse. Generally, the literature indicates that costs in special education vary in direct relationship to the severity of learner handicaps (Braddock, 1976; Hayes, 1976). Programs for the language impaired or mildly handicapped, for instance, report far fewer expenses for education than programs for either the physically or severely intellectually handicapped children.

A common approach used in reporting costs in special education is the use of a "cost index" for programs being studied. A cost index refers to "a ratio of the cost of programs for exceptional children to the cost of programs for regular students" (Essigs, 1976, p. 8).

The National Education Finance Project (1968) utilized the cost index approach by handicap category to study special education costs. This was the first comprehensive

study in the past 35 years to be completed in the area of educational finance. As a part of this comprehensive project, Rossmiller, Hale and Frohreich (1970) studied costs in special education. They compiled expenditure information from a sample of 24 school systems providing services for all categories of handicapped children in the states of Wisconsin, New York, Texas, Florida and California. Results indicated the national trends of cost expenditures in special education varied according to the severity of the disability. The costs in special education varied from 1.18 to 3.64 times the cost of educating a child in the regular classroom. As an average, the cost index for the general special education program was 2.0 times that spent for regular education. Rossmiller cited three major reasons for the higher costs in special education: Lower teacher-pupil ratios, increased use of ancillary support personnel such as social workers, psychologists, equipment; and additional transportation expenditures.

A number of cost studies completed between 1970-1976 reported results similar to Rossmiller's findings. Sorenson (1973) and Clemmons (1974) compiled information pertaining to costs in special education from school systems in Minnesota and Illinois. Both projects reported, in terms of the cost index, that variations in costs rise or fall in direct relationship to the severity of the handicaps of learners served. Studies conducted in Minnesota (Clemmons,

1974), Indiana (Jones & Wilkerson, 197) and Texas (Texas Education Agency, 1975), also reported cost indices by disability category. Costs in special education programs were analyzed in both special public services such as transportation, medical services, facilities utilized, and in specific areas of instruction. The results of these studies are summarized in Table 4 (Marinelli, 1976, p. 169).

Cost studies in special education pertaining to cost-effectiveness, usually measured in student achievement, are sparse. Hayes (1976) conducted a cost-effectiveness study to analyze the relationship between inputs (instructional setting), outputs (student achievement), and costs. Results indicated that, as in previous studies, costs vary between categories of exceptionality. Further, he found special education programs under investigation were generally good. In terms of cost-effectiveness, Hayes indicated that costs in special education programs do not necessarily correlate with the quality of the instruction or achievement gains. By replication of cost-effectiveness studies such as this, the area of cost-beneficial special education can be further defined. Inputs, such as appropriate instructional programs, need further analysis, planning, and implementation to determine the most cost-effective outputs in terms of learner success (Rossmiller & Geske, 1977; Marson, et al., 1977; Flynn, 1975).

Table 4

A Comparison of Cost Indices Study and States Involved

Category of Exceptionality	Rossmiller et al.*(WI, FL,CA,TX,NY)	Jones & Wilkerson* (Indiana)	Sorenson* (Illinois)	Snell* (Indiana)	Clemmons* (Minnesota)	Texas Education Agency* (Texas)
Gifted	1.14					
Educable Mentally Retarded	1.87	1.63	1.72	1.94	1.71	2.83
Trainable Mentally Retarded	2.10	1.70	2.31	1.81	2.03	2.22
Auditorially Handicapped	2.99	3.71	(Hard of 2.35Hearing)	1.55	2.99	3.48
Visually Handicapped	2.97	6.01	2.41 (Deaf)	1.22	2.34	4.38
Speech Handicapped	1.18	1.19	2.75	4.18	1.27	5.97
Physically Handicapped	3.64	2.76	2.94	1.32	2.89	2.76
Special Learning Disorders	2.16	2.38	2.02	1.56	1.75	2.76
Emotionally Distrubed	2.83	3.73	3.95		1.22	2.61
Multiply Handicapped	2.73	2.93	3.38			
Homebound/ Hospitalized	1.42	1.74				
Pregnant Students						1.29
Minimally Brain Injured						2.94

Note: Reprinted from David Braddock, Dollars and Sense in Special Education. Office of Education (DHEW), Washington, D.C., June, 1976; Eric Document No. ED136 544

Summary

Four general areas have been presented in this review of literature. These areas are summarized below:

1. Paraprofessionals in the field of education have been used since the late 1800s. Their roles have changed in assignments from non-instructional tasks to instructional tasks. Research in peer and cross-age tutoring with paraprofessionals has stressed socio-emotional growth of the tutor, although recently research has emphasized specific academic achievement of the tutees. Although empirically based research has increased in the 1970s, limited empirical research has been conducted on the effectiveness of training programs for paraprofessional tutors in general educational settings.

2. Generally, the paraprofessional movement in special education parallels that in the general educational field. As of 1974, 46,000 paraprofessionals were being utilized in special education settings. In terms of training for paraprofessionals, surveys indicated the majority of the United States have not incorporated certification procedures or guidelines. Studies investigating training for paraprofessionals reported both increased use of effective instructional procedures by paraprofessional tutors and positive results in tutee performance.

3. Three general tutorial methods have been used by paraprofessionals. The traditional tutorial method was often weak in research design. Also, reports indicated a lack of empirical data to analyze specific tutor-tutee performance. Although the traditional method often appeared throughout the literature in the 1960s, few studies reported any training of the paraprofessional to use appropriate instructional procedures.

The structured tutorial approach, on the other hand, emphasized training the tutor in specific techniques to facilitate the tutee's academic performance. Despite criticism of weak research design in several studies (Devin-Sheehan, 1976), the research relating to structured tutoring repeatedly demonstrated positive results in the tutee's academic performance.

A technique showing much promise for tutorial sessions is the programmed tutoring model. The programmed tutoring model has consistently shown positive results for tutees in special education settings. Specific studies using programmed tutoring techniques have shown a 75% reduction in assignments to special education settings. Although studies using a programmed tutorial model have been successful, they are sparse and in need of extensive application and generalization to all handicapped learners in special education settings.

4. Instructional expenditures to educate exceptional learners have been costly, a 3,000% increase in the past 30 years. Costs in special education are directly associated to the severity of the handicap. Cost indices, commonly used to report education expenditures, indicated that special education programs were twice as expensive as regular education programs. Few studies reported cost-effective special education programs. One study indicated that expenditures in special education was not directly associated with the quality of the instructional programs. Finally, the research indicated the need for continued investigation and replication to analyze and implement cost-effective special education programs.

CHAPTER III

METHODS AND PROCEDURES

Target Population

The population targeted in this investigation was third, fourth, fifth, and sixth grade learners exhibiting identified mild learning or emotional handicaps and enrolled daily in special education resource or self-contained classrooms in two Utah elementary schools. The population was further defined as those attending elementary school in Utah communities ranging in population from approximately 15,000 to 90,000 citizens.

Accessible Population

Utah special education programs serve the learning disabled in resource room settings, whereas emotionally handicapped learners are served mainly in self-contained classrooms. Learners available for sample selection were those attending special education resource rooms or self-contained classrooms in Box Elder and Salt Lake School Districts. Also, elementary schools available for selection were those in close proximity to high schools to facilitate the utilization of high school paraprofessionals in study sites.

From these schools, learners in grades 3-6 attending the resource or self-contained classrooms on a daily basis were randomly selected for this investigation.

Sample Selection

To assure that learners from each of the four grade levels were represented equally in the study, a stratified sampling procedure was followed. All 3-6 grade learners attending either resource room or self contained classrooms were given both the Woodcock Reading Mastery Test (WRMT) Form A and the Engelmann-Becker (E-B) Reading Placement Test. (Both measures are described in the Instrumentation section, p. 47.) The sample was comprised of students displaying any reading difficulty indicated by the E-B Reading Placement Test. Students names were recorded and entered on Sample Selection List. The Sample Selection List had the categories for third, fourth, fifth and sixth grades. A total of 39 potential participants were selected at random from each of the four groups for placement in either the experimental or control groups. Thirteen third graders, 12 fourth graders, 7 fifth graders, and 7 sixth graders comprised the 39 participants. Thirty-three participants attended resource rooms in Schools A or B, whereas 6 participants attended the self-contained classroom in School B. School A had no self-contained special education program at the time of treatment.

Tutorial Program Materials

The Engelmann-Becker Beginning Reading Program (1977) is a phonetic-based program designed for use by paraprofessionals and professionals in teaching letter sounds and sound blending to learners with decoding problems. These sound-blending skills are then applied in decoding words, sentences, and paragraphs.

All program materials are presented in a self-contained, portable package with a programmed instructional format. Each lesson is programmed in a scripted, direct instructional format detailing instructional, correction, reinforcement and monitoring procedures. The learning tasks for tutees have been subdivided into small, sequential steps, requiring specific overt tutee responses. Sample program pages depicting this programmed instruction format can be found in Appendix B.

The E-B Beginning Reading Program is designed to teach the student to:

1. Pronounce and identify sounds for each letter such as g, l, aw, th.
2. Decode simple (phonetically) regular words.
3. Pronounce and identify the sounds of common letter combinations such as ar, al, ou, ea, ee, ir, er, th.
4. Read words containing letter combinations.

5. Read sentences containing the words taught.

6. Read paragraphs, generalizing sound-symbol skills to decode new words.

7. Read complete stories using the sounds and words contained in the lessons (E-B Press Beinning Reading Instructors Manual, 1978).

Procedures

Tutees from elementary schools and tutors from high schools participated in this project. School administrators from the Salt Lake and Box Elder School District gave permission to conduct this investigation in two elementary and two high schools, located in close proximity to one another. For both high schools criteria for selector tutors was based on both teacher and counselor recommendations of interested, volunteer 10th-12th graders showing responsibility and consistent attendance. Additionally, students from the resource room special setting in the Box Elder High School were selected in order to also benefit from the tutorial program in terms of firming up reading skills and increasing self confidence. The tutors from the Salt Lake District (termed "District A") were selected from "child's world" and "parenting" classes and all tutors from the high school in Box Elder District (termed "District B") were selected from the special education resource room.

From these teacher and counselor recommendations, the names of potential tutors were compiled for selection.

Volunteer paraprofessional tutors participated in a five day inservice training with the experimenter. At the completion of the inservice training, tutoring schedules were arranged and tutors were randomly assigned to handicapped learners.

In order to check appropriate use of tutorial procedures, each tutor had been instructed to tape one session per week. The experimenter randomly assigned one day a week of each week for tutors to tape tutorial sessions. A note was left for each paraprofessional tutor indicating which instructional session was to be taped. Two college volunteers in Special Education at Utah State University were trained to review weekly taped sessions. Each of these listeners, receiving credit for participation, checked tutorial instructional procedures using a Listener's Monitoring Chart (see Appendix I). Each tutor was then checked weekly in his/her use of instructional, reinforcement and correction procedures.

Following treatment given to tutees in the experimental group, tutees in both experimental and control groups were post-tested. The E-B Reading Placement Test and the WRMT was administered to each learner by trained university students from Utah State University.

Inservice Training Procedures for Paraprofessionals

The inservice training of the paraprofessional tutors emphasized three areas, general format of the instructional package to be used in tutoring sessions, instructional procedures and recording procedures. In terms of general format, each tutor was acquainted with the tutor-tutee seating arrangement, the time length advised for tutorial sessions and the general script format used in the tutorial materials.

Tutorial sessions were then simulated emphasizing specific instructional procedures. After initial practice sessions, the simulation included practice with correction and reinforcement procedures.

Record keeping procedures as described in Appendix A and B were also demonstrated and practiced. Tutors were also given instructions to contact the experimenter if and when unforeseen problems arose.

Treatment Procedures for Tutorial Sessions

Treatment for each tutee in the experimental groups consisted of participation in a minimum of 15 tutorial sessions. Any tutees unable to complete at least tutorial sessions were excluded from further investigation. Each paraprofessional tutor was asked to follow prespecified procedures during all tutorial sessions. All sessions were conducted in the resource or self-contained classroom. Each tutor was to praise the learner for coming to the session.

The tutee was then presented with the first learning task (e.g. sound card, word list) and the tutor was to instruct the learner to perform a specific task such as decoding the presented sound card or word list. Following this presentation, the learner was to respond to each consecutive direction. If and when necessary, a specific correction procedure was used by the tutor. The tutee was praised for attempts and correct responses.

At the completion of each session, the paraprofessional recorded the learners' progress on the given record chart. Tutees also recorded their progress on "Game Charts" which were used for play at the end of the three month reading treatment. The following specific information was recorded daily on the Tutor Monitoring Sheet (see Appendix A):

1. Name of tutor and tutee.
2. Daily lesson number.
3. Learner and paraprofessional time spent in daily tutoring sessions (starting and ending times).
4. The number of skills and subskills were mastered in the session.
5. Unsuccessful attempts and/or problems encountered during the session.

Inservice Training for Listeners

Basically, the training procedure conducted with paraprofessional tutors was also used to train two listeners.

In addition, the volunteer listeners were trained to listen to given tapes of tutorial sessions and systematically record all information on the Listener's Monitoring Chart (see Appendix I). An interrater reliability coefficient of .99 was obtained during the training session, a nearly perfect agreement between listeners on scoring information from taped sessions.

Instrumentation

Two measures were employed to gather pretest and post-test data. The Engelmann-Becker (E-B) Beginning Reading Placement Test, part of the instructional program, was administered to both experimental and control groups at elementary School A and School B. Also, the Woodcock Reading for Mastery Test (WRMT) was given to all groups. Both measures were administered by college students who received specific training in these two measures.

The E-B Beginning Reading Placement Test, previously developed by E-B Press (1978) as the instructional program placement tool, was administered to all learners in the resource or self-contained setting to serve as a basis for both selection of participants and appropriate placement into the E-B Beginning Reading Program. Learners responded to test items until they made five errors in five consecutive responses. Items which appear on the test represent instructional objectives of the E-B Beginning Reading

Tutorial Program (see Appendix A for the list of program objectives).

To estimate the reliability of this measure, the investigator used the coefficient of stability, the test-retest reliability approach. Learners exhibiting similar characteristics to the target population were tested on the E-B Placement Test twice with a period of 5-6 days delay between administrations. Scores obtained from these two administrations were then used to determine test stability. The test-retest coefficient of stability computed for the E-B Placement Test was .99, indicating a high degree of test reliability. Content validity information was also obtained to determine the degree to which the test items represented the content on the Reading Program. A matrix depicting a sample of test items matching the instructional objectives stated for the E-B Beginning Reading Program is presented in Appendix E.

The Woodcock Reading Mastery Test (WRMT), which permits both norm and criterion-referenced score interpretation, was administered individually to third, fourth, fifth, and sixth graders attending the resource room or self-contained classroom. The WRMT, composed of five subtests, covers the following areas in reading: letter identification, word identification, word attack, word comprehension, and passage comprehension.

Two types of correlation coefficients have been reported in the Woodcock manual. Split-half correlation coefficients are reported for a development form of the test, ranging between .02 and .99. Alternate-form test-retest reliability coefficients obtained from second and seventh grade classes to whom Forms A and B of the Woodcock were administered, range from .68-.93 (Salvia & Ysseldyke, 1978). Due to restricted variance in the seventh graders scores on letter identification, a lower correlation coefficient, .16, was obtained on the letter identification subtest.

Content validity was established by identifying what experts considered the most relevant of 2,417 items over the five subtests. Standardization, established after a two year period, was based on a stratified random sample of 5,000 learners from various ethnic backgrounds, types of communities, income levels and parental occupation groups (Burros, 1975).

The question format of WRMT items is of the constructed response-type to decrease possible biasing effects of guessing from multiple choice items. The WRMT can be interpreted in terms of grade equivalent scores, or percentile ranks for norm-referenced purposes. An advantage of the WRMT is its use for both norm-referenced and criterion-referenced purposes. As stated by Woodcock, "joint norm-referenced criterion-referenced interpretations describe a person's competency with a given task compared to others on the same task" (p. 25).

Data Collection

Data collected throughout the study pertained to either the tutee's academic achievement, or to cost effectiveness information. In terms of achievement, pre and posttest data were collected for each tutee on two testing instruments, the Woodcock Reading for Mastery and the E-B Press Reading Placement Test. Data relating to daily progress were also recorded by paraprofessional tutors of the Tutor Monitoring Charts.

In order to check for appropriate tutorial instructional procedures, listeners were trained to identify specific appropriate tutorial responses from the taped sessions. When appropriate procedures used by the paraprofessional tutors occurred, listeners recorded a mark (✓) in the designated column of the Listener's Monitoring Chart (Appendix I). Also, any inappropriate tutorial responses noted on the tape were recorded on the Listener's Monitoring Chart. A list of appropriate and inappropriate tutorial instructional procedures that listeners were trained to identify are listed in Appendix I.

Data relating to cost effectiveness were collected in the areas of staff development, materials, facilities, equipment and travel. Salaries paid and staff participation comprised costs in staff development. Material costs consisted of the number of manuals, workbooks, manipulatives and audio-visual materials used throughout the treatment

period. Facilities and equipment costs, desks, chairs, chalkboards, and room or centers used. Using a Cost Examination Sheet (see Appendix K), each cost area was examined using three cost models, the maximum, moderate, and minimum cost models. Each cost model listed and examined costs in terms of initial or start-up costs, management costs and operational costs.

Design

A pretest-posttest control group design was used to conduct the study. This experimental design controls for eight threats to internal validity identified by Campbell and Stanley (1963): history, maturation, testing, instrumentation, regression, selection, mortality, and interaction effects. According to Campbell and Stanley (1963), sources of external invalidity such as interaction of testing, sample selection and treatment, and reactive effects (Hawthorne, John Henry and novelty effects) are not controlled for in the use of the design. The pretest-posttest control group design is presented in Table 5.

Objective 1

In reference to the first major objective of this investigation as stated in Chapter I, the investigator examined the effectiveness of programmed tutorial materials used by paraprofessional tutors with learners attending the

Table 5

Research Design

	Pretest	Treatment	Posttest
Experimental Group	0	X	0
Control Group	0		0

Key: 0 = testing
X = treatment

self-contained and resource room. In order to control for initial differences on the two pretests, an analysis of covariance was used. The two covariates were the scores from the two dependent measures, the Engelmann-Becker Beginning Reading Placement Test and the Woodcock Reading Mastery Test. ANCOVA served to test the following four hypotheses:

1. Basic skill inventory adjusted posttest mean scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest A in the groups receiving paraprofessional tutorial instruction will not be significantly different from the adjusted posttest mean scores of the groups not receiving paraprofessional tutorial instruction.

2. Basic skill inventory adjusted posttest mean scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest B in the groups receiving a paraprofessional tutorial instruction will not be significantly different from the adjusted posttest mean scores of the groups not receiving paraprofessional tutorial instruction.

3. Basic skill inventory adjusted posttest mean scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test in the groups receiving paraprofessional tutorial instruction will not be significantly different from the adjusted posttest mean scores of the groups not receiving paraprofessional tutorial instruction.

4. Adjusted posttest mean scores measured by Woodcock Reading Mastery Test (WRMT) will not be significantly different between the groups receiving paraprofessional tutorial instruction and those not receiving paraprofessional tutorial instruction.

Other Analyses

Objective 1

In addition to statistical analyses to examine the effectiveness of paraprofessional tutors using a programmed tutorial reading program, analysis in terms of practical significance was also conducted. From the data gathered on the criterion measure, the investigator examined whether or not 80% of the individuals mastered 80% of the skills taught, the 80/80 criterion. Although Briggs and Gagne (1974) reported that a commonly used criterion has been 90/90, where 90% of the learners master 90% of the skills taught, the investigator chose an 80/80 criterion. Seldom can all learners benefit from the same program; by establishing an 80/80 criterion the investigator was able to determine the

effectiveness of the program although 20% of the learners may have failed to benefit. Whereas inability to attain a 90/90 criterion may fail to indicate practical significance of the program, the 80/80 criterion could indicate program effectiveness with pragmatic application to a large number of learners (i.e., at least 80%).

Objective 2

The second major objective of this investigation was to determine the cost effectiveness of instruction delivered by paraprofessionals using programmed tutorial materials in elementary resource rooms or self-contained classrooms.

Resource specifications were analyzed in this study in terms of initiation (start-up), operational, and management costs. The validation component for resource specifications and cost estimation, titled Sharing Educational Success, and used by the Division of Research and Development (1967) within the Utah State Board of Education was duplicated for this study. This validation component (see Appendix K) requires a breakdown of total program costs into specific categories such as staff development, materials, facilities, equipment, and transportation. These costs are further itemized into initiation, operation, or management expenditures. This procedure permits program cost estimation and cost analysis to help determine possible adoption of the program. Resource specifications by category foster

determination of program effectiveness as a whole, costs per learner during a specified amount of time, and costs in program continuation.

In further consideration of possible program adoption, all program expenditures were collected in three cost models. First, a maximum cost model indicated the highest expenditures that could possibly be used to implement the program in various Utah school districts. Moderate and minimum cost models were used to calculate selected cost deletions and alternatives for program adoption at reduced expenditures.

Given the data pertaining to costs, the investigator calculated costs and cost-benefit alternatives using the three cost models in terms of:

1. Total program costs: the total start-up, management and operational costs which were summed to obtain the total program costs.

2. Per learner cost: the total start-up, management and operational costs which were divided by the total number of learners to derive learner costs.

3. Continuing costs: the total operating costs added to operationally related management costs to determine continuing costs.

CHAPTER IV

RESULTS

The present investigation was designed to examine the effectiveness of paraprofessionals using programmed tutorial materials to help handicapped learners in resource or self-contained settings increase beginning sound-symbol and blanding reading skills in two Utah school districts. The following chapter presents the results of the investigation as they relate to the two objectives established in Chapter I. Relative to the first objective, the results of the four hypothesis are listed. Also, the results of six additional research questions have been presented, four of which pertain to the first hypothesis. Finally, results of both the second objective and additional analyses such as mastery of tutorial procedures by paraprofessionals and the 80/80 criterion were stated.

Data from the experimental groups used in statistical analyses were from participants who completed a minimum of 15 tutorial sessions, the requirement for treatment. As a result of this requirement, the mortality rate for the experimental group in both School Districts A and B were two and give respectively. Also, two tutees in the control group from School District A and one tutee from School

District's B control group were unavailable for posttesting.

As stated in the first objective, one purpose of the study was to examine the effectiveness of programmed tutorial materials used by paraprofessionals with learners attending the self-contained or resource room. Four hypotheses, relative to the objective were tested:

Hypothesis 1

Hypothesis 1 states that basic skill inventory adjusted posttest mean scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest A in the groups receiving treatment will not be significantly different from the adjusted posttest mean scores of the groups not receiving treatment.

The adjusted posttest means on the criterion measure Subtest A for the groups receiving treatment was 48.55 and 36.39 for the control group (see Table 6). An F value of 13.61 (DF 1/27) was required for statistical significance at the .05 alpha level. The adjusted F value of 22.99 exceeds the critical value of 13.61, indicating statistical isngificance at the .001 alpha level. These differences therefore support a significant association between the reading treatment and the adjusted posttest means of the Subtest A reading scores.

Table 6

Criterion Measure Part A Subtest Scores

Both Utah School Districts

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	1089.00	22.99*
Regression	1	1326.49	
Error	27	47.36	

	Experimental Groups	Control Groups
Adjusted Means	48.55	36.39

*Significant at the .001 level

Hypothesis 2

Hypothesis 2 states that the adjusted posttest mean scores measured by the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest B will not be significantly different between the groups receiving treatment and those not receiving treatment.

Table 7 summarized the pretest/posttest information obtained from experimental and control groups on the Engelmann-Becker (E-B) Beginning Reading Placement Test Subtest B. The adjusted posttest means for combined experimental and control groups for School Districts A and B were 39.45 and 39.30 respectively. The adjusted F value of .00741 (DF 1/27) did not exceed the critical value of 4.21. The differences in the adjusted posttest means were not statistically significant at the .05 alpha level. The null hypothesis was retained.

Hypothesis 3

Hypothesis 3 states that basic skill inventory adjusted posttest, mean total reading scores on the Engelmann-Becker (E-B) Beginning Reading Placement Test in the groups receiving treatment will not be significantly different from the adjusted post-test mean scores of the groups not receiving treatment.

Table 7

Criterion Measure Part B Subtest Scores

Both Utah School Districts

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	.17055	.00741*
Regression	1	582.324	
Error	27	22.98	

	Experimental Groups	Control Groups
Adjusted Means	39.45	39.30

*Not significant at the .05 level.

Analysis of covariance was used to adjust experimental and control group osttest means for possible initial differences among learners reflected in the pretest means. Covariance was computed not only using the total reading scores for each group, but also using the two subtest reading scores of the Engelmann-Becker Beginning Reading Placement Test which determine the total reading score. Analyses of these scores were computed using both combined and separate school district scores.

As shown in Table 8, the adjusted posttest means for the experimental and control groups on the total reading scores for both school districts 88.13 and 75.60 respectively. An F value of 4.21 (DF 1/27) is required for statistical significance at the .05 alpha level. The adjusted F value, 14.19 exceeds the critical value (4.21) indicating that the difference between the adjusted posttest means was statistically significant at the .05 level. Therefore, the null hypothesis was rejected.

Hypothesis 4

Hypothesis 4 states that adjusted posttest mean scores measured by the Woodcock Reading for Mastery Test (WRMT) will not be significantly different between the groups receiving treatment and those not receiving treatment.

Table 8

Criterion Measure Total Reading Scores

Utah School Districts A and B

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	1155.58	14.19*
Regression	1	3523.20	
Error	27	81.40	

	Experimental Groups	Control Groups
Adjusted Means	88.13	75.60

*Significant at the .001 level.

Table 9 summarizes the pretest/posttest information obtained from all groups on the Woodcock Reading for Mastery Test (WRMT).

As indicated in Table 9, the adjusted posttest means for combined experimental and control groups for School Districts A and B were 115.47 and 112.63 respectively. The adjusted F value of .607 (DF 1/27) did not exceed the critical value of 4.12. The differences in the adjusted posttest means were not statistically significant at the .05 alpha level. The null hypothesis was retained.

Additional Analyses of Hypothesis 1

Questions

In reference to hypothesis 1, six research questions were posed, which are presented with their results below:

1. What was the difference between the Subtest A reading scores from the E-B Beginning Reading Placement Test of the experimental and control groups for School District A?

An analysis of covariance (ANCOVA) was also computed using the pretest and posttest means from Subtest A of the E-B Beginning Reading Placement Test. As Table 10 reveals, the adjusted posttest means for the experimental and control groups were 49.40 and 35.72 respectively. An F value of 4.67 (DF 1/13) is required for statistical significance at the .05 alpha level. The resulting F value of 17.05 (DF 1/13) exceeds the critical value of 4.67 indicating that

Table 9

Norm-referenced Measure Total Reading Scores

Utah School Districts A and B

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	57.78	.607*
Regression	1	1653.15	
Error	27	95.08	

	Experimental Group	Control Group
Adjusted Means	115.47	112.63

*Not significant at the .05 level.

Table 10

Criterion Measure Subtest A Reading Scores

Utah School District A

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	730.66	17.05*
Regression	1	274.43	
Error	13	42.84	

	Experimental Group	Control Group
Adjusted Means	49.40	35.72

*Significant at the .001 level.

the differences in the adjusted posttest means on subtest A of the criterion measure were statistically significant at the .05 alpha level.

2. What was the difference between the Subtest B reading scores from the E-B Beginning Reading Placement Test of the experimental and control groups for School District A?

An analysis of covariance was computed to adjust posttest means of School District A using the pretest means of part B; the second subtest of the E-B Beginning Reading Placement Test. Table 11 shows the results of this analysis. The adjusted posttest means for the experimental and control groups were 39.38 and 36.73 respectively. An adjusted F of 2.62 (DF 1/13) was obtained, failing to exceed the critical value of 4.67, showing that the differences in the adjusted posttest means on subtest B of the criterion measure were not statistically significant at the .05 alpha level.

3. What was the difference between the total reading scores from the E-B Beginning Reading Placement Test of the experimental and control groups attending School District A?

The adjusted posttest means for the experimental and control group on the total reading scores of School District A were also obtained. The adjusted posttest mean for the experimental group was 89.63 and 70.23 for the control group (see Table 12). An F value of 4.67 (DF 1/13) was required for statistical significance at the .05 alpha level.

Table 11

Criterion Measure Subtest B Scores

Utah School District A

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	27.71	2.52*
Regression	1	680.62	
Error	13	10.55	
		Experimental Groups	Control Groups
Adjusted Means		39.38	36.73

*Not significant at the .05 level

Table 12

Criterion Measure Total Reading Scores

Utah School District A

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	1437.36	15.37*
Regression	1	1740.66	
Error	13	93.47	
		Experimental Group	Control Group
Adjusted Means		89.63	70.23

*Significant at the .001 level.

These differences therefore support a significant relationship between the reading treatment and the adjusted posttest means of the total reading scores of School District A.

4. What was the difference between the subtest A reading scores from the Engelmann-Becker (E-B) Beginning Reading Placement Test of the experimental and control groups attending School District B?

The adjusted posttest means for the experimental and control group on the Subtest A reading scores of School District B were 46.52 and 38.59 respectively. An F value 4.84 (DF 1/11) was required for statistical significance at the .05 alpha level. The obtained F value of 4.40 approached, but did not exceed the critical value of 4.84 (see Table 13). The differences between the adjusted posttest means therefore were not statistically significant at the .05 alpha level.

5. What was the difference between the Subtest B reading scores from the Engelmann-Becker (E-B) Beginning Reading Placement Test of the experimental and control groups attending School District B?

As indicated in Table 14, the adjusted posttest means for the experimental and control groups for School District B were 40.06 and 41.29 respectively. The adjusted F value of .271 (DF 1/11) did not exceed the critical value of 4.84. The differences in the adjusted posttest means were not statistically significant at the .05 alpha level.

Table 13

Criterion Measure Subtest A Reading Scores

Utah School District B

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	197.84	4.40*
Regression	1	1092.62	
Error	11	44.92	

	Experimental Group	Control Group
Adjusted Means	46.52	38.59

*Significant at the .10 level

Table 14

Criterion Measure Subtest B Reading Scores

Utah School District B

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	4.82	.271*
Regression	1	119.87	
Error	11	17.74	

	Experimental Groups	Control Groups
Adjusted Means	40.06	41.29

*Not significant at the .05 level.

6. What was the difference between the total reading scores from the E-B Beginning Reading Placement Test of the experimental and control groups attending School District B?

The adjusted posttest means on the criterion measure for School District B were 86.15 for the experimental group and 80.13 for the control group. An adjusted F value of 2.53 does not exceed the necessary critical value of 4.84 indicating that the difference between the adjusted posttest means was not significant at the .05 alpha level (see Table 15).

Table 15

Criterion Measure Total Reading Scores

Utah School District B

Analysis of Covariance

Source	DF	Mean Square	Adjusted F
Treatment	1	114.79	2.53*
Regression	1	208.00	
Error	11	45.34	
		Experimental Groups	Control Groups
Adjusted Means		86.15	80.13

*Significant at the .20 level

Program Costs

As stated in the second objective in Chapter I, a second purpose of the project was to determine the cost effectiveness in using paraprofessionals with programmed tutorial materials to instruct learners attending the elementary resource or self-contained classroom. All expenditures were examined in terms of initiation (start-up), operational, and management costs. These costs were itemized for consideration of other Utah School Districts interested in implementing the program.

As shown in Table 16, program costs were collected in the areas of staff development, materials, facilities, equipment, and travel. Also, these expenditures were further categorized for implementation using maximum, moderate, and minimum program costs. In terms of staff development, paraprofessional costs obtained were based on salaries used by northern Utah school districts for paraprofessional services. Also, inservice training service expenditures were reported on the basis of the third year special education teacher 1979 salary schedule used in northern Utah school districts. This salary schedule also provided the salary schedule used to employ a third-year psychologist with a Masters Degree for the purpose of pre and posttesting services. All program materials, originally developed by the Outreach and Development Division of the Exceptional Child Center in

Table 16

Cost Expenditures of Implementation for Research Investigation

	Maximum Costs			Moderate Costs			Minimum Costs		
	Initiation	Operation	Management	Initiation	Operation	Management	Initiation	Operation	Management
Staff Development									
1. 5 hour paraprofessional inservice training in Salt Lake City (5 hrs x 20 paraprofessionals x $3.00 per hour)	$300.00			$300.00			Paraprofessional tutors received class credit rather than salaries for their instructional inservice training.		
2. 5 hour paraprofessional inservice training Tremonton (5 hrs x 20 paraprofessionals x #2.00 per hour)	$300.00			$300.00			(same as above)		
3. 10 week paraprofessional tutoring, 20 minutes per day (10 weeks x 20 paraprofessionals x $1.00 per day)		$200.00			$200.00			All paraprofessional tutors received class credit rather than hourly salaries for their instructional salaries.	
4. 10 hour total inservice training of paraprofessionals (10 hrs x $8.97 per hr)	$89.70			$89.70			$89.70		
5. Pretesting by psychological services on criterion and norm-referenced measures (40 learners x 1 testing hour each x $14.00 per hour)	$560.00								
6. Posttesting by psychological services on criterion and norm-referenced measures (40 learners x 1 testing hr each x $14.00 per hr)	$560.00				No psychological services necessary. Special Education teacher will pre & posttest learners during assessment periods.			No psychological services necessary. Special Education teacher will pre & posttest learners during assessment periods	

Table 16

Continued

	Maximum Costs			Moderate Costs			Minimum Costs		
	Initiation	Operation	Management	Initiation	Operation	Management	Initiation	Operation	Management
Materials									
1. 15 instructor's manuals (@$2.50 per manual)		$37.50			$37.50			(3 manuals) $7.50	
2. 40 student workbooks (@$6.00 per workbook)		$240.00			$240.00			(5 student workbooks) $30.00	
3. Acetate sheets (10 sheets @10¢ each)								$1.00	
4. Storybooks (40 storybooks @$1.50 each)		$60.00			$60.00			(5 story-books) $7.50	
5. Engelmann-Becker Beginning Reading Placement Tests (80 tests @50¢ per test)	$40.00			$40.00			$20.00		
6. Woodcock Reading Mastery Tests (80 tests @25¢ each)	$20.00			$20.00			---		
7. Pencils (140 pencils @5¢ each)		$7.00			$7.00			(70 pencils) $3.50	
8. 4 stopwatches		No purchases necessary. Stopwatches & taperecorders supplied by school districts.			No purchases necessary. Stopwatches & taperecorders supplied by school districts.			No purchases necessary. Stopwatches & taperecorders supplied by school districts.	
9. 2 tape recorders									

Table 16

Continued

	Maximum Costs			Moderate Costs			Minimum Costs		
	Initiation	Operation	Management	Initiation	Operation	Management	Initiation	Operation	Management
Facilities & Equipment									
1. One room or center within each school		No rental or purchase of facilities or equipment necessary. All facilities and equipment supplied by school districts.			No rental or purchase of facilities or equipment necessary. All facilities and equipment supplied by school districts.			No rental or purchase of facilities or equipment necessary. All facilities and equipment supplied by school districts.	
2. 2 student desks or 2 small tables per school district.									
3. 4 desk chairs per school.									
Other									
1. Reinforcers									
a. 1 tiefighters Starwars toy @$3.99		$3.99			$3.99			$3.99	
b. Xeroxed copies of good note sheets (10 copies @5¢ ea)		$.50			$.50			$.50	
Total Expenditures of Initiation, Operation, and Management categories	$1869.70	$548.99	-0-	$749.70	$548.99	-0-	$109.70	$53.99	-0-
Number of learners upon which costs were based in each cost model: 40	Total Maximum Costs:		$2418.69	Total Moderate Costs:		$1298.69	Total Minimum Costs:		$163.69
	Per learner costs:		$60.46	Per learner costs:		$32.46	Per learner costs		$4.09
	Continuation costs per learner:		$13.72	Continuation costs per learner:		$13.72	Continuation costs per learner:		$1.35

Logan, Utah, were reported in Table 16 with specific costs established by the Outreach and Development Division.

As indicated in Table 16, the initiation costs within the maximum cost model categories of instructional materials, facilities, equipment, and travel were minimal ($60.00). The primary start-up cost would pertain to the area of staff development ($1,809.70). Most initiation expenditures would be spent for the inservice training of paraprofessionals and the pre and posttesting of tutees by psychological services within the school district. Cost expenditures pertaining to pre and posttesting were based on average Utah District salaries paid to first-year school psychologists holding a Master of Science Degree. Other purchases categorized with initiation costs were teacher-time to conduct the inservice training of paraprofessionals, paraprofessional training hours, and test materials for pretest and posttest administrations.

Operational expenditures too, were collected for analysis. The major operational purchases within the maximum cost model included paraprofessional time for tutoring and instructional materials such as student workbooks, instructors manuals, and story books. Other operational items were student desks, chairs, stopwatches, and instructional space; these items however were provided by the school districts so purchase was not necessary. Further, as shown in Table 16,

the project required no specific administrative services from either school, which resulted in minimal management costs.

Cost Effectiveness

To examine cost effectiveness, the total costs of initiation, operation, and management were summed to obtain the total program costs in not only the maximum and moderate cost models but also the minimum cost model. The total program costs were $2418.69, $1298.69, and $163.69 respectively. Each model of program cost was then divided by 40, the total number of learners in order to obtain per learner costs. Per learner costs for the maximum cost model was $60.46, and $32.46 for the moderate cost model, and $4.09 for the minimum cost model.

Furthermore, to obtain continuing costs per learner for each cost model, the total operational and management costs were divided by the total number of learners. As administrative services were not required for this program implementation, no management costs were obtained. Continuing costs per learner for the maximum cost model was $13.72, for the moderate cost model, $13.72, and $1.35 for the minimum cost model.

Mastery of Tutorial Procedures by Paraprofessionals

In order to document appropriate use of tutorial procedures, two college student listeners were trained to check tutorial sessions. Each tutor was instructed to tape one session per week; the trained listeners then reviewed each tape for appropriate or inappropriate use of instructional, reinforcement, and correction procedures. Information for each tutor's mastery of tutorial procedures is presented in Table 17. The data indicate that tutors from School Districts A and B combined had a total average of 77% mastery of instructional procedures for teaching known and unknown sounds. Furthermore, tutors from both School Districts A and B exhibited 47% mastery of instructional procedures used for activities in the students workbook.

In addition to the statistical analyses computed, data were also gathered on the criterion measure to examine whether or not 80% of the learners receiving the minimum requirement for 15 tutorial sessions mastered 80% of the skills taught. As seen from the data in Table 18, 100% of the tutees in School District A receiving treatment mastered at least 86% of the skills taught. The data further indicate that tutees from School District B completing treatment mastered 82% of the skills taught by paraprofessional tutors.

The combined percent of mastery for both school districts indicate that, on the average, the 13 learners

Table 17

Tutorial Procedure Mastery of Paraprofessionals

	Tutorial Procedures to Teach Known and Unknown Sounds	Tutorial Procedures to Teach Workbook Pages
	Percent of Mastery	Percent of Mastery
School A		
Tutor 1	44	51
Tutor 2	75	26
Tutor 3	79	43
Tutor 4	95	29
Tutor 5	66	29
Average	72	36
School B		
Tutor 1	100	59
Tutor 2	76	not taped
Tutor 3	98	53
Tutor 4	69	not taped
Tutor 5	81	34
Tutor 6	75	85
Average	83	58
School Districts A and B Total Percent of Mastery	77	47

Table 18

Percent of Beginning Reading Skill Mastery

Tutees: School Districts A and B

	School District A % Mastery	School District B % Mastery
Tutee 1	89*	69
Tutee 2	85	--*
Tutee 3	80	96
Tutee 4	82	63*
Tutee 5	87	82
Tutee 6	93	82
Tutee 7	74	85
Tutee 8	91	--*
Tutee 9	93	78*
Tutee 10	--*	73*
Total (with * tutees)	86	78
Total (without * tutees)	86	82
Total Schools A & B (with * tutees)	82	
Total Schools A & B (without * tutees)	84	

*Indicates tutees unable to complete minimum treatment requirement of 15 tutorial sessions

completing the reading treatment mastered at least 84% of the skills taught by paraprofessionals (see Table 18).

CHAPTER V

DISCUSSION

This chapter presents a discussion of the investigation into the effectiveness of using paraprofessionals with programmed tutorial materials to help handicapped learners. The investigation focused on learners, attending resource or self-contained settings in two Utah school districts, who lacked beginning reading sound-symbol and blending skills. Discussion will first center on the results of the four hypotheses and six research questions pertaining to Objective 1 established in Chapter I. Included in this section is a discussion of both paraprofessional mastery of tutorial procedures, and tutee mastery (using the 80/80 criterion), of reading skills. The chapter will focus, second, on a discussion of the results of Objective 2 (stated in Chapter I) relating to cost effectiveness.

Paraprofessional tutors using programmed tutorial materials effectively helped tutees master beginning reading sound-symbol and blending skills. The data suggests that the learners who received treatment showed performance superior to those in non-treatment groups. The output of the instruction, in terms of the tutee's academic gains, could be considered cost-effective when considering the economical investment of cost expenditures.

An analysis of covariance computed on both the adjusted posttest mean differences on Subtest A and on total reading scores of the criterion measure, were statistically significant ($p < .05$) for School Districts A and B. However, the same statistical technique used to compute the differences on the adjusted posttest means solely a Subtest B for both school districts failed to demonstrate statistical significance for both schools at the .05 alpha level. In order to interpret these differences, one must first differentiate between the skills represented by each subtest. Subtest A was comprised of the 56 sounds taught in the program. Subtest A was comprised of the 56 sounds taught in the program. Subtest B consisted of 50 words to decode that contained sounds from Subtest A. Furthermore, each lesson consisted of three main sections:

1. Practice the known sounds from the 56 sounds.
2. Teach one unknown sound from the 56 sounds.
3. Complete one workbook page reading words containing known sounds.

Working within rigid high school and elementary school time schedules, paraprofessionals could adequately complete the first two sections of the lesson; the third section, however, may not have been covered as effectively. This effect would result in higher scores on Subtest A than on Subtest B of the criterion measure.

Observations were also noted on the quality of instruction. Data obtained from the taped sessions indicated that paraprofessionals were more effective in implementing the first two sections of the lesson (Table 17). Paraprofessionals from both school districts used more inappropriate instructional procedures on the last third of the tutorial session.

Although the trend in observational data on tutoring behavior (Table 18) suggests that School District A received better tutee skill mastery in beginning reading accompanied by lower levels of paraprofessional mastery, the data can be misleading. It should be noted that School B paraprofessional tutors 2 and 4 failed to follow instructions to tape particular sections of the tutorial session, though each taped the procedures for known and unknown sounds. These failures to tape may be a result of their inadequacy in teaching competencies, thereby omitting significant and possibly misleading data from paraprofessional mastery. This is somewhat substantiated by a teacher's anecdotal complaint against tutor 4's failure to comply with the programmed tutorial methodology. This teaching inadequacy was also indicated by the regressed scores on both dependent measures of tutee 4, who received the instruction. On the whole, only one paraprofessional, tutor 6 of School District B, indicated a mastery of 80% in the total programmed tutorial instructional procedures. The failure to master

80% of the paraprofessional instructional competencies indicates that paraprofessionals from these two high school settings may require more training and practice on specific instructional procedures set forth in the student's workbook.

Another factor that may have contributed to the finding of statistically significant differences in Subtest A, though not in Subtest B may be rllated to the placement procedures of the reading program. With the present placement procedures recommended in the instructor's manual, a learner may be placed in the workbook section not providing equal practice in reading words representative of all known sounds. In several cases, learners may have mastered the entire 56 sounds. In several cases, learners may have mastered the entire 56 sounds; however, they may have been placed in a workbook section where only the known sounds are practiced. Although the investigator attempted to revise the placement procedures to remediate this issue, several learners from both schools were placed behind the appropriate entry section. Therefore, learners may have received daily, consistent practice on the 56 sounds, though they were unable to practice blending and reading words from all the sounds. This could then result in higher scores for Subtest A than for Subtest B on the criterion measure.

Three of the five subtests comprising the total reading scores of the norm-referenced measure, The Woodcock Reading Mastery Test, did not pertain to the reading treatment;

therefore, statistical significance of the total reading scores from the WRMT was neither expected nor obtained. Two of the five subtests, however, the Word Identification and Word Attack Subtests (see Appendix H) were directly related to skills taught in the reading program. Both subtests check the learner's ability to blend and read words containing the 56 sounds also taught in the reading program. Though a norm-referenced measure, the WRMT was used to check the learner's mastery of words; these two subtests then, bear similarities to objectives found in Subtest Part B of the criterion measure. It would appear then, the reasons for the nonsignificant statistical results indicated by the WRMT were similar to the nonsignificant results obtained on Part B of the criterion measure.

In addition to analyzing the statistical data, one must consider the practical significance of the reading treatment. One way to assess the effectiveness of the reading program is to examine the degree of mastery achieved by learners receiving the reading treatment. As shown in Table 18, tutees of School Districts A and B completing treatment reached the 80/80 criterion in that at least 80% of the tutees mastered 80% of the skills taught. This combined 80% mastery in both School Districts A and B suggests that the reading treatment may be practical in teaching tutees beginning reading skills. To further suggest the pragmatic application of the reading treatment, both Scool Districts have

requested continuation of treatment beyond the 10 week treatment period. Teachers from both resource and self-contained settings have responded favorably to the treatment received by their learners.

Cost Effectiveness

Data were collected and analyzed to determine the cost effectiveness in using paraprofessionals with programmed tutorial materials to instruct learners attending the resource or self-contained classrooms. As indicated in the maximum cost model of Table 16, the cost expenditures per learner were approximately $60.46. Although significant academic gains were evident from the criterion measure, the Engelmann-Becker (E-B) Beginning Reading Placement Test, the cost of skill mastery using the maximum cost model seems excessive. Closer examination of the data, however, may show the cost effectiveness of this reading treatment to master beginning reading skills.

The maximum cost model in Table 16 provides evidence that primary cost expenditures were used in start-up activities such as staff development and testing services. One major advantage of these initiation costs is that such expenditures are "one-time-only" purchases. Additionally, initial staff development expenditures such as paraprofessional training can be an investment in training instructors to effectively use specific instructional procedures to

teach basic reading skills. The input of developing staff as paraprofessionals may be economical when considering the academic outputs achieved in terms of tutee academic success. In addition, initiation costs in paraprofessional training need not increase should the school district increase paraprofessional staff. One teacher trainer can prepare several paraprofessionals at one time. Furthermore, at no additional costs, the trained paraprofessionals may provide intensive, effective, instructional services for any length of time considered desirable by the school district.

An economical means of staff development by training and using high school paraprofessionals has been suggested. However, an expensive and common mode used to train educational staff has been enrollment in university or college training programs. To provide instructional training by university classes and credit would increase staff development costs by literally thousands of dollars. For example, if a third-year resource teacher with a Master's Degree, rather than high school paraprofessionals, were to deliver programmed tutorial instruction to tutees, staff development would increase total costs by approximately $9,898.00. This total expenditure would increase per-learner costs to $247.25, four times the initial per learner cost. Furthermore, continuing costs would rise from $13.72 to $203.00 for each tutee. Comparison of these figures suggests, then, that the utilization and training of high school paraprofessional

tutors with programmed tutorial materials can be a cost effective investment for instructing tutees in beginning reading skills

Cost Benefit Alternatives

The largest expense from the maximum cost model in Table 16 is initiation costs of staff development and testing services for implementing treatment in other Utah school districts. As shown by both the Moderate and Minimum Cost Models in Table 16, alternative means of developing competent staff are available to the school districts, resulting in economical per learner costs.

The major expenditure reduction from the Maximum to the Moderate Cost Model pertained to the omission of using the norm-referenced measure, The Woodcock Reading Mastery Test. It should be noted that the actual contribution of the WRMT to the instructional process was nonexistent, although implementation of this measure incresed expenditures approximately 40%. This major expense in testing services resulted in significantly imbalanced costs between testing and treatment services.

Alternative means, however, may be utilized to maintain balanced and pragmatic expenditures. First, schools preferring to use the WRMT as an assessment tool for this project need not employ the testing services of a school psychologist. The major portion of Utah school districts conducts assessment and evaluation at the beginning and end of the school

year to check each learner's knowledge of basic reading skills. Administration of the WRMT at the beginning and end of the school year by special education personnel would eliminate approximately 75% of the Maximum Cost Model (Table 16) testing services by a school psychologist. Furthermore, such a reduction would decrease testing expenditures from $1,120 in the Maximum Cost Model to $280.00 in the Moderate Cost Model. This alternative would also result in a reduced per learner cost from $60.46 to $32.46.

A second alternative may be used to obtain reduced expenditures. As evidenced by the Minimum Cost Model of Table 16, total elimination of the Woodcock Reading Mastery Test would decrease total expenditures from $2,418.69 in the Maximum Cost Model ot $163.69 in the Minimum Cost Model. In addition to these assessment alternatives, options to staff development are available to the school districts, resulting in economical per learner costs. The cost expenditures to train and utilize paraprofessionals as shown by Items 1, 2, and 3 of the staff development section in the Maximum and Moderate Cost Models were $800.00. The research project, however, actually trained and employed high school paraprofessional tutors who received class credit rather than an hourly salary for participation. As evidenced by the Minimum Cost Model in Table 16, this means of employing paraprofessional resources decrease cost expenditures in staff development approximately $800.00, resulting in significantly reduced per learner and continuation cost per learner.

A third alternative to reduce costs, as shown by the Maximum Cost Model in Table 16, pertains to material consumption. Rather than providing instructor's manuals for all paraprofessional tutors, the project can be implemented using 2-3 manuals repeatedly. Furthermore, to decrease material consumption of the student workbook by 40 tutees, they could instead use acetate sheets to work on each page so as not to deplete the workbooks. This alternative to material utilization reduced material costs from $404.50 in the Maximum and Moderate Cost Models to $60.50 in the Minimum Cost Model.

The use of these alternatives, then, can significantly reduce not only total expenditures, but also per learner and continuation costs. As evidenced by the three cost models in Table 16, total expenditures can be reduced from $2,418.69 in the Maximum Cost Model to $1,298.69 in the Moderate Cost Model, to $163.69 in the Minimum Cost Model. These cost benefit alternatives also reduce per learner costs from a maximum of $60.46 to a minimum of $4.09. The continuing costs per learner then can be decreased from $13.72 in the Maximum and Moderate Cost Models to $1.35 in the Minimum Cost Model.

Continuation Costs

The expenditures involved in continuing treatment suggest a high degree of cost effectiveness. In relation to

the Maximum and Moderate Cost Models, the major portion of costs such as staff development and materials have already been purchased. These fiscal areas, then, would not be an added expense to costs for continuing treatment for an indefinite period of time. Continuing supervision of the paraprofessional tutors would involve minimal time input, despite whichever cost model would be used. A supervisor, possibly an elementary or high school teacher, need only check and maintain attendance of paraprofessionals in tutorial sessions. Therefore, despite the use of either the Maximum, Moderate, or Minimal Cost Model in Table 16, costs of continuing treatment seem minimal in return for the academic gains received by tutees in the resource or self-contained setting.

CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Using a pre-post control group research design in two school districts, the effectiveness of using high school paraprofessional tutors to instruct tutees in the resource or self-contained classrooms was examined. Paraprofessionals participating in the study received a 5-hour minimum of in-service training in specific instructional procedures to teach beginning reading skills with the E-B Press Beginning Reading Tutorial Program. Forty tutees were randomly assigned to either experimental or control groups. Data on daily reading performance and instructional costs were collected, along with data depicting paraprofessionals' accuracy in instructional implementation.

Both experimental and control learners were pre and posttested using criterion and norm-referenced measures, the E-B Beginning Reading Placement Test, and the Woodcock Reading Mastery Test. The E-B Beginning Reading Placement Test was used to examine learners' mastery of 56 sounds and ability to blend these sounds into words. The Woodcock Reading Mastery Test assessed the learners' ability to decode phonetic sound-combinations, identify words and letters, and indicate comprehension of various words and passages.

An analysis of covariance was used to compare the adjusted group means of experimental and control groups on both measures.

The investigation yielded the following findings:

1. The statistically significant differences between the experimental and control group means for School Districts A and B from the total reading scores on the E-B Beginning Reading Placement Test suggested that the E-B Press Beginning Reading Program positively affected the posttest scores of the experimental groups.

2. The adjusted posttest means for the experimental and control groups for School Districts A and B on Subtest A of the criterion measure exceeded the critical value denoting statistical significance ($p < .05$), favoring both experimental groups.

3. The difference between experimental and control groups' posttest means on Subtest B of the E-B Beginning Reading Placement Test for School Districts A and B was not statistically significant.

4. The difference between the experimental and control groups' adjusted posttest means on the total reading scores of the Woodcock Reading Mastery Test for both School Districts A and B was not statistically significant at the .05 alpha level.

5. The percent of mastery for both School Districts A and B indicate that all tutees who received treatment

(a minimum of 15 tutorial sessions) mastered at least 84% of all the skills taught by the paraprofessional tutors.

6. Paraprofessional tutors from School Districts A and B indicate mastery of an average of 77% of the instructional procedures for teaching known and unknown sounds, the first part of each tutorial session. Also, tutors from both school districts exhibited 47% mastery of the instructional procedures for teaching word and sentence reading skills, the second part of the reading treatment.

7. Using Maximum Costs to implement this tutorial project in various Utah school districts would result in a total expenditure of $2,418.69, a per learner cost of $60.46, and continuing costs per learner of $13.72. As shown by the Moderate Cost Model in Table 16, the use of cost-benefit alternatives can reduce total costs to $1,298.69, per learner costs to $32.46, and continuing costs per learner to $13.72. To further reduce costs using cost alternatives, a school district may implement the tutorial project using the Minimum Cost Model, reducing total expenditures to $163.69, obtaining a per learner cost of $4.09, and a continuing cost per learner of $1.35.

Conclusions

From this investigation, conclusions were made regarding the method of instructional delivery by using high school paraprofessional tutors with the E-B Press Beginning Reading

Program, tutee achievement, paraprofessional training, and the amount of time spent in the tutorial program. The following indicate specific conclusions derived from the results of this investigation:

1. Tutees attending self-contained and resource classrooms in School Districts A and B mastered specific decoding and blending skills taught by high school paraprofessional tutors using programmed tutorial materials.

2. In terms of instructional delivery, high school paraprofessional tutors from School Districts A and B, given minimum inservice training in specific instructional, reinforcement, and correction procedures, were capable of instructing tutees in specific beginning reading skills using programmed tutorial materials. It should be noted, however, that these tutors may retain the appropriate procedures given periodic review and minimal, but consistent, supervision.

3. The amount of time these tutees spent in tutorial instruction may have affected the degree of mastery in decoding and blending skills taught by high school paraprofessional tutors using programmed tutorial materials. Tutees from School Districts A and B, who participated in either the entire treatment period or a minimum of 15 tutorial sessions, attained superior academic skill gains over those learners failing to participate over the 10 week treatment period.

4. As evidenced by the Maximum, Moderate, and Minimum Cost Models in Table 16, the costs of using high school paraprofessional tutors with programmed tutorial materials to instruct handicapped learners can be minimal in return for academic gains in beginning reading skills.

Recommendations

To develop future programs using paraprofessional tutors with programmed tutorial materials to instruct handicapped learners, the following recommendations are made:

1. This study provided evidence that training paraprofessionals to use programmed tutorial materials can help tutees in specific academic gains. It is recommended that paraprofessional training be provided to as many high school students as possible to develop tutorial programs in schools wherever needed.

2. Although cost-effectiveness in using paraprofessionals with the E-B Press Beginning Reading Program to instruct handicapped learners was investigated the study was limited to examination of one programmed tutorial package. It is recommended that other materials of this type be used and examined to determine average costs for this particular medium of instruction and service delivery method.

3. This investigation provided evidence that learners in resource and self-contained settings in School Districts A and B developed specific reading skills from paraprofessional tutors with programmed tutorial materials. For future

research, further examination is necessary in using learners from the elementary setting who, despite handicapping or non-handicapping conditions, have not yet mastered beginning reading skills. Furthermore, these learners should receive treatment whether or not they receive special services in the resource or self-contained special education setting.

4. It is recommended that this investigation be replicated over an extended period of time to evaluate long-term effects in both retention of skill gains and cost-effectiveness by using paraprofessionals with programmed tutorial materials.

5. To allow for closer supervision and less attrition of paraprofessional tutors, high school teachers should be utilized in the selection, training, and supervision of paraprofessional tutoring.

6. The evidence suggested that learners received inadequate practice of specific skills in the E-B Press Beginning Reading Program. In terms of instructional development, it is recommended that the E-B Press Beginning Reading Program be revised so that the workbook directly coordinates with specific skills taught to the tutees. Also, extensive practice and review should be integrated into the reading program. Given these critical revisions/modifications, it is recommended, then, that this investigation be replicated.

7. A major pitfall of the criterion measure, the E-B Beginning Reading Placement Test, was the limitation in

reliability and validity information. The criterion measure, then, for the E-B Beginning Reading Program, requires further revision for validity and reliability to ensure appropriate assessment, placement, progress, and evaluation. Furthermore, a component needs to be added to the measure pertaining to the paragraph reading sections in the reading program.

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APPENDIXES

Appendix A

Instructor's Manual and Recording Charts

TUTOR______________

LEARNER____________

TUTOR DAILY MONITORING CHART

Date_______ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page: ______ Comments:	Date______ Time session started:______ Time session ended:________ Worked on cards___to___ Workbook page:_______ Comments:
Date____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:______ Comments:	Date_____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:_____ Comments:
Date_____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:_____ Comments:	Date_____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:_____ Comments:
Date_____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:_____ Comments:	Date_____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:_____ Comments:
Date_____ Time session started:_____ Time session ended: Worked on cards___to___ Workbook page:_____ Commends:	Date_____ Time session started:_____ Time session ended:_______ Worked on cards___to___ Workbook page:_____ Comments:

Appendix B

Student Workbook Sample Pages and Student Recording Chart

1

c a m i n f u d s r

10 sec. 1 2 3 4 5 6 7 8

am	fun
in	dim
man	am
fun	man
dim	in

15 sec. 1 2 3 4 5 6 7 — 15 sec. 1 2 3 4 5 6 7 8

in ----------> _____

man ----------> _____

dim ----------> _____

fun ----------> _____

am ----------> _____

15 sec. 1 2 3 4 5 6 7 8 — 15 sec. 1 2 3 4 5 6 7 8

3

ē f d r i c o n t h

10 sec. 1 2 3 4 5 6 7 8

ram	nod
con	dim
sin	ram
us	rut
fan	sin
mē	mē
nod	us
dim	fan
ran	ran
rut	con

30 sec. 1 2 3 4 5 6 7 8 — 30 sec. 1 2 3 4 5 6 7 8

sin	- - - - - - - - - - ->	
mē	- - - - - - - - - - ->	
ran	- - - - - - - - - - ->	
con	- - - - - - - - - - ->	
dim	- - - - - - - - - - ->	
us	- - - - - - - - - - ->	
rut	- - - - - - - - - - ->	
ram	- - - - - - - - - - ->	
fan	- - - - - - - - - - ->	
nod	- - - - - - - - - - ->	

30 sec. 1 2 3 4 5 6 7 8 — 30 sec. 1 2 3 4 5 6 7 8

5

m s f r c n h u a ē

10 sec. 1 2 3 4 5 6 7 8

us	man	an	ram
am	dim	fan	sit
rut	an	nod	in
ram	cat	con	fun
in	mē	ran	nod
man	us	can	con
fun	rut	sit	ant
sin	hot	dim	sin
hot	ran	mē	ran
ant	man	cat	man
dim	am	ant	am
cat	fan	sin	fan
mē	nod	fun	mē
can	con	hot	us
sit	ant	ram	hot
con	sin	man	rut
ran	sit	in	man
nod	fun	us	an
fan	in	am	dim
an	ram	rut	cat

60 sec. 1 2 3 4 5 6 7 8

60 sec. 1 2 3 4 5 6 7 8

60 sec. 1 2 3 4 5 6 7 8

60 sec. 1 2 3 4 5 6 7 8

Supplement to Workbook Page 35

Words not in Lesson

is

to

the

Sentences

This dog will need to eat.
Did he get to feel the eel.
The whip is in the sand.
That kitten will whiff the meal.
Whack the bee that is on the seat.
Why did he meet them at the dam?

(41 words, 33 seconds, no more than 1 error)

When did he meet them?
Whiff the meal, then eat it.
Feed the mean eel this meat.
Read this then meet that man.
Did the eel beat the bee?
Why did Sam need a seat?

(35 words, 28 seconds, no more than 1 error)

Appendix C

Instructor's Manual Revisions

For this investigation, the following revisions were made in the Instructor's Manual for paraprofessional use:

1. SECTION PLACEMENT, page 7:

Am I Teaching in the Right Section?
Begin page 1 of the workbook:
/__/when sounds 1-14 are mastered
Begin page 18 of the workbook:
/__/when sounds 1-28 are mastered
Begin page 35 of the workbook:
/__/when sounds 1-40 are mastered
Begin page 42 of the workbook:
/__/when sounds 1-51 are mastered
Begin page 55 of the workbook:
/__/when sounds 1-56 are mastered

2. PROCEDURES FOR TEACHING UNKNOWN SOUNDS, page 19.

   a. This procedure (page 19) was the first procedure taught in each session.

   b. In step 2, the following was omitted (deleted)

*shuffle the new sound card with 5 cards from the known-sounds stack and lay them in a row

3. PROCEDURES FOR KNOWN SOUNDS (this was the SECOND activity of each tutorial session). Step 2, pages 16-17 was revised to say the following:

Step 2
*Say: WATCH ME. I AM GOING TO SAY THESE SOUNDS FAST. WHEN I FINISH, I WANT YOU TO SAY THEM FAST.
*Instructor reads the sounds at a rate of one per second.
*Say: NOW IT'S YOUR TURN. I WANT YOU TO KEEP SAYING THESE SIX SOUNDS FAST UNTIL YOU CAN SAY ALL THE SOUNDS IN SIX SECONDS.

4. The THIRD activity for each session pertained to procedures for using the workbook. The following revisions were made:

a.

Part 3, step 1, page 24:

*Point to the word am in the first list of words in the workbook.

*Say: I AM GOING TO SOUND OUT AND SAY THIS WORD. WATCH ME. (point to the sounds as you say: aaammm. am.)

*Say: SEE IF YOU CAN DO THAT WITH ME (point to the sounds as you and the student say: AAAMMM. AM.) Be sure the student is not stopping between the sounds.

*Say: NOW DO THAT BY YOURSELF. SOUND IT OUT AND THEN SAY THE WORD.

b. Part 3 step 3, page 24:
This step was deleted from the manual.

c.

Part 4, step 4, page 25:

*Say: NOW IT'S YOUR TURN. I'LL TIME YOU I WANT YOU TO POINT TO, SOUND OUT, AND SAY EACH WORD. READY? BEGIN.

To correct: If the student makes an error, stop him immediately. Point to the word.
*Say: SOUND OUT AND SAY THE WORD WITH ME. Point to each sound and say the sounds and word with the studeht.
*EXCELLENT SOUNDING!
*Say: Now SOUND IT OUT AND SAY THE WORD BY YOURSELF.
*Have the student finish the rest of the words in the list. Slash the number for his trial and repeat.
*GOOD SOUNDING.

*(same as in manual)

*(same as in manual)

*Repeat for each list on the page.

	am in man fun
15 sec.	dim 12345678

*Say: THAT WAS VERY GOOD. YOU READ THAT LIST IN LESS THAN FIFTEEN SECONDS.

d. Part 3, step 5, page 26: This step was deleted from the manual.

Suggested Revisions

As a result of this study, the following suggestions were recommended in revision of both the Instructor's Manual and Student Workbook:

Instructor's Manual

The instructor's manual requires revisions in the placement procedures, the sessions overview, and specific instructional procedures. Although the placement procedures were clear and concise, the test sheets were too numerous. Suggestions were made to revise the test sheets to contain responses by learner and placement onto the same sheet. This revision may reduce the room for testing and placement error. Furthermore, the placement procedures need to supplement a section on reading sentences and paragraphs in order to adequately place and evaluate learner progress in all skills in the student workbook.

Each tutorial session is comprised of three parts: teaching one unknown sound, reviewing the known-sounds stack, and completing a workbook page. The Instructor's Manual, pages 7-11, repeat this information unnecessarily. These pages therefore need revision for further clarification to reduce repetition and confusion. Also, each tutorial section needs additional information to provide a clearer understanding of each activity.

The Instructor's Manual can be improved by specific additions and deletions. The designated areas to undergo revision have been graphically presented in this appendix.

Student Workbook

A major problem with the student workbook is the lack of provision for mass and equal practice of all recently introduced sounds and words. For example, sounds 28-40 are found on less than a total of 10 pages in the workbook. Furthermore, the content of the student workbook needs to be further organized in order to provide immediate practice and application of new sounds.

Additionally, review of skills and pages to check for mastery of skills need to be implemented at periodic intervals throughout the student workbook. This will insure learner success and proper program placement. Periodic review pages could not only help learner retention of all sounds, but also reduce the possibility of the learner moving through the workbook at an unsatisfactory rate.

Appendix D

Engelmann-Becker Beginning Reading Placement Test

Student Copy

BEGINNING READING

Pretest/Posttest
Part A

Test 1 Part A	Test 2 Part A
m	g
a	l
s	w
$\bar{e}$	k
f	$\bar{o}$
d	v
r	p
i	e
c	b
o	y
n	j
t	x
h	$\bar{y}$
u	z

Test 3 Part B	Test 4 Part B	Test 5 Part B
ir	ai	a-e
qu	ou	i-e
ea	igh	o-e
ur	ay	u-e
ol	oa	ew
ee	al	
er	sh	
wh	oi	
oo	ar	
aw	ch	
or	oy	
th		

TEACHER COPY

BEGINNING READING

Pretest/Posttest
Part A

Student_____

Date_____

Tested by_____

Circle One: Pretest Posttest
Total Correct: ____/56
Placement: _____

PART A

Criteria: 2 seconds/sound

Scoring: 1 = correct and withing 2 seconds
0 = incorrect or response took longer than 2 seconds

Instructions: Administer all of Part A until student makes 5 consecutive errors. See Teacher's Manual for further instructions and placement.

Test 1	Test 2	Test 3	Test 4	Test 5
Key	Key	Key	Key	Key
m____ am	g____ go	ir____ bird	ai____ pain	a-e____ ate ā
a____ at	l____ led	qu____ quit	ou____ out	i-e____ kite ī
s____ see	w____ wet	ea____ eat	igh____ sigh	o-e____ hōme ō
ē____ sēē	k____ kite	ur____ urn	ay____ pay	u-e____ ute ū
f____ fan	ō____ hōme	ol____ old	oa____ oat	ew____ new (oo)
d____ dad	v____ vet	ee____ see	al____ fall	
r____ rat	p____ pet	er____ her	sh____ she	
i____ in	e____ end	wh____ why	oi____ oil	
c____ cat	b____ bet	oo____ too	ar____ car	
o____ on	y____ yes	aw____ jaw	ch____ chair	
n____ no	j____ jet	or____ for	oy____ toy	
t____ ten	x____ ox	th____ the		
h____ hat	ȳ____ crȳ			
u____ up	z____ zoo			
errors____	errors____	errors____	errors____	errors____

Student Copy

BEGINNING READING

Pretest/Posttest
Part B

Test 1 Part B	Test 2 Part B
fit	yet
mad	kiss
hut	web
ram	zip
cot	mȳ
mē	fix
sin	jab
fat	nō
mit	vet
rod	lag

Test 3 Part B	Test 4 Part B	Test 5 Part B
sir	barn	kite
quit	say	lame
fell	load	rope
gold	toy	brew
moon	paid	fuse
paw	foil	poke
urn	salt	shine
fern	chin	wade
wheat	might	dew
thorn	shout	fume

TEACHER COPY

BEGINNING READING

Pretest/Posttest
Part B

Student_____

Date_____

Tested by_____

Circle One: Pretest Posttest
Total Correct: _____/50
Placement: _____

PART B

Criteria: 3 seconds per word

Scoring: 1 = correct and response given within 3 seconds
0 = incorrect or response took longer than 3 seconds

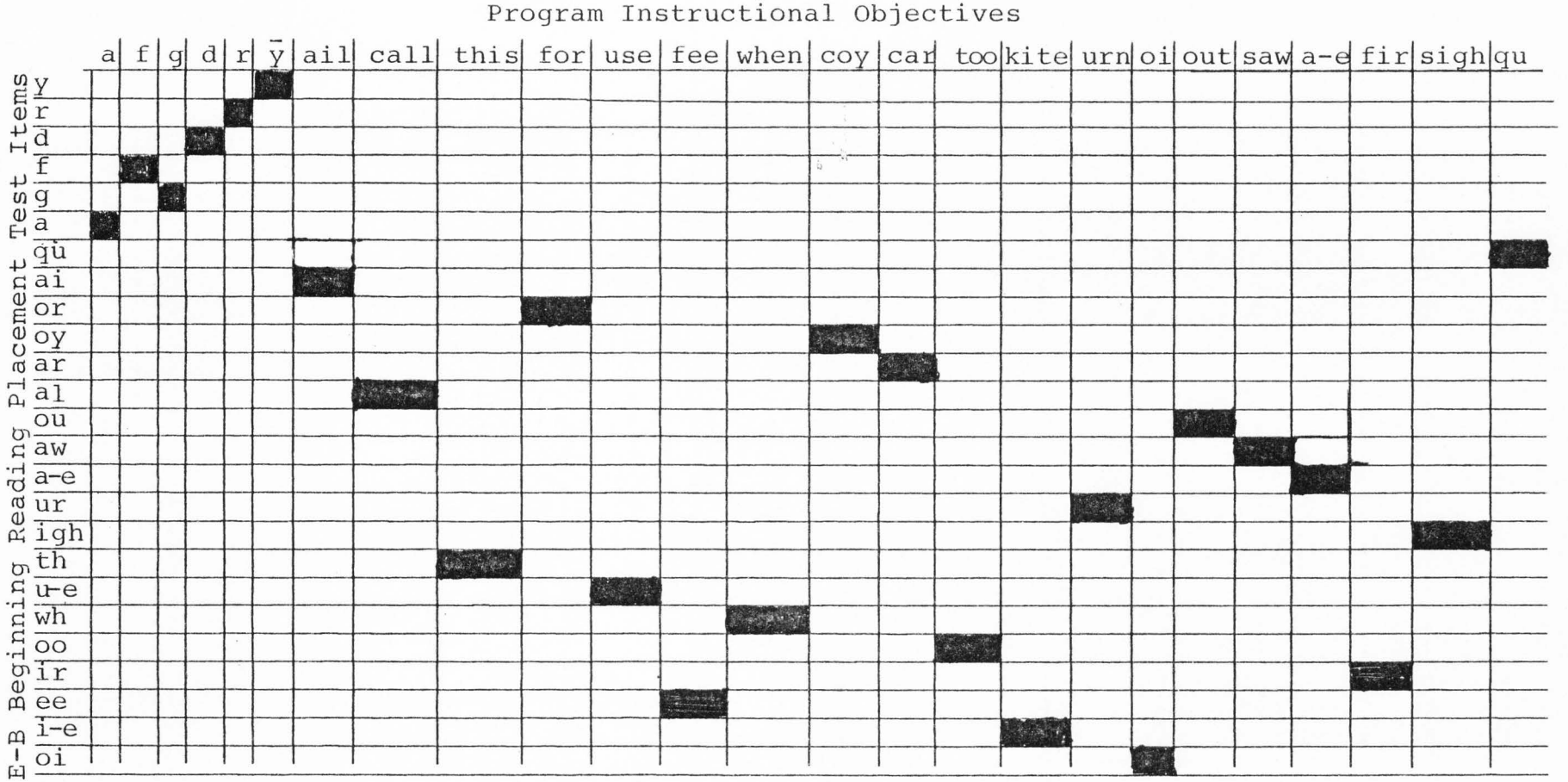
Instructions: Administer all of Part B until student makes 5 consecutive errors. See Teacher's Manual for Further instructions and placement.

Test 1	Test 2	Test 3	Test 4	Test 5
fit____	yet____	sir____	barn____	kite____
mad____	kiss____	quit____	say____	lame____
hut____	web____	fell____	load____	rope____
ram____	zip____	gold____	toy____	brew____
cot____	mȳ____	moon____	paid____	fuse____
mē____	fix____	paw____	foil____	poke____
sin____	jab____	urn____	salt____	shine____
fat____	nō____	fern____	chin____	wade____
mit____	vet____	wheat____	might____	dew____
rod____	lag____	thorn____	shout____	fume____
errors____	errors____	errors____	errors____	errors____

Appendix E

Tutorial Program Content Matrix

Content Matrix
Program Instructional Objectives
Matched to E-B Placement Test Items



Appendix F

Test-Retest Reliability Data from E-B Beginning Reading Placement Test

Table 32

Analysis of Covariance, Norm-Referenced Measure (WRMT)

Subtest 3, Word Attack, Utah School District B

Source	DF	Mean Square	Adjusted F
Treatment	1	2.79	*.0249
Regression	1	563.12	
Error	11	112.39	
		Experimental Group	Control Group
Adjusted Means		26.81	25.87

*Not significant at the .05 level.

Table 33

Analysis of Covariance, Norm-Referenced Measure (WRMT)

Subtest 3, Word Attack, Utah School Districts A & B

Source	DF	Mean Square	Adjusted F
Treatment	1	.3273	*.0034
Regression	1	1122.73	
Error	27	94.99	
		Experimental Group	Control Group
Adjusted Means		24.31	24.52

*Not significant at the .05 level.

Table 19

Raw Scores from the Engelmann-Becker Beginning Reading Placement Test

Participant	Sex	Grade	Pretest Score	Retest Score
P01	M	3	40	40
P02	M	3	38	--*
P03	M	3	54	56
P04	M	3	43	41
P05	M	4	87	88
P06	M	4	56	56
P07	M	4	64	68
P08	M	5	74	76
P09	M	5	88	87
P10	M	6	81	88
P11	M	6	81	84

*unscored due to absence

Note. All scores represent the number correct from a total possible score of 106.

Appendix G

Raw Data on Engelmann-Becker Beginning Reading Placement Test

Table 20

Summary of Raw Data, School A Experimental Group

E-B Beginning Reading Placement Test

Participant	Sex	Part A		Part B		Total	
		Pre	Post	Pre	Post	Pre	Post
E01	M	46	56	35	36	81	92
E02	M	20	42	35	36	55	78
E03	F	20	38	35	42	55	80
E04	F	30	53	29	32	59	85
E05	F	42	44	34	37	76	81
E06	M	31	*48	1	*38	32	*86
E07	M	33	52	32	35	65	87
E08	F	48	50	45	41	93	91
E09	M	44	54	45	45	89	99
E10	F	20	51	42	46	62	97

*Attrition subjects; posttest scores have been averaged from subjects completing treatment.

Note. School A in Salt Lake School District.

Table 21

Summary of Raw Data, School A Control Group

E-B Beginning Reading Placement Test

Participant	Sex	Part A		Part B		Total	
		Pre	Post	Pre	Post	Pre	Post
C01	M	19	16	14	20	33	36
C02	M	34	41	45	44	79	85
C03	M	40	35*	17	33*	57	68
C04	M	38	27	39	33	77	60
C05	M	44	30	31	29	75	59
C06	F	32	42	37	42	69	84
C07	F	42	38	46	49	88	87
C08	M	49	35*	44	33*	93	68
C09	M	47	46	46	44	93	90
C10	M	35	40	44	39	79	79

*Attrition subjects; posttest scores are an average of non-attrition scores.

Note. School A in Salt Lake School District.

Table 22

Summary of Raw Data, School B Experimental Group

E-B Beginning Reading Placement Test

Participant	Sex	Part A		Part B		Total	
		Pre	Post	Pre	Post	Pre	Post
E01	M	21	32	0	25	21	57
E02	M	33	44	13	35	46	79
E03	M	21	31	23	34	44	65
E04	M	33	42*	35	33*	68	75
E05	M	33	39	17	12	50	51
E06	M	39	43	46	43	85	86
E07	M	45	42*	42	33*	87	75
E08	M	37	46	36	43	73	89
E09	M	48	55	44	47	92	102
E10[a]	M	37	53	31	31	68	84

*Average posttest score from attrition.

[a]Subject E10 was not placed into resource or self-contained classroom.

Note. School B in Box Elder School District.

Table 23

Summary of Raw Data, School B Control Group

E-B Beginning Reading Placement Test

Participant	Sex	Part A		Part B		Total	
		Pre	Post	Pre	Post	Pre	Post
C01	M	42	41	38	40	80	81
C02	F	40	43	27	40	67	83
C03	M	4	6	13	36	17	42
C04	F	45	49	42	45	87	94
C05	M	34	39	39	43	73	82
C06	F	42	42	39	47	81	89
C07	M	16	28	43	37	59	65
C08	M	37	40	37	38	74	78
C09	M	37	51	41	47	78	98
C10	-	33*	37*	35*	41*	68*	78*

*Test scores from attrition obtained by average.

Note. School B in Box Elder School District.

Appendix H

Raw Data from Woodcock Reading Mastery Tests (WRMT)

Table 24

Summary of Raw Data, School A Experimental Group

Woodcock Reading Mastery Tests

Participant	Sex	Subtest Letter Identification		Subtest Word Identification		Subtest Word Attack		Subtest Word Comprehension		Subtest Passage Comprehension		Total Reading	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
E01	M	45	42	94	77	29	20	20	19	28	27	122	110
E02	M	45	42	90	74	40	11	40	27	46	36	133	112
E03	F	41	42	93	89	39	17	15	13	39	25	119	110
E04	F	44	44	68	73	10	14	21	23	20	24	107	111
E05	F	45	45	65	76	13	16	24	24	25	35	112	117
E06	M	33	43*	17	83*	3	22*	0	20*	12	29*	68	114*
E07	M	44	42	67	68	20	29	18	24	19	18	88	109
E08	F	41	43	96	95	37	28	33	25	32	29	122	119
E09	M	44	44	102	102	45	38	15	16	21	31	122	123
E10	F	40	44	88	100	25	31	16	17	35	39	111	123

*Averaged attrition posttest scores

Note. School A in Salt Lake School District.

Table 25

Summary of Raw Data, School A Control Group

Woodcock Reading Mastery Tests

Participant	Sex	Subtest Letter Identification		Subtest Word Identification		Subtest Word Attack		Subtest Word Comprehension		Subtest Passage Comprehension		Total Reading	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
C01	M	28	29	0	29	6	2	2	1	6	8	69	69
C02	M	42	40	87	73	30	29	23	19	28	26	116	109
C03	M	36	40*	52	80*	11	25*	16	20*	16	29*	96	112*
C04	M	44	43	99	89	39	20	23	26	30	25	124	116
C05	M	43	45	71	72	24	22	34	19	31	25	114	114
C06	F	44	45	119	100	31	36	28	24	43	41	130	128
C07	F	41	42	121	103	42	43	34	30	51	42	134	128
C08	M	44	40*	121	80*	44	25*	50	20*	59	29	144	112*
C09	M	44	45	103	104	39	38	38	24	48	42	110	130
C10	M	35	37	89	73	27	17	25	21	27	30	112	107

*Posttest scores from attrition (averaged)

Note: School A in Salt Lake School District

Table 26

Summary of Raw Data, School B Experimental Group

Woodcock Reading Mastery Tests

Participant	Sex	Subtest Letter Identification		Subtest Word Identification		Subtest Word Attack		Subtest Word Comprehension		Subtest Passage Comprehension		Total Reading	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
E01	M	35	35	50	70	6	7	3	21	17	23	86	101
E02	M	34	37	29	52	6	12	4	25	8	20	79	99
E03	M	42	44	54	68	2	15	20	23	13	25	96	110
E04*	M	41	37	84	75	43	20	35	20	36	26	123	106
E05	M	34	30	28	33	9	4	2	2	5	11	76	75
E06	M	41	42	108	103	36	38	11	17	48	39	122	122
E07*	M	37	37	66	75	9	20	22	20	31	26	103	106
E08	M	34	38	71	95	17	31	18	27	28	36	103	119
E09	M	35	40	98	107	41	39	11	21	41	35	109	122
E10	M	33	34	55	72	29	18	13	27	18	26	96	106

*Participants of attrition with averaged scores.

Note. School B in Box Elder School District.

Table 27

Summary of Raw Data, School B Control Group

Woodcock Reading Mastery Tests

Participant	Sex	Subtest Letter Identification		Subtest Word Identification		Subtest Word Attack		Subtest Word Comprehension		Subtest Passage Comprehension		Total Reading	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
C01	M	38	36	85	84	32	24	31	24	27	35	115	112
C02	F	40	42	60	69	10	20	33	22	28	30	106	110
C03	M	37	39	61	72	8	1	25	14	31	37	103	100
C04	F	41	42	98	109	37	35	42	28	53	42	129	127
C05	M	37	43	86	93	25	33	19	34	23	41	109	125
C06	F	40	42	89	102	23	45	27	28	32	40	116	128
C07	M	38	36	77	78	41	20	28	21	28	21	115	105
C08	M	42	42	89	89	13	22	21	21	22	21	111	113
C09	M	41	43	99	114	23	29	19	24	32	43	117	128
C10*	-	39	41	82	90	23	25	27	24	30	34	113	116

*Averaged scores from unavailable participant.

Note. School B in Box Elder School District

Table 28

Analysis of Covariance, Norm-Referenced Measure (WRMT) Subtest 2, Word Identification, Utah School District A

Source	DF	Mean Square	Adjusted F
Treatment	1	127.416	*1.77
Regression	1	4603.846	
Error	13	71.656	
		Experimental Group	Control Group
Adjusted Means		84.15	78.47

*Significant at the .05 level.

Table 29

Analysis of Covariance, Norm-Referenced Measure (WRMT) Subtest 2, Word Identification, Utah School District B

Source	DF	Mean Square	Adjusted F
Treatment	1	50.55	*.9106
Regression	1	3588.04	
Error	11	55.52	
		Experimental Group	Control Group
Adjusted Means		91.12	87.04

*Not significant at the .05 level.

Table 30

Analysis of Covariance, Norm-Referenced Measure (WRMT) Subtest 2, Word Identification, Utah School Districts A & B

Source	DF	Mean Square	Adjusted F
Treatment	1	49.61	*.478
Regression	1	7365.56	
Error	29	103.69	

	Experimental Group	Control Group
Adjusted Means	86.15	83.53

*Not significant at the .05 level.

Table 31

Analysis of Covariance, Norm-Referenced Measure (WRMT) Subtest 3, Word Attack, Utah School District A

Source	DF	Mean Square	Adjusted F
Treatment	1	29.65	*.3009
Regression	1	605.72	
Error	13	98.52	

	Experimentql Group	Control Group
Adjusted Means	22.57	25.30

*Not significant at the .05 level.

Table 34

Analysis of Covariance, Norm-Referenced Measure (WRMT)

Total Reading Scores Utah School District A

Source	DF	Mean Square	Adjusted F
Treatment	1	83.29	*.850
Regression	1	1330.07	
Error	13	97.89	
		Experimental Group	Control Group
Adjusted Means		114.40	109.84

*Not significant at the .05 level.

Table 35

Analysis of Covariance, Norm-Referenced Measure (WRMT)

Total Reading Scores, Utah School District B

Source	DF	Mean Square	Adjusted F
Treatment	1	39.01	*.5507
Regression	1	1491.27	
Error	11	70.92	
		Experimental Group	Control Group
Adjusted Means		116.50	112.60

*Not significant at the .05 level.

Table 36

Analysis of Covariance, Norm-Referenced Measure (WRMT)

Total Reading Scores, Utah School Districts A & B

Source	DF	Mean Square	Adjusted F
Treatment	1	57.781	*.607
Regression	1	1653.152	
Error	27	95.08	
		Experimental Group	Control Group
Adjusted Means		115.47	112.63

*Not significant at the .05 level.

Appendix I

Listener's Monitoring Chart for Taped Session

List of Appropriate and Inappropriate Responses

Tutor:

Week:

	Appropriate	Inappropriate
UNKNOWN SOUNDS		
Step 1		
Step 2		
KNOWN SOUNDS		
Step 1		
Step 2		
Step 3		
Step 4		
WORKBOOK		
Part 2 Step 1		
Part 3 Step 1		
Step 2		
Step 3		
Step 4		
Step 5		
Step 6		
Part 4		
Read words in list		
Read sentences		
PRACTICE PAGE IN WORKBOOK		

Appropriate Procedures for
Teaching Unknown Sounds

Step 1

1. Tutor places new sound on table
2. Tutor says new sound to tutee two times
3. Tutor and tutee say sound together
4. Tutee says sound without tutor two times

Note: Any of the four procedures above were marked inappropriate if excluded.

Step 2

1. Tutor lays out six sound cards
2. Tutor instructs tutee to pick up new sound card and say the sound.
3. Tutor repeats step 1 if tutee makes any mistake.
4. Tutor praises tutee, remixes the 6 sound cards, and tells learner to read all the sounds.
5. Praises tutee

Note: Any of the five procedures above were marked inappropriate if excluded or used out of sequence.

Appropriate Procedures for
Teaching Known Sounds

Step 1

1. Tutor lays out six sound cards (from the known-sounds stack), telling tutee to say each sound.
2. Tutor corrects tutee by procedure on page 16 if necessary.

Step 2

1. Tutor says sounds fast
2. Tutor instructs learner to say sounds fast (within 6 seconds), and times tutee saying sounds.
3. Tutor corrects tutee by procedure on page 16 if necessary.
4. Tutor praises tutee--continues to time tutee to meet criterion.

Step 3

1. Tutor praises tutee for saying sounds in time limit.
2. Tutor mixes 6 cards and instructs learner to say them fast again.
3. Tutor praises tutee or corrects tutee by procedure on page 16.

4. Tutor remixes 6 sound cards and instructs tutee to say sounds fast again.
5. Tutor praises tutee or corrects tutee by procedure on page 16.

Step 4

1. Tutor repeats steps 1,2,3, with six more cards in the known cards stack, until all known sounds stack has been practiced.
2. If tutee says any sound incorrectly 3 times, the sound card is to be placed into the unknown sounds pile.

Note: Any of the procedures above were marked inappropriate if excluded or out of sequence.

Appropriate Procedures for Using the Student Workbook

Part 2 Step 1

1. Tutor instructs tutee to say sounds across top of page.
2. Tutor praises tutee or corrects tutee by procedure on page 16.

Part 3 step 1

1. Tutor sounds out and says first word in list.
2. Tutor and tutee sound out and say first word in list.
3. Tutor instructs tutee to sound out and say first word in list.

Part 3 setp 2

1. Tutor repeats Part 3 step 1 with all words in the word list.

Part 3 step 3

Note: This step was revised to be used only as a correction procedure for step 4.

Part 3 step 4

1. Tutor instructs learner to point to, sound out, and say the word as he is timed.
2. Tutor praises tutee or uses correction procedure (step 3) on page 24 if necessary.
3. Tutor repeats part 3, step 4: 1,2, for the next two word lists

Part 3 step 5
Note: step 5 was omitted.

Part 3 step 6
1. Tutor instructs tutee to point to, sound out, and say the word in the third word list.
2. Tutor instructs tutee to follow dotted line and print/write the word on the blank line.
3. Tutor repeats part 3 step 6: 1, 2, for all words in the third word list.
4. Tutor repeats step 4 with fourth wordlist.

Note: Any of the procedures above were marked inappropriate if excluded or used out of sequence.

Appropriate Procedures for Reading Sentences and Paragraphs

Part 4 step 1
1. Tutor instructs tutee to read wordlist on workbook supplement page.
2. Tutor instructs tutee to read sentences/paragraphs quickly.
3. Tutor praises tutee or uses correction procedure on page 27 if necessary.

Practice Pages

1. Tutor instructs tutee to point to, sound out, and say each word in the first list while being timed.
2. Tutor praises tutee and uses correction procedure on page 25 if necessary.
3. Tutor repeats 1, 2, with each word list.

Note: Any of the procedures a-ove were marked inappropriate if excluded or used out of sequence.

Appendix J

Number of Tutoring Sessions Received by All Tutees

Table 37

Number of Tutoring Sessions Received by All Tutees

School District	Tutee	Number of Attended Sessions	Total Minutes	Average Minutes in Session
A	E01	22	394	17.90
A	E02	25	297	11.88
A	E03	21	325	15.47
A	E04	31	375	12.09
A	E05	31	451	14.54
A	E06	1	25	.25
A	E07	26	339	13.03
A	E08	12	219	18.25
A	E09	27	375	13.88
A	E10	31	498	16.06
	Average:	25		
B	E01	8	126	15.75
B	E02	31	588	18.96
B	E03	6	77	12.83
B	E04	15	290	19.33
B	E05	5	not marked	-----
B	E06	31	295	9.51
B	E07	22	310	14.09
B	E08	25	475	.19
B	E09	23	481	20.91
B	E10	26	569	20.73
	Average:	19		

Appendix K

Cost Examination Sheet: Resource Specification

Resource Specifications Cost Examination Sheet

	Initiation	Operational	Management
I. Staff Development			
II. Materials			
III. Facilities and Equipment			
IV. Other (Reinforcers, travel)			
Total Expenditures: _____			
Total Number of Learners upon which Costs were Based: _____			
Total Per Learner Costs: _____			
Continuation Costs Per Learner: _____			

VITA

Deborah Wingert

Candidate for the Degree of

Doctor of Philosophy

Dissertation: The Use of High School Paraprofessional Tutors With Programmed Tutorial Materials to Instruct Elementary Learners With Handicaps

Major Field: Special Education

Biographical Information:

Personal Data: Born in Minneapolis, Minnesota, November 21, 1949; married.

Education: 1967-1971, B.S., Art Education, University of Minnesota. 1973, Elementary Education Certification, Westminister College, Salt Lake City, Utah. 1974, Social Studies Training (MACOS Program), University of Colorado. 1976-1977, Master of Science in Emotional Handicaps. 1977-1980, Completed Ph.D. in Learning Disorders, Mental Retardation and Emotionally Handicapped with a minor in Instructional Technology.

Professional Training: Aging and Aged Developmentally Disabled Consortium, December 1978.
AAESPH Annual Conference (American Association for Educating the Severe and Profoundly Handicapped), San Francisco, CA, 1977.
Teaching Autistic and Severely Retarded Children, Utah State University, Spring Quarter, 1977.
Engelmann and Becker--Corrective Reading Program Workshop, Salt Lake City Board of Education, Spring 1975.
U-Sail Workshops, Utah's System for Advancement of Individualized Learning: U-Sail Program, Salt Lake City, Utah. Attended workshops from 1972-1975.

Professional Experience:

1977-1978 Research Assistant to Dr. Alan Hofmeister AADD Project (Aging and Aged Developmentally Disabled Project), Instructional Programmer, Outreach and Development Division, Exceptional Child Center, Utah State University.

1976-1977 Research Assistant to Dr. Alan Hofmeister, Spelling Programmer (Direct Instruction) Outreach and Development Division, Exceptional Child Center, Utah State University.

1974-1976 5-6th grade pullout teacher (remedial math and reading)

1973-1974 6th grade regular classroom teacher

1971-1972 Teaching Assistant (4,5,6th grades)

1970-1971 Art teacher: Minneapolis Public Schools Community Education (evenings), Substitute Teacher (daily)

1967-1970 Arts and Crafts Supervisor, Theatre Arts/Creative Dramatics Instructor.

Professional Organizations:

American Association for Mental Deficiencies

American Association for the Education of the Severely Profoundly Handicapped

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