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# The Feasibility of Utilizing the Videotape for Improvement of Technique in Number Typewriting

Arlin A. Prochnow

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THE FEASIBILITY OF UTILIZING THE VIDEOTAPE  
FOR IMPROVEMENT OF TECHNIQUE IN  
NUMBER TYPEWRITING

by

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Valley City, North Dakota, 1964

An Independent Study  
Submitted to the Faculty  
of the  
University of North Dakota  
in partial fulfillment of the requirements  
for the degree of  
Master of Science

Grand Forks, North Dakota

August  
1970

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This independent study submitted by Arlin A. Prochnow in  
partial fulfillment of the requirements for the Degree of Master  
Science from the University of North Dakota is hereby approved  
the Faculty Advisor under whom the work was completed.

John D. P...  
Chairman, Business Education Dept.

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Advisor

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## CHAPTER I

### INTRODUCTION

The business teacher is vitally interested in discovering methods to make his classroom teaching more interesting and effective. In typewriting as well as other subjects, teachers strive for the best method of providing effective teaching in less time. Teachers are particularly interested in developing a close teacher-student relationship that provides for the handling of individual differences.

The videotape medium of communication is very new; relatively little is known about its use as a classroom tool, and further studies need to be made before all of the possible applications of this new audio-visual aid are identified.

Because the application of this medium is quite new, literature and research is almost non-existent in regard to methods and procedures of teaching via videotape. Although information on the use of videotape is limited, a wealth of information on microteaching methods are available and may be applied to videotape teaching. The possibility of teaching typewriting with the assistance of the videotape is an interesting field for research.

#### Statement of the Problem

The problem of this study was to determine the effectiveness of using the videotape to improve and correct techniques in the typewriting of number copy.

Three problems were considered in this study. These problems are:

1. To determine the difference in speed in number typewriting between the experimental group using the videotape as an aid to the improvement and correction of typewriting techniques and the control group using the traditional method.

2. To determine the difference in accuracy in number typewriting between the experimental group using the videotape as an aid to the improvement and correction of typewriting techniques and the control group using the traditional method.

3. To determine the degree of difference that exists in number typewriting techniques between the experimental group using the videotape as an aid to the improvement and correction of typewriting techniques and the control group using the traditional method.

#### Purpose of the Study

The primary purpose of this study was to provide evidence that would substantiate the utilization of the videotape as a device to aid in the teaching of correct number typewriting techniques.

#### Need for the Study

This study would provide general information in regard to the use of videotape in typewriting classrooms. Videotape equipment is readily being adapted for classroom use; however; there is virtually no information presently available for typewriting teachers in regard to the use of this specialized equipment. Literature indicates that there is a greater incentive for improvement when a person is able to

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know himself and evaluate his performance on a given technique. Because of this unique feature of videotaping, it would seem logical to say that students who view themselves while typewriting and evaluate their performance would differ from those subjected to traditional instruction. A study is needed, therefore, to measure the performance of typing students using the videotape.

#### Delimitations of the Study

1. The experiment included thirty-four students enrolled in the typewriting I class at Lakota High School during the 1969-70 school year.
2. Only the video portion of the videotape was used.
3. The length of the experiment covered approximately two weeks or the time spent in the presentation of the numbers.
4. One-minute timed writings were used to compare the achievement of the two groups in speed and accuracy in typing numbers.

The researcher recognized that there were many typewriting factors which may have been considered in this experiment; but to enable a concise study to be conducted, only techniques, speed, and accuracy in typing numbers were considered.

#### Limitations of the Study

In a study of this nature, the researcher was limited to his knowledge of the operation of the videotape and its application to the typewriting analysis.

## Definition of Terms

Below is a list of terms that will appear in this study.

- straight-copy material: Material written in sentence form commonly used for typing speed tests.
- Gross strokes: The total number of characters and spaces in given timed writing.
- Gross words: The gross strokes typed from the printed copy and divided by five.
- Number copy: Typewritten material made up of Arabic numerals.
- Videotaping: The process of using a videotape camera and recorder to reproduce images on videotape.

## Null Hypothesis

The Null Hypothesis states: (1) there will be no significant difference in speed improvement in the teaching of numbers in typewriting between the experimental group using the videotape as compared with the control group using the traditional method; (2) there will be no significant difference in technique improvement in the teaching of numbers in typewriting between the experimental group using the videotape as compared with the control group using the traditional method.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

Much research has been done concerning the improvement of speed and accuracy in typewriting, but very little is available concerning the use of the videotape for this purpose.

Due to the latest trends in automated equipment, more emphasis is being placed on speed and accuracy in the use of numbers in our modern era. This emphasis in the use of digits provides the teachers with the responsibility of preparing typists to be as proficient on the number keyboard as they are on the alphabetic keyboard.

The development of techniques, together with speed and accuracy, is one of the prime functions in the teaching of numbers in typewriting. Tonne, Popham, and Freeman state: "If technique is developed, speed and accuracy are natural concomitants . . . . Speed and accuracy are not ends in themselves, they come as the result of control."<sup>1</sup>

Smith and Wooschlager<sup>2</sup> logically predict that through the use of videotape techniques in business education classrooms, students

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<sup>1</sup>Herbert A. Tonne, Estelle L. Popham, and M. Herbert Freeman, Methods of Teaching Business Subjects (New York: Gregg Division, McGraw-Hill Book Company, 1965), p. 40.

<sup>2</sup>Patsy C. Smith and Ruth E. Wooschlager, "Prospective Business Teachers See Themselves As Others See Them," The Balance Sheet (March, 1969), p. 308.

view themselves in action, and who can evaluate their own performance with their instructor, will differ greatly from those subjected to traditional training. They will be able to react positively and benefit from a replay and a critique. Through this medium of videotape, business education students see themselves as others see them. The incentive to improve comes from the judgment of self-criticism.

Before techniques become automatic, they must be retaught several times. The instructor must determine the weakness of his students through observations and then redemonstrate the basic skills needed for improvement until mastery is attained. Tonne, Popham, and Tonne comment further on techniques as they cite the following example:

A typist may have developed very good stroking facility and may have reached a fairly high rate of speed although he brings his hand away from the keyboard when shifting. If the teacher points out to him the need for improving his operation of the shift key, he may say, "But that way is awkward. I can do it much faster this way." Obviously, the change over will impede progress until the new skill is brought to the level of the old one. The task of the teacher is to show the learner that the ultimate gain will be worth the effort.<sup>1</sup>

The teacher could show the student his weaknesses in technique through the use of the videotape.

Another way the videotape is being used is in micro-teaching situations in the business methods classes. The student who is preparing to become a business teacher is videotaped while he teaches a short five-minute lesson. The playback follows immediately--or when the class meets for the next time. The replay is critiqued by the

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<sup>1</sup>Ibid., 49.

student-teacher himself as well as the instructor. This technique serves as a means for revealing both strengths and weaknesses in the individual's teaching performance. The ultimate goal in microteaching is for the teacher to become a willing and effective critic of his own teaching. The ability to start and stop the video-recorder and replay segments of the tape enables the student-teacher to see immediately his own actions and leads to the student's awareness of the problem, a necessary first step toward its solution.

Just as a teacher profits from viewing a videotape of his own teaching, a student may benefit from viewing a videotape of his own techniques at the typewriter.

Hanson<sup>1</sup> states that the videotape is: ". . . a useful tool for the teacher whenever it is desired that sight and sound be recorded and played back for the review and evaluation by the teacher and/or students." The application of both senses, sight and sound, will permit the student to remember and comprehend more and actually see what his deficiency in techniques really are. Hanson also states that learning will be improved when as many senses as possible are used in the learning situation.

Nanassy<sup>2</sup> also agrees on the theory of teaching through the use of as many senses as possible when he advocates: "One of the essential ingredients in effective teaching is the judicious use of audio-visual aids. . . . the learning process is accelerated and

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<sup>1</sup>Robert N. Hanson, "How You Can Use Videotape," Business Education World, IL (May, 1969), pp. 7-8, 26.

<sup>2</sup>Louis C. Nanassy, "Visual Aids In Teaching Typewriting," Methods of Teaching Typewriting, XXXVIII (New Jersey: Somerville Press, 1965), p. 237.

strengthened when presentations appeal to more than one sensory organ. . . . Better and longer lasting results are generally obtained through multi-sensory learning experiences."

The teaching of any subject matter can be retained longer if more emphasis is placed on the topic during presentation. Tonne, Popham, and Freeman point out:

. . . the instructor should teach through the use of as many senses as he can. . . . In typewriting, the student learns correct stroking by seeing the demonstrator's hand and arm position, by hearing a clean-cut stroke, by looking at the keyboard and getting the "feel" of the reaches before he attempts touch typewriting.<sup>1</sup>

The combination of nearly all the sensory learning organs may be put to use in corrective measures by implementing them with the use of the videotape recorder in the typewriting classroom.

Any teaching aid must be measured in some manner to determine its validity. West suggests that students should be evaluated by averaging their performance on a test. He comments further:

It is inappropriate either to select the best of several performances or to use repeated tries at the same test copy--because test reliability is thereby lowered. Instead, use the sum (or average) of all performances on any given testing occasion.<sup>2</sup>

#### Presentation of Numbers

Results of a questionnaire-survey conducted nationally by Robinson reveals how many numbers typewriting teachers prefer to teach in each lesson. Fifty-three percent of the respondents

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<sup>1</sup>Tonne, Popham, and Freeman, op. cit., p. 43.

<sup>2</sup>Leonard J. West, "Teaching Typewriting," Delta Pi Epsilon Research Bulletin Number 2 (1962), p. 11.



ferred to present only two new number keys per lesson, while over fifty percent of the same respondents preferred to present three new letter keys per lesson.<sup>1</sup> He continues by stating that regardless of the method used, better results were obtained when the teaching of numbers was delayed for a period of from eight to ten days following the completion of the teaching of the letter keyboard. This period of time appeared to be needed by most students for establishing control over the letter key locations and the various reach patterns.

Lessenberry, Crawford, and Erickson also recommend postponing the introduction of numbers until a certain degree of skill has been reached. They state:

At this point, you must decide whether the class is ready to start to learn the control of the figures and lower case characters. You should have had some indication in recent timings of the range in skill and of the probable class average typing rate. . . a reasonable rate to expect for 75 percent of the students is. . . .27 wam or more on 1-minute writings.<sup>2</sup>

A number of experiments have been done in the field of micro-teaching with the use of the videotape. No research studies, however, were found which gave a report relating to the use of the videotape in typewriting.

In summary, there are several conclusions that can be drawn from this review that gives meaning to the study.

1. People will comprehend and retain more information if in the learning process, they used more than one sensory organ.

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<sup>1</sup>Jerry W. Robinson, Practices and Preferences in Teaching Typewriting, Monograph 117 (Cincinnati: South-Western Publishing Co., 1967), p. 27.

<sup>2</sup>D. D. Lessenberry,; T. James Crawford,; and Lawrence W. Erickson, Manual for 20th Century Typewriting (7th ed.; Cincinnati: South-Western Publishing Company, 1957), p. 18.

2. The use of the videotape in teaching will benefit students who need to be self-critical or professionally criticized.

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## CHAPTER III

### PROCEDURES

This chapter will explain the specific steps followed in conducting this experiment relating to the use of the videotape in teaching of numbers.

#### Organization for the Experiment

The Lakota High School gave the writer permission to conduct this experiment in the typewriting classroom in its school system. The school administration gave the researcher full cooperation and was very helpful in lending assistance in the actual videotaping of the experiment.

One typewriting class was used in the experiment. The class consisted of thirty-four students. Thirty-two of these students were sophomores and two students were seniors. None of the students enrolled in the class had previous training on the use of the typewriter. The typewriting room used for the experiment was 21' x 28' in size. The room was of sufficient size for the videotape equipment to be moved throughout the classroom. The videotape recorder used in the experiment was a Sony, Model PVR-304RV. The camera was equipped with both a wide angle lens for a broad view and a telephoto lens for close-up filming. After experimenting with both lenses, the wide angle was selected as the lens to be used for the experiment because it showed more of the student at his typewriter. After five weeks of school had

sed and the keyboard and technique instruction on the alphabet been presented, the students were ready to learn numbers. The experiment began at that time.

### Equating the Sample

At the beginning of the experiment, three one-minute timed writings were administered to the students. These timed writings were taken from the "20th Century Typewriting" text using straight copy material suited for students who had just completed the introduction to the alphabetic keyboard. (See Appendix, page 48). This was the official text used by the Lakota High School at the time of this experiment. Student performance on each timed writing was determined by computing average gross words per minute and calculating total average errors (See Table 1, page 13, and Table 2, page 14). A total of three timed writings were given. On each timed writing, the speed and errors were calculated separately. The two best one-minute timed writings were averaged for each student to determine his pretest rate for matching purposes. As indicated in the related literature, a pretest was used to determine whether the students had reached the level of expectancy for presentation of the number keyboard or whether time was needed for additional practice on the alphabetic keyboard. The class was divided into two groups--a control group and an experimental group. Both groups were in the same classroom; however, neither group was aware that they were being placed in a group. The gross words per minute scores taken on the pretest were arrayed from high to low. The groups were then matched primarily according to gross words per minute. Consideration was also given to their

TABLE 1

AVERAGE SPEED AND ERRORS, COMPOSITE  
 ITED AND RANK ATTAINED BY THE  
 STUDENTS IN THE CONTROL  
 GROUP ON THE PRETEST

Student Number	Average Speed <sup>a</sup>	Average Errors <sup>b</sup>	Composite ITED	Class Rank
1	16	3	78	4
2	11	2	61	7
3	23	2	74	27
4	17	3	74	11
5	19	2	92	1
6	29	7	74	12
7	42	2	55	9
8	17	5	62	28
9	23	2	48	26
10	21	2	94	10
11	17	2	82	31
12	17	1	55	38
13	21	4	74	23
14	21	3	35	37
15	9	2	29	44
16	14	3	68	33
17	18	3	82	30

- a. The average gross words per minute on the best two of three one-minute timed writings.
- b. The average errors per minute on the best two of three one-minute timed writings.
- c. Class Average:
- |                         |      |
|-------------------------|------|
| Gross words per minute  | 19.7 |
| Gross errors per minute | 2.8  |
| Composite ITED scores   | 66.0 |
| Class Rank              | 21.7 |

TABLE 2

AVERAGE SPEED AND ERRORS, COMPOSITE  
 ITED AND RANK ATTAINED BY THE  
 STUDENTS IN THE EXPERIMENTAL  
 GROUP ON THE PRETEST

Student Number	Average Speed <sup>a</sup>	Average Errors <sup>b</sup>	Composite ITED	Class Rank
1	20	4	97	2
2	17	2	68	6
3	46	2	82	7
4	16	2	62	16
5	22	7	68	13
6	15	5	48	19
7	27	8	74	14
8	24	1	48	20
9	10	5	68	34
10	25	2	23	31
11	17	1	96	3
12	18	4	55	35
13	12	2	35	40
14	19	2	74	15
15	16	1	78	8
16	18	1	86	22
17	23	1	68	24

a. The average gross words per minute on the best two of three one-minute timed writings.

b. The average errors per minute on the best two of three one-minute timed writings.

c. Class Average: Gross words per minute 20.2  
 Gross errors per minute 2.9  
 Composite ITED scores 66.0

osite score on the Iowa Test of Educational Development, and their rank. These 34 subjects were assigned identical numbers according to their matching scores in each group. After placing the 34 students into the two groups, a toss of the coin was used to determine which group would be the experimental group. A code letter was placed after each student's name on the class roll to indicate the group in which the student was placed. The letter "C" represented the control group and the letter "E" represented the experimental group. The average gross words per minute on the pretest for the control group was 17 words per minute with 2.8 gross errors per minute. The experimental group had an average of 20.3 words per minute with 2.9 gross errors per minute. The composite scores on the ITED were averaged and resulted in an average of 1136 from a total of 1136 for the 17 students involved in the control group and a 66 average from a total of 1130 for the students involved in the experimental group. The rank in class was averaged with a rank of 24.0 for the experimental group and a 21.7 for the control group. There were ten girls and seven boys in the experimental group and eleven girls and six boys in the control group. No attempt was made, however, to assign the students to a group according to their sex.

#### Conducting the Experiment

Students were not informed that they were participating in an experimental study. They were not told why the videotape was being used other than to make them aware of weaknesses in their techniques. It was necessary, however, to inform the students that everyone would be viewed on the videotape sometime during the semester and that some students would be viewed twice before others would be viewed for the

time. This was to enable the researcher to follow through on experiment. To reduce tension caused by the videotape, the researcher explained that the timed writings that were to be given would be graded in any way but merely used as a means of following student achievement for guidance purposes.

Lesson plans were prepared for each set of numbers presented. Numbers were presented according to the lessons corresponding with "20th Century Typewriting" text. The traditional home-row method of teaching the numbers was used. All the numbers were presented in lessons. Number drills relating to the numbers presented for each one followed the presentation. The lessons were presented in approximately 15 minutes and the remainder of the period was used as a practice session.

After all the numbers had been presented, each student in the experimental group was videotaped while typing a practice drill on the typewriter keyboard. The videotape machine was mounted on wheels so it could be moved up and down the aisles. Approximately two minutes were allowed to videotape each student. The videotaping of the students was done in random order so that they would be less aware that they were being taped.

In order to rate the students objectively, the researcher adopted a value scale of the following: 1=excellent; 2=very good; 3=average; 4=poor. An evaluation form was selected using this scale to evaluate their number typing technique. Figure 1, page 17, illustrates the types of errors in technique that were observed during the videotaping. They consisted of: Quick stroking of the fingers, curvature of the wrists, elbows close to the body, position at the typewriter,



FIGURE 1  
CHECKSHEET EVALUATION  
TYPEWRITING I

Technique Used	First Taping Session		Second Taping Session	
	Rating	Comments	Rating	Comments
Wick Stroking of Fingers	1 2 3 4		1 2 3 4	
Curvature of Wrists	1 2 3 4		1 2 3 4	
Elbows Close to Body	1 2 3 4		1 2 3 4	
Position at Typewriter	1 2 3 4		1 2 3 4	
Technique of Carriage Return	1 2 3 4		1 2 3 4	
Space Bar Technique	1 2 3 4		1 2 3 4	
Head Movement	1 2 3 4		1 2 3 4	
Student Sitting Tall in Chair	1 2 3 4		1 2 3 4	
Fingers Returning to Home Row	1 2 3 4		1 2 3 4	

Rating Scale: 1=Excellent  
2=Very Good  
3=Average  
4=Poor

technique of carriage return, space bar technique, head movement, student sitting tall in his chair, and fingers returning to the home row. A para-professional assisted in the videotaping. The researcher compiled an evaluation checksheet on the techniques of each student as they were being videotaped. This checksheet was gone over with the student prior to viewing his techniques on the tape. During this first taping session, thirteen of the seventeen students were taped. The remaining four students were taped during the practice session on the following day. During the practice session of the second day, a checksheet evaluation was made of all the students in the control group concerning their techniques.

#### Conferences with the Student

Individual conferences were held with each student in the experimental group during the next class period and also during the students free period. While each student was viewing himself on the tape, the researcher pointed out the weaknesses in technique that were observed on the evaluation sheet. Each individual conference lasted approximately five minutes in length. During the next typing class period, the techniques on the evaluation checksheet were gone over orally with each student.

#### Testing

After going over the techniques with each group, three one-minute timings were given to both groups. Simple number combinations of four-digit numerals with space intervals resulting in one five-digit word were used. The average of the two best timings for both speed and accuracy were recorded.

The same procedure followed at the end of a two week period. The experimental group was again taped and an evaluation checksheet was prepared for each student in both groups. The length of practice time between the two testing periods enabled the students to become more familiar with straight copy and number typing. Individual conferences were again held with the students in the experimental group. A second series of testing followed after techniques were gone over with both groups (See Appendix, page 50). The same procedure was followed as in the initial testing session. The same type of number combinations were used for the second testing period. Three one-minute timings were again given and the two best scores were averaged and recorded in the record book for the second testing.

#### Final Evaluation

At the end of the first semester or approximately eleven weeks later, the final testing analysis was conducted. The same testing procedure was followed. The students were not videotaped during this time. The average scores were again recorded in the record book for evaluation purposes. After the three timed writings were recorded, each student's average gross words and average errors were completed. From the individual students averages, the class average was computed for each of these testing periods. The average gross words per minute and average errors were compared in each group.

#### Class Averages

From the data collected, class averages were determined for the pretest scores, the periodical testing scores, the techniques

evaluated, and the final evaluation scores. These class averages are used to compare the gains or losses of the two groups in the area of speed and technique improvement.

STANDARDIZATION OF THE

## CHAPTER IV

### FINDINGS

The experiment involved videotaping the typewriting techniques of 34 students enrolled in Typewriting I at Lakota High School during the 1969-70 school year. The class was divided into two groups according to their gross typing speed achieved on a pretest, composite ITED test scores, and class rank. After the presentation of the number keyboard, the experimental group was videotaped while typing numbers. Two weeks later, they were taped again. Typing techniques were observed and recorded for both groups by the researcher using an evaluation checksheet. The researcher then met with each student in both groups individually and explained their weaknesses in techniques. In addition to individual conferences with the researcher, the experimental group was shown their typing techniques on the videotape. The purpose was to compare the improvement, if any, in techniques through observation and by comparing scores by means of timed writings for speed.

The findings reported in this study were based on (1) an evaluation of typing techniques used by the students and (2) by an evaluation of one-minute timed writings. This information is used to compare the effect that videotaping had on improving the typing techniques and speed in typing numbers in relation to the traditional method of instruction in typing numbers.

Through the analysis of the data, the researcher determined:

(1) the effect of the videotape on typewriting techniques and (2) the effect of the videotape on speed between the control group and the experimental group.

#### Analysis of Speed and Accuracy For The Control Group

Table 3, on page 23, shows the data accumulated for the control group. This table illustrates the results of gross words per minute and gross errors per minute for two individual timings and the final timed writing. The first timed writing was given after the researcher had gone over the techniques verbally with each student pointing out their weaknesses. The class average on the first timing was 15.2 gross words per minute and 1.2 gross errors per minute. The second timing was given two weeks later and resulted in 15.8 average gross words per minute with a 1.2 average gross errors per minute. The average speed was increased .5 over the first timing while the error limit remained the same. Nine of the seventeen students showed an increase of one or more words while five students decreased one or more errors per minute. The final test scores showed a slight increase in speed of 1.6 words per minute over the first timing with no definite decrease in the number of errors committed. Thirteen students revealed an increase of one or more words over the first timing.

#### Analysis of Speed and Accuracy For The Experimental Group

Table 4, on page 24, shows the data accumulated for the experimental group. This table illustrates the results of gross words

AVERAGE SPEED AND ACCURACY ATTAINED  
BY CONTROL GROUP ON NUMBERS

Student Experiment Number	First Timing		Second Timing		Third Timing	
	GWPMA	GEPMB	GWPMA	GEPMB	GWPMA	GEPMB
1	24	1	25	1	27	1
2	22	0	19	1	Dropped	
3	16	1	19	3	23	4
4	18	0	19	1	16	0
5	15	1	18	0	19	1
6	18	1	19	1	17	1
7	14	2	13	2	15	1
8	18	2	19	0	19	0
9	10	0	16	2	15	1
10	14	1	14	1	16	1
11	13	7	15	1	16	1
12	12	2	9	2	13	0
13	12	0	11	0	15	1
14	13	0	17	5	15	3
15	14	3	12	1	12	0
16	14	0	14	1	15	1
17	13	0	11	0	16	0
	15.2 <sup>a</sup>	1.2 <sup>b</sup>	15.8 <sup>a</sup>	1.2 <sup>b</sup>	16.8 <sup>a</sup>	1.0 <sup>b</sup>

Class Average: <sup>a</sup>Gross Words Per Minute  
<sup>b</sup>Gross Errors Per Minute

AVERAGE SPEED AND ACCURACY ATTAINED  
BY EXPERIMENTAL GROUP ON NUMBERS

Student Experiment Number	First Timing		Second Timing		Third Timing	
	GWPM <sup>a</sup>	GEPM <sup>b</sup>	GWPM <sup>a</sup>	GEPM <sup>b</sup>	GWPM <sup>a</sup>	GEPM <sup>b</sup>
1	26	0	27	2	29	1
2	21	1	24	0	26	0
3	19	1	19	0	23	3
4	20	1	19	3	18	4
5	17	1	17	1	13	1
6	16	1	18	1	20	5
7	15	6	20	5	23	3
8	14	1	19	1	18	1
9	11	1	16	1	17	1
10	17	4	18	0	19	0
11	18	0	15	4	17	2
12	15	1	18	1	18	2
13	14	0	17	1	18	1
14	15	1	16	1	15	1
15	12	0	12	0	12	1
16	11	2	17	5	13	2
17	12	1	13	1	15	3
	16.0 <sup>a</sup>	1.2 <sup>b</sup>	17.9 <sup>a</sup>	1.5 <sup>b</sup>	18.4 <sup>a</sup>	1.8 <sup>b</sup>

Class Average:   <sup>a</sup>Gross Words Per Minute  
                      <sup>b</sup>Gross Errors Per Minute



minute and gross errors per minute for two individual timings in the final timed writing. The techniques evaluated were shown to a student on the videotape prior to the timing. The class average for the first timing was 16.0 gross words per minute with 1.2 gross errors per minute. There appeared to be no significant difference between the two groups following the first timing. The experimental group typed .8 words per minute faster while the average errors remained the same. The second timing resulted in 17.9 average gross words per minute with 1.5 average errors per minute. The average speed was increased 1.9 words per minute and the errors increased .3 words per minute. Twelve students increased one or more words per minute and four students decreased one or more errors per minute. The final test indicated a 2.4 word per minute increase over the first timing with a .6 increase in the average errors committed. Twelve students increased two or more words per minute over the first timing.

#### Comparison of Techniques For The Control Group

The technique scores the control group received are reported in Table 5, page 26. The class average for the first evaluation based on the evaluation scale was 2.03. The second evaluation revealed a slight increase in the technique scores. Seven students increased .2 or more, six students remained the same, and four students decreased slightly in their technique scores over the first evaluation.

#### Comparison of Techniques For The Experimental Group

The technique scores the students in the experimental group received are reported in Table 6, page 27. The class average for the

TABLE 5

AVERAGE COMPARISONS OF TECHNIQUES BETWEEN  
FIRST AND SECOND EVALUATION  
OF THE CONTROL GROUP

(Based on the following Rating Scale:  
1=excellent; 2=very good; 3=average; 4=poor)

Student Experiment Number	First Evaluation	Second Evaluation	Evaluation Difference
1	1.0	1.0	0.00
2	1.7	1.2	+0.50
3	1.4	1.4	0.00
4	1.9	1.9	0.00
5	1.6	1.6	0.00
6	1.4	1.4	0.00
7	1.6	1.6	0.00
8	2.0	1.8	+0.20
9	2.0	2.1	-0.10
10	2.4	2.2	+0.20
11	2.2	1.7	+0.50
12	2.1	2.2	-0.10
13	2.7	3.0	-0.30
14	2.4	2.2	+0.20
15	2.1	2.3	-0.20
16	3.0	2.9	+0.10
17	3.0	2.6	+0.40
	2.03 <sup>a</sup>	1.94 <sup>b</sup>	+0.09 <sup>c</sup>

Class Average: <sup>a</sup>Class average on first evaluation

<sup>b</sup>Class average on second evaluation

<sup>c</sup>The difference between the first and second evaluation

TABLE 6

AVERAGE COMPARISONS OF TECHNIQUES BETWEEN  
FIRST AND SECOND EVALUATION  
OF THE EXPERIMENTAL GROUP

(Based on the following Rating Scale:  
1=excellent; 2=very good; 3=average; 4=poor)

Student Experiment Number	First Evaluation	Second Evaluation	Evaluation Difference
1	1.3	1.0	+0.30
2	1.2	1.4	-0.20
3	1.7	1.7	0.00
4	1.4	1.4	0.00
5	1.8	1.3	+0.50
6	2.3	1.6	+0.70
7	2.3	1.2	+0.11
8	2.2	1.8	+0.40
9	2.0	1.2	+0.80
10	2.2	1.7	+0.50
11	2.4	2.3	+0.10
12	1.6	1.3	+0.30
13	2.6	2.9	-0.30
14	2.1	1.7	+0.40
15	1.8	1.3	+0.50
16	2.0	2.0	0.00
17	2.1	1.8	+0.30
	1.94 <sup>a</sup>	1.62 <sup>b</sup>	+0.32 <sup>c</sup>

Class Average: <sup>a</sup>Class average on first evaluation  
<sup>b</sup>Class average on second evaluation  
<sup>c</sup>The difference between the first and second evaluation

first evaluation was 1.94 while the second evaluation indicated 1.62. This was an improvement in technique of .32 over the first evaluation. Eleven students revealed an increase of .3 or more, three students remained the same, and four students decreased slightly in their technique scores over the first evaluation.

Stroking of the Fingers.--Based on the rating scale of

1=excellent; 2=very good; 3=average; 4=poor; the control group received a grand mean on the first evaluation of 2.4 and a grand mean of 2.2 on the second evaluation. The experimental group had a grand mean of 2.5 on the first evaluation and a grand mean of 2.1 on the second evaluation. The control group improved .2 on the second evaluation while the experimental group improved .4 on the second evaluation.

Curvature of the Wrists.--The control group received a grand

mean of 2.0 on the first evaluation and a grand mean of 1.9 on the second evaluation. The experimental group received a grand mean of 2.0 on the first evaluation and a grand mean of 1.9 on the second evaluation.

Elbows Close to the Body While Typing.--The control group

received a grand mean of 1.6 on the first evaluation and a grand mean of 1.4 on the second evaluation. The experimental group received a grand mean of 1.9 on the first evaluation and a grand mean of 1.5 on the second evaluation. The control group improved .3 on the first evaluation and .1 on the second evaluation.

Position at the Typewriter.--The control group received a

grand mean of 1.9 on the first evaluation and a grand mean of 1.9 on

e second evaluation. The experimental group received a grand mean of 1.5 on the first evaluation and a grand mean of 1.5 on the second evaluation.

Technique of the Carriage Return.--The control group received a grand mean of 1.8 on the first evaluation and a grand mean of 1.7 on the second evaluation. The experimental group received a grand mean of 1.6 on the first evaluation and a grand mean of 1.6 on the second evaluation. The control group improved .1 over the first evaluation while the experimental group showed no improvement.

Technique in Using the Space Bar.--The control group received a grand mean of 1.8 on the first evaluation and a grand mean of 1.7 on the second evaluation. The experimental group received a grand mean of 1.9 on the first evaluation and a grand mean of 1.5 on the second evaluation. The experimental group improved .4 on the second evaluation while the control group improved .1.

Technique of Head Movement.--The control group received a grand mean of 2.9 on the first evaluation and a grand mean of 2.6 on the second evaluation. The experimental group received a grand mean of 2.1 on the first evaluation and a grand mean of 1.8 on the second evaluation. Both groups improved .3 on the second evaluation.

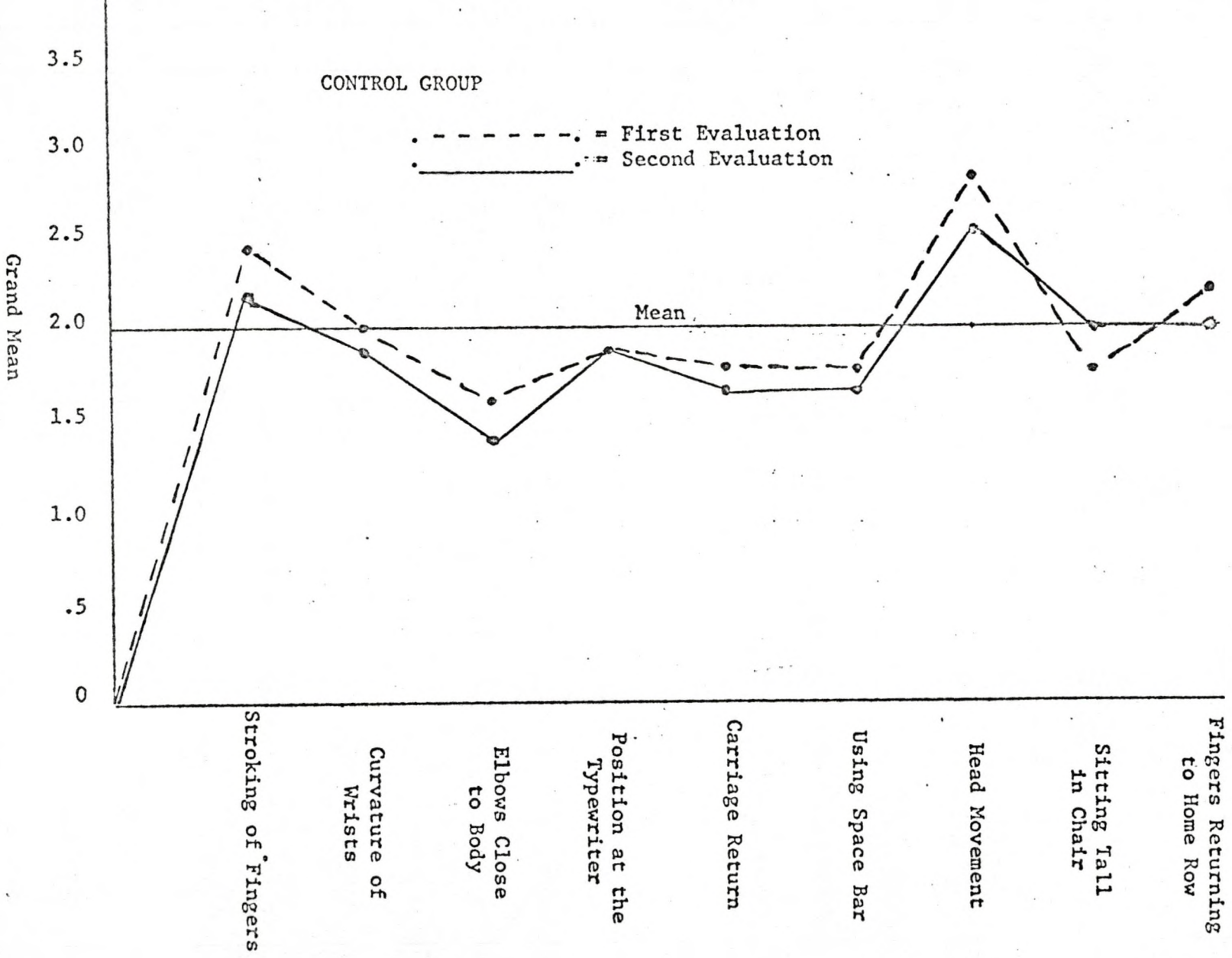
Technique of Student Sitting Tall in the Chair.--The control group received a grand mean of 1.8 on the first evaluation and a grand mean of 2.0 on the second evaluation. The experimental group received a grand mean of 1.6 on the first evaluation and a grand mean of 1.2 on the second evaluation. The experimental group increased their technique by .4 on the second evaluation while the control group decreased .2 on the second evaluation.

Fingers Returning to the Home Row.--The control group received a grand mean of 2.2 on the first evaluation and a grand mean of 2.0 on the second evaluation. The experimental group received a grand mean of 2.4 on the first evaluation and a grand mean of 1.6 on the second evaluation. The control group improved .2 on the second evaluation while the experimental group improved .8 on the second evaluation.

#### Summary of Techniques For Control Group

The technique scores which gave the students in the control group the most difficulty while being observed at the typewriter are reported in Figure 2, page 31. Head movement was the technique giving the students the most difficulty in the control group. Sixteen of the seventeen students had trouble with head movement which showed a class average of 2.9 based on the rating scale. Quick stroking of the fingers was the second most difficult technique observed showing a class average of 2.4. The technique that was observed which gave the students the least amount of difficulty was having the elbows close to the body. This technique had a class average of 1.9.

Head movement was again the technique giving the students the most difficulty on the second evaluation. The class reported an average of 2.6 based on the rating scale. Observation of head movement also showed the most improvement on the second evaluation. The techniques of position at the typewriter and student sitting tall in his chair resulted in a decrease over the first evaluation.



EXPERIMENTAL GROUP

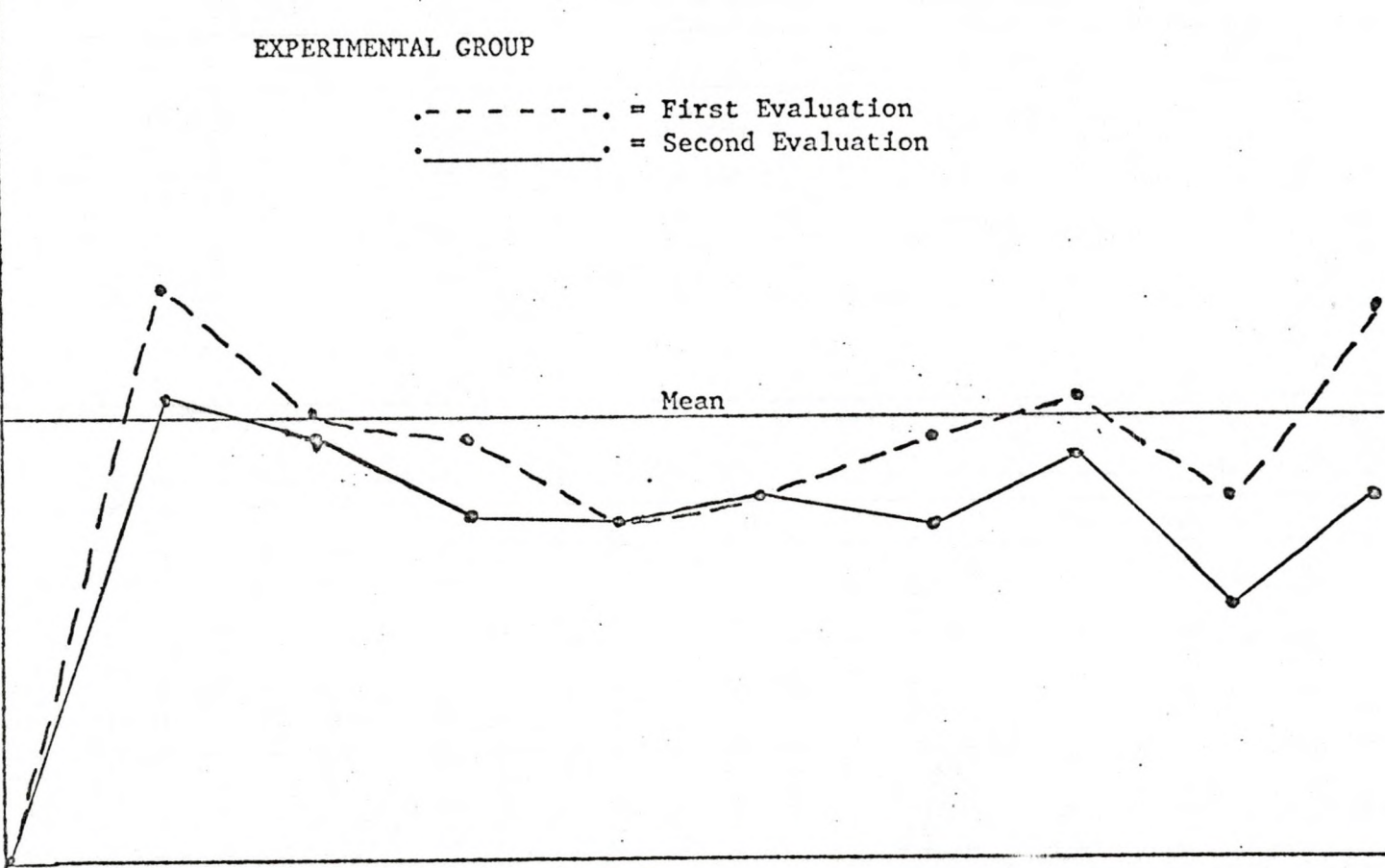
Grand Mean

3.5  
3.0  
2.5  
2.0  
1.5  
1.0  
.5  
0

--- = First Evaluation  
— = Second Evaluation

Mean

Fingers Returning to Home Row  
Sitting Tall in Chair  
Head Movement  
Using Space Bar  
Carriage Return  
Position at the Typewriter  
Elbows Close to Body  
Curvature of Wrists  
Stroking of Fingers





## Summary of Techniques For Experimental Group

The technique scores which gave the students in the experimental group the most difficulty while being observed at the typewriter are reported in Figure 3, page 32. Quick stroking of the fingers gave the students the most difficulty with a class average of 5. Thirteen students had trouble with this technique. Fingers returning to the home row was the second most difficult technique observed showing a class average of 2.4

Comparing the second evaluation with the first, the results indicated that quick stroking was again the most difficult with a class average of 2.1. Nine students showed an increase in technique all over the first evaluation. The technique showing the most improvement was 'fingers returning to the home row.' Ten students indicated a definite increase in this technique. Results indicated a total difference of 13 or 31 percent increase over the first evaluation. The technique giving the students the least amount of difficulty was 'students sitting tall in their chair' which showed a class average of 1.2 on the rating scale.

Comparing the two groups on a class average for all techniques involved indicates the control group with an improvement of 4.4 percent on the second evaluation over the first and the experimental group with an improvement of 16.5 percent on the second evaluation over the first.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter five includes a summary of the experiment, conclusions, and recommendations based upon the material collected during the experiment. The conclusions are the writer's interpretations of the data, and the recommendations based on those conclusions.

#### SUMMARY

In this experimental study, the videotape was used to determine the effectiveness of improving and correcting techniques in the typewriting of number copy. Two groups were used in the experiment. Both groups were given the same material to be typed and a checksheet evaluation was used to check techniques used while typing numbers. A pretest, two periodical tests, and a final test were also given to each group of students. These tests consisted of 3 one-minute timed writings. The results of the technique evaluation sheets and the timed writings were averaged for each group and recorded on tables. A summary of the data based on these evaluations follows:

1. The control group improved their average gross words typed by 1.6 words per minute on numbers. This amount indicates the improvement in speed between the first timing of the experiment and the semester timing.

2. The experimental group improved their average gross words by 2.4 words per minute on numbers typed. This amount indicates the improvement in speed between the first and second timing of the experiment.

3. The control group showed a decrease of .2 errors committed when comparing the first timing with the semester timing.

4. The experimental group showed an increase of .6 errors committed when comparing the first timing with the semester timing.

5. The control group improved their technique average by .09 based on the rating scale of: 1=excellent; 2=very good; 3=average; 4=poor. This amount reveals the improvement of technique between the first evaluation of the experiment and the last evaluation without the use of the videotape.

6. The experimental group improved their technique average on the rating scale by .32. This amount reveals the improvement of techniques between the first evaluation of the experiment and the last evaluation with the use of the videotape.

7. The control group had the most difficulty with the technique of head movement on both the first and second evaluation.

8. The control group had the least difficulty with the technique of quick stroking of fingers on both the first and second evaluation.

9. The experimental group had the most difficulty with the technique of quick stroking of fingers on both the first and second evaluation.

10. The experimental group had the least difficulty with the technique of position at the typewriter on the first evaluation and the student sitting tall in his chair on the second evaluation.

11. The control group showed the greatest improvement in the technique of having elbows close to the body.

12. The experimental group showed the greatest improvement in the technique of fingers returning to the home row.

### CONCLUSIONS

The use of the videotape seems to have had a mixed effect upon the typing techniques and typing speed of first-year typing students. Although the class was small, the researcher believed that as many variables as possible were controlled which otherwise would have had a possible effect upon the results of the study. The two groups were matched as close as possible according to speed, composite ITED scores, and class rank. The time of the day and the procedures in the classroom were the same for both groups. The course material presented and the practice time on the numbers was the same for both groups.

The learning ability is increased when as many senses as possible are used. The idea of seeing yourself in action and discussing the weakness of each technique should increase this learning process.

The following conclusions were made by the writer from the data collected and the summary of the data. The use of the videotape does not appear to affect the development of speed. Both groups displayed a constant rate of improvement in speed throughout the experiment. In gross words per minute typed, the experimental group revealed a greater improvement than the control group by .8 words. The difference does not appear to indicate a significant gain in achievement of speed between the two groups.

The use of the videotape does seem to reveal a slight difference in the number of errors committed. The control group showed a decrease in the number of errors committed during the experiment while the experimental group showed a slight increase in the number of errors committed. This could have been due to the experimental group using the videotape which made them more aware of their typing techniques, thus possibly creating more tension while typewriting.

In techniques observed, the experimental group showed a greater improvement than the control group by .23 based on the rating scale.

Quick Stroking of the Fingers.--The control group improved .2 on the second evaluation based on the rating scale of: 1=excellent; 2=very good; 3=average; 4=poor; , while the experimental group improved a .4 on the second evaluation. This difference does not appear to indicate a great gain in improvement of technique in quick stroking between the two groups.

Curvature of the Wrists.--Both the control group and the experimental group improved .1 on the second evaluation over the first. There was no difference in the degree of improvement of the curvature of the wrists on the second evaluation by either group. The use of the videotape does not appear to make any affect on the technique of curvature of the wrists.

Elbows Close to the Body.--The control group improved their technique by .2 on the second evaluation compared to .4 for the experimental group. The difference does not appear to indicate a great gain in improvement of technique in having the elbows close to the body while typing.

Position at the Typewriter.--Both groups showed no improvement on the second evaluation over the first. The use of the videotape does not appear to have any affect on the technique of position at the typewriter.

Technique of Carriage Return.--The control group showed an average improvement of .1 on the second evaluation while the experimental group showed no improvement. The use of the videotape appears to show no significant difference in improvement in the technique of returning the carriage.

Technique in Using the Space Bar.--The control group showed an improvement of .1 on the rating scale compared to a .4 for the experimental group. The use of the videotape may have been a factor in the improvement in the technique of using the space bar efficiently.

Technique of Head Movement.--Both groups showed an average improvement of .3 based on the rating scale. The use of the videotape does not appear to have any effect on the technique of head movement while typewriting.

Technique of Student Sitting Tall in the Chair.--The control group decreased on the second evaluation by .2 on the rating scale. The experimental group improved their technique by .4 on the rating scale. The experimental group improved their technique by .4 on the rating scale. The difference of seeing yourself type at the typewriter through the use of the videotape appears to have had some influence on the improvement in the technique when comparing the two groups.

Fingers Returning to the Home Row.--The control group showed an improvement of .2 on the second evaluation. The experimental group showed an improvement of .8 on the second evaluation. The difference in improvement in fingers returning to the home row may have been through the use of the videotape.

The null hypothesis stated: There will be no significant difference in speed and technique improvement in the teaching of numbers in typewriting between the experimental group using the videotape as compared with the control group using the traditional method. There was not a great difference between the two groups in either average speed or technique improvement. The experimental group did not demonstrate an improvement that would be of any significance. Therefore, these facts are not of such a magnitude to reject the null hypotheses. Therefore, under the experimental conditions and the data collected, the null hypotheses must be accepted.

#### RECOMMENDATIONS

The following recommendations are based on the findings of this study:

1. Although there was very little difference in gain of speed the experimental group demonstrated a slightly greater improvement. For this reason, the videotape should be used to keep students alert and striving for improvement.
2. The use of the videotape appears to aid in correcting some of the necessary techniques needed for typewriting improvement.

For this reason, the videotape should possibly be used from the beginning of typewriting instruction until the basic techniques are mastered.

Based on the findings, the following are recommendations for further research:

1. Further research is needed to include a larger sampling of subjects.
2. The subjects from each sample should also be matched according to finger dexterity tests and reading comprehension to get a closer matched group.
3. All students in both groups should use the same make and model of typewriter.
4. Two separate classes should be used.
5. Further research should be made starting at the beginning of the year when the alphabetic keyboard and techniques are first introduced.



APPENDIX A

UNEDITED COMMENTS

CONTROL GROUP

## UNEDITED COMMENTS

## CONTROL GROUP

If I had seen myself on the tape, I am sure I would have improved. You are more alert and attentive when someone is watching you. I do a better job and am a lot neater.

I think it might have helped to have been taped. It would probably make you improve, but it depends on the person. If the individual was a nervous person, it wouldn't help much because their mind would not be on their work. If I had been taped, I think it would have helped me because I am not a nervous person and if I saw the things I did wrong, I would try to improve them. I know some of the errors I make, like leaning back in my chair and not sitting up straight but it might help if I saw myself doing these things.

I think if I would have been taped, it would have helped me because it is easier to learn if you can actually see yourself make the mistakes. If you know exactly what your mistakes are, it is much easier to correct them. I am sure it would have made me nervous the first time and I probably would have made lots of mistakes. I think if you would do it more often, I would have gotten used to it and then I could see how I really look when I am typing and would be able to correct my mistakes.

I don't think it would have helped me because it is how you control your fingers and how you practice that does it.

I believe that I would have benefited from being videotaped. I would have had a chance to see the errors I have been making and if you can see the mistakes, it would be easier to improve. It is easier to comprehend what you are doing wrong if you see the actual mistake instead of someone telling you what you are doing wrong. I believe it is easier on the student and the teacher. I believe the videotape machine and other machines like it should be used in the classroom.

It would not have helped me because I would have been nervous while I was typing and then I would have slowed down.

I feel that the videotape would have helped me if I was taped because it would have shown me my mistakes.

I think that the videotape would have helped me alot even though wasn't taped because at the time when you were taping us, I found myself trying harder to use the correct typing techniques. I think we are more able to understand the mistakes we make by seeing them.

I was not taped, but I feel if I would have been taped, it would have helped me.

I thought that by being taped would have helped me but under the pressure of being taped at the time would have caused me to type better and differently. I wasn't taped but I feel when you went around just observing me helped me to try and better myself. I think it would have helped me by being taped because just seeing my mistakes should have made me want to go back and try to correct those mistakes and maybe again I could be taped to see if I had improved them. Now I know what my mistakes are and I am at least trying to improve my typing.

I feel that I could have done better if I had been taped. Then I could have found out what I was doing wrong and probably corrected myself. At the present time, I can't see what I am doing wrong.

I think that the tape could have helped me, if I had been taped. It would have shown me just exactly what I do wrong, and I could have tried to improve myself. I think that I would have tried to improve myself too. I think that the videotape should be used more often.

If I was taped, I would know the mistakes I am doing, then I would try to correct them.

If I would have been taped, I would have tried to use it to the right extent.

APPENDIX B

UNEDITED COMMENTS

EXPERIMENTAL GROUP

## UNEDITED COMMENTS

## EXPERIMENTAL GROUP

I think it helped me to learn what I was doing wrong in my movements, and because of it, I feel that it helped me to type better and get my movements down. I also think that it would help if the tape would have been taken when the person is unaware of the camera.

My opinion of being taped in typing class is that it is helpful if a person takes advantage of it. It did help me in typing as it showed me what things I was doing wrong and how I could improve. For example, I should not look at the keyboard but try and keep my eyes on the copy.

I thought that the tape helped me because that way it showed me my mistakes and I could improve them. When I was taped, I think if I would have known that they were taping me, I would have done everything the opposite way. So I think it is best if you can tape them when they are not looking. When I saw my mistakes and came back in the typing room to try and improve them, I was aware of what I was doing. I felt I could catch myself easier.

I feel that it helped me to be taped because I know what I have been doing wrong by seeing myself while typing. I have tried to improve on the way I sit and return my carriage. I have also tried to improve on returning my fingers to the home row faster. Being taped made me nervous because I knew it was there, but if you were to hide the camera you would see how I really typed. I feel that when I am being taped, I type differently, so there are some areas that I could improve on. As a whole, I feel it did help me more than it would have without it.

I think the videotape helped me to a certain extent. After I saw what I did wrong, I went back to my typewriter and tried to improve. To see myself typing compared to the correct way of hand position, posture, and watching the book instead of your hands, helped me to think about the correct way of typing and after awhile, it just became a habit of mine.

It didn't seem to help me much because I am a terrible typist. I try to correct myself but it seems I just can't.

I feel I learned a lot from being taped. I could see my errors and go back and do it so I wouldn't make the same mistakes.

I feel it was worth it in a way because the instructor could see what you were doing wrong. Most of the things done wrong are usually

done wrong daily. But I also feel that in a way it isn't fair judging because you know you were being taped and it made you nervous and everything went wrong more or less. But altogether, I feel it does you good because it gives you the general idea of what you are doing wrong.

I think it might have helped us because if we see how we were typing and if we knew what we were doing wrong, we would try to do better. On the other hand, a person who was very nervous would type differently if he knew he was being taped. I don't think you should have told us that we were going to be taped because when I get nervous, I can't type as well.

I thought that I typed better because I was being taped. It would have helped me if I would have been able to correct myself. I think that we should have had a better camera because it was hard to see yourself on the television screen.

I thought the videotape was well worthwhile. It helped me to see my mistakes while I was actually doing them and I came back and really worked to improve. In my opinion, the more times I would have been videotaped, the more improvement there would have been on my part. I think more of this should be done in the classroom.

I think I gained something from being taped because I was able to see what I was doing wrong and when I typed after that, I remembered to do them right. It is easier to learn to type better from seeing the right way and the wrong way than to be told what to do.

It didn't help me much because I can't do anything when I know people are watching me. I didn't get a true picture of myself. I can do things better when I am by myself. It might help some people but not me. I feel the only way I can learn to type better is if I had my own typewriter at home and could practice by myself or had time to come in after school. Since I was only taped twice and knew when he was doing it, I got nervous and made a lot of mistakes. This might work in some cases, and might work very well.

I think it helped a little bit but I don't think I changed the way I typed. It helped to let me know where I was making my mistakes and was especially beneficial to the ones who really wanted to improve.

I think that the videotape was quite useful in some cases probably in most cases. I think that it made the students very nervous and emotional and probably won't help or improve them.

APPENDIX C

PRE-TEST MATERIAL

STRAIGHT COPY

## PRE-TEST MATERIAL

## STRAIGHT COPY

. 4 . 8 .  
 It takes time for things to grow. When a man plants a  
 12 . 16 . 20 .  
 seed of corn, he does not go out the next day to look for a  
 24 . 28 . 32 .  
 new stalk of corn, First the blade; then the ear; and then  
 36 . 40 .  
 all the grain on the ear.

. 4 . 8 .  
 It is much the same with a skill. It takes time for a  
 12 . 16 . 20 .  
 skill to grow, and it takes the right kind of work, too. A  
 24 . 28 . 32 .  
 seed of corn will grow corn and not wheat or rye. From the  
 36 . 40 . 44 .  
 work you do to build a skill, will come a skill of the same  
 48 .  
 kind.

. 4 . 8 .  
 To type well, you must learn to type with speed, to be  
 12 . 16 . 20 .  
 sure; but you must learn to type with ease so that what you  
 24 . 28 . 32 .  
 type will be right. Do the work in the right way; then you  
 36 . 40 . 44 .  
 can be sure that both speed and ease will come at the right  
 48 . 52 . 56 .  
 time. You have to work and you have to wait.



APPENDIX D

TESTING MATERIAL

NUMBER COPY

## TESTING MATERIAL

## NUMBER COPY

First Timing

8956	9843	0189	7568	8954	5648	9756	1974	4568	2332	0985	3452	12
8493	7895	8453	7249	8791	8975	6432	7896	5940	2385	3245	6549	24
2039	4877	5678	4839	2137	8476	7658	4980	2120	1092	5768	4867	36
2345	6789	6543	2198	5665	7896	6785	9010	0098	2232	7759	1543	48

Second Timing

2468	9734	7265	9802	7310	2347	8965	0989	4756	8392	1010	8383	12
9357	9358	1045	7943	8720	6574	8392	0266	4433	8822	0033	1166	24
2002	9939	4484	5577	6767	8567	8448	8343	9202	9067	9878	1919	36
1181	0987	9876	4568	4322	3343	5644	7767	8878	0909	2597	1764	48

Third Timing

2637	4778	9878	4567	3202	1980	4582	3452	7804	5758	3242	1901	12										
7896	5678	4510	9890	2093	8576	4763	9898	7620	4867	2018	6744	24										
5810	9988	9900	6890	1910	2345	5432	3425	6688	7786	9439	2010	36										
8294	5682	9675	1584	0984	2485	2349	9834	6843	9494	8732	4411	48										
--		--		--		--		--		--		--										
1		2		3		4		5		6		7		8		9		10		11		12

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