

A STUDY OF THE RELATIONSHIP BETWEEN READING
ABILITY AND TYPEWRITING PERFORMANCE
OF BEGINNING TYPEWRITING STUDENTS

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TABLE OF CONTENTS

	Page
LIST OF TABLES	vi
 Chapter	
1. INTRODUCTION	1
The Problem	2
Statement of the Problem	2
Hypothesis	2
Importance of the Study	3
Delimitations of the Study	4
Definition of Terms	5
Methods and Procedures	9
Summary	11
2. REVIEW OF RELATED LITERATURE	12
The Relationship of Typewriting to	
Reading Performance	12
The Relationship of Reading to	
Typewriting Performance	18
Summary	28
3. COMPILATION OF DATA	30
4. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	34
Summary	34
Conclusions	35
Recommendations	36

	Page
BIBLIOGRAPHY	38
A. Books	38
B. Periodicals	39
C. Other Publications	40
APPENDIX	41
A. Computation of Means	41
B. Computation of Standard Deviations	42
C. Computation of Pearson Product-Moment Correlation Coefficient	43
D. Cloze Test	44
E. Typewriting Test	46

LIST OF TABLES

Table

1. Range, Mean and Standard Deviation of
Cloze and Typewriting Tests 32

Chapter 1

INTRODUCTION

In the field of business education, the importance of proficiency in typewriting is evidenced by the number of studies dealing with the subject. Studies have been conducted which deal with almost every conceivable topic that has a relationship to typewriting.¹

Interest in typewriting has expanded to fields other than business education. There is an increasing number of studies from the area of reading which attempt to show that a relationship between typewriting and reading exists and which attempt to describe the nature of this relationship.

The most frequent problem investigated in these studies concerns the way in which typewriting proficiency and practice affect reading performance. If it can be shown that typewriting has an effect on reading performance, it would be of benefit to typewriting teachers to know if and how reading ability affects typewriting performance. Less actual research has been done to explore this side of the relationship. In addition, the evidence that is available is conflicting. As far back as 1943 Fuller stated:

The theory of reading for typewriting has not kept pace with modern developments due to two factors. First,

¹Thomas A. Sinks and Jay F. Thurstone, "Effect of Typing on School Achievement in Elementary Grades," Educational Leadership, 29:344-348, January, 1972.

we are still influenced by the theory of reading for typewriting based upon introspective analysis made over a quarter of a century ago. Second, we have borrowed theory from the general reading field and proofreading field without being sure that it was applicable to typewriting.¹

In the opinion of Wood, who reviewed literature concerning several aspects of the subject, reading is important to typewriting since reading skills are necessary for successful typewriting performance. However, he concluded his review by stating, "More experiments in this area are needed to establish a definite correlation between reading and typewriting."²

The Problem

Statement of the Problem

The purpose of this study was to determine whether or not a relationship exists between the reading ability and typewriting skill of beginning typewriting students in high school..

Hypothesis

The null hypothesis was as follows: There will be no significant relationship between a student's reading ability and his skill in typewriting.

¹Donald C. Fuller, "Reading for Typewriting," The Journal of Business Education, 19:19-20, October, 1943..

²Jerry L. Wood, "Reading and Typewriting," Journal of Business Education, 40:109-111, December, 1964..

Importance of the Study

It is generally agreed that typewriting teachers should attempt to meet the individual needs of the students. Also, it is generally agreed that typewriting teachers must deal with classes in which the students represent a wide range of skills and abilities. Unfortunately, much time often elapses before a teacher is able to determine the proficiency level of each student, his particular strengths and weaknesses, and the ways to best meet his specific needs. This is especially true in beginning typewriting classes since the teacher has no prior information about the student's typewriting skill to help meet individual needs from the start.

The typewriting teacher usually does have access to some prior information about each student from his school records. One such bit of information is the student's level of reading ability. If this information is not given, simple procedures are available for the teacher to rapidly get a valid measure of each student's reading level. If it can be shown that a student's reading level affects his typewriting proficiency, the typewriting teacher might be able to use such information to plan an appropriate program of instruction for each student from the very beginning of the year. Wood has stated that ". . . unless business teachers are aware of some of the reading problems their student possess, they cannot effectively conduct a

successful typing program."¹ He has recommended that typewriting teachers determine the reading levels of their beginning typewriting students in order to help the slower readers succeed. In essence, information about a student's reading ability might be valuable for prognosis, instructional planning and selection of materials.

Delimitations of the Study

The study took place at Park Hill Senior High School. Park Hill is located in suburban Kansas City, Missouri, and has an enrollment of slightly over 1300 students. Approximately forty-eight students participated in the study. These subjects were enrolled in one of two beginning typewriting classes. All students in both classes were used as subjects. There were no prerequisites for acceptance in the beginning typewriting classes. The same instructor and the same materials were used in both classes. Testing took place in January, 1975.

The material was taken from Century 21 Typewriting, the typewriting book used by both classes for regular classroom instruction.² Using the guideline suggested

¹Wood, op. cit., p. 109.

²D. D. Lessenberry and others, Century 21 Typewriting, First-Year Course (Cincinnati: South-Western Publishing Company, 1972) p. 229.

by Robinson for determining the difficulty levels of typewriting materials, the material used in this study was found to have a 1.5 or average syllabic intensity, an average word length of 5.6 which is also in the average range, and a high frequency rating of eight which is considered low average in difficulty.¹ The readability level of the same material was found using the Flesch Reading Ease Formula.² The Reading Ease Score was found to be 62.877 which is classified as standard difficulty level.

Definition of Terms

Cloze Procedure

The cloze procedure is the method used in this study to determine reading ability. In this procedure, as used in this study, every fifth word in a 300-word reading passage was deleted and replaced by a blank of uniform length. The students were required to fill in each blank by writing in the word they thought had been deleted. Correct responses were only those which exactly matched the deleted word. The cloze procedure was developed

¹Jerry W. Robinson, "Matching Copy Structure to Practice Purpose in Typewriting," Practices and Preferences in Teaching Typewriting, ed. Jerry W. Robinson (Chicago: South-Western Publishing Company, 1967), p. 58.

²Rudolf Flesch, How to Test Readability (New York: Harper and Brothers, 1951).

by Taylor and has been widely used as a valid measure of reading ability.¹

Reading Ability Level

Reading ability was determined by the number of correct responses on the cloze task. Reading level was considered to increase as the number of correct cloze responses increased..

Readability

Readability describes the reading level of written material. For determining the reading level of the material used in this study, the Flesch Reading Ease Formula was used.² According to this formula scores of 90 to 100 are typical of very easy materials, 80 to 90 are easy, 70 to 80 are fairly easy, 60 to 70 are standard, 50 to 60 are fairly difficult, 30 to 50 are difficult, and 0 to 30 are very difficult.

Typewriting Skill

Typewriting skill was measured using correct words a minute (cwam). In this method, the number of incorrectly typed words is subtracted from the total number of words.

¹W. L. Taylor, "Recent Developments in the Use of the Cloze Procedure," Journalism Quarterly, 30:414-438, Fall, 1953.

²Flesch, loc. cit.

typed. The number of words correctly typed is then divided by the writing time.¹ In this study the time of four minutes was uniform for all subjects.

Syllabic Intensity

Syllabic intensity refers to the average number of syllables per word in the typewriting material. It is considered to be a measure of the difficulty of the copy to be typed. Material with syllabic intensity of 1.3 is considered easy, 1.4 is low average, 1.5 is average, 1.6 is high average, and 1.7 is difficult.²

Average Word Length

Average word length is a measure of copy difficulty and refers to the average number of letters per word in the material. The difficulty indexes are as follows: 5.2 is easy, 5.4 is low average, 5.6 is average, 5.8 is high average, and 6.0 is difficult.³

High Frequency Words

High frequency words refers to the percentage of frequently used words that appear in the typewriting material.

¹S. J. Wanous, "An Analysis of Some Evaluative Measures of Typewriting Performance," The Balance Sheet, 48:4-8, September, 1966.

²Robinson, loc. cit.

³Ibid.

Material which has a high frequency word index of 85 is considered easy, 80 is low average, 75 is average, 70 is high average, and 65 is difficult.¹

Correlation Coefficient

The correlation coefficient is a measure of the degree of association between two variables. In this study, the Pearson Product-Moment Correlation Coefficient was used to determine the degree of association between reading ability and typewriting proficiency.²

Mean

The mean is a measure of central tendency and represents the average score of a group of scores. It is calculated by dividing the sum of all the scores by the total number of scores.³

Standard Deviation

The standard deviation is a measure which is used to give relative values to scores in relationship to the mean or average score.⁴

¹Ibid.

²Edward W. Minium, Statistical Reasoning in Psychology and Education (New York: John Wiley and Sons, Inc., 1970), p. 130.

³John T. Roscoe, Fundamental Research Statistics (New York: Holt, Rinehart and Winston, Inc., 1969), p. 38.

⁴Roscoe, op. cit., p.53.

Methods and Procedures

Selection of Subjects

Forty-eight sophomore and junior students from Park Hill Senior High School were used as subjects. The sample included the total enrollment of two beginning typewriting classes. Both classes had the same instructor who used the same materials and teaching methods in both groups. The students were heterogeneously grouped in their classrooms.

Park Hill is located in a suburban area of Kansas City, Missouri. It is classified socio-economically as primarily middle class.

Determining Reading Level

Reading level was determined by using the cloze procedure developed by Taylor.¹ In the cloze procedure the reading material is prepared with systematic deletions and the reader is required to supply the missing word in each blank.

The reading material for this study consisted of a 300-word selection from the typewriting book used in the classroom, Century 21 Typewriting.² Every fifth word in the

¹Taylor, loc. cit.

²Lessenberry and others, loc. cit.

selection was deleted and replaced with a blank ten spaces in length. Students were instructed to guess what word they thought was left out and write it in the appropriate blank. Only responses which exactly matched the deleted word were considered correct.

Extensive research has been carried out to validate the cloze procedure as a tool for measuring reading ability.¹ One of the advantages of using cloze procedure is that students reading ability can be measured on the exact materials they are using in the classroom.

Determining Typewriting Proficiency

One week after the cloze test was administered, the typewriting test was given. To determine the level of proficiency in typewriting, the students were given a four-minute timed typewriting test. The materials consisted of the same, but undeleted 300-word passage as used in the cloze task. Typewriting proficiency was measured by calculating the number of correct words a minute (cwam). In this method, the number of words which have been typed incorrectly was deducted from the total words typed. The number words typed accurately was then divided by the time of the writing. One advantage in using this method is that it takes into consideration both speed and accuracy.

¹Earl F. Rankin Jr., "Cloze Procedure-A Survey of Research," Yearbook of the National Reading Conference, 14:133-148, 1965.

Treatment of the Data

Students' reading scores were calculated according to the number of correct responses on the cloze task. Typewriting scores were calculated according to the number of correct words a minute on the typewriting task. The relationship between the two was determined using the Pearson Product-Moment Correlation Coefficient.¹ Fischer's Table V.A was used to determine the significance of the obtained correlation coefficient.²

Summary

A number of studies have been concerned with the effect of typewriting practice on reading performance. Much less research has been done to determine if a relationship exists between reading level and typewriting performance. The major purpose of this study, therefore, was to determine if such a relationship existed.

The subjects were forty-eight sophomore and junior students enrolled in beginning typewriting classes. A Cloze test was given to determine reading level and a timed typewriting test was given to measure typewriting proficiency. The same materials were used for both the reading and typewriting tests. Students' scores were ranked on both tests and a correlation coefficient was calculated to determine if a relationship existed.

¹Roscoe, op. cit. pp. 71-81.

²Minium, op. cit., pp. 320-321, 445-446.

Chapter 2

REVIEW OF RELATED LITERATURE

Two separate aspects of the literature concerning reading and typewriting have been reviewed. Many studies have been done in the area of reading to determine how typewriting practice and proficiency affect a student's reading performance. Of greater relevance to this investigation are those studies from the field of typewriting which have explored the other side of the relationship. That is, how aspects of reading affect typewriting performance. In this review then, several representative studies from the field of reading have been considered first. Next, those investigations dealing with the relationship of reading to typewriting have been reviewed.

The Relationship of Typewriting to Reading Performance

As early as 1930, Conrad tested the effects of using the typewriter in elementary school to improve performance in other academic areas.¹ The experimental groups used typewriters for written work while the control groups wrote

¹Edith V. Conrad, "Study of the Influence of Manuscript Writing and of Typewriting on Children's Development," Journal of Educational Research, 29:254-265, December, 1935.

in manuscript. After six months, results on the Stanford Achievement Battery showed large gains for the experimental groups as compared with the control groups in the areas of reading language composition, computation, and spelling.

Typewriting and dictation equipment were used by Tetreault to determine if the reading level of slow learning first graders could be improved.¹ His subjects included fourteen first grade children who scored from the twenty-fourth to the fifty-fourth percentile on the Gates Reading Readiness Tests. The subjects were divided equally into experimental and control conditions. The experimental group received regular reading instruction plus had use of the dictating equipment and had two fifteen-minute typewriting sessions per day. The control group received only regular reading instruction. This portion of the study lasted from the beginning of the school year until the midterm. At midterm, the reading ability of each subject was tested using the Stanford Achievement Test. The results showed that the experimental group was significantly better than the control group in spelling, letter recognition, word reading and study skill.

The treatment of the two groups was reversed at midterm. End of the year testing indicated that, after using the typewritier and dictating equipment, the original

¹G. E. Tetreault, "Typewriting/Dictation to Boost Reading Skills," The Instructor, 79:116-118, February, 1970.

control subjects performed as well in reading as the original experimental subjects. In addition, it was found that 71.4 percent of the total group did better than expected in the regular reading program.

Rowe taught typewriting to third and fourth grade pupils for an eight-week period during the summer and compared their progress in reading comprehension and vocabulary with that of a similar group of children who did not have typewriting instruction.¹ While the control group lost one month's growth in reading comprehension and three months in vocabulary, the experimental group gained four months in reading comprehension and seven months in vocabulary.

In 1968 an experimental program was tried in the elementary schools of Humboldt, Kansas, to determine if the use of electric typewriters would increase language arts performance.² All students in grades three through six participated. An outside team evaluated the program and, in 1970, published their findings. Among other conclusions, they reported that, as a result of the program, a number of students had a total language gain ranging from one to 3.9

¹John L. Rowe, "Readin', Typin', and 'Rithmetic," Business Education World, 39:9-12, November, 1959.

²Kansas State Department of Education, Experimental Motivation in Language Arts, Federal Program E.S.E.A. Title III, Project No. 67-3077, (Iola, Kansas: Register Printing Company, 1970), p. 17.

years, several students made reading gains from one to three and a half years, and the quality of students' creative writings was positively affected.

The results of a project designed to evaluate the effect of typewriting practice on the language skills of junior high students was reported by Kiley.¹ Two groups of ninth grade students differing in academic ability were included in the program. One group was composed of high achievers who had not previously been in a typewriting class. The other group included typewriting students who had reading or language problems and who were failing in their academic work.

The program lasted forty-five minutes per day for nine months and consisted of a number of activities which interrelated typewriting and language arts. Some of the activities included daily drills on the alphabet, timed typewriting of spelling demons, word games, writing reports on a number of topics, and writing personal and business letters. When needed, punctuation, grammar, and sentence structure were taught. During the second semester, students worked more individually on a contract basis.

The results of the program showed that the low achieving group was typewriting as well as average ninth grade typewriting students. When the high and low achievers

¹Margaret A. Kiley, "Improving Language Skills Through Junior High Typewriting," Business Education Forum, 26:16-17, March, 1970.

were combined, five-minute typewriting rate for ninety-nine percent of the students ranged from twenty-five words per minute to seventy words per minute with four or less errors, with the majority of the students typewriting at thirty to thirty-five words per minute. Pre and Post-tests in reading showed that gains were made for both groups in spelling, vocabulary, and reading comprehension. Teacher observations indicated that composition ability and attitudes toward writing had also improved.

Fuhr investigated the effects of teaching typewriting to improve the reading of high school remedial readers over a twenty-week period.¹ Sixty-four students were divided into four groups. The first group received five weekly lessons in remedial reading, the second group had five weekly classes in beginning typewriting, the third group had both five weekly classes in remedial reading and five weekly classes in beginning typewriting, and the control group had neither. The results of the Metropolitan Achievement Test, Advanced Reading showed that typewriting was the only factor that significantly improved reading scores.

These studies, which are representative of the majority of investigations, support the idea that typewriting practice improves reading performance. The results of a number of other studies have been reported by Whitmill to provide a positive basis for the recent trend of including

¹Morton L. Fuhr, "The Typewriter and Retarded Readers," Journal of Reading, 16:30-32, October, 1972.

typewriting as a part of the elementary and middle school curriculum.¹ There are only a few studies which show a lack of influence of typewriting to reading or which show a negative influence.

Wood and Freeman studies the effects of typewriting on the reading performance of first and second grade children.² One of the effects they noted was a temporary decline in the children's rate of reading. In addition, negligible differences were found in reading performances as measured by the Gates Reading Test.

Fuller reported a study by Cecelia Unzicker, "An Experimental Study of the Effects of the Use of the Typewriter on Beginning Reading."³ In this study the effects of typewriting on visual perception, reading speed and word recognition of first grade students was investigated. It was found that the greatest gains made as a result of typewriting practice was in the visual perception test.

¹Lucille B. Whitmill, "Typewriting: An Integral Part of the Elementary and Middle School Curriculum," Business Education Forum, 27:41, April, 1973.

²Ben L. Wood and Frank N. Freeman, An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom (New York: The Macmillan Company, 1932).

³Donald C. Fuller, "Reading for Typewriting," The Journal of Business Education, 19:19-21, September, 1943.

The Relationship of Reading to Typewriting Performance

The difference between reading rate and typewriting rate has been one area of concern in studying the relationship between reading and typewriting. Russon and Wanous have implied that reading is an important factor in typewriting since students commonly make mistakes because of incorrect reading of the copy.¹ In their opinion, this is a result of reading the copy too rapidly.

Similarly, Tonne, Popham, and Freeman have noted that rapid reading is apt to cause typewriting errors. They have stated:

Reading for typewriting requires attention to details, not skimming. Since most mechanical errors in typewriting seem to involve the central letters of words and since in ordinary reading the most common word errors are likewise in the center of words, is it not safe to assume that teachers err in telling their typewriting students to read faster, to read by word-wholes, and to read for meaning when seeking to improve or test their maximum typewriting speed?²

Evidence to support the view that reading rate and typewriting rate are not positively associated can be found in a correlational study conducted by Rundle to determine the relationship between reading speed and typewriting

¹Allien R. Russon and S. J. Wanous, Philosophy and Psychology of Teaching Typewriting (Cincinnati: South-Western Publishing Company, 1960), p. 165.

²Herbert A. Tonne, Estelle L. Popham, and M. Herbert Freeman, Methods of Teaching Business Subjects (3d ed.; New York: Gregg Division McGraw-Hill Book Company, 1965), p. 134.

speed for twenty-nine second year typewriting students at the high school level.¹ The students were first administered the Traxler High School Reading Test followed by a ten-minute typewriting test. Reading rate was correlated with both the net words per minute typed and the gross words per minute typed. The findings showed that reading rate correlated .00428 with net words per minute and .026 with gross words per minute. Rundle concluded that there is little correlation between reading speed and typewriting speed. In addition, Rundle reported that the fastest reader had the lowest typewriting score while the slowest reader had a typewriting score above the median rate.

The correlation between reading rate and typewriting rate was also studied by Fuller.² He compared ordinary reading and reading for typewriting for fifty-one high school students in their second year of typewriting, forty-nine third-year typewriting students and two expert typists. Reading rates as measured by the Traxler Reading Test were compared to typewriting rates. Fuller found that the slowest reader was able to read 2.4 times as fast as is necessary for the fastest typist. On the whole, the rate for ordinary reading was about 5.7 times the reading rate for typewriting.

¹Edna E. Rundle, "A Study of the Correlation Between Reading Speed and Typewriting Speed," The National Business Education Quarterly, 17:48-54, October, 1948.

²Fuller, "Reading for Typewriting," (October, 1943), loc. cit.

In ordinary reading an average of 1.1 words were absorbed in .30 of a second while in reading for typewriting, an average of .32 of a word was absorbed in .47 of a second.

Fuller used this study to support his view that typewriting requires attention to details. Therefore, teaching typewriting students to read faster, to read by word-wholes, and to read for meaning are not good practices since they would seem to lead to poorer typewriting performance.

The question of whether to teach reading for meaning has also received attention in the typewriting field. As previously cited, Tonne, Popham, and Freeman have stated that teachers make a mistake in teaching students to read for meaning in the typewriting class.¹ Similarly, Fuller has noted that word meanings are not involved in typewriting.² Since typewriting involves slow, careful reading and perception of details, reading for meaning can create inaccurate typewriting.

Although it is Wood's belief that the main purpose of reading for typewriting is not meaning but the reproduction of symbols, he has asserted that comprehension does play a role in typewriting.³ He has stated that, since

¹Tonne, Popham, and Freeman, loc. cit.

²Donald C. Fuller, "How to Read for Typewriting," The National Business Education Quarterly, 12:35, December, 1943.

³Wood, "Reading and Typewriting," op. cit., p. 110.

typewriting ". . . must depend to a high degree on the comprehension of instructions that must be read, reading becomes one of the most important supports in the structure of typewriting."¹ Therefore, reading for meaning applies to typewriting only insofar as understanding directions is concerned.

A stronger position has been taken by Colvin who has advocated the teaching of meaning to typewriting students in order to follow directions in completing assignments, for indexing, alphabetizing, and filing materials in office practice sets, and for proper reading application blanks.² She has also suggested reading aloud by students so the typewriting teacher can check on meaning, pronunciation, and spelling of difficult words and for paragraph meaning.

In accord with Colvin's position is the view expressed by Johnson.³ According to Johnson, the two objectives of reading in beginning typewriting include reading for content and reading to become word-conscious. She has advocated using the regular textbook as the material for reading lessons and has advocated reading in unison by the students.

¹Ibid.

²Julie Colvin, "Typewriting and the Fundamental Processes," American Business Education, 14:45-46, October, 1957..

³Verda B. Johnson, "Teaching for Better Understanding in Typewriting," Journal of Business Education, 41:149-50, January, 1966..

All students should have the opportunity to interpret what is read, either orally or in typewritten form according to this view. The content of questions asked might include the classification of a letter, the interpretation of a table or chart, and the like. She has also stated that words should be pronounced, spelled, and defined and students should be asked to construct sentences using these words.

Differences of opinion have also been evident in the literature concerning the importance of reading ability to typewriting, especially as it concerns the slower student. Fuller has stated that students come to the typewriting classroom with a background in reading which is easily adapted to the typewriting situation.¹ Those students who do not read properly or accurately do so because of mind-wandering, inattention, lack of interest, or because of attempts to read by thought units. Therefore, ". . . proper classroom motivation to read carefully is all that is required to correct most reading errors."²

In contrast, Wood has placed much emphasis on the role of reading for typewriting.³ In his opinion, typewriting teachers will not be successful unless they are aware of some of the reading problems their students are having.

¹Fuller, "How to Read for Typewriting," loc. cit.

²Fuller, "How to Read for Typewriting," op. cit., p. 40.

³Wood, op. cit., p. 109.

Clem has also indicated that reading is highly related to typewriting.¹ In her opinion, slow readers who are unable to develop letter unity to form words, who have difficulty with reading comprehension, and who have not developed word discriminations or visual perception will also be slow typists. These readers will be unable to become efficient in typewriting.

Colvin has implied that reading has a definite relationship to typewriting.² According to her view, typewriting teachers need to teach reading so that students are able to type at different levels. This includes the stroke level for beginning typists, then the word level, and finally a combination of these two levels for application to difficult words and combinations in typewriting sentences.

The question of whether or not reading ability is related to typewriting skill has been empirically studied with conflicting results. The relationship of intelligence and reading ability to speed and accuracy in typewriting was studied by Eckert.³ Ninety beginning typewriting students from the ninth grade were subjects. These students were

¹Jane E. Clem, Techniques of Teaching Typewriting (2d ed.: Chicago: Gregg Publishing Company, 1956), pp. 193-194.

²Colvin, loc. cit.

³Sidney W. Eckert, "A Comparison of Intelligence and Reading Ability with Speed and Accuracy in Typewriting," Unpublished Master's thesis, University of Minnesota, 1960, cited in National Business Education Quarterly, 30:17, October, 1961.

enrolled in a nine week typewriting course and were given timed tests every fifth day for the last seven weeks. A correlation coefficient was computed to determine the relationship between the last typewriting test and the predictors: first typewriting test, intelligence, and reading ability. Reading ability was measured by reading in the Natural Sciences section of the Iowa Test Battery. Intelligence was found to have the lowest correlation for rate (.041) and reading ability was found to have the lowest correlation for accuracy (.021). The first typewriting test was found to be the best predictor of performance on the last test in both speed and accuracy with coefficients of .826 and .378, respectively.

Erickson reported a study by Robinson in which a number of predictors of academic success were correlated with the gross-words-per-minute of the typewriting speed of straight copy.¹ He found that the correlation coefficients ranged from .376 to .451 for grade-point average, .357 to .404 for reading levels, and .347 to .401 for intelligence. In addition, he found that none of the predictors used in the study correlated significantly with typewriting accuracy.

¹J. W. Robinson, "Effects of Copy Difficulty upon Typewriting Performance," Unpublished Doctor's dissertation, University of California, 1966, cited by Lawrence W. Erickson, "The Teaching of Typewriting," Contributions of Research to Business Education, Ninth Yearbook of the National Business Education Association (Washington D. C.: National Business Education Association, 1971)p. 19.

A study by Sorrell provided support for the idea that reading is positively related to typewriting.¹ At the end of their freshman year, seventy-eight high school students were given a reading test and an intelligence test. Sixty-one of these students were then enrolled in a typewriting course. At the end of the course another reading test was given to all seventy-eight students and grade-level gains were computed. Correlation coefficients were computed to determine the relationship between IQ and reading, IQ and typewriting, and reading level and typewriting. The correlation coefficients were .70, .40, and .45, respectively. The effect of typewriting on reading gains was also studied. It was found that students taking typewriting gained an average of .2 of a grade level over those who did not take typewriting. Other findings showed that very few students who scored low on either the IQ or reading tests reached a high level of proficiency in typewriting while very few students who were high in IQ or reading were found among the poorest typists.

O'Brien conducted a study designed to determine if there were any traits characteristic of high ranking and low ranking typewriting students.² The subjects were forty

¹Helen H. Sorrell, "A Study of Typewriting and Reading Scores," Unpublished Master's thesis, The University of Wisconsin, 1958, cited in National Business Education Quarterly, 28:66-67, October, 1959.

²Edward J. O'Brien, "A Study of the Characteristics of the Highest and Lowest Ranking Typewriting Students," Unpublished Master's thesis, University of North Dakota, 1960, cited National Business Education Quarterly, 30:39, October, 1961.

high school students, twenty of whom were selected by their typewriting teachers as being the highest ranking in speed and accuracy and twenty as being the lowest ranking. Equal numbers were drawn from four different secondary schools. After selection by teachers, students were interviewed according to a prepared interview check list. Among those factors in which high ranking students were found to be superior to low ranking students, included typewriter usage, amount of prior typewriting experience, intelligence, English, vocabulary, and reading abilities.

The relationship between vocabulary and comprehension in reading and errors in beginning typewriting was studied by Triplett.¹ SRA reading vocabulary and reading comprehension scores were obtained for each student as well as nine straight-copy timed writings and five production timed writings. Typewriting errors were classified and analyzed for those students scoring in the top and bottom twenty-seven percent on the reading vocabulary test and for those students scoring in the top and bottom twenty-seven percent in reading comprehension. Results showed that all beginning typewriting students tended to make the same kinds of errors. Differences, however, were found in the frequency of errors for the two groups of readers. Compared to students with low reading comprehension, students with high reading

¹Betty Triplett, "The Relationship of Reading Vocabulary and Reading Comprehension to Typewriting Errors in Beginning Typewriting," Unpublished thesis, Southern Illinois University, 1968, cited in National Business Education Quarterly, 38:48-49, Fall, 1969.

comprehension made seventy-three percent fewer errors on timed writings, sixty-one percent fewer errors on production timed writings and fewer accidental errors on timed writings and production timed writings. Compared to students with low vocabulary scores, students with high reading vocabulary made seventy-seven percent fewer errors on timed writings, fifty-three percent fewer errors on production timed writings, and fewer accidental errors on timed and production timed writings. It was concluded that reading ability did influence the frequency of errors for typewriting students.

That conflicting results have been reported with regard to the relationship of reading ability to typewriting performance is not very surprising. In testing reading ability, a variety of materials have been used in the various studies. In many instances it can be questioned as to what reading habits are actually being measured since it is known that different reading habits are used for different purposes in reading.¹ For example, it can be asked if a different relationship to typewriting would be exhibited if the students' reading is measured on the material to be typed than when it is measured on material which is quite dissimilar to the kind of material required for the typewriting task.

¹Wood, "Reading and Typewriting," loc. cit.

Summary

Substantial evidence is available to show that typewriting has a positive effect on reading and other aspects of language arts. Only a few studies show that typewriting has negligible or negative influences. The majority of investigations have been conducted at the elementary school level, although a few have been reported at the junior high and high school levels. Evidence of the success of these studies is apparent today to make typewriting a part of the elementary school curriculum.

The relationship of reading to typewriting has not been as clear-cut. Studies have been conducted covering several facets of reading and typewriting.

One of the areas investigated has been the relationship of reading rate and typewriting rate. In general, little positive correlation has been found between the two. Rather, in the opinions of most authorities, rapid reading tends to have a negative effect in that it leads to inaccuracies in typewriting. It is most often asserted that slow, careful reading is required for accurate typewriting.

¹Joyce Sherster, "Performance Goals in Typewriting," Effective Secretarial Education, Twelfth Yearbook of the National Business Education Association (Washington D. C.: National Business Education Association, 1974), p. 95.

Another question that has received considerable attention is whether or not reading for meaning has a place in typewriting. Opinions have ranged from the position that meaning is not involved at all in typewriting and should not be taught to the position that teaching reading comprehension of words and paragraphs is a basic part of typewriting instruction. Another position stressed was that reading comprehension is important for following written directions for typewriting but has no place in actual typewriting act.

The relationship of reading ability to typewriting performance has also been studied with conflicting results. It has been questioned as to whether differences in the types of materials used to test reading may be responsible for the differing results.

Chapter 3

COMPILATION OF DATA

To determine reading level, a cloze test over a 300-word typewriting passage was given. A student's score for this test was calculated by adding together the total number of the student's responses which exactly matched the non-deleted passage. To determine typewriting skill, the student's were given four minutes to typewrite the same but undeleted passage as used in the cloze task. Each student's typewriting score was calculated using the number of correct words a minute (cwam). To obtain this score, the number of words incorrectly typed was subtracted from the total number of words typed. The figure obtained was then divided by the writing time.

The original sample consisted of 54 students. Six students were dropped due to absenteeism on the days the tests were given, resulting in a final sample of forty-eight subjects.

The relationship between the two sets of scores, reading and typewriting, was determined using the Pearson Product-Moment Correlation Coefficient.¹

¹Minium, Statistical Reasoning in Psychology and Education, op. cit., pp. 133-139.

First, the mean and standard deviations for each set of scores were calculated using the formulas provided by Minium.¹ These are as follows:

$$\bar{X} = \frac{EX}{n}$$

$$\bar{Y} = \frac{EY}{n}$$

$$S_x = \frac{1}{n} \sqrt{nEX^2 - (EX)^2}$$

$$S_y = \frac{1}{n} \sqrt{nEY^2 - (EY)^2}$$

Where:

- $\bar{X}$ = Mean of cloze scores
- X = Cloze scores
- $\bar{Y}$ = Typewriting scores
- Y = Mean of typewriting scores
- E = Sum of scores
- n = Number of students
- S_x = Standard deviation of cloze scores
- S_y = Standard deviation of typewriting scores

The range of scores on the cloze task went from a low of 17 to a high of 38 with a mean of 28.875 and a standard deviation of 4.897. On the typewriting test, CWAM ranged from 18 to 53. The mean and standard deviation for the typewriting test were 33.333 and 7.3918, respectively. These results are shown in Table 1. The computations of the means and standard deviations are included in the Appendix.

For Practicality in computing the Pearson Product-Moment Correlation Coefficient, the raw score method as outlined by Minium was used.² The formula is as follows:

¹Minium, op. cit., p. 139.

²Ibid.

Table 1
Range, Mean and Standard Deviation
of Cloze and typewriting Tests

Test	Range	Mean	Standard Deviation
Cloze	17-38	28.875	4.897
Typewriting	18-53	33.333	7.391

$$r_{xy} = \frac{nEXY - (EX)(EY)}{\sqrt{nEX^2 - (EX)^2} \sqrt{nEY^2 - (EY)^2}}$$

Where:

r_{xy} = Correlation coefficient
 X = Cloze scores
 Y = Typewriting scores
 E = Sum of scores
 n = Number of subjects

The correlation coefficient was found to be $+.6135$. The computation of the correlation coefficient has been included in the Appendix.

To determine if the correlation of $+.6135$ is significantly different from zero, Fischer's table for determining the values of correlation coefficients required for different levels of significance was used.¹ Using 46 degrees of freedom (number of pairs of scores - 2), the limits for the .01 level of significance are $\pm .368$. This means that correlation coefficients which fall between zero and $\pm .368$ are not significant at the .01 level. Since the correlation coefficient of $+.6135$ falls well above those limits, it can be stated that there is a significant positive relationship between reading scores and typewriting scores at the .01 level of confidence.

¹Minium, op. cit., pp. 320-321, 445-446.

Chapter 4

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine whether or not a relationship existed between the reading ability and typewriting skill of high school students.

Summary

Forty-eight sophomores and juniors from two beginning typewriting classes at Park Hill Senior High School were used as subjects. Both classes had the same instructor and used the same materials. Beginning typewriting classes were used so that students would have had some knowledge of typewriting procedures and yet have limited experience in typewriting.

Reading ability was determined using the cloze procedure. A 300-word passage from the typewriting book was used with every fifth word deleted. Scores were calculated by adding the number of student responses which exactly matched the unutilated text. Typewriting scores were calculated using correct words per minute on a four minute typewriting test using the same, but undeleted, passage as used in the cloze task. The typewriting test was administered exactly one week after the cloze test.

The degree of relationship was determined using the Pearson Product-Moment Correlation Coefficient.¹ The statistical significance of the correlation coefficient was determined by using Fisher's Table V.A.² The mean and standard deviation for both the cloze task and the typewriting test were also calculated and the range of scores was noted for each test. The findings of the study follow:

1. The scores on the cloze test ranged from a low of 17 to a high of 38.
2. The range of scores of the typewriting test was 18 to 53.
3. For the cloze test, the mean was 28.875 and the standard deviation was 4.897.
4. The mean and standard deviation for the typewriting test were 33.333 and 7.391, respectively.
5. The relationship between reading ability and typewriting as measured by a correlation coefficient was $+.6135$.
6. The correlation coefficient of $+.6135$ was found to be statistically significant at the .01 level of confidence.

Conclusions

According to the results of this study, there is a positive relationship between reading ability as measured

¹Minium, op. cit., p. 139.

²Minium, op. cit., pp. 445-446.

by the cloze procedure and typewriting proficiency as measured by correct words per minute. These results apply to the beginning high school students used in the study when the same material is used for both the reading and typewriting tasks.

Since the obtained correlation coefficient of $+0.6135$ was found to be statistically significant at the $.01$ level, the null hypothesis that there will be no difference between reading ability and typewriting skill was rejected. These results imply that those students who were good readers tended to be good typists, while those students who were poor readers tended to be poor typists.

Recommendations

The following recommendations have been based upon the findings in this study:

1. Similar studies are warranted to determine if the same results will occur with other groups of students.

2. Studies are also desirable in which the same material is used for the reading and typewriting tasks and in which the kinds of materials and difficulty levels of the materials are varied to determine the relationship between reading and typewriting for the various materials and difficulty levels.

3. A long-term study to determine the predictive powers of reading ability on typewriting performance is desirable.

4. In the classroom, the typewriting teacher might use the cloze procedure as a quick way to determine the reading ability of beginning typewriting students as a basis for individualizing instruction.

5. Classroom research might be carried out by teachers to determine if those students who are having problems in reading and typewriting will have more success if the materials they use for typewriting are at their level of reading.

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APPENDIX A

Computation of Means¹

$$\bar{X} = \frac{EX}{n}$$

$$= \frac{1386}{48}$$

$$= 28.875$$

$$\bar{Y} = \frac{EY}{n}$$

$$= \frac{1600}{48}$$

$$= 33.333$$

Where:

$\bar{X}$ = Mean of cloze scores

X = Cloze scores

$\bar{Y}$ = Mean of typewriting scores

Y = Typewriting scores

E = Sum of scores

n = Number of students

¹Minium, Statistical Reasoning in Psychology and Education, op. cit., p. 139.

APPENDIX B

Computation of Standard Deviations¹

$$\begin{aligned}
 S_x &= \frac{1}{n} \sqrt{nEX^2 - (EX)^2} \\
 &= \frac{1}{48} \sqrt{(48) 41,172 - 1,920,996} \\
 &= \frac{1}{48} (235.074) \\
 &= 4.897 \\
 S_y &= \frac{1}{n} \sqrt{nEY^2 - (EY)^2} \\
 &= \frac{1}{48} \sqrt{(48) 55,956 - 2,560,000} \\
 &= \frac{1}{48} (354.807) \\
 &= 7.3918
 \end{aligned}$$

Where:

X = Cloze scores

Y = Typewriting scores

E = Sum of scores

n = Number of students

Sx = Standard deviation of cloze scores

Sy = Standard deviation of typewriting scores

¹Ibid.

APPENDIX C

Computation of Pearson Product-Moment Correlation Coefficient¹

$$\begin{aligned}
 r_{xy} &= \frac{nEXY - (EX)(EY)}{\sqrt{nEX^2 - (EX)^2} \sqrt{nEY^2 - (EY)^2}} \\
 &= \frac{48 (47,266) - (1386) (1600)}{\sqrt{(48) 41,172 - 1,920,996} \sqrt{(48) 55,956 - 2,560,000}} \\
 &= \frac{51168}{\sqrt{55,260} \sqrt{125,888}} \\
 &= \frac{51168}{(235.074) (354.807)} \\
 &= \frac{51168}{83402.836} \\
 &= +.6135
 \end{aligned}$$

Where:

r_{xy} = Correlation coefficient

X = Cloze scores

Y = Typewriting scores

E = Sum of scores

n = Number of subjects

¹Ibid.

APPENDIX D

Cloze Test

Some of you may _____ be moving from a _____ structured school situation to _____ relatively unstructured work situation. _____ of your initial problems _____ be the wise utilization _____ your working time. It _____ always easy to waste _____; this truth becomes even _____ obvious in the work _____. For example, most business _____ have a coffee or _____ break in the morning _____ again in the afternoon. _____ employees may take more _____ the allotted time for _____ break. This habit is, _____ a very genuine sense, _____ the same as stealing _____ their employer because the _____ are being paid for _____ time they are not _____ on the job. Your _____ has a right to _____ that you will use _____ work time in a _____ and responsible manner. One _____ to do this is _____ plan and organize your _____ so that it can _____ completed within a specified _____ period.

Still another distinct _____ may be in the _____ relations domain. In the _____ of work you will _____ with many different kinds _____

people. Some of these _____ you may enjoy and _____ you may dislike; nevertheless, _____ is essential that you _____ how to get along _____ those whom you may _____ care for as well _____ with those whom you _____. If you are to _____ your relations with others, _____ often will have to _____ an earnest effort to _____ so. In strained situations, _____ will learn that good _____ are a positive asset. _____, you should realize that _____ irritations and issues of _____ work situation can readily _____ transmitted into curt or _____ dealings with the clients _____ the company by whom _____ are employed. As you _____ appreciate, your employer has _____ direct and distinct concern _____ how satisfactorily you can _____ along with others.

APPENDIX E

Typewriting Test¹

Some of you may soon be moving from a somewhat structured school situation to a relatively unstructured work situation. One of your initial problems may be the wise utilization of your working time. It is always easy to waste time; this truth becomes even more obvious in the work situation. For example, most business organizations have a coffee or rest break in the morning and again in the afternoon. Some employees may take more than the allotted time for the break. This habit is, in a very genuine sense, almost the same as stealing from their employer because the employees are being paid for work time they are not spending on the job. Your employer has a right to expect that you will use your work time in a contentious and responsible manner. One way to do this is to plan and organize your work so that it can be completed within a specified time period.

Still another distinct problem may be in the human relations domain. In the world of work you will associate with many different kinds of people. Some of these persons may enjoy and others you may dislike; nevertheless, it is

¹D. D. Lessenberry and others, Century 21 Typewriting, loc. cit.

essential that you learn how to get along with those whom you may not care for as well as with those whom you like. If you are to promote your relations with others, you often will have to make an earnest effort to do so. In strained situations, you will learn that good manners are a positive asset. Also, you should realize that the irritations and issues of the work situation can readily be transmitted into curt or impatient dealings with the clients of the company by whom you are employed. As you can appreciate, your employer has a direct and distinct concern in how satisfactorily you can get along with others.