AN ABSTRACT OF THE THESIS OF

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Title: The Effect of Previewing Words on Timed Writings

Abstract approved: _Redacted for privacy_____
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The purpose of this study was to supply information
that would help improve typing courses by identifying
successful skillbuilding practices and to provide students
with a means of increasing speed and/or accuracy during
timed writings. More specifically, the purpose of this
study was to answer the question:

    Does the previewing of words have any effect

    on the speed and/or accuracy scores of

    typing students?

Procedures

The participants in this research included
178 students enrolled in 9 Typing 1 classes at West Albany
High School, Albany, Oregon. An experimental group of
95 students and a control group of 83 students were formed.
Students in the experimental group were given preview words
to practice prior to taking a three-minute timing on the

paragraph containing the preview words. Students in the control group were given timings on the same paragraph with no preview. Speed and accuracy scores were recorded for all students participating in the study.

Two null hypotheses were developed regarding the effect of previewing on three-minute timed writings. The t-test was used to test these null hypotheses.

Findings

It was established that if the t-scores of the pretests, timings, and posttests were greater than 1.975, the null hypotheses of this research were rejected. The results of all calculations showed that none of the pretest, timing, or posttest t-values exceeded 1.975. Because there was no statistically significant difference between the t-scores of the experimental and control groups, the null hypotheses of the research were accepted.

Conclusions

1. Research in the area of typing can include the use of intact class groups can produce valid findings without involving incompatibility or bias.

2. The previewing of words from a particular paragraph immediately prior to taking a timed writing on the same paragraph is unlikely to cause any change in the speed or accuracy score of that timing.

3. It is doubtful that previewing--as done in this study--will help students increase speed and/or accuracy on timed writing scores.

Recommendations

1. Research projects should be initiated to study the effects previewing may have on students who have been psychologically conditioned to believe that this type of drill will increase speed and/or accuracy on a timed writing.

2. This study should be duplicated but altered to include one or all of the following: (a) allow students to individually choose their own preview words; (b) include a system which would check the errors made during the preview drill; (3) include an examination of the relationship that exists between the preview words, test timing words, errors of the preview drill, and errors of the test timing.

3. Future studies should address the comparison of previewing versus postviewing.

4. Based on the findings of this study, it is recommended that previewing not be used extensively in the typing classroom until further research yields a level of significant difference that validates it as an effective method of instruction.

The Effect of Previewing Words
on Timed Writings

by

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Commit your works to the Lord,

And your plans will be established.

Proverbs 16:3

Now to Him who is able to do exceeding abundantly

beyond all that we ask or think,

according to the power that works within us,

to Him be the glory...forever and ever.

Amen.

Ephesians 3:20-21

To all advisors, committee members, professional personnel, colleagues, and friends who were willing to support, encourage, and instruct me during this research project, please accept my sincere thanks.

To my husband, Jim, and to my parents, Ed and Irene Wendell, thank you for believing in me and for loving me.

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CHAPTER I

INTRODUCTION

The typing classroom is a high pressure learning environment in which only those methods and techniques that are most effective should be used (Madison, p. 4). If teachers base skillbuilding techniques on procedures that have not been substantiated by research, the students will not have received the best learning experience in the limited amount of time available in the typical typing class.

This thesis has been completed for the purpose of substantiating the use of a skillbuilding technique in typing.

Statement of Purpose

The purpose of this study was to supply information that would help improve the typing course by identifying successful skillbuilding practices and to provide students with a means of increasing speed and/or accuracy during timed writings.

Statement of the Problem

The problem was to determine if previewing words from a timed writing would have an effect on speed scores and/or accuracy scores of Typing 1 students.

Statement of the Hypothesis

The following null hypotheses of the study were established:

1. There was no statistically significant difference between speed scores of beginning Typing 1 students who preview the words of a timed writing as compared with students who do not preview the words.

2. There was no statistically significant difference between accuracy scores of beginning Typing 1 students who preview the words of a timed writing as compared with students who do not preview the words.

Delimitations

The study did not attempt to determine the amount of time that should be spent doing timed writings in the typing class. Likewise, it did not attempt to specify the length

of the timed writings themselves. It attempted to determine only the effect of previewing on the timings, no matter how often or in what length they were given.

The study also did not attempt to indicate specific paragraphs that should be used for timed writings. The timed writing copy used in the study was obtained from a single textbook which was chosen because of the availability of the book and its regulated timings. Other texts, however, could have been used in conducting the study.

Because typing lists of common business words were readily available, the study did not attempt to classify preview words in a manner that would make them transferable to many different paragraphs. Although some of the preview words were common business words, the intent of the preview was to recognize typing words within individual paragraphs that caused typing difficulty for students.

The study was not designed to serve as a means of determining grading standards for timed writings. The previewing technique was examined as a skillbuilding tool that would lead to improved performance on graded material.

Finally, the timings themselves were given on different days of the week and at varying times during the class period. This study does not attempt to determine a particular weekday or time frame within the class period when timings should be administered.

Limitations

A limitation of the study was the use of intact class groups. Generalizations of the conclusions to the target population should be avoided for this reason.

Another limitation of the study was the attrition rate. The number of subjects in the study fluctuated due to scheduling changes and dropouts.

A further limitation of the study was the amount of actual class time allowed for the typing period. School schedules and assemblies caused variations in the daily routine of the classes and the amount of time available for typing.

The final limitation was the different teaching personalities and styles of the four teachers involved with the study. Specific instructions were given as to how the timings were to be administered, but a determination as to how strictly these instructions were followed was not measurable.

Definition of Terms

In order to provide a common understanding of essential terms used in this study, specific words have been defined as follows:

Timed Writing Copy: A paragraph or series of related paragraphs typed for a specified amount of time for the purpose of measuring the speed and accuracy level of typing students.

Typing 1 Class: A group of students (whose individual members may or may not have had a limited exposure to the use of the typewriter) assembled to learn basic keyboarding techniques and other related knowledge. Typing 1 was a one-year course divided into four quarters.

Skillbuilding: A technique of presenting material and drills to typing students for the purpose of increasing typing ability.

Speed Score: The amount of typing strokes computed in word form that a student was able to type within a prescribed amount of time on a specific type of paragraph.

Accuracy Score: The amount of typographical errors typed by a student during a particular timing.

Typographical Error: Any stroking deviation in typing from the original copy. Typographical errors may be letters, numbers, symbols, or a lack of proper service key use (such as the space bar, etc.).

Preview Words: Words that have been determined as error causing words for typing students.

Previewing: A technique whereby specific error causing words of a particular paragraph have been presented to students for the purpose of practice before the entire paragraph is actually typed.

In this study particular words from specific timing paragraphs were arranged to produce three lines of type which averaged 60 strokes in length. Students in the experimental group typed each line of preview words for 30 seconds prior to taking the related timing. Time was not given for the students to check for errors that may have been made when practicing the preview words. The preview drill was immediately followed by a three-minute timing. Each test timing was only given once during the research.

CHAPTER II

REVIEW OF RELATED LITERATURE

Examination of the literature revealed the preview
technique to be a traditionally accepted and effective
method of instruction in shorthand and was supported by
authors and researchers (Anderson, p. 101; Merrier, p. 10).
This review attempted to: (1) examine the effectiveness of
this skillbuilding technique; (2) illustrate the similari-
ties in the learning of typing and shorthand; (3) support a
theory of lateral transference of previewing from shorthand
to typing; and (4) clarify the need for the study.

Previewing in Shorthand

The technique of previewing material has been called
traditional, generally accepted, and a widespread practice
among business educators (Pullis, p. 54). Previewing has
been said to:

1. Take into consideration the individual differences
    of student abilities, yet allow all students to
    move through a skillbuilding drill together
    (Leslie, p. 280).

2. Increase transcription rates (speed) of students
    and lower the error rate (accuracy) in the copy
    (Jester, p. 133; Valenti, p. 3).

3. Provide purposeful repetition as external
    stimulation designed to support learning (Woodward
    and Moseley, p. 247; Gagne, p. 409).

4. Provide learning through a variety of senses which
    enhanced the learning situation as preview words
    were seen as well as heard (Leslie, p. 246).

5. Provide concentrated drills for a short period of
    time which was more effective for skillbuilding
    than lengthy drills (Seagoe, p. 61).

From the related literature it was determined that
previewing in shorthand was a drill technique that was
beneficial in nature.

Similarities of Typing and Shorthand

Typing and shorthand possess learning elements that are
similar in nature. Students who acquired a proficient level
in either subject combined thought and movement into one
deftness; practiced words, sentences, and paragraphs to
enhance these movements; and increased the speed and
accuracy of these movements through directed skillbuilding

drills. Klausmeier (p. 296) specifically identified these three similar elements when he stated that learning involved perceptual-motor skills, repetition, and stimulus-response activities. These elements are basic learning theories that have been recognized by business educators as learning elements common to both typing and shorthand (Rowe, p. 296).

Transfer of Previewing to Typing

Several theories have been used to support the theory that if previewing was beneficial in shorthand then it could prove to be valuable in typing.

The theory of generalization suggested that transfer of learning occurred when a concept of one situation provided understanding in another situation (Sorenson, p. 464). Thorndike's theory of identical elements stated that when sufficient elements of two activities were identical in nature, transfer of learning could effectively take place (Russon and Wanous citing Thorndike, p. 137). Because perceptual-motor skills, repetition, and stimulus-response activities have been shown to be identical elements of typing and shorthand, it could be concluded that previewing could also have a beneficial effect on the speed and/or accuracy scores of timed writings in typing.

Need for the Study

Because of the limited amount of time available to teachers in the classroom, only those methods and techniques that have proven to be most effective should be introduced into the (typing) curriculum (Osborn, p. 7). Teachers needed current research to examine in order to choose those methods that they wished to incorporate into their practice sessions in the form of skillbuilding drills (Pullis, p. 43). By using proven techniques, one of the goals of typing (which was the development of rapid stroking ability as a continual movement through words of varying lengths) should be obtained by students (Condon, p. 142; Russon and Wanous, p. 186).

In addition, further clarification of the preview method was essential. Of the literature reviewed regarding previewing in typing, not all authors agreed as to the effectiveness of this technique as a skillbuilding method. Hamilton (p. 196) "recommended techniques for improving typewriting...include...preview words." Clem (p. 223) said that previewing was considered to be a directed practice toward the specific goal of speed and accuracy.

In contrast, the results of a study by Lynch (1952) on previewing in typing was reported by West (p. 267) to be of "dubious value...and...pure foolishness" because of the age of the study, the limited number of students tested, and the

short length of time the study was administered. However, of the literature citing the preview technique, an overwhelming majority considered previewing to have a definite place in the typing classroom (Winger, p. 88).

In a personal interview on August 2, 1982, Dr. Fred E. Winger, a nationally recognized authority in the field of typing, stated that to his knowledge no recent significant studies on the impact of previewing in typing had been published. He has believed for some time, however, that previewing does have a place in the classroom and has been encouraging research in this area. This view was also supported by two other specialists in the field of typing who were contacted by letter (Appendices A and B). Personal letters from Dr. Jerry Robinson, assistant vice-president and senior editor of the South-Western Publishing Company (Appendix C), and Dr. C. Theo Yerian, president of Educational Research Associates (Appendix D), substantiated the need for research on the use of preview words.

In order to determine whether or not the preview technique did in fact provide students with a method of obtaining success on timed writings, the relationship of preview words in the typing class was examined and researched.

CHAPTER III

METHODS AND PROCEDURES

Introduction

Based on the findings and opinions found in the literature reviewed in Chapter 2, the following research question was still unresolved:

Does the previewing of words have any effect on the speed and/or accuracy scores of typing students?

To test the hypotheses, an experiment was designed to compare the speed and accuracy scores of students who were given preview material to students who were not.

Selection of Test Instructors

Because the number of classes involved in the research would be determined by the instructors who were willing to participate in the testing, the Typing 1 teachers at West Albany High School were allowed to choose whether or not to be involved in the study. All four of the teachers decided to participate in the research which meant that nine sections of Typing 1 classes would be used for test purposes.

The nature of the research was explained in detail to the instructors and they were given a written format (Appendix E) to use when administering the preview words and timings. They also received a score sheet (Appendix F) on which to record the results of the timings. This score sheet also served as a time schedule which charted the following information:

1. the timing number,

2. the day of the week the timing was to be given, and

3. the time of the class period itself when the timing was to be done (beginning, middle, or end of the period).

The written format to be used in administering the tests was followed by all teachers as a measure to control the varying teaching styles, personalities, and methods of the different teachers during instruction.

Sample Population

The sample population was composed of nine Typing 1 classes which totaled 178 students from West Albany High School in Albany, Oregon. This sample size (according to Fox, 1969) was considered large enough to support the experiment.

Because the groups available for study were intact groups, random selection of the participants was not possible. By a draw from a hat the classes were divided into two groups, experimental and control. The outcome of the draw was as follows:

Experimental Groups		Control Groups	
Per. 2	Teacher B	Per. 0	Teacher D
Per. 3	Teacher B	Per. 1	Teacher A
Per. 4	Teacher C	Per. 4	Teacher A
Per. 5	Teacher D	Per. 6	Teacher C
Per. 5	Teacher B		

The results of this draw placed 95 students in the experimental group and 83 students in the control group.

Calendar Framework for the Research

The classroom research took place during the third quarter of the 1982-83 school year from February 10 through March 17, 1983. This section of the school year was chosen for the following reasons:

1. The students in Typing 1 had attained a basic level of skill at the typewriter by this point in the year.

2. This period of time was not interrupted by any extended vacations such as winter or spring break.

3. The sample population was relatively stable as few
   schedule changes occur in the middle of the
   semester.

The research was to include a total of 1 pretest
timing, 1 posttest timing, and 22 test timings. In order to
avoid any bias, the timings were divided evenly between the
days of the week and the time of the class period at which
they were to be given. The results of the timings were as
follows:

Day of the Week		Time of the Period	
Monday	3	Beginning	8
Tuesday	4	Middle	6
Wednesday	6	End	8
Thursday	5		
Friday	4		
Total	22	Total	22

Due to schedule changes, some timings were moved to
different days of the week than originally designated.
These changes accounted for the fact that the timings did
not evenly rotate among the different days of the week on
which timings were given.

Determination of Preview Words

In an effort to select appropriate words for preview,
the following method was used to identify words:

1. During the second quarter of the school year the students in the Period 0 Typing 1 class typed each of the timings to be used in the research as a 3-minute timing. These students did not know that these timings were to be used for research purposes. As a result of having typed these timings their scores during the actual research period were disqualified from the study.

2. These timings were proofread and scored by the students. Upon completion of the scoring, they were again proofread by the instructor to verify errors and words per minute.

3. The typographical errors were recorded on a separate paper and each individual word was tallied as to the number of times it was missed.

4. The words were then arranged to produce three lines of type as close to 60 strokes in length as possible. Since each line of the test paragraphs was approximately 60 strokes, the preview lines would resemble the timings in format so as not to confuse the students with varying line lengths.

5. The words were placed in the preview lines (Appendix G) in the order in which they were found in the timing copy. Preview words were not

duplicated. The words that had been missed most often were the words included in these preview lines.

By using these techniques to detect preview words, the students themselves determined which words caused errors and should be used for preview purposes.

Pretesting

In order to determine individual mean scores for each student at the beginning of the experiment, each student was given one 3-minute timing on Timing 117 of PROGRESSIVE TYPEWRITING SPEED PRACTICE by Hansen and Skaff (1976). The timing selected was normal copy having a syllabic intensity within a range of 1.35 and 1.50. All the timings used throughout the testing had a syllabic intensity within this range as a control factor in choosing material to be used in the research.

Upon completion of the timing, students proofread the copy and recorded the number of errors over the number of words typed. This score was recorded by the instructor as the pretest score. Timing 117 was later used in the experiment for the purpose of posttesting.

Experimental Groups

The instructors of the experimental groups were given a list of timings and the days on which they were to be administered to the students. They were asked to use the written dialogue in giving the preview and timings as a control measure for the research.

The students prepared for the timings by typing their name on special papers provided for the research timings. Timings and preview sheets were distributed to all students. Upon instruction from the teacher, the students typed the first line of the preview for 30 seconds. The same technique was used for the second and third lines of the preview. Immediately following the preview students were instructed to set their machines for doublespacing, lay aside the preview word paper, and were given a 3-minute timing on the test paragraphs that corresponded to the preview words. Time was not given for students to check for errors in the preview before taking the timing.

At the end of three minutes, time was called and the students scored the timing by proofreading and recording the numbers of errors over the words per minute. All timings for the research were conducted in a similar manner throughout the duration of the study.

Each instructor re-examined each timing individually to verify scoring. These scores were recorded on a sheet designed to hold all the timing scores for the entire research project.

Control Groups

Students in the control groups were treated the same as the experimental students in that they were also given special papers designed for the timings. They typed the test paragraphs for three minutes, then proofread and recorded errors over words per minute. The teacher also verified the scores and recorded the timings on the specially designed score sheets.

The only difference between the groups was that the control classes did not complete the 1 1/2 minutes of preview prior to taking the timing. Because the amount of time involved with the previewing of words was minimal, a placebo was not administered to the control groups. The preview time of the experimental classes was easily absorbed by the control classes in spending extra time on other class activities that were unrelated to the timing research.

Posttesting

Upon completion of all experiment timings, pretest Timing 117 was again administered as the posttest. Between

the time of pretesting and posttesting, these paragraphs
were not typed by any of the students involved in the
experiment. Pretesting and posttesting on the same
paragraphs was used as a control factor in determining
individual mean scores. The lapse of time between the two
testings eliminated the possibility of sensitization and was
considered to be a valid measuring device. Again, the
teacher verified and recorded each posttest score.

When all pretesting, timings, and posttesting was
completed, a letter (Appendix K) was prepared and
distributed to the parents of students involved in the
research. This was done to comply with federal and state
regulations and policies regarding the use of human subjects
in research projects.

Treatment of Data

Data obtained from the pretests, timings, and posttests
were evaluated under the direction of Dr. Richard Lee Cole,
Professor of Agricultural Education and Graduate School
representative of Oregon State University, and Mr. Adel
Hollowa, doctoral student of statistics at Oregon State
University.

The following statistical tests and equations were used
in the evaluation of data obtained from the pretests,
timings, and posttests of this study:

t-Test. The t-test was used to test the null
hypotheses for a statistically significant difference
at the .05 level.

$$t = \frac{|X_1 - X_2|}{\sqrt{S_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Pooled Variance (Sp^2). Because the t-test used a
pooled variance value in its equation, this value was
calculated. This unbiased estimator of the variance of
the difference between the two sample means was
determined by the following equation:

$$S_p^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

t-value for 176 degrees of freedom (t_n). Because the
t-value for 176 degrees of freedom was not listed in
statistical tables, the following equation was used to
calculate this value:

$$t_n = t_{n_1}(\alpha) + \left(\frac{n - n_1}{n_2 - n_1}\right)\left(t_{n_2}(\alpha) - t_{n_1}(\alpha)\right)$$

Using this last equation it was established that the t-value for 176 degrees of freedom was 1.975. If the t-scores of the pretests, timings, and posttests were greater than 1.975, the null hypotheses were rejected.

CHAPTER IV

FINDINGS AND DISCUSSION

The purpose of this study was to provide information that would help improve typing courses by identifying successful skillbuilding practices, and to provide students with a means of increasing speed and/or accuracy during timed writings. The following research question was addressed in this study:

Does previewing of words have any effect on the speed and/or accuracy scores of typing students?

The experiment was designed to compare the speed and accuracy scores of 178 Typing 1 students--95 of which previewed material as opposed to 83 students who did not preview. Except for the preview words, the experimental and control groups were pretested, posttested, and timed on identical material from which performance scores were gathered. These scores represented the data that was analyzed to determine whether or not the null hypotheses of the research were accepted or rejected.

Analyzing the Data

The first step in analyzing the data was to determine the degrees of freedom (t_n) to be used. The following equation was used in this calculation:

$$t_n = (n_1 - 1) + (n_2 - 1)$$
$$t_n = (83 - 1) + (95 - 1)$$
$$t_n = 176 \text{ degrees of freedom}$$

Once the degrees of freedom were calculated, a value for t was computed using the following equation:

$$\text{t-value} = t_{n_1}(\alpha) + \left(\frac{n - n_1}{n_2 - n_1}\right)\left(t_{n_2}(\alpha) - t_{n_1}(\alpha)\right)$$

$$\text{t-value} = 1.986(\alpha) + \left(\frac{176 - 100}{200 - 100}\right)\left(1.972(\alpha) - 1.986(\alpha)\right)$$

$$\text{t-value} = 1.975 \text{ (hypotheses value)}$$

This t-value of 1.975 was used throughout the findings section of this study to determine if the null hypotheses were accepted or rejected. (The term "hypothesis t-value" was used to refer to this 1.975 value.) Using this hypotheses t-value, the following statements were established:

1. Experimental and control data t-scores less than 1.975 caused the null hypotheses to be accepted.

2.   Experimental and control data t-scores greater than or equal to 1.975 caused the null hypotheses to be rejected.

Because the data was obtained from pretests, timings, and posttests, the findings chapter of this research was divided into the following three sections:

1.   Pretest Findings

2.   Timings Findings

3.   Posttest Findings

In each of these subsections, data supplied by the experimental and control groups were treated according to the statistical tests and equations chosen for this research. Tables were prepared to show the number of students, mean score, standard deviation, and variance for the pretest, timings, and posttest. These t-scores were then compared with the hypotheses t-value 1.975 to determine whether or not there was a statistically significant difference at a .05 level.

Pretest Findings

The purpose of comparing the pretest scores was twofold. First, it verified that the experimental and control groups were statistically the same at the beginning of the study. Second, it provided a basis for determining

if change took place in the experimental and control groups because of the experimentation.

Table 1. Pretest Error Findings

	Control	Experimental
Number	83 (n_1)	95 (n_2)
Mean Number of Errors	6.59 (X_1)	6.37 (X_2)
Variance	10.69 ($S_1{}^2$)	9.57 ($S_2{}^2$)
Standard Deviation	3.27	3.09

Using the information from Table 1 above, the variance value and t-score for pretest errors were calculated as follows:

$$S_p{}^2 = \frac{(n_1 - 1)\, S_1{}^2 + (n_2 - 1)\, S_2{}^2}{n_1 + n_2 - 2}$$

$$S_p{}^2 = \frac{(83 - 1)\, 10.69 + (95 - 1)\, 9.57}{83 + 95 - 2}$$

$$S_p{}^2 = 10.09$$

$$t = \frac{|X_1 - X_2|}{\sqrt{S_p^2 \, \frac{1}{n_1} + \frac{1}{n_2}}}$$

$$t = \frac{|6.59 - 6.37|}{\sqrt{10.09 \left(\frac{1}{83} + \frac{1}{95}\right)}}$$

$$t = 0.461$$

In a similar manner pretest word findings were arranged in the following way:

Table 2. Pretest Word Findings

	Control	Experimental
Number	83 (n_1)	95 (n_2)
Mean Number of Words	31.95 (X_1)	30.83 (X_2)
Variance	51.72 (S_1^2)	48.13 (S_2^2)
Standard Deviation	7.19	6.94

The information from Table 2 was used to determine the variance value and t-score for pretest words as follows:

$$S_p^2 = \frac{(83 - 1)\ 51.72 + (95 - 1)\ 48.13}{83 + 95 + 2}$$

$$S_p^2 = 49.80$$

$$t = \frac{|31.95 - 30.83|}{\sqrt{49.80\ \frac{1}{83} + \frac{1}{95}}}$$

$$t = 1.056$$

Neither the t-score for pretest errors (0.461) or the pretest word score (1.056) exceeded the hypotheses t-value (1.975). Therefore the null hypothesis that there is no statistically significant difference between the speed and/or accuracy scores of Typing 1 students who preview words of a timed writing as compared with students who do not preview the words was accepted. The two groups were statistically the same and bias did not exist.

This finding was important to the study as it verified that in this instance intact class groups could be used for experimentation without involving bias. There was some question during the preparation of this research as to whether or not it would be necessary to randomly place students into the experimental and control groups rather than use intact groups.

Because students are placed in classes in a manner that does not allow for true random selection, this type of research could not be conducted without the use of intact groups. The results of this pretest, therefore, did support their use in this type of experimentation.

Timing Findings

During the six weeks of classroom experimentation a total of 1,519 three-minute timings were taken by the 83 students in the control group and 1,808 timings were taken by the 95 students in the experimental group. Using the information provided in the following table:

Table 3. Timing Error Findings

	Control	Experimental
Number	1,519 (n_1)	1,808 (n_2)
Mean Number of Errors	6.55 (X_1)	6.60 (X_2)
Variance	17.54 (S_1^2)	15.23 (S_2^2)
Standard Deviation	4.19	3.90

The variance value and the t-score for timing errors were calculated as shown below.

$$S_p^2 = \frac{(1,519 - 1)\, 17.54 + (1,808 - 1)\, 15.23}{1,519 + 1,808 - 2}$$

$$S_p^2 = 16.28$$

$$t = \frac{|6.55 - 6.60|}{\sqrt{16.28 \left(\frac{1}{1519} + \frac{1}{1808} \right)}}$$

$$t = 0.356$$

Timing word findings were then recorded in the following table:

Table 4. Timing Word Findings

	Control	Experimental
Number	1,519 (n_1)	1,808 (n_2)
Mean Number of Words	34.37 (X_1)	34.39 (X_2)
Variance	64.51 (S_1^2)	66.51 (S_2^2)
Standard Deviation	8.03	8.16

The variance and t-score for timing words were determined as follows:

$$S_p^2 = \frac{(1,519 - 1)\ 64.51 + (1,808 - 1)\ 66.51}{1,519 + 1,808 - 2}$$

$$S_p^2 = 65.60$$

$$t = \frac{|34.37 - 34.39|}{\sqrt{65.60\left(\dfrac{1}{1519} + \dfrac{1}{1808}\right)}}$$

$$t = 0.071$$

Statistical analysis of the errors and words per minute of the timing scores yielded t-values lower than the hypotheses t-value of 1.975. Therefore the hypothesis that there is no statistically significant difference between the speed and/or accuracy scores of Typing 1 students who preview words of a timed writing as compared with students who do not preview the words was accepted. The timing error t-score (0.356) and the timing word t-score (0.071) showed that a statistically significant difference at the .05 level did not exist.

As mentioned in Chapter 2 of this research, the previewing of words had been a traditionally accepted method of instruction and was considered to be an effective skill-building tool for classroom use. Because previewing was a widespread practice among business educators, a

statistically significant difference may have been expected as a finding of this research. It was found, however, that when faced with statistical analysis through actual classroom testing and research, the preview method of instruction did not support itself as a means of promoting speed or accuracy for timed writings.

Posttest Findings

Statistical information related to the posttest error findings was organized in the following table:

Table 5. Posttest Error Findings

	Control	Experimental
Number	82 (n_1)	94 (n_2)
Mean Number of Errors	5.82 (X_1)	5.69 (X_2)
Variance	15.88 (S_1^2)	14.38 (S_2^2)
Standard Deviation	3.98	3.79

The variance and t-score for posttest error findings were computed as follows:

$$S_p^2 = \frac{(82 - 1)\ 15.88 + (94 - 1)\ 14.38}{82 + 94 - 2}$$

$$S_p^2 = 15.08$$

$$t = \frac{|5.82 - 5.69|}{\sqrt{15.88\left(\frac{1}{82} + \frac{1}{94}\right)}}$$

$$t = 0.222$$

In a manner similar to the analysis of the preceding data, Table 6 was organized as follows:

Table 6. Posttest Word Findings

	Control	Experimental
Number	82 (n_1)	94 (n_2)
Mean Number of Words	37.78 (X_1)	36.97 (X_2)
Variance	65.54 (S_1^2)	56.39 (S_2^2)
Standard Deviation	8.10	7.51

The variance and t-score for posttest word findings were determined as follows:

$$S_p{}^2 = \frac{(82 - 1)\,65.54 + (94 - 1)\,56.39}{82 + 94 - 2}$$

$$S_p{}^2 = 60.65$$

$$t = \frac{|37.78 - 36.97|}{\sqrt{60.65\left(\dfrac{1}{82} + \dfrac{1}{94}\right)}}$$

$$t = 0.688$$

Examination of the posttest scores revealed results similar to those found in both the pretest findings subsection and timings subsection of this research. The t-values for posttest error findings (0.222) and posttest word findings (0.688) were lower than the hypotheses t-value (1.975) which indicated there was no statistically significant difference at a .05 level between the speed and/or accuracy scores of the experimental and control groups.

Since the purpose of analyzing these findings was to examine the effect of previewing on the posttest scores, the posttest error and word t-scores proved that the null

hypotheses of this research were true. That is, there is no statistically significant difference between the speed or accuracy scores of students who preview as compared with students who do not preview words.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to supply information
that would help improve typing courses by identifying
successful skillbuilding practices, and to provide students
with a means of increasing speed and/or accuracy during
timed writings. The following research question was
addressed in the study:

Does previewing of words have any effect on the
speed and/or accuracy scores of typing students?

Procedures

The participants in this research included 178 students
enrolled in 9 Typing 1 classes at West Albany High School,
Albany, Oregon. An experimental group of 95 students and a
control group of 83 students were formed. Students in the
experimental group were given preview words to practice
prior to taking a three-minute timing on the paragraph
containing the preview words. Students in the control group
were given timings on the same paragraphs with no preview.

Speed and accuracy scores were recorded for all students participating in the study.

Two null hypotheses were developed regarding the effect previewing may have had on three-minute timed writings. The t-test was used to test these null hypotheses.

Conclusions

1. Research in the area of typing can include the use of intact class groups and produce valid findings without involving incompatibility or bias.

2. The previewing of words from a particular paragraph immediately prior to taking a timed writing on the same paragraph is unlikely to cause any change in the speed or accuracy score of that timing.

3. It is unlikely that the previewing of words from a particular paragraph would cause any change in the speed or accuracy scores of that timing when a lapse of time has occurred between the preview and the corresponding timing.

4. It is doubtful that previewing--as done in this study--will help typing students increase speed and/or accuracy on timed writing scores.

These conclusions should be interpreted in relation to the limitations and delimitations listed in Chapter 1 of this research study.

Recommendations

1. Future studies should be broadened to include a population consisting of high school, community college, and university students.

2. Studies should be undertaken to determine whether or not the previewing technique might yield different results when tested in specialized typing courses such as skillbuilding classes rather than general typing courses.

3. Research projects should be initiated to study the effects previewing may have on students who have been psychologically conditioned to believe that this type of drill will increase speed and accuracy on a timed writing.

4. This study should be duplicated but be slightly altered to allow for a system whereby students would be able to individually choose the words for preview rather than assign all students the same preview words.

5. Further studies should be initiated to test the preview technique. A study should be designed to examine the preview words after they have been typed. In this study the researcher would try to determine whether or not typing errors that have been made on the preview words have a direct carry-over effect on the test timing words. The researcher could examine the relationship that exists between the preview words, the test timing words, the typographical errors found in the preview drill, and the typographical errors found in the test timing.

6. Future studies should address the comparison of previewing versus postviewing to determine whether or not postviewing would prove to have a positive effect on speed and/or accuracy scores of students on timed writings.

7. Based on the findings of this study, it is recommended that previewing not be used extensively in the typing classroom until further research yields a level of significant difference that validates it as a method of instruction that will have a positive effect on timed writing scores.

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APPENDICES

APPENDIX A

Letter to South-Western Publishing Company
Requesting Previewing Information

123 Old Evergreen Rd.
Philomath, OR 97370
November 5, 1982

South-Western Publishing Co.
5101 Madison Road
Cincinnati, OH 45227

Attention: Dr. Jerry Robinson

Ladies and Gentlemen:

As a typing instructor who is working on a masters degree in business education, I am interested in gathering information on the skillbuilding technique of previewing in typing. The hypotheses of my thesis are:

1. There is no significant difference in the speed scores of typing students who preview words as compared to the speed scores of typing students who do not preview words.

2. There is no significant difference in the accuracy scores of typing students who preview words as compared to the accuracy scores of typing students who do not preview words.

I have studied literature related to this topic and find that although previewing of words in shorthand is a commonly used method of drill, there is little or no statistic to support the theory as being a worthwhile practice. The information related to typing and previewing is even more limited. Our South-Western representative (I teach at West Albany High School in Ablany, Oregon) suggested that I write you and ask if you had any research on this topic.

Actual classroom research for my research project will start in late January of 1983 and I would like to gather as much data on previewing as possible before that time. Any data that you might have would be of great interest to me.

If you have any information that might help, please let me know. I would like to thank you in advance for any assistance you might be able to offer me. Thank you again.

Cordially yours,

Mrs. Marion E. Harrison
Typing Instructor

APPENDIX B

Letter to Educational Research Associates
Requesting Previewing Information

123 Old Evergreen Road
Philomath, OR 97370
November 4, 1982

National Book Company
333 SW Park Avenue, 4th Floor
Portland, OR 97205

Attention: Mr. C. Theo. Yerian

Ladies and Gentlemen:

As a typing instructor who is working on a masters degree in business education, I am interested in gathering information on the skillbuilding technique of previewing in typing. The hypotheses of my thesis are:

1. There is no significant difference in the speed scores of typing students who preview words as compared to the speed scores of typing students who do not preview words.

2. There is no significant difference in the accuracy scores of typing students who preview words as compared to the accuracy scores of typing students who do not preview words.

When I was at the business conference in Eugene on October 8, Mr. Yerian showed me a book entitled TIMINGS FOR TYPING which listed preview words on the right side of the page and a timing on the left side. I am interested in this book and the previewing of words in relation to my thesis.

Will you please send me any research that you have regarding this topic. How did you write this book—is it backed by actual research or was it written because the idea of previewing is used in shorthand classes? Any and all information of this subject would be of great interest to me.

I will be conducting an experiment in my typing classes during the second semester of this year. Would it be possible for you to send me any research you have as soon as possible? If you need further explanation from me, please phone me at either of the numbers listed below.

Any assistance you can give me would be greatly appreciated.

Thanking you in advance for
your help,

Mrs. Marion E. Harrison
Typing Instructor
West Albany High School, Albany, OR

APPENDIX C

Response Letter from South-Western Publishing Company

SOUTH-WESTERN
PUBLISHING
CO.

November 19, 1982

Mrs. Marion E. Harrison
123 Old Evergreen Road
Philomath, OR 97370

Dear Mrs. Harrison

You have identified one of many teaching/learning practices about which
there is little, if any, formal research to support. I am glad that
you are planning to study the effects, if any, of previewing words
in preparation for typing timed writings.

As you say, more has been written about previewing in shorthand than
in typewriting. Even so, the supporting "research" is primarily ex-
perience based rather than research based. I know of no research
whose design tested whether previewing words improved timed typing
performance.

In my own work with typing students in both classroom and tutorial
settings, I have preferred to have students type a copy selection
first to identify the troublesome words and then have students prac-
tice the words identified as "difficult." I have no proof, however,
that this practice has anything more than a psychological effect.
In using this procedure, I have students type the words in their
timed writing settings (the word before, the difficult word, and the
word following). Several of us feel that the trouble spot may not
necessarily be in the word identified as troublesome but rather in
the preceding word or something one anticipates in the word that
follows.

Certainly I believe we can say that previewing or postviewing is not
harmful. Whether either is better than something else we might do
(simply typing the copy again, for example) is anyone's guess.

Good luck to you in your project. I shall be most interested in
learning the results of your experiment (previewing with one group,
not previewing with another).

Sincerely yours

Jerry W. Robinson
Assistant Vice President
and Senior Editor

APPENDIX D
Response Letter from Educational Research Associates

*a nonprofit
educational research
and development corporation*

EDUCATIONAL RESEARCH ASSOCIATES

333 SW Park Ave., 4th & 5th Floors
Portland, OR 97205
(503) 228-6345

ERA

November 16, 1982

Mrs. Marion E. Harrison
Typing Instructor
West Albany High School
Albany, OR. 97321

Dear Mrs. Harrison:

Thank you for stopping by our exhibit booth during the OVA
Conference in Eugene.

Yes, I remember your remarks concerning your Masters thesis as you
were examining our "Timings for Typing." When you asked me
concerning the manner in which the preview words were selected,
I could not give you a definite answer... only an "off the cuff"
response.

As it turned out, I was closer to the right response than I realized.
There was no attempt to pick out words that, for instance, are
included in the Horne, Peterson, Silverthorn Word List (hope these
names are spelled correctly; haven't had reason to recall them for
some time). The important criterion, according to Mr. Carl Salser,
Executive Director of ERA, was to provide material of average
difficulty, both from the point of view of typewriting and dictation
purposes.

So, Mrs. Harrison, we have no scientific data for you to use spec-
-ifically in your thesis. It is true that common word beginnings
and such letter combinations as "ie," and "ei," were kept in mind.
Also, a fair balance of long and short words were selected.

As I reread your "hypothesis," the question of how you are
interpreting the word "significant" comes to mind. If I had to bet
now, I would be willing to place my money on the fact that typists
(are you setting up degrees of skill?) who preview words and word
combinations will type faster and very probably more accurately.

You can be sure that we wish you well in your "drive" toward your
Masters.

Sincerely,

C. Theo. Yerian
President

APPENDIX E

Format for Administering Timings

BE SURE TO INSISIT ON EVERY STUDENT TYPING THROUGH THE ENTIRE TIMING--NO STOPPING ALLOWED.

1. Hand out preview papers.

2. Hand out timing papers for students to type on; have students type name, etc. on the paper.

3. Turn in the PROGRESSIVE TYPEWRITING book to the paper of the correct timing for the day.

4. Have the students put the preview sheet in the front of the book--locate the preview section for the timing--BE SURE THE STUDENTS ARE DOING THE CORRECT PREVIEW WORDS FOR THE CORRECT TIMING.

5. Teacher directed preview-- 30 seconds per line.

   "Preview line____" "Ready, Type" (30 sec.) "Return"
   "Preview line____" "Ready, Type" (30 sec.) "Return"
   "Preview line____" "Ready, Type" (30 sec.) "Return"

   "Set your line space regulator on '2'"
   "Put the preview papers in the bookstand"
   "Get the PROGRESSIVE TYPEWRITING book up"
   "This will be a 3-minute timing on number ____, page____"

   BE SURE EVERYONE IS READY TO GO AT THIS POINT

   "Eyes on copy, type"

   AT THE END OF THREE MINUTES

   "Return and stop"

6. After the timing, be sure total errors are listed over GWAM and ECO rate.

7. If the class did the preview words, have students circle the word "Preview" on their papers.

8. Collect all papers.

***FOR TEACHERS WHO ARE NOT DOING THE PREVIEW WORDS--

1. Follow instructions 2, 3, the latter part of 5, 6, 7, and 8 only.

APPENDIX E

Timing Score Sheet

PERIOD: _____

TEACHER: _____

STUDENT NAME

I.D. Number	Pretest 2/8 Mid.	Posttest 3/17 Mid.	54 Thur. 2/10 Beg.	57 Thur. 2/10 Mid.	60 Mon. 2/14 End	63 Wed. 2/16 Mid.	66 Wed. 2/16 End	69 Fri. 2/18 Beg.	72 Tues. 2/22 Beg.	75 Tues. 2/22 Mid.	78 Thur. 2/24 Beg.	81 Mon. 2/28 Mid.	84 Mon. 2/28 End	87 Wed. 3/02 End	90 Fri. 3/04 Beg.	93 Fri. 3/04 Mid.	96 Mon. 3/07 Beg.	99 Wed. 3/09 Mid.	102 Wed. 3/09 End	105 Fri. 3/11 Mid.	108 Mon. 3/13 End	111 Tues. 3/15 Mid.	114 Tues. 3/15 End	120 Thur. 3/17 Beg.

APPENDIX F

Preview Word Sheets

PREVIEW WORDS   Page 1

Page 22   Timing 54

1. The severe summer surprise residents of East Park. with could
2. scarcely see were short distance away. winter blizzard more
3. real. carefully tended rock gardens washed hillside, guests

Page 24   Timing 57

4. Starting next month, you eligible to join investment plan.
5. This program provided convenience our employees; we urge for
6. if buy stock, of invested, part this monthly fill enclosed

Page 25   Timing 60

7. print your yearly catalog. last few years we have enjoyed job
8. printing many brochures, know important how much customers
9. Therefore, lithographers care and attention, usual. In letter

Page 27   Timing 63

10. have moved building, try office neat possible. We signed
11. six-year with maintenance company cleaning services.
12. According contract, will cabinets, windowsills vacuum Before

Page 29   Timing 66

13. this opportunity Within next weeks, Hill, you appointment
14. discuss ways which Investment Services can help provide
15. your family steady income after have retired. questions

PREVIEW WORDS   Page 2

Page 31   Timing 69

1. promotion! Director Marketing, look forward meeting you soon.
2. Since our company manual fully explain all details involved
3. job transfers, happy help with questions. moving We reliable

Page 33   Timing 72

4. thinking about earn greater return invest? For high returns,
5. you think investing funds. money in your capital year our
6. portfolio has stocks, bonds, and commercial small private

Page 35   Timing 75

7. Most such data and computer belong modern these words new,
8. ideas represent fact, principles of processing were used ago
9. when cave dwellers their count Egypt sticks soft tablets.

Page 36   Timing 78

10. received request Wednedsay, one-family homes. discovered
11. number bathrooms but some have fenced-in yards, felt this
12. might very important feature. sending considered within

Page 38   Timing 81

13. key our —or any manufacturer, for that matter—is line
14. products ensure success drug company. prescribe to if from
15. detail and women. relationships important asked research

PREVIEW WORDS   Page 3

Page 39   Timing 84

1. Would you like If have probably considered risk involve
2. money that Will business be a success? need buy equipment,
3. rent space, meet your weekly answer these questions people

Page 41   Timing 87

4. like exciting superb benefits, allows discounts air travel?
5. your our special program, work make flights take off and
6. land information central is Here, air the arrive busy, modern

Page 43   Timing 90

7. One branch is now applicants position center. title new
8. administrative support secretary, this promoting job? will be
9. selected must, help to perform routine answering telephone,

Page 45   Timing 93

10. were very happy placing emphasis teaching write effective
11. letters. offer in- employees attend new night classes
12. training they will help them clear, complete food volume

Page 47   Timing 96

13. As result recent merger with Motors. Three of these state.
14. equipped old, worn-out and operating levels. fourth Midwest.
15. Built four ago, this machines available, but never profit.

Page 49   Timing 99

16. thought getting accident insurance people have subscribed
17. quite policy, for they to worry about being unable have
18. Because nature work that consider taking will your wanted

PREVIEW WORDS   Page 4

Page 52   Timing 102

1. months several requests review company policy regarding
2. leaves of absence. circumstances definite period time--
3. usually more two weeks this supervisor which you must be

Page 55   Timing 105

4. you been studying which may reorganize business operations
5. In November or December, we this study to members do so
6. would like to information Chicago. because be from which

Page 58   Timing 108

7. credit union organization joins people money use savings
8. members charge them. operated under government charter the
9. Congress. Within this framework, helps shares worked their

Page 61   Timing 111

10. helped very much improve the quality conditions grateful
11. superb suggestions improving increasing productivity.
12. follow-up content with jobs, our turnover important problem,

Page 64   Timing 114

13. using history States. college studying complex problems
14. labor movement, I welcome this opportunity of concepts
15. this ask differences unions effect, trade same students

Page 71   Timing 120

16. Charles, month-long tenth anniversary know, great success.
17. Before sale, we were grossing hundred thousand dollars month
18. our During period, naturally, And monthly higher presale

APPENDIX G

Letter to Parents

TOM HOLMAN
PRINCIPAL
TERRY MURRAY
ASSISTANT PRINCIPAL
RICHARD PIGG
VICE-PRINCIPAL
CHRIS YAEGER
VICE PRINCIPAL
CO-OP WORK DIRECTOR
PAUL GREIG
ATHLETIC DIRECTOR

WEST ALBANY HIGH SCHOOL

1130 Queen Avenue, S.W.
ALBANY, OREGON 97321-2196

PHONE 967-4545

April 8, 1983

Dear Parents:

For the past six weeks, the business teachers at West have conducted a study to determine whether or not a particular typing drill can be effective in improving speed and/or accuracy scores on timings.

All students enrolled in Typing 1 have participated in this study. Half the students were randomly chosen and given a specific typing drill, followed by a timing. The other half of the students did not type the drill, only the timing.

The results of these timings will be analyzed statistically to determine whether or not the drill is an effective tool to improve speed and/or accuracy. Mrs. Marion Harrison will be using this research in partial completion of her Master's degree in business education. Her thesis will contain the results of this experiment and will be published, absent the names of all students. All statistics will be reported as "Group A" and "Group B", or "Student A" and "Student B".

Until the results of the study are compiled, we have no way of knowing if the drill was effective or not. Either way, we will be able to use this study when deciding which typing drills are most beneficial for student use.

If you have any questions regarding the research, please feel free to contact Mrs. Marion Harrison.

Cordially yours,

THE BUSINESS DEPARTMENT
WEST ALBANY HIGH SCHOOL

Marion E. Harrison, Coordinator of Research Project
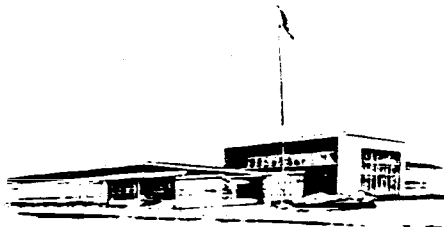
GREATER ALBANY PUBLIC SCHOOL DISTRICT 8J