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ABSTRACT

The purpose of this study was to determine the effects of cross-age teaching experiences on the language achievement, self-concept, and school sentiment of eleventh graders who were identified as low achievers in language. Sixty eleventh-grade students were selected on the basis of language scores on the California Achievement Test and randomly assigned to one experimental and two control groups (Control I and Control II). Experimental and Control I students received three week's training in language arts and teaching techniques. Experimental subjects tutored fourth-grade students in language arts for nine weeks, and Control I returned to their regular classes. Control II students did not receive training nor did they tutor. The three groups were pre- and post-tested on the language section of the California Achievement Test, Piers-Harris Children's Self Concept Scale, and the School Interest Inventory. Results of an analysis of covariance, using pretest scores as covariate, while not significant, showed interesting trends in the areas of self-concept and school sentiment. Tutors were found to be valuable assets in the classroom and represented a viable addition to the existing curriculum. (Author)

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Final Report

Project No. 3-2203

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THE EFFECTS OF CROSS-AGE TEACHING EXPERIENCES IN LANGUAGE ACHIEVEMENT, SELF CONCEPT, AND SCHOOL SENTIMENT OF ELEVENTH GRADERS WHO TEACH LANGUAGE ARTS TO FOURTH GRADERS

By

Pam Lewis and William C. Bruce

Bacon County Board of Education
Alma, Georgia

May, 1974

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CHAPTER I

INTRODUCTION

The literature of the last few years reflects a growing interest in cross-age teaching programs. These programs commonly use older students to teach younger students with the participants usually being two or three grade levels apart. Initial interest focused on the anticipated benefits to be derived by the learner in the cross-age teaching arrangement. More recently, however, attention has been shifting to the benefits accrued by the student who serves as the cross-age teacher. Dr. Herbert Thelen (1969) recognized this growing interest in gains for the cross-age teacher when he stated:

> .....Today's new element is the anticipation of benefits to the tutor. It is hoped that he will develop his own academic skills or understanding further, as he employs them to teach another; that he will form a better character (e.g. attitudes), become better adjusted or more adequate as a person, discover new interests or commitments for his life (p. 229).

The anticipated gains for the cross age teacher appear to be both cognitive and affective. The cognitive learning for the cross-age teacher is described as follows by Gartner, Kohler, and Riessman (1971):

> .....He reviews the material; he has to organize, prepare, illustrate the material to present it to his students; he may try to reshape or reformulate it so as to enable his pupils to learn it and thus himself see it in new ways; he may need to seek out the basic character of the subject in order to teach it better, and may thereby himself understand it better (p. 62).

The affective gains may result from the experience of being singled out to do an important activity. The cross-age teacher may acquire some insight into the role of the teacher, and this knowledge should make the education process more meaningful to him. Consequently, the extent to which the experience affects the personal growth and attitude toward learning of the cross-age teacher becomes significant.

Finally, cross-age teaching arrangements may serve as a possible vehicle for attaining goals in education presently considered tantamount to an improved instructional program. Cross-age tutoring allows for the following things: differentiated staffing, individualization of instruction, emphasis on the participatory process, and the establishment of more cooperative learning situations. However, little attention has been paid to integrating cross-age teaching programs into an existing curriculum structure.

This study will attempt two things:

1. To examine the cognitive and affective benefits to be derived by the cross-age teacher.

2. To integrate an innovative program into the existing curriculum structure.

Statement of the Problem

It is the purpose of this study to determine if experimental high school students (hereinafter referred to as experimental students) who tutor elementary school pupils will improve in achievement, self-concept, and school sentiment when compared with control high school students (hereinafter referred to as control students) who do not tutor elementary school pupils.

Hypotheses

1. It was hypothesized that there would be a significant difference between experimental and control students in language achievement.

2. It was hypothesized that there would be a significant difference between experimental and control students in self-concept scores.

3. It was hypothesized that there would be a significant difference between experimental and control students in school sentiment scores.

Review of Selected Literature

Cross-age teaching programs are currently enjoying great popularity in American education. A review of the literature suggests that primary significance has been attached to the benefits derived by the students who were tutored. Consequently, many tutorial programs have been structured to obtain optimum benefits for the learners with primary emphasis on increasing academic achievement levels (Shaver and Nunn, 1971; Olsen, 1969; Stavros, 1971).

McClellan (1972), in a summary of the research and cross-age tutorial programs cites the following general findings: (1) cross-age tutorial patterns tend to increase tutoring effectiveness: (2) a highly structured controlled program generally means better results than informal tutoring; (3) the level of learning in most instances is actually raised for both tutor and tutee; and (4) the tutoring process tends to lend itself to many subject-matter areas.

A notable exception is the program developed by the National Commission on Resources for Youth which has served as a model for uniting the cross-age tutoring concept with the Neighborhood Youth Corps. The demonstration programs in Newark and Philadelphia were concerned primarily with the learning and

development of the student tutors. A true assessment of the program's effectiveness is precluded, however, by a lack of pre-test data (Kohler, 1968).

Further interest in benefits to be accrued by the tutors in cross-age teaching projects stemmed from the work of Peggy and Ronald Lippitt (1968); their impressionistic observations of the tutors suggested the need for carefully controlled studies to assess gains made by the tutors. A report by Eiseman and Lippitt (1966) further indicates a need for additional empirical research in cross-age tutoring programs to verify positive shifts in attitude by the tutors toward learning and self. A follow-up investigation of the Youth Tutoring Youth Project (Wing, 1972) again provided subjective data to show tutors gained self-confidence and showed positive attitudinal changes, but objective data did not indicate changes which were statistically significant.

The review of literature further revealed that cross-age tutorial programs often had reciprocal effects for the learner and the cross-age teacher. Morita (1972) noted significant gains in reading made by both sixth-grade tutors and the second-grade students they tutored. Another aspect of his study was an assessment of behavior of both the tutors and their students using Burke's Behavior Rating Scale; the students tutored showed significant improvement in behavior whereas the tutors did not. Trostel Werth (1961) investigated a cross-age tutorial arrangement using high school seniors to tutor freshmen in English; he was interested in comparing the effectiveness of the tutorial program with the traditional instructional program in improving achievement and interest for low achievers in reading comprehension, language usage skills, and spelling. The results indicated significant gains in interests for both the tutored students and their tutors. The students who were tutored also had more significant gains in reading than those in the traditional program, but no significant difference was noted in the tutorial and traditional arrangement for language usage or spelling.

Bailey(1973) used seventh-grade tutors to teach first, second, and third-graders; the tutoring experience for the seventh-graders affected in a positive manner their gain scores in paragraph meaning, spelling, language, social studies and science on the Stanford Achievement Tests. Gains were also noted on Coppersmith Self-Esteem Inventory apparently indicating higher self-esteem as a result of the tutoring experience. Still other significant results are reported by Rust (1969). His results showed significant difference in achievement test scores for tutors. No significant statistical difference in social status was found for the experimental group compared with the control group, even though a more positive trend was noted for the experimental group.

Restricting the investigation to affective gains made by tutors, Robertson (1972) used a semantic differential to measure self-concept. Results showed the self-concept of the fifth grade tutors to be significantly different and more positive than either the control group or the second experimental group who were trained as tutors but did not actually perform as tutors.

Two similar studies involving fifth-graders who tutor first-graders in reading

were conducted by Norris and Wantland (1972) and Robertson and Sharp (1972). The tutors were given special training consisting of tutor behavior, tutoring skills, and instructional procedures and objectives. Results of both studies indicated the experimental groups of tutors made significantly higher gains in reading than controls. Benefits for both tutors and tutees were indicated.

Hogan and Horsfall (1970) evaluated a cross-age teaching program in terms of attitudinal changes toward school manifest by the high school tutors. Attitudes measured on a semantic differential were significantly higher for the tutors as compared with the control group; moreover, after high school eighty-two per cent entered college as compared with eighteen per cent of the control group.

A study by Rogers (1970) is of particular interest to this study because it compared cross-age teaching experience with regular classroom instruction. Sixth-grade underachievers tutored third-graders whose reading performance was below the median score for their grade. Effects were studied for both groups; the sixth-graders from the two schools used were divided into three equated groups of ten and designated as one experimental and two control groups. The experimental group received three weeks of intensive reading instruction, one week of training in tutorial skills, and served as tutors for eight weeks. Control group I received three weeks of reading instruction and returned to the regular reading classroom. Control group II received no special treatment. The results of the study indicated that serving as reading tutors was equally as effective in improving reading performance as the regular classroom instruction.

The review of literature indicated a need for further research to codify apparent gains for the student teacher in a cross-age teaching arrangement. Moreover, experimental research efforts have not been replicated once the programs have progressed beyond the demonstration stage. Many program evaluations relied heavily on impressionistic observations, and research was particularly limited in assessing the affective domain of which self-concept and school sentiment are examples.

CHAPTER II

PROCEDURES

Introduction

The study was conducted in Alma, Georgia using high school students in a cross-age teaching arrangement. Bacon County schools have received national attention for the innovations incorporated into the instructional program as a result of the implementation of the educational component of the Alma-Bacon County Model Cities Program.

Alma-Bacon County is a small, rural community located in the Coastal Plains Region of Georgia. Bacon County has a land area of 293 square miles and a total city-county population of 8,233. The economy of Bacon County is based primarily on small-scale traditional farming with agro-business and textile and garment factories providing marginal sources of income. In terms of size and economic base, it is typical of many rural areas in the Southeast. The activities of this county, both in range and scope, however, are highly atypical. Alma-Bacon County is in its third action year of a Model Cities Program, the only such program in the nation which encompasses an entire city-county area.

Through the efforts of the director of the education component of the Model Cities Program, a proposal was submitted and approved for the Urban Rural School Development Program grant. The global objective of the program is to enhance in a positive and developmental manner student growth via improved performance by teachers and related personnel.

During the second year of the grant (1972), a Training Resource Center was established. It is staffed by four faculty members of doctoral status who work on-site with additional instructional aid being supplied by Georgia Southern College and a nearby curriculum center which employs eight subject matter specialists. The Training Resource Center houses a library which contains complete ERIC materials and readers as well as over 300 volumes related to courses which are offered on-site. Georgia Southern College provides course numbers, titles, and credits as well as technical and instructional assistance. The college is presently considering Alma-Bacon County as a residence center.

A comprehensive analysis of Bacon County's School System, with subsequent recommendations for immediate and long-range improvements, constituted a major component of the first year Model Cities Program. Recommendations were made to broaden and significantly re-structure the curriculum, develop the capabilities of

the teaching staff, and introduce new concepts and techniques of learning in the traditional classroom. These recommendations were translated into significant changes for the 2,263 students enrolled in Bacon County schools, and the 220 people employed by the school system. Bacon County High School is the only school in the county for grades nine through twelve. The current enrollment is 650. The school year is divided into three quarters of twelve weeks each.

Subjects

The subjects for this study were sixty eleventh-grade students selected from the total group of eleventh-graders enrolled in Bacon County High School for the 1973-74 school year. Subjects were chosen because they were the sixty students with the lowest scores on the California Achievement Test language section, which was administered during the Spring Quarter of the preceding year. After students were identified for participation in the study, they were randomly assigned in equal numbers (N=20) to three groups designated as experimental, Control I and Control II. Several changes had to be made in the initial group assignments because of drop-outs and persons not being eligible for school the next year.

Treatments

Subjects assigned to the experimental group received three weeks of training in tutorial techniques and the language arts during the latter part of the Fall Quarter. The experimental subjects then spent the nine weeks of the Winter Quarter tutoring two fourth-grade students who were in need of individual help in language arts instruction.

Control I subjects received the same three weeks of training that the experimental subjects received during the Fall Quarter. They did not participate in the tutorial program, but resumed their regular schedule.

Control II subjects received neither the three weeks of training nor participated in the tutoring program.

All subjects in the three groups were enrolled in either Basic Comm cations or Career English as the language arts elective for the eleventh-grade. It was impossible to have all sixty students enrolled in only one course, although it might have been more desirable from the standpoint of control. There were four electives offered, and limiting the three groups to only two of the four courses did establish as much control as possible over classroom instruction.

Rationale for Training

Niedermeyer (1970) studied the effects of training on the instructional behavior of cross-age teachers and concluded:

.....that the instructional behaviors of trained and untrained tutors are quite different. The instructional behaviors implied by the objectives of a training program should be based on established psychological principles. If it is desired that tutors behave according to these principles, then they should be trained (p. 122).

In a review of cross-age teaching programs published in Nations Schools, Jane S. Shaw (1973) noted: "Without guidance tutors cross-age teachers tend to mimic the worst qualities of teachers they've had" (p. 46).

Considerable research has been devoted to developing models for training programs. Grant Van Harrison (Harrison and Cohen, 1969), while working with Systems Development Corporation, developed highly structured materials for training cross-age teachers. Research on the effectiveness of his approach led him to state:

.....that those tutors who had been trained with the package demonstrated greater mastery of the skills than those who previously had been trained to use the skills on a piecemeal basis while they were working with a learner. Tutors who were trained with the package demonstrated more confidence than those who had been trained a little at a time (p. 54).

A different approach was developed by Peggy and Ronald Lippitt (1968) after ten years of experimenting at the University of Michigan's Institute for Social Research. The Lippitt training program stresses the development of an open, non-structured relationship between the cross-age teacher and the learner. The cross-age teacher is taught to understand why children have trouble in school, and he develops his own ways to teach.

The training program developed for the purposes of this study incorporates principles and techniques from both the Harrison and Lippitt approaches.

Training Program

The three week training program consisted of training in the language arts for the first two weeks, and training in teaching techniques during the final week.

Bacon County participates in Project PLAN in grades one through eight. (The acronym PLAN stands for Program for Learning in Accordance with Needs.) PLAN is a computer-based, individualized instructional program that has been developed on a demonstration basis by Westinghouse Learning Corporation. The computer is not used directly for instructional purposes. It assists the teacher in data processing and the diagnostic analysis that is necessary to provide an individualized program of instruction for each student. Inherent to this system of instruction is a series of Teacher Learning Units (TLU's) provided for each pupil.

The two weeks of instruction related to language arts was focused on the selection and use of TLU's for the tutoring program. The language arts training program was evaluated by (1) subject's mastery of the selected TLU's as indicated by the mastery tests which accompany each TLU, and (2) teacher-made tests given at the midpoint and end of the training session.

The training in teaching techniques was based on the application of learning theory and the development of skills in interpersonal relationships. Examples of the concepts included are:

1. The value of extrinsic and intrinsic rewards as motivators to promote learning.

2. The correct use of positive reinforcement.

3. The ability to put the learner at ease.

4. An awareness of the physical, social, and emotional characteristics of the learners.

5. The importance of directing and controlling the attention of the learner.

6. The necessity of letting the learner know what is expected of him.

Techniques such as role playing, brain-storming, and discussions of familiar classroom incidents were used.

During the nine-week period in which the experimental group tutored the fourth-grade tutees, the tutors attended a once-a-week training session on Friday of each week. In these sessions tutors were asked to obtain a list of TLU's that their tutees would be working on the next week. The training sessions were then conducted using those TLU's that they were to use the next week. The TLU's were studied and analyzed with activities added to supplement the TLU activities.

During the last session the tutors were exposed to the techniques of video taping. The students put together a video tape of what they felt would be the important outcomes of the tutorial process for both the tutor and the tutee. Included in the tape were examples of the methods and procedures they had used in the tutoring process. All the filming and directing was done by the students from the experimental group.

Selection of Tutees

Tutees were selected on the basis of the recommendations by the fourth-grade teachers in the elementary school. The teachers were asked to recommend those students for whom the tutoring sessions would be significant and important. The final

selection of the tutees was made by the elementary teachers and the elementary school principal.

Data Collection

The California Achievement Test (Tiegs and Clark, 1970) was administered in May of the 1972-73 school year and used for the identification of the sixty subjects for the three groups. It was administered again in September to the total group of subjects as a pre-test, and finally as the post-test in March 1974. Only three sections of the language arts section of the test were used: Section 6, Capitalization; Section 7, Punctuation II; and Section 8, Usage and Structure.

Self-Concept was assessed by the Piers-Harris Children's Self Concept Scale (Piers, 1969). This measure was administered in November, 1973 as a pre-test and again in March, 1974 as a post-test.

The third variable to be assessed, school sentiment, was measured by the School Interest Inventory (Cottle, 1966). It was also administered in November, 1973 and March, 1974 as a pre- and post-test.

All tests were administered according to the directions contained in the test manuals. The one variation in the testing procedure was during the May, 1973 California Achievement Test (CAT) administration. This test was given to all the eleventh grade students, while the subsequent sessions involved only those subjects who were part of the study.

Data Analysis

In order to test the three hypotheses, an analysis of covariance was used. The pre-test score served as the covariate and the post-test score as the criterion measure. The same analysis technique was used for all three hypotheses.

CHAPTER III

RESULTS

The study attempted to do two things: (1) to examine the cognitive and affective benefits to be derived by the cross-age teachers and (2) to integrate an innovative program into the existing curriculum structure.

Purpose 1:

Evaluation of the cognitive and affective benefits of the tutorial program was based on three variables: (1) language achievement, (2) self-concept, and (3) school sentiment. The results that follow are presented in the order of the three research hypotheses listed in Chapter I.

Table 1 contains the means and standard deviations for each of the groups on the California Achievement Test. Also contained in the table are the adjusted means which are a result of the covariance analysis.

Table 1
Means*, Standard Deviations and Adjusted Means
California Achievement Test

	May 1973		Sept. 1973		March 1974		
Group	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	Adjusted $\bar{X}$'s
Experimental	6.00	1.70 (N=20)	7.43	1.07 (N=19)	8.28	1.55 (N=19)	7.85 (N=19)
Control I	6.24	1.68 (N=20)	7.05	1.91 (N=19)	8.05	2.03 (N=19)	7.88 (N=19)
Control II	5.10	1.94 (N=20)	5.80	1.92 (N=16)	7.20	2.36 (N=16)	7.92 (N=16)

*Scores are grade equivalents

Table 2 contains the results of the analysis of covariance using the pre-test score (September 1973) as the covariate. It is clear from the covariance analysis and an inspection of the adjusted means that no significant difference exists between

the three groups. The data fail to support the hypothesis that the tutorial program had a significant effect on the eleventh grade students and the null hypothesis cannot be rejected.

Table 2
Analysis of Covariance
California Achievement Test

Source	df	Adjusted SS	Ms	F
Between	2	.04	.02	
Within	50	108.69	2.17	NS*
Total	52	108.73		

*($p<.05$; $F>3.18$)

Results of the data analysis of the self-concept scores are presented in Tables 3 and 4. Table 3 contains the means, standard deviations, and adjusted means for the three groups. Table 4 contains the results of the analysis of covariance. The F value in Table 4 does not indicate that the null hypothesis can be rejected, indicating no significant difference between the three groups.

Table 3
Means*, Standard Deviations, and Adjusted Means
Piers-Harris Children's Self Concept Scale

	November 1973		March 1974		
Group	$\bar{X}$	S.D.	$\bar{X}$	S.D.	Adjusted $\bar{X}$'s
Experimental	56.95 (N=20)	11.85	54.25 (N=20)	11.64	55.28 (N=20)
Control I	58.74 (N=19)	9.99	59.58 (N=19)	8.51	59.02 (N=19)
Control II	58.53 (N=17)	12.27	58.59 (N=17)	11.44	58.14 (N=17)

*Scores are raw scores

Table 4
Analysis of Covariance
Piers-Harris Children's Self Concept Scale

Source	df	Adjusted SS	Ms	F
Between	2	177.56	88.78	
Within	52	2236.90	43.02	2.06* (NS)
Total	54	2414.46		

*($p<.05$; $F>3.175$)

The final variable of school sentiment was assessed by the School Interest Inventory. Tables 5 and 6 present the results of the analysis of the data. Table 5 contains the means, standard deviations, and adjusted means for the three groups. Table 6 contains the results of the analysis of covariance.

Table 5
Means*, Standard Deviations, and Adjusted Means
School Interest Inventory

	November 1973		March 1974		
Group	$\overline{X}$	S.D.	$\overline{X}$	S.D.	Adjusted $\overline{X}$'s
Experimental	28.35 (N=20)	9.86	27.85 (N=20)	9.11	28.17 (N=20)
Control I	28.11 (N=19)	11.62	29.79 (N=19)	7.10	30.03 (N=19)
Control II	30.53 (N=17)	9.90	33.71 (N=17)	10.17	33.24 (N=17)

*Scores are raw scores

The interpretation of this variable is the reverse of the previous variables considered. An increase in the interest of a student toward school is indicated by a decrease in the student's score on the measure.

Table 6
Analysis of Covariance
School Interest Inventory

Source	df	Adjusted SS	Ms	F
Between	2	249.85	124.92	
Within	52	2636.02	50.69	2.46* (NS)
Total	54	2885.86		

*($p < .05$; $F > 3.175$)

Results of the analysis of covariance indicate that the third hypothesis cannot be supported. The null hypothesis of no significant difference between the groups cannot be rejected.

Purpose 2:

While no significant differences were found on the cognitive and affective variables, this finding should not preclude the integration of such a procedure in the curriculum. Based on teacher judgements, tutors were found to be extremely helpful and a positive influence in the classroom. The tutorial program is one which fits flexibly into the existing curriculum with no major changes required.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

This final chapter presents the conclusions of the study based on the data analysis and results reported in the previous chapter. The recommendations comprise the final section of the chapter. Conclusions are based on the data analysis and results.

Conclusions

Results of the analysis of covariance for the three variables indicate no significant differences between the three groups. Further examination of the data by inspecting pre, post, and adjusted means for trends presents a possibility for variable three, school sentiment. The data indicate a trend in terms of a decrease in interest by the control groups and a slight increase in interest by the experimental group.

The same type inspection of self concept means indicates a more positive self concept for the controls. This trend is the opposite of the effect expected.

Although the overall conclusion clearly must be that there were no significant differences between the groups, the trends provide some possibilities for recommendations.

Recommendations

The fact that no significant differences were obtained when eleventh-grade students tutored fourth-graders does not eliminate the possibility that cross-age tutoring is an effective technique. It is recommended that studies following the procedures outlined in this report be conducted to systematically examine the many possibilities that still exist.

The study should be replicated with:

1. larger numbers of subjects over a longer treatment period,
2. other criterion measures,
3. differential identification of underachievers,
4. differential definition of terms (for instance, specific definitions of what self concept is to be measured, ie. self concept as learner or self concept of ability as opposed to global self concept),
5. criterion referenced testing instruments.

Furthermore, it is recommended that broad based studies designed to identify and remediate underachievers be undertaken.

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