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ABSTRACT

A survey conducted in 1974 in the Little Rock area revealed there was a demand for office personnel who could take shorthand. There was a definite need for the initiation and implementation of a program at McClellan High School to boost enrollment in shorthand courses. The purpose of this study was to determine if students could acquire a proficiency level in transcription for employment in a one-year period that exceeds the level now achieved in the traditional shorthand classes. A comparative study was conducted to ascertain whether students could achieve a higher level of skill through the use of machines or by the traditional approach. All students had one hour of instruction daily. The machine method of teaching shorthand appeared to be a superior method. Forty-four percent of the students in the experimental machine shorthand groups had reached a job-entry skill level by the end of the school year. This compared to 6 percent in the control groups of traditional Gregg Shorthand. (VA)

A COMPARATIVE STUDY OF ALTERNATIVE METHODS AND TECHNIQUES IN STENOGRAPHIC TRAINING

(VT 102 191)

by

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I. INTRODUCTION

A survey conducted in 1974 in the Little Rock area revealed there was a demand for office personnel who could take shorthand. Out of approximately one hundred and sixty questionnaires returned in the survey, over sixty percent of the businesses indicated they had personnel using shorthand on the job. Forty-eight businesses indicated they employed personnel because a student had taken shorthand even though it was not used on the job. The reason for this being that students who have had shorthand usually have better language skills, are better spellers, can punctuate better, etc. One respondent who manages a local employment agency indicates that shorthand is a must, and there is from $50 to $100 difference per month in the salaries of shorthand secretaries.

Since 1971-72 fewer students at McClellan have taken shorthand each year. In 1971-72 McClellan High School had 105 students enrolled in shorthand compared to 59 enrolled in 1973-74. Since 1969 second year shorthand has not been offered due to lack of student interest. The drop-out rate in first-year shorthand over the last four-year period has been 13%. At the conclusion of Shorthand I, the average student attains a skill level of approximately 60 wpm which is not sufficient for most positions. The survey previously mentioned revealed that the majority of employers require a minimum job-entry skill of 80 wpm. Students have a difficult time working two years of shorthand into their schedule after taking all the required subjects and the other elective business courses they need.

There was a definite need for a program to be initiated and implemented at McClellan High School to boost enrollment in shorthand. The program should also provide students with job-entry skills at the end of one year.

It was believed that machine touch shorthand might be one way to provide students with job-entry skills at the end of one year; and therefore, was selected as the basis of a one-year experimental study at McClellan High School. This experimental program was partially funded as a research problem by the State Department of Education.

Statement of the Problem

The purpose of this study was to determine if students could acquire a proficiency level in transcription for employment in a one-year period that exceeds the level now achieved in the traditional shorthand classes.

Purpose of Study

The major objective of the program was to develop and implement a shorthand program that would provide students with job-entry skills at the end of one school year.

Specific objectives were:

1. Reduce the drop-out rate of shorthand students.
2. Prepare students for better-paying jobs.
3. Motivate more students to take shorthand.
4. Determine if greater speeds can be attained in a shorter time with machine shorthand than the traditional method.
5. Determine if greater transcription accuracy can be attained with machine shorthand than the traditional method.
6. Have 80% of the students keyboarding at least 90 wpm by the end of one school year.
7. Determine if students can achieve greater speed and accuracy by using instructional tapes and aids with minimum teacher instruction than students who will have maximum teacher instruction and little use of instructional aids.

II. METHODS

It was proposed that a research and development project in machine shorthand be initiated at McClellan High School during the 1974-75 school year. It was a comparative study to ascertain whether students could achieve a higher level of skill through the use of machines or by the traditional approach.

It was anticipated that more students would express an interest in shorthand as a result of the project. A meeting was held of all students who were interested in taking shorthand. Literature was distributed about machine shorthand and a shorthand machine was exhibited. In response to the meeting, forty-seven students indicated a desire to participate in machine shorthand training.

Students participating in the study were divided into four groups. Experimental Groups A & B used the shorthand machines and started with twenty students in each. Experimental Group A had nineteen students at the end of the year and Experimental Group B had seventeen making a total of thirty-six students in the experimental groups. Control Groups A & B used the traditional Gregg shorthand. Control Group A had twenty-five students at the beginning of the year and ended the year with eighteen. Control Group B started with twenty-two students and ended with eighteen, making a total of thirty-six in the combined control groups. The data used in this report were based on the students completing the course.

Since this was a comparative study, efforts were made to match the groups as evenly as possible by IQ test scores and accumulative grade point averages. Experimental Group A had an average IQ score of 104.1 and an average grade point of 2.6. Experimental Group B had an average IQ score of 105.2 and an average

grade point of 2.7. Control Group A had an average IQ score of 104.3 and an average grade point of 2.7. Control Group B had an average IQ score of 105.1 and an average grade point of 2.6. Other criteria used in selecting and grouping students was:

1. Students must be in the eleventh or twelfth grade--twelfth grade students had first choice.
2. Students must have had at least one year of typewriting.
3. Students must have maintained average or above grades in English the year prior to enrolling.

Four students who wanted to participate in the experimental group had a "D" average in English the year prior to the study. Due to their high IQ and grade point, the decision was made to allow the students to participate.

Teachers and counselors assisted in the selection, matching, and grouping of the students. The project staff also worked in close consultation with the state supervisory staff in planning and conducting the experimental project.

All students had one hour of instruction daily. The students in the experimental groups were not able to take machines home; therefore, had little or no extra practice.

Experimental Group A using the machine approach was organized in which the students received a minimum amount of instruction, dictation and assistance from the instructor. The students in this group were primarily taught through the medium of tapes and other self-instructional aids. Experimental Group B using the machines was given a maximum amount of instruction, dictation and assistance from the instructor and tapes were used as an aid only.

Control Groups A & B were taught through the traditional student-teacher classroom method, using the traditional Gregg shorthand. Tapes correlated with the Gregg Shorthand textbook were also used as an aid.

The teacher for the project had four years of traditional shorthand teaching

experience. The teacher took the machine shorthand correspondence course from Stenograph Machines, Inc. and was certified to teach machine shorthand. The same teacher taught all groups involved in the comparative study.

Shorthand tapes were used on an Edison Envoy Shorthand Laboratory to aid the teacher. This helped the students progress individually to their maximum ability. Transcribing the shorthand on a typewriter was a very important part of the course. English, vocabulary, and spelling were incorporated into the instruction of all groups.

Four eleventh grade students participated in the project. Provisions will be made for these students to continue their study through the shorthand laboratory if they so desire.

Facilities and Equipment

A well-lighted, air-conditioned room was available for the classroom. Twenty L-shaped desks were furnished by the Pulaski County Special School District. An Edison Envoy Shorthand Laboratory with four channels and student listening stations were used. Other equipment used in the study included twenty Stenograph shorthand machines and twenty IBM Selectric typewriters.

III. FINDINGS

The findings of the study will be reported by the objectives. The major objective was to develop and implement a shorthand program that would provide students with job-entry skills at the end of one school year.

The results of the survey conducted in 1974 in the Little Rock area revealed that the majority of employers require 80 wpm for job-entry; therefore, the main goal was to have students acquiring a proficiency level in transcription at 80 wpm.

The findings for this objective are based on three-minute takes of new material. The scores used in the tables are the three highest takes transcribed with at least 95% accuracy. These three scores were gathered from the last nine weeks grading period. Experimental Groups A and B used the shorthand machine and Control Groups A and B used the traditional Gregg shorthand. Experimental Group A had minimum teacher instruction and was taught primarily through the medium of tapes. Experimental Group B had a maximum amount of teacher instruction and assistance and used the tapes only as an aid.

As shown on Table 1 under the Experimental Group A frequency column, three students transcribed from 95-100 wpm, one student transcribed 90-94 wpm, and two students transcribed 80-84 wpm making a total of six students. Listed under Experimental Group B frequency column two students transcribed from 95-100 wpm, one transcribed from 85-89 wpm, and four transcribed from 80-84 wpm making a total of ten students. The total of the two experimental groups who could transcribe 80 or more wpm

was sixteen students or 44%. Control Group A had no students who transcribed 80 wpm and only two students in Control Group B transcribed between 80-84. This was a total of two students or .06% in the two control groups who could transcribe 80 or more wpm.

TABLE 1

FREQUENCY DISTRIBUTION OF SPEED SCORES FOR STUDENTS IN SHORTHAND CLASSES AT McCLELLAN HIGH SCHOOL MAY, 1975

Words Per Minute	Experimental Group - A			Experimental Group - B			Control Group - A			Control Group - B		
	f	Cum f	Cum % f	f	Cum f	Cum % f	f	Cum f	Cum % f	f	Cum f	Cum % f
95-100	3	19	100	2	16	100						
90-94	1	16	84	3	14	88						
85-89	0	15	79	1	11	69						
80-84	2	15	79	4	10	63				2	17	100
75-79	1	13	68	2	6	37	1	16	100	1	15	88
70-74	3	12	63	1	4	25	5	15	94	0	14	82
65-69	1	9	47	1	3	19	0	10	63	1	14	82
60-64	8	8	42	2	2	12	5	10	63	9	13	76
55-59	0	0	0	0	0	0	2	5	31	2	4	24
50-54	0	0	0	0	0	0	3	3	19	2	2	12
Median	69.7			80.5			61.0			61.2		
Mean	75.2			80.0			62.8			62.2		

Key:

f = frequency - the number of students scoring in this interval.

cum f = cumulative frequency beginning with the lowest score to determine median score.

cum % f = cumulative percent of number of students in the group.

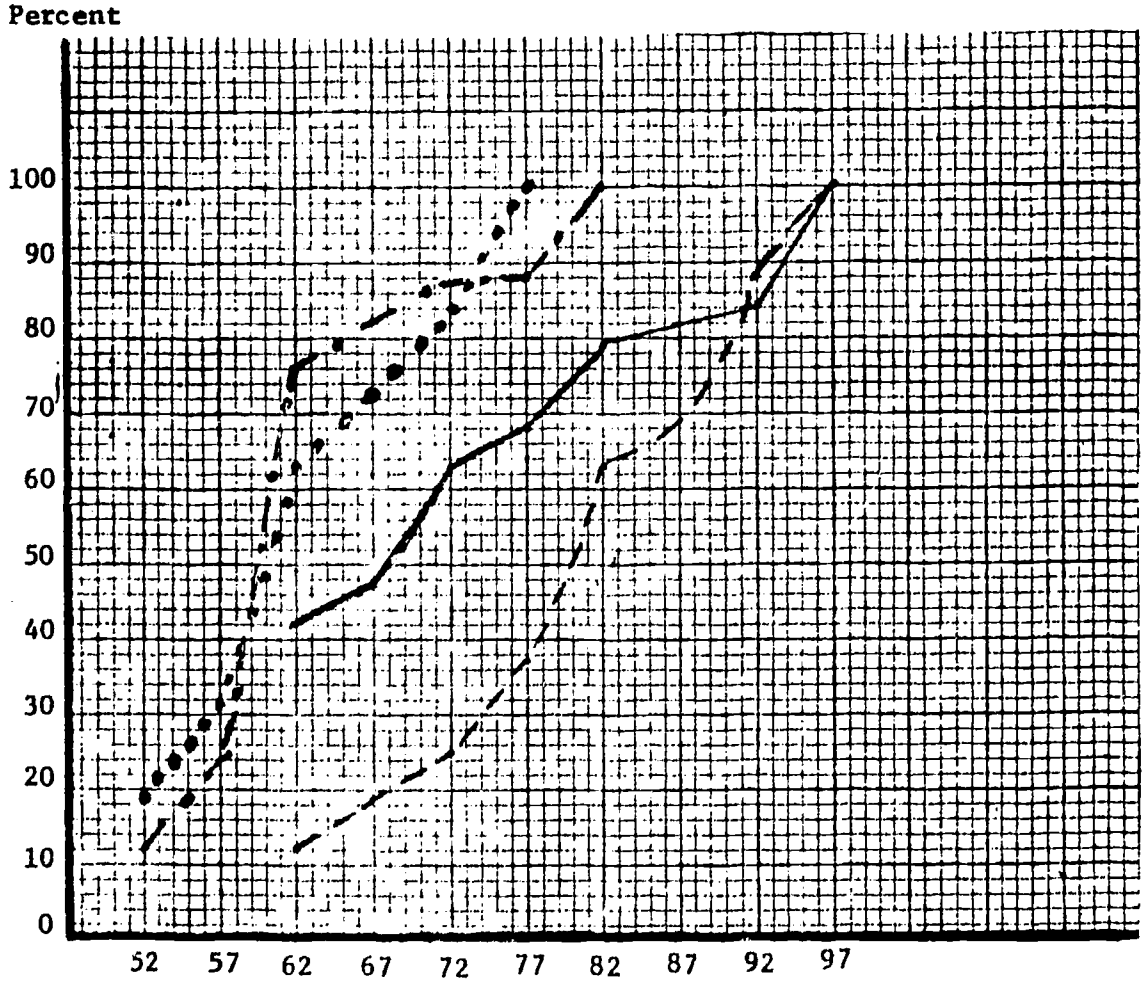

Figure 1

Accumulative Percentage Curve of Speed Showing
Number of WPM Made by Shorthand Students
at McClellan High School in 1974-75

Key:

_____ Experimental Group A

- - - - - Experimental Group B

. . . . . Control Group A

- . - . - Control Group B

1. Reduce the drop-out rate of shorthand students.

Since absenteeism is often associated with students who drop-out of shorthand, a study was made of absenteeism in the experimental and control groups and compiled in Table 2. Table 2 shows that students in the control groups missed more class periods than students in the experimental groups. The median for the experimental groups was 10.3 class periods missed and the median for the control groups was 13.4. The mean for the experimental groups was 10.4 class periods missed and the mean for the control groups was 15.15 class periods missed.

TABLE 2

FREQUENCY DISTRIBUTION OF NUMBER DAYS ABSENT
OF SHORTHAND STUDENTS AT McCLELLAN HIGH SCHOOL
1974-75

Days Absent	Experimental Group A & B			Control Group A & B		
	f	Cum. f	Cum. % f	f	Cum. f	Cum. % f
0	4	36	100%	0	36	100%
1 - 3	2	32	89%	5	36	100%
4 - 6	7	30	83%	4	31	86%
7 - 9	3	23	64%	2	27	75%
10 - 12	8	20	56%	5	25	69%
13 - 15	3	12	33%	7	20	56%
16 - 18	3	9	25%	1	13	36%
19 - 21	2	6	17%	3	12	33%
22 - 24	3	4	11%	1	9	25%
25 or More	1	1	3%	8	8	22%
Median		10.3			13.4	
Mean		10.4			15.5	

Key:

f = frequency - the number of students scoring in this interval.

cum f = cumulative frequency beginning with the lowest score to determine median score.

cum % f = cumulative percent of number of students in the group.

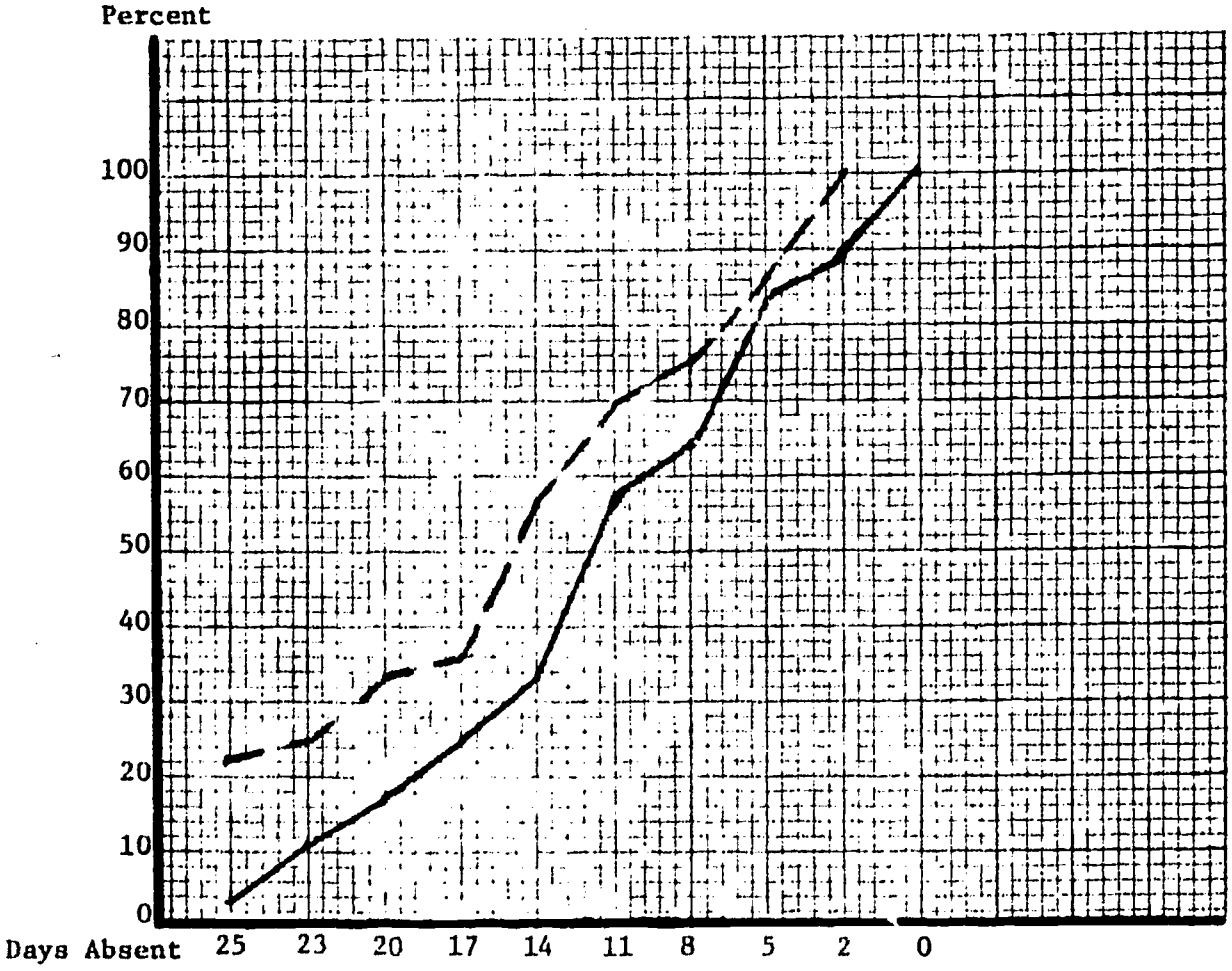

Figure 2

Accumulative Percentage Curve of Absentees Showing
Number of Days Missed by Shorthand Students
at McClellan High School in 1974-75

Key:

_____ Experimental Groups A & B

- - - - - - - - Control Groups A & B

The experimental groups also had fewer drop-outs than students in the control groups. Table 3 indicates that one student dropped out of Experimental Group A, three out of Experimental Group B, seven out of Control Group A, and four out of Control Group B.

TABLE 3

ENROLLMENT FOR STUDENTS IN SHORTHAND CLASSES
AT McCLELLAN HIGH SCHOOL
1974-75

Enrollment Period	Experimental Group A	Experimental Group B	Control Group A	Control Group B
Beginning of Program	20	20	25	22
End of Program	19	17	18	18
Loss or Gain	-1	-3	-7	-4

One student in the experimental groups dropped shorthand and took another subject at the end of the first semester. Five students in the control groups dropped shorthand and took another subject at the end of the first semester. All other drop-outs in both experimental and control groups were due to students moving away or dropping out of school entirely.

2. Prepare students for better paying jobs.

One respondent who manages a local employment agency in the Little Rock area indicated that salaries for shorthand secretaries are $50 to $100 more per month than those with only typewriting skill. A follow-up study of students who participated in the experimental and control groups will be necessary to determine if students are using their machine shorthand skill and if students in the experimental groups are receiving better salaries than those in the control groups. Therefore, it is recommended that a special follow-up study be conducted on students who participate in this program to determine if the program did prepare the experimental students for better paying jobs. The follow-up study should be limited to students who were graduating seniors.

3. Motivate more students to take shorthand.

The number of students enrolled in shorthand at McClellan High School at the beginning of each year since 1971 is shown on Table 4. This shows the fluctuating enrollment and how the enrollment increased from 59 in 1973-74 to a total of 94 in 1974-75.

TABLE 4

SHORTHAND ENROLLMENT SINCE 1971
AT McCLELLAN HIGH SCHOOL

School Year	Enrollment Beginning of School	Enrollment End of Year
1970-71	91	77
1971-72	105	95
1972-73	69	65
1973-74	59	56
1974-75	94	72

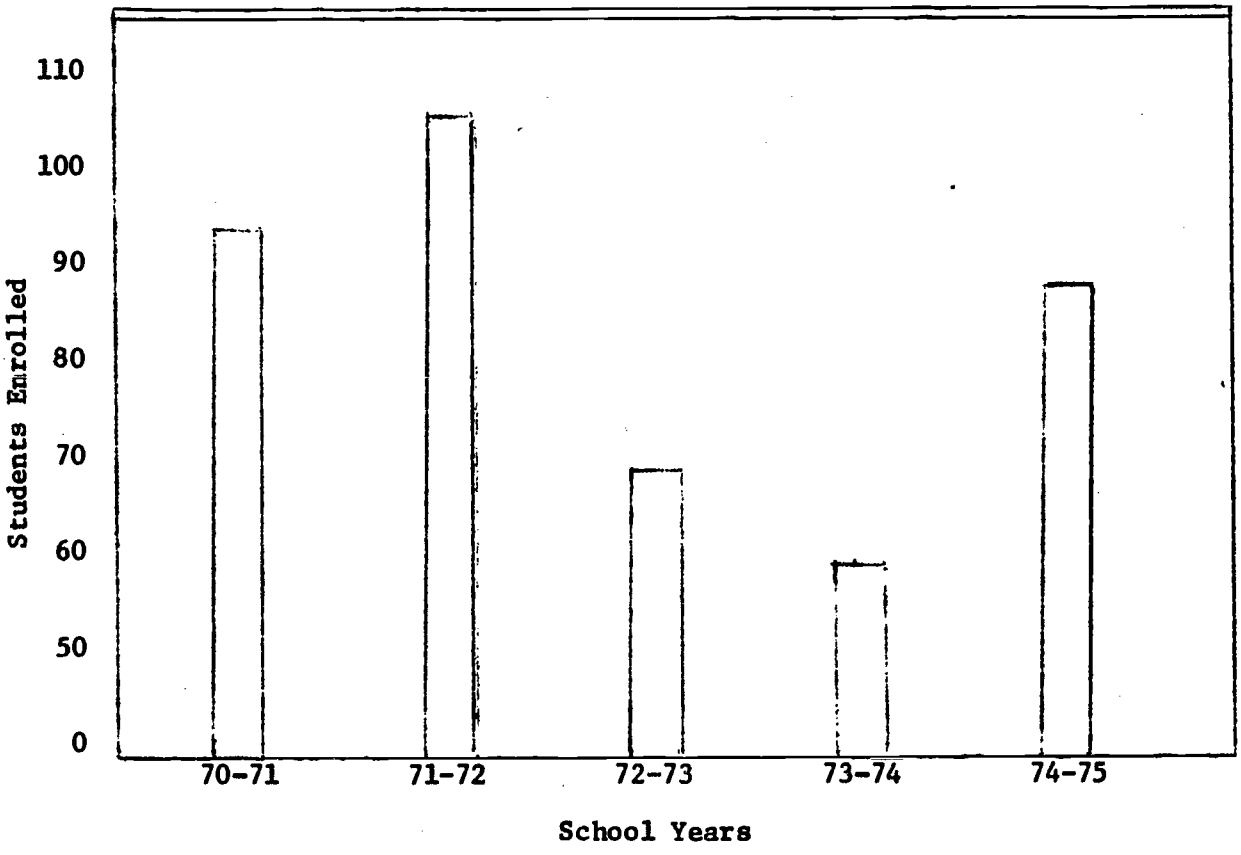

Figure 3

Seven of the students requesting machine shorthand had to be eliminated. The experimental groups were limited to 20 each because only 20 machines were available. The seven students were eliminated by the criteria used in selecting students. The increase in enrollment from 1973-74 to 1974-75 was due to the interest in machines shorthand.

The enrollment for the 1975-76 school year is 70 with 20 of these being enrolled in machine shorthand. It was the opinion of the instructor who conducted the study that the enrollment in machine shorthand dropped due to the dissatisfied students in Experimental Group A who spread the word that is was a difficult course. During the first semester Experimental Group A students became frustrated and dissatisfied due to an

attempt to use individualized study procedures with a minimum amount of instruction, dictation and assistance from the instructor. Several students indicated they would wait and see if students in the study were able to obtain jobs using their machine shorthand skill before they enrolled in the course.

4. Determine if greater speeds can be attained in shorter time with machine shorthand than the traditional method.

Of the four classes of shorthand students at McClellan High School during the 1974-75 school year, the two experimental classes using the machines transcribed more words per minute than the two control classes. A study of the data indicates that Experimental Group B showed the greatest gain. As shown in Table 1, page 7, Experimental Group B had two students transcribing between 95 and 100 words per minute, three students transcribing between 90 and 94 words per minute and one student transcribing between 85 and 89 words per minute while none of the students in either control class were able to transcribe more than 80 words per minute.

Another indication that the experimental groups transcribed more than the control groups is the median and mean number of words per minute. Experimental Group B had a median of 80.5, a mean of 80.0, and Experimental Group A had a median of 69.7, a mean of 75.2 compared to the Control Group A with a median of 61.0, a mean of 62.8 and Control Group B a median of 61.2 and a mean of 62.2.

5. Determine if greater transcription accuracy can be attained with machine shorthand than the traditional method.

Of the four classes of shorthand students at McClellan High School during the 1974-75 school year, Experimental Group B (taught with a maximum

amount of teacher instruction, dictation and assistance) had the best transcription accuracy. Experimental Group A (taught primarily through the aid of tapes and little teacher instruction) had the lowest transcription accuracy. The information in Table 5 is based on the highest three transcription scores of 3 minute takes with 95% accuracy during the last nine-week grading period. For example, a student who transcribed an average of 80 wpm in three minutes would be allowed up to a maximum of twelve errors or four errors per minute and still be within the limits of the prescribed standard.

Table 5 also shows that Experimental Group A had a median of 6.3 errors per minute and a mean of 5.3 errors per minute. Experimental Group B had a median of 4.0 errors per minute and a mean score of 3.5 errors per minute. Control Group A had a median score of 5.7 errors per minute and a mean score of 5.7 errors per minute. Control Group B had a median score of 4.7 errors per minute and a mean score of 5.0 errors per minute.

TABLE 5

FREQUENCY DISTRIBUTION OF TRANSCRIPTION ACCURACY
FOR STUDENTS IN SHORTHAND CLASSES AT
McCLELLAN HIGH SCHOOL
May, 1975

Number Errors	Experimental Group - A			Experimental Group - B			Control Group - A			Control Group - B		
	f	cum f	cum % f	f	cum f	cum % f	f	cum f	cum % f	f	cum f	cum % f
0.0 - 0.9				1	16	100				1	17	100
1.0 - 1.9				1	15	94				0	16	94
2.0 - 2.9	3	19	100	3	14	88	2	16	100	0	16	94
3.0 - 3.9	3	16	84	2	11	69	1	14	88	1	16	94
4.0 - 4.9	1	13	68	6	9	56	2	13	81	7	15	88
5.0 - 5.9	2	12	63	1	3	19	3	11	69	2	8	47
6.0 - 6.9	3	10	53	0	2	12	4	8	50	3	6	35
7.0 - 7.9	4	7	37	1	2	12	1	4	25	3	3	18
8.0 - 8.9	1	3	16	0	1	6	3	3	19	0	0	
9.0 - 9.9	0	2	10	1	1	6	0	0		0	0	
10.0 - 10.9	0	2	10	0	0		0	0		0	0	
11.0 - 11.9	1	2	10	0	0		0	0		0	0	
12.0 - 12.9	0	1	5	0	0		0	0		0	0	
13.0 - 13.9	1	1	5	0	0		0	0		0	0	
Median	6.3			4.0			5.7			4.7		
Mean	5.3			3.5			5.7			5.0		

Key:

f = frequency - the number of students scoring in this interval.

cum f = cumulative frequency beginning with the lowest score to determine median score.

cum % f = cumulative percent of number of students in the group.

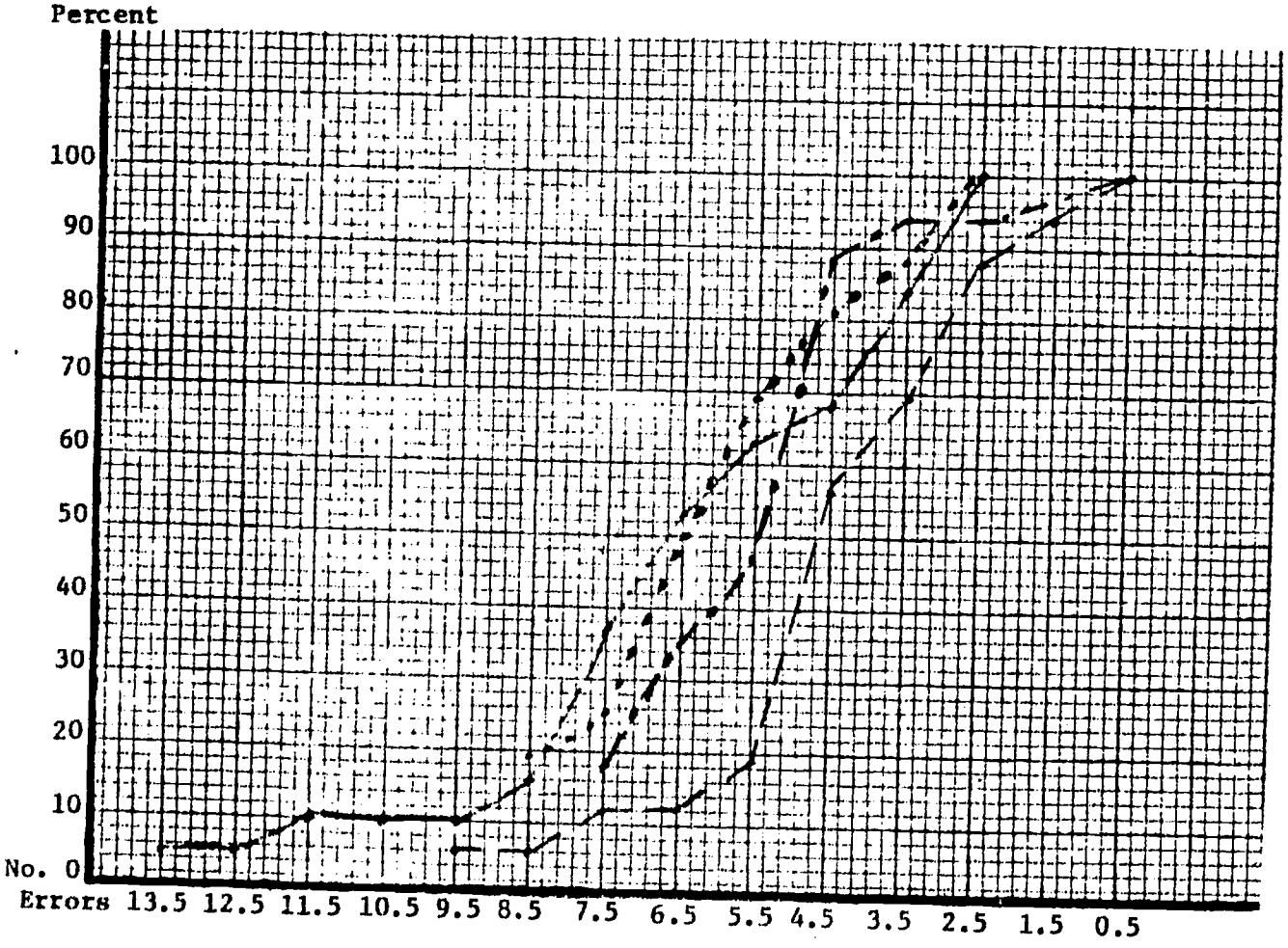

Figure 4

Accumulative Percentage Curve of Accuracy
Showing Number of Errors Made by Students
at McClellan High School in 1974-75

Key:

_____ Experimental Group A

- - - - - - - - - Experimental Group B

. . . . . Control Group A

- . - . - . - . - Control Group B

6. Have 80% of the students keyboarding at least 90 wpm by the end of one school year.

The findings for this objective can be found by referring to Table 1, page 7. Four students in Experimental Group A and five students in Experimental Group B could accurately keyboard and transcribe 90 or more wpm by the end of the school year on three minute takes of new material. This was a total of nine students and represents 25% of the students in the experimental groups. None of the students in the control group could take and accurately transcribe material at 90 wpm.

This objective was found to be too unrealistic to reach with only one hour of instruction and practice daily.

7. Determine if students can achieve greater speed and accuracy by using instructional tapes and aids with minimum teacher instruction than students who will have maximum teacher instruction and little use of instructional aids.

The students in Experimental Group A were taught primarily through the medium of tapes and given a minimum amount of instruction, dictation and assistance from the instructor. The tapes were prepared by Stenograph Machine, Inc. to correspond with the textbook, #510, Book 1, Keyboard and Theory. Experimental Group B students were given a maximum amount of instruction, dictation and assistance from the instructor.

A study of the data indicates that Experimental Group B showed the greatest gain in speed. As shown in Table 1, page 7, Experimental Group B had a median score of 80.5 and mean of 80.0. Experimental Group A had a median of 69.7 and a mean of 75.2.

Table 5, page 16, shows that Experimental Group B had the best accuracy score with a median of 4.0 errors per minute and a mean score of

3.5 errors per minute. Experimental Group A had a median score of 6.3 errors per minute and a mean score of 5.3 errors per minute.

IV. SUMMARY OF FINDINGS

The machine method of teaching shorthand appeared to be a superior method of teaching shorthand at McClellan High School during the 1974-75 experimental study.

Forty-four percent of the students in the experimental machine shorthand groups had reached a job-entry skill level by the end of the school year by transcribing 80 or more wpm with 95% accuracy. This was based on new material for three-minute takes. This compared to .06% in the control groups of traditional Gregg shorthand.

Absenteeism was greater in the control groups than in the experimental groups. The median from the experimental groups was 10.3 class periods missed and the median for the control groups was 13.4 class periods missed. The experimental groups also had fewer drop-outs than the control groups. Four students dropped out of the experimental groups and eleven dropped out of the control groups.

A follow-up study of graduating seniors who participated in the study will be necessary to determine if students are using the machine shorthand skill and if students in the experimental groups are receiving better salaries than those in the control groups.

Machine shorthand did motivate more students to take shorthand at McClellan High School. The enrollment increased from 59 in 1973-74 to 94 in 1974-75.

The experimental groups using the machines transcribed more words per minute than the control groups. Experimental Group A had a median score of 69.7 wpm and Experimental Group B had a median score of 80.5 wpm. Control Group A had a median score of 61.0 wpm and Control Group B had a median score

of 61.2 wpm.

Experimental Group B on the machines had the best transcription accuracy with a median of 4.0 errors per minute on three-minute takes of new material. Control Group B had a transcription accuracy median of 4.7 errors per minute. Control Group A ranked third in transcription accuracy with a median of 5.7 errors per minute. Experimental Group A (the group on machines with little teacher instruction and taught primarily with tapes the first semester) ranked last in transcription accuracy with a median of 6.3 errors per minute.

Twenty-five percent of the students in the experimental machines group could keyboard and transcribe at a rate of 90 or more wpm by the end of the school year. The scores were based on three-minute takes of new material and 95% accuracy. None of the students in the control group could take and accurately transcribe material at 90 wpm.

Of the two experimental groups on the machine, Experimental Group B showed the greatest gain in speed and also had the best accuracy scores. Experimental Group B had a maximum amount of teacher instruction, dictation, and assistance while Experimental Group A had a minimum amount of teacher instruction, dictation and assistance and was taught primarily through the medium of tapes. Experimental Group B had a median of 80.5 wpm and a median of 4.0 errors per minute. Experimental Group A had a median of 69.7 wpm and a median of 6.3 errors per minute. Experimental Group A became discouraged and frustrated during the first semester due to lack of teacher instruction and assistance. During the second semester the instructor discontinued the individualized study and provided teacher instruction and assistance. While Experimental Group A did not achieve to the extent as did Experimental Group B, it did, however, exceed the achievement of both Control Group A and Control Group B.

There were some interesting aspects of the study that were not included

in the proposal:

1. Students using shorthand machines developed a skill called "scripthand". At the end of the year they could take scripthand at 50 wpm.

2. Two students were entered in the District V FBLA first-year shorthand contest--the only students using the machine. One machines student placed first in the contest and the other placed third.

3. Machine classes have gotten some unexpected community interest in the form of visitors to the classroom, correspondence and newspaper articles about the course, and the class was the subject of a Channel 7 Newscene interview which was shown on the 6:00 and 10:00 p.m. news.

4. Students who had taken traditional shorthand before taking the machine system were asked which system they preferred. The majority favored the touch (machine) system. The reasons they gave were that machine shorthand is faster, they could read it back faster, notes never got cold, and homework was more interesting.

At least one student is already registered for a course in a court reporting school in Texas as a result of the course. Several others have expressed similar interests. One student has obtained a full-time job in an office using machine shorthand skills. Other students hope to find jobs using the skill.

V. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine if students could acquire a proficiency level in transcription for employment in a one-year period that exceeded the level now achieved in the traditional shorthand classes.

Based on the findings of the study it is concluded that the majority of students who participated in the experimental groups using the touch system at McClellan High School acquired a proficiency level in transcription for employment in the one-year period and did, for the most part, exceed the level achieved in the traditional shorthand classes.

Touch shorthand appears to be a superior method of shorthand and it is believed that more schools should consider adding it to their business education curriculum. Touch shorthand is not limited to court reporting but lends itself for use anywhere shorthand skills are needed. It can easily open the door to many prestigious jobs such as executive secretary, medical-technical secretary, court reporter, and conference reporter.

Shorthand students, traditional or touch method, need a teacher's instruction and assistance. Tapes are a valid aid but should not be used as the only means of instruction.

As a result of the study the following recommendations are made:

1. Prospective employers be informed that machine shorthand is an available skill and also be made aware of the advantages.
2. A workshop be conducted in the state to assist teachers who might be interested in starting a touch shorthand program in their schools.
3. Touch shorthand become part of the regular business education curriculum at McClellan High School.
4. A recruiting program be instigated to acquaint students with the advantages of the touch system.

5. Instructional tapes be used only as an aid in the classroom and not as a replacement for the teacher.

6. Students have additional practice on the machines by arranging a practice period for them or making it a two-hour block course.

7. More schools in the state consider adding machine shorthand to their business education curriculum.

8. Conduct a follow-up study of graduating seniors who participated in the study to determine if students are using the machine shorthand skill and if students in the experimental groups are receiving better salaries than those in the control groups.

APPENDIX

APPENDIX A

Table 6. IQ Scores and Accumulative Grade Averages for Students in Experimental Groups (Machine Shorthand)

Student	IQ Score	Accumulative Grade Averages
1	107	3.5200
2	102	1.6956
3	97	2.2272
4	91	1.8333
5	113	2.1538
6	98	1.8181
7	118	3.4090
8	117	3.0434
9	97	2.2800
10	80	2.2800
11	105	2.9130
12	108	3.0000
13	101	2.2000
14	106	2.2272
15	106	3.1863
16	101	2.3181
17	105	3.9583
18	114	3.0454
19	113	2.2916
20	102	1.8400
21	102	2.1600
22	101	2.9130
23	107	3.0454
24	97	2.7727
25	118	2.0416
26	101	2.3200
27	94	1.6363
28	99	3.0454
29	113	2.6363
30	101	3.9600
31	108	3.0000
32	108	2.7200
33	109	2.3571
34	108	2.7142
35	106	3.2666
36	113	3.3571

Average IQ Score for the experimental groups is 104.61.

Average Accumulative Grade Point for the experimental groups is 2.6441.

APPENDIX B

Table 7. IQ Scores and Accumulative Grade Averages for Students in Control Groups (Traditional Gregg Shorthand)

Student	IQ Score	Accumulative Grade Averages
1	96	2.6800
2	95	2.0714
3	109	2.8400
4	85	1.6250
5	122	2.3636
6	96	2.2666
7	118	4.0000
8	109	3.0714
9	85	2.5333
10	100	1.4347
11	107	3.1429
12	95	2.6086
13	108	2.6428
14	119	4.0869
15	109	1.8000
16	110	3.2700
17	96	1.9333
18	103	3.1818
19	125	3.2666
20	118	3.4666
21	102	2.4000
22	97	2.7500
23	119	2.8400
24	113	3.8636
25	85	2.0714
26	114	2.3333
27	98	1.9285
28	101	2.5000
29	107	3.1666
30	115	2.5000
31	100	3.2857
32	89	2.0400
33	118	3.5416
34	113	2.5000
35	86	1.6000
36	108	2.7391

Average IQ Score for the control groups is 104.72.

Average Accumulative Grade Point for the control groups is 2.6763.

APPENDIX C

Table 8. Transcription Accuracy and Speed Scores for Students in Experimental Groups (Machine Shorthand). The scores listed in the tables are the highest takes transcribed with at least 95% accuracy. Code: N/A means not acceptable.

No. of Students	Transcription Speed Scores			Transcription Error Scores		
1	100	100	90	11	5	3
2	60	N/A	N/A	13	N/A	N/A
3	70	70	N/A	7	8	N/A
4	70	70	60	3	5	3
5	70	60	60	7	5	5
6	N/A	N/A	N/A	N/A	N/A	N/A
7	80	70	70	10	2	3
8	80	80	80	5	8	9
9	100	90	80	14	8	5
10	70	60	60	9	4	8
11	60	60	N/A	0	7	N/A
12	100	90	90	2	1	2
13	80	80	80	0	3	5
14	100	100	90	0	6	3
15	100	100	90	1	4	1
16	60	N/A	N/A	8	N/A	N/A
17	100	90	90	2	3	4
18	80	80	70	8	4	7
19	100	100	100	0	2	2
20	70	70	60	5	7	1
21	80	80	70	1	11	1
22	100	100	100	3	6	6
23	90	90	80	1	3	3
24	60	60	N/A	4	5	N/A
25	N/A	60	N/A	N/A	7	N/A
26	60	60	60	5	1	1
27	60	60	60	5	7	8
28	90	80	80	8	0	2
29	70	70	70	1	4	6
30	80	80	80	0	2	3
31	60	60	60	3	4	5
32	80	80	80	0	0	2
33	90	60	60	8	1	8
34	70	70	70	1	5	5
35	90	90	90	0	1	3
36	70	70	N/A	11	12	N/A

Average transcription speed for the experimental groups is 77.58 wpm.

Average transcription accuracy for the experimental groups is 4.43 errors per minute.

APPENDIX D

Table 9. Transcription Accuracy and Speed Scores for Students in Control Groups (Traditional Gregg Shorthand). The scores listed below are the highest takes transcribed with at least 95% accuracy. Code: N/A means not acceptable.

No. of Students	Transcription Speed Scores			Transcription Error Scores		
1	70	70	70	9	10	6
2	N/A	N/A	N/A	N/A	N/A	N/A
3	70	70	70	3	9	8
4	N/A	N/A	N/A	N/A	N/A	N/A
5	80	70	70	4	1	2
6	50	50	N/A	4	7	N/A
7	70	70	70	4	5	9
8	60	60	60	3	4	10
9	60	50	N/A	10	5	N/A
10	60	50	50	9	8	9
11	60	60	50	2	7	9
12	60	60	60	3	3	6
13	60	60	60	3	4	8
14	80	80	70	4	4	0
15	60	50	50	10	0	9
16	70	70	70	3	11	11
17	60	60	50	5	8	10
18	60	60	60	0	0	1
19	60	60	60	3	8	9
20	80	80	70	3	12	0
21	80	80	80	3	4	5
22	60	60	60	1	3	7
23	50	50	50	2	2	6
24	80	80	80	2	5	6
25	60	60	60	9	8	5
26	60	60	50	5	9	5
27	50	50	50	2	4	8
28	60	60	60	7	10	4
29	60	60	60	0	7	7
30	60	60	60	8	3	2
31	60	60	60	0	8	10
32	70	70	60	8	5	1
33	60	60	60	2	4	7
34	60	60	60	3	1	8
35	N/A	N/A	N/A	N/A	N/A	N/A
36	60	60	60	2	7	6

Average transcription speed for the control groups is 62.47 wpm.

Average transcription accuracy for the control groups is 5.32 errors per minute.