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A Study of Selected Factors Relating to Success Achieved by Beginning Typewriting Students at the High School Level

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A STUDY OF SELECTED FACTORS RELATING TO
SUCCESS ACHIEVED BY BEGINNING TYPEWRITING STUDENTS
AT THE HIGH SCHOOL LEVEL

by

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CHAPTER I

INTRODUCTION

During the last decade, with typewriting still recognized as
a highly essential skill in any office work, as well as a very
useful communication tool, many educators began to recommend that
all high school students should take a typewriting course. However,
in the most recent years a growing number of failures among high
school students enrolled in beginning typewriting courses has led
educators to look for causes of these failures. As a result, the
validity of the idea that all high school students should take
typewriting courses began to be questioned.

Learning the keyboard of a typewriter is not the only element
of beginning typewriting. It also involves the ability to spell,
knowledge of grammar, and knowledge of the elements of word division.
Students without the foregoing knowledge will usually not be suc-
cessful in a beginning typewriting course. West[1] comes to this
conclusion on the basis of his review of the published literature
dealing with teaching of typewriting.

It might be helpful if some predictive factors could be found
that could indicate whether or not a student would be successful
in beginning high school typewriting.

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[1]West, Leonard J., _Acquisition of Typewriting Skills_. New York:
Pitman Publishing Corporation, 1969, pp. 6-7.

Statement of the Problem

The purpose of this study is to determine whether certain factors are significantly related to the student's success in a high school beginning typewriting course.

To learn whether certain factors are related to students' success in beginning typewriting, this study will compare the similarities and differences that may exist between successful and unsuccessful students according to the following selected variables:

1. sex

2. I.Q. test scores

3. class attendance

4. 10th grade English grade

5. overall semester grade point average

6. Differential Aptitude Tests

    6.1 spelling

    6.2 grammar

    6.3 clerical

It is hoped that the results of this study will be useful in predicting students' success or failure and serve as an aid in assisting teachers to help students who are weak in typewriting.

Significance of the Study

This study may lead to greater knowledge of factors which may contribute to success in a beginning typewriting course. Furthermore, it might also be helpful in better planning of vocational

education in general. Lanham and Cook[2] point out the growing need

for persons with typewriting skills since 44 percent of all office

and retail jobs require this skill and, of all office jobs requiring

one or more skills, 85 percent of them require typewriting. U.S.

Labor statistics indicate that there is a growing demand for office

workers and the percentage of office workers in the total labor

force is increasing. Forecasts indicate that there will be an

increase of approximately three and one-half million clerical office

workers by 1980.[3]

With the growing need for more office workers who can type

the enrollment in beginning typewriting has increased considerably

during the last decade. West[4] points out that more than half of all

public secondary school students have been enrolled in a typewriting

class at some time during their high school attendance. However, the

larger enrollment of students in beginning typewriting classes has

been accompanied by a greater percentage of failures. Why some

students succeed and others fail is a complex problem.

<div align="center">Hypothesis</div>

The research hypothesis tested in this study will be:

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[2]Lanham, Frank W. and Cook, Fred S., "Preparing Students for Office and Distributive Occupations--the Intensified Approach," Business Education Yearbook, No. 8 (1970), 255-62.

[3]U.S. Bureau of Labor Statistics, Tomorrow's Manpower Needs, Vol. IV, revised 1971, Bulletin 1737. Washington, D.C.: U.S. Department of Labor, 1971, p. 19.

[4]op. cit.

There is a difference in success achieved by students of beginning typewriting at the high school level in terms of eight selected variables.[5]

Scope of the Study

Students from fourteen beginning typewriting classes in Muskegon Senior High School, which has a population of 2,000 students, participated in this study. The subjects of this study were randomly drawn from a total of 507 students enrolled in beginning typewriting during the fall term of 1971. The total sample is 112 students, 32 of whom are males and 80 of whom are females.

Delimitations

This study:

1. will be limited to students enrolled in beginning typewriting classes at Muskegon Senior High School.

2. is confined to students who received a grade of A, B, or C, and D or E, according to the standard established by the participating instructors in the Department of Business Education.

3. will include only students enrolled in the selected classes during the fall of the 1971-72 academic year.

4. is concerned only with the variables specifically selected;

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[5]The eight variables are: sex, I.Q., attendance, 10th grade English grade, overall end of semester GPA, clerical aptitude, spelling aptitude, grammar aptitude.

however, it is understood that many other variables may be instrumental in success.

5. realizes that teachers are different.

Assumptions

The following assumptions are made in this study:

1. That success in beginning typewriting is not fortuitous but is based on a number of identifiable variables.

2. That all data collected for this study have been recorded accurately in their original form.

3. That students participating in this study will have basically the same amount and quality of teaching.

4. That participating instructors will assign class grades on the basis of earned achievement.

5. That a significantly representative population is available to properly conduct the study.

6. That the teachers involved in this study utilized the same standardized grading procedures.[6]

Definition of Terms

Beginning Typewriting. The first semester course offered at Muskegon Senior High School. The textbook utilized is 20th Century

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[6]See Appendix A.

Typewriting--9th Edition.[7] This covers lessons 1 through 75.

Personal typewriting is included in this course.

Straight Copy Typewriting. This refers, in the simplest case, to word-for-word typing from longhand, typed, or printed matter that does not involve any consideration of form or arrangement other than reasonably regular right-hand margins. It is done without erasing errors, and it sometimes involves line-for-line copying with no requirements for decisions about line length and word division by the typist.[8]

High School Level. Grades 10, 11 and 12 of the Muskegon Senior High School are considered high school level.

Successful Students.[*] Students who received a grade of A, B, or C, according to the standards of the Business Education instructors of Muskegon Senior High School.

Unsuccessful Students.[*] Students who received a grade of D or E, according to the standards of the Business Education instructors of Muskegon Senior High School.

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[7]Lessenberry, D. D.; Crawford, James T.; and Erickson, Lawrence W., 20th Century Typewriting, 9th Edition. Cincinnati: South-Western Publishing Co., 1967. Lessons 1-75.

[8]West, op. cit., p. 226.

[*]This dichotomy of successful and unsuccessful was decided upon for this study because students receiving a grade of C or higher are considered successful in the Muskegon Senior High School and are permitted to continue in more advanced typewriting classes, while those receiving grades of D or E are considered unsuccessful and are strongly advised against continuing in further typewriting classes. See Appendix A for further elaboration of grading standards.

Differential Aptitude Tests (DAT).[9]   These are standard aptitude

tests used to make predictions of how a student can be expected to

develop in school and in a job. The tests employed in this study

are: spelling, grammar and clerical aptitude.

Spelling Aptitude. Measures how well a person can spell common

English words.

Grammar Aptitude. Measures how well a person can recognize

mistakes in grammar, punctuation, and wording of easy sentences.

Clerical Aptitude. Measures how quickly and accurately a person

can compare and mark written lists such as names and numbers.

Otis-Lennon Mental Ability Test or Intelligence Quotient.[10]

This is a test that has been developed to comprehensively measure

the range of mental ability for students commonly found in grades

K-12. The test in this study is of the intermediate level and was

administered to 9th grade students in the spring prior to fall

entrance to the 10th grade.

Stanine Scale. A stanine scale is an approximately normal

transformantion with only nine score categories being allowed;

1 being the lowest category and 9 being the highest category.[11]

Attendance of students. Refers to the number of days a student

is absent from beginning typewriting class.

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[9] Bennett, George K.; Seashore, Harold G.; and Wesman, Alexander
G., Differential Aptitude Tests, Booklets 1 and 2 of Form L. New
York: The Psychological Corporation, 1963.

[10] Otis, Arthur S. and Lennon, Roger T., Otis-Lennon Mental
Ability Test, Technical Handbook. New York: Harcourt, Brace &
World, Inc., 1969.

[11] See Appendix B for discussion of stanine.

<u>Grade Point Average (GPA)</u>. This is the average of all fall semester, 1971 grades, including typewriting, based on a 4.0 system (A = 4.0, B = 3.0, C = 2.0, D = 1.0, and E = 0 points).

Organization of the Study

The organization of the study is as follows:

Chapter II -- a review of the related literature concerning the problem under study.

Chapter III -- the procedures, methodology, and hypotheses employed in collecting, analyzing and presenting the data.

Chapter IV -- the results of the findings are reported.

Chapter V -- the summary, conclusions, implications, and recommendations for further study appear in this chapter.

CHAPTER II

REVIEW OF RELATED LITERATURE

In seeking a solution to the high failure rate among students in beginning typewriting classes, investigators have attempted to develop instruments and to identify characteristics useful in predicting typewriting success.

In order to have a better understanding of the problems involved in beginning typewriting, the review of literautre is divided into the following sections:

1. The importance of typewriting.

2. Beginning typewriting techniques.

3. Grading students so as to identify successful (A, B, and C) students as compared to unsuccessful (D and E) students.

4. Studies comparing various factors and grades in selected courses with the achievement level in beginning typewriting.

The Importance of Typewriting

Most of the studies in the last few years have indicated a growing need for typists. Present and projected employment figures for stenographers, typists and secretaries, the high number of students enrolled in high school typing classes, and the large number of domestic sales of typewriters lead to a conclusion that there is a vast market for office workers with typing skills.[1]

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[1]West, op. cit., p. 29.

Liles and Liles[2] conducted an extensive research study for the Georgia Department of Education and projected that typewriting is a basic need for office workers and college students.

More recently Lanham and Cook[3] noted that typewriting is the one single business skill most often required in an entry office or entry retail job. Clem[4] recognized the need for typists in the present age of automation. This was supported by Rowe,[5] who predicted a greater need for typing skills.

Projections show that in 1980 there is an expected need for somewhat over one million additional typists, secretaries and stenographers.[6] This projection does not include part-time secretarial employment estimated to include over half a million persons, nor does it account for the number of those who make at least some use of the typewriter in their jobs.

Consideration should also be given to persons wanting or needing personal typewriting. Legible adult longhand is written at a rate of about 100 letters a minute, while only one semester of

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[2]Liles, Parker and Liles, Zenobia T., _A Guide for the Improvement of Typewriting Instruction_, 2nd Edition. Atlanta: Georgia Department of Education, 1968, pp. 1-2.

[3]Lanham and Cook, op. cit.

[4]Clem, Jane E., "The Influence of Automation on the Teaching of Typewriting," _Business Education Forum_, XIV (April 1960), 22.

[5]Rowe, John L., "How to Meet Changing Needs in Typewriting," _Business Education World_, XLIV (September 1963), 9-11.

[6]_Tomorrow's Manpower Needs_, op. cit., p. 19.

typewriting will bring most students to at least 150 strokes a minute.[7] This means about a 50 percent increase over longhand, to which should be added the advantage of the perfect legibility of transcript. In view of the above factors, West[8] feels that everyone should be taught to typewrite.

Beginning Typewriting Techniques

Learning to type is not as simple and as easy as many who do not teach typewriting seem to think. Lessenberry[9] points out the need for lesson organization used by experienced teachers to get the best results.

In beginning typewriting the basic goal for the students is to learn to operate the typewriter by the touch method, and to drill to obtain speed and accuracy. For the most part lessons contain straight copy material.[10]

Authors of related literature differ in their opinions as to time and emphasis necessary for reaching the objectives in one

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[7]Freemon, F. N., "Teaching Handwriting," Washington, D.C.: National Education Association, Department of Classroom Teaching, No. 2 (1954).

[8]West, op. cit., p. 11.

[9]Lessenberry, D. D., "A Rationale for a Widely Used Sequence of Introducing the Letter Keyboard," Practices and Preferences in Teaching Typewriting. Cincinnati: South-Western Monographs, No. 117 (March 1967), p. 17.

[10]Lessenberry, et al., op. cit.

semester of beginning typewriting. Liles and Liles[11] determined that teaching the keyboard should be the basic goal, and that the development of speed and accuracy should have lesser importance than now given by most teachers. Crawford[12] indicated that when objectives are introduced they should flow into a sequence to reach the primary goal of mastering the typewriter. Erickson[13] indicated the need for more practice in order to fix certain basic responses and insisted that beginning typewriting should involve learning by drill until the learning is well established. Wanous[14] believes that in the first semester the following three factors might be weighed: techniques, 40 percent; basic skill, 40 percent; and problem typewriting, 20 percent.

Erickson believes that teaching typewriting should be undertaken in the spirit of discovery and a search for improved methods and procedures, yet it must always be undertaken within the framework of an understanding of the skill learning process.[15]

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[11]Liles and Liles, op. cit., pp. 25-29.

[12]Crawford, James T., "Fundamental Consideration of Successful Typewriting Instruction," Business Education Forum, XVII (October 1962), 20, 28.

[13]Erickson, Lawrence W., "Modes of Instruction and Their Meaning," Practices and Preferences in Teaching Typewriting. South-Western Monographs, No. 117 (March 1967), p. 10.

[14]Wanous, S. J., "An Analysis of Some Evaluative Measures of Typewriting Performance," Practices and Preferences in Teaching Typewriting. South-Western Monographs, No. 117 (March 1967), p. 83.

[15]Erickson, op. cit., pp. 10-16.

Grading Students

The review of literature concerning what goals a successful typist must reach revealed that grading is related to standards set by the individual teacher or business department. The grades are linked to the number of words typed per minute. West[16] points out various methods used to rate the students on the basis of the number of words typed per minute. In beginning typewriting, grading is done in relation to straight copy material but West indicates that this is not a realistic typing situation. He feels that grading should be done on the basis of fulfilling the normal typewriting tasks, and an average of several tests should be used to determine the gross words typed per minute. For flexibility, Bennett[17] prepared a scheme to grade by individual improvement rather than a set standard. Carter[18] undertook a review of the typewriting literature for a five-year period to gather inclusive elements in grading beginning typewriting. He found that for grading purposes various lengths of timed writings were being used with variations of gross words per minute. Gross words were defined as all words typed in a given time with various number of errors allowed; net words per

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[16] West, op. cit., pp. 546-47.

[17] Bennett, James C., "A Case for Flexible Grading in Typing," Business Education Forum, XXIV (November 1969), 20.

[18] Carter, William K., "A Study and Evaluation of Methods of Grading First Year Typewriting Based on Comprehensive Review of Current Professional Literature, 1947-1952." Unpublished Master's thesis, State University of Iowa, Iowa City, Iowa, 1953.

minute were determined by the gross number of words typed less the number of errors in the typing. Other techniques used in grading are gross words per minute, excluding errors; and net words per minute when errors are deducted from gross words per minute.

Erickson[19] believes that additional consideration needs to be given for techniques, production work, and work habits and attitudes. According to Winger[20] the second-ranking area singled out by type-writing teachers as a constant problem is that of grading. He also suggests various measures for grades as follows: net words per minute, correct words per minute, mailable words per minute, per-centage of accuracy, net production rate, gross words per minute and production work.

As suggested by Carrington,[21] a study should be made to establish standards and grading procedures for 1-minute timed writings, and it should be included in textbook materials.

Featheringham[22] recommends that tests, besides being used for grading purposes, should also be a learning opportunity, and sug-gested that meaningful materials be used in a timed writing test differing from the traditional textbook approach.

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[19] Erickson, op. cit., p. 10.

[20] Winger, Fred E., "Typewriting," Changing Methods of Teaching Business Subjects, 1971 Yearbook, National Business Education Association, pp. 91-95.

[21] Carrington, Max R., "Are Sustained Timed Writings Necessary for Typewriting Evaluation?" Business Education Forum, XXIV (January 1970), 26.

[22] Featheringham, Richard D., "The Proper Use of Typewriting Tests," Business Education Forum, XXVI (April 1972), 49.

Rather than using the traditional grading scale of A, B, C, D, or E, West[23] suggests using a numbering system from 0-100. This has greater flexibility in reporting grades.

Other authors suggest different ways of grading which are not now being widely used. Office standards of usable words per minute are suggested by Clevenger[24] as appropriate for grading. Goldsmith[25] describes a grading plan using class projects with all projects timed. Grades based on percentage of error are presented by McCarthy.[26] He stresses accuracy rather than speed. Anderson and Johnson[27] suggest standard production tests with standard deviations when considering a grade. Rainey[28] has a similar plan to that of West in assigning points to typing materials, and he used this system to motivate students.

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[23] West, op. cit., pp. 546-58.

[24] Clevenger, Earl, "Grading Typing Papers," Business Education Forum, III (November 1948), 41-43.

[25] Goldsmith, Samuel, "A Simplified Typewriting Grading Plan," Business Education World, XXXIX (April 1959), 13-16.

[26] McCarthy, Richard A., "Accuracy Grade Based on Per Cent of Error," The Journal of Business Education, XXXIV (November 1958), 72-74.

[27] Anderson, Ruth I. and Johnson, Margaret H., "Standardized Production Typewriting Tests," Business Education World, XLVIII (February 1962), 26-28.

[28] Rainey, Bill G., "Grading Plan for Typing Evaluates and Motivates," Business Education World, XLII (February 1962), 21-24.

Studies Comparing Grades in Various Courses with the
Achievement Level in Beginning Typewriting

Very few prognostic studies have been conducted in recent years

to investigate a number of factors that might prove useful in pre-

dicting beginning typewriting success. Triplett[29] conducted SRA

reading tests to obtain scores for reading vocabulary and reading

comprehension in order to determine their relationship to typing

errors. She found that reading ability seemed to influence the

number of errors made by beginning typewriting students. Students

with high reading vocabulary made 77 percent fewer errors on timed

writings than students with low reading vocabulary. Students with

high reading comprehension made 73 percent fewer errors on timed

writings than students with low reading comprehension.

Ivarie[30] found that there is a moderate relationship between

spelling and typewriting accuracy. He conducted a single factor

study concerning the relationship of good spelling ability to

learning to typewrite with two beginning typewriting classes in

South Salem (Oregon) High School. The experimental group received

regular instruction in spelling, while the control group received

none. His findings were: 1) there is a moderate relationship

between spelling ability and typewriting speed; 2) there is a

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[29]Triplett, Betty, "The Relationship of Reading Vocabulary and
Comprehension to Typewriting Errors in Beginning Typewriting."
Southern Illinois University (Edwardsville), 1968. National Business
Education Quarterly, XXXVIII (Fall 1969), 48-49.

[30]Ivarie, Theodore W., Jr., "Are Spelling and Typing Related?"
Business Education World, XLIV (November 1963), 18-19.

slight-to-moderate relationship between spelling ability and type-writing accuracy; 3) there is a moderate relationship between the improvement in typewriting speed and the improvement in spelling over a one school year period; and 4) there is a high relationship between improvement in spelling and the improvement in typewriting accuracy over a one school year period.

However, West[31] seemed to disagree with Triplett by indicating that a student's vocabulary was not a real test of the student's ability to type, for no one vocabulary list could be of the same difficulty for each student.

Another study reported by Foss[32] showed a marked correlation between intelligence and typewriting performance. By using the Hemmon-Nelson Intelligence Test and the Stanford Achievement Test, I.Q. scores and grade levels were determined for the 168 partici-pating 9th grade students. The method of grading the students was based solely on speed, accuracy, and production. On the basis of the analysis, the following conclusions were drawn: 1) that the students having an I.Q. of 90 or less are two years or more below grade level, and will not master the mechanics of typewriting; 2) grouping by either I.Q. or Basic Mentality scores will give an overall predictability of class results; 3) the ability of students to qualify in speed requirements is almost directly related to the

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[31]West, op. cit., p. 468.

[32]Foss, Hetrich A., "How Much Does Intelligence Affect Typing Performance?" Business Education World, XLIV (October 1963), 24-25, 33.

B.M.-I.Q. scores, which suggests that the higher the rating, the fewer the failures.

Erickson[33] found that I.Q. was a significant factor in achieving high typewriting speed. In a subsequent study of the teaching of typewriting at the elemtary level, Erickson also found that there was a relationship between student I.Q. and straight copy type-writing rates.[34]

In contrast to the above findings, Robinson[35] found low correlations between I.Q. and typewriting skill, as measured by straight copy.

On the basis of her informal typing study, Lane[36] has noted that there is a high relationship between achievement in typewriting classes and in other high school subjects. Students who have high typewriting grades usually also have high grade point averages in other subjects.

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[33]Erickson, L. W., "Developing High Speed Typewriting Skill--A Case Study Approach," The Balance Sheet, XLV (February 1964), 244-47, 288.

[34]Erickson, L. W. and Claw, C., "The Manual Portable Typewriter as a Tool of Learning with Fifth Grade Elementary School Pupils," Summary Research Report. New York: Teachers College, Columbia University, 1959.

[35]Robinson, J. W., "Effects of Copy Difficulty Upon Typewriting Performance." Unpublished Doctor's dissertation, University of California, Los Angeles, 1964.

[36]Lane, Willa, "How Do Typewriting Grades Compare with Overall High School Grades?" Business Education World, LVII (March-April 1971), 18-20.

In her study conducted in Missouri Public Schools, Linn[37] found that poor attendance was another contributing factor to typewriting failures.

A number of researchers have come to the conclusion, on the basis of their studies, that the typewriter could be used as an aid to learning. Bartholome[38] found that copy materials used in typewriting could improve spelling. This agrees with Ivarie's finding that improved spelling has a relationship to typewriting speed and accuracy. Of lesser significance is Clark's study, which proved that economics can be taught in the use of materials to be typed in beginning typewriting classes.[39] This was also verified in a study by Clayton.[40]

Summary

While many research studies have been conducted in the area of instruction, very few major studies have been conducted in prediction

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[37]Linn, Emma June, "A Survey to Determine the Reasons for Typewriting I Dropouts and Typewriting I Failures in the AAA Secondary Public Schools of Missouri." Unpublished Master's thesis, Souther Illinois University, Carbondale, Illinois, 1965.

[38]Bartholome, L. W., "The Typewriter as a Tool for Improving Spelling." Unpublished Doctor's dissertation, University of California, Los Angeles, 1968.

[39]Clark, M. A., "Incidental Learning in Economics in Beginning Typewriting." Unpublished Doctor's dissertation, University of Minnesota, Minneapolis, Minnesota, 1967.

[40]Clayton, G. D., "Incidental Learning of Economic Concepts in Beginning Typewriting Classes." Unpublished Doctor's dissertation, Oklahoma State University, Stillwater, Oklahoma, 1962.

of typewriting success. The prognostic studies have not provided conclusive predictive evidence.

Because of a wide variety of instructional levels, the large number of cases involved, the different research instruments used, and the method of conducting and reporting research findings, the results have varied widely. Moreover, direct comparison of research studies cannot generally be made because of the varied determinants of success or failure. Furthermore, conclusions of many prognostic studies were based on small samples as well as on students' and teachers' opinions and judgments.

CHAPTER III

PROCEDURE, METHODOLOGY AND HYPOTHESES

Procedure

Sources of basic data

The basic test data included student scores from: the grammar,
spelling and clerical parts of the Differential Aptitude Tests, and
the Otis-Lennon Mental Ability test for the intermediate level.
These tests were administered by school personnel during the spring
of 1971 at the 9th grade level of the Muskegon public school system.

Typewriting grades, English grades, attendance, and semester
GPA, as well as test scores, were obtained from student personnel
records.

Choosing the sample

The universe from which the sample was drawn was the 507
Muskegon Senior High School students who were enrolled in 14 differ-
ent beginning typewriting classes during the fall of 1971. One out
of every four students was randomly selected--a total of 126.
However, 14 were deleted because of incomplete records. The final
sample was 112 tenth grade students (22.1%), 32 of whom were males
and 80 of whom were females.

Table 1 shows a breakdown of the final sample by sex and grade
in beginning typewriting. Students receiving a grade of A, B, or C

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were classified as successful and those receiving a grade of D or
E were classified as unsuccessful.

Table 1

Beginning Typewriting Grades by Sex

Grade	Female N	Female %	Male N	Male %	Total N	Total %
Successful						
A	6	7.5	1	3.1	7	6.3
B	32	40.0	6	18.8	38	33.9
C	16	20.0	5	15.6	21	18.7
	54	67.5	12	37.5	66	58.9
Unsuccessful						
D	18	22.5	16	50.0	34	30.4
E	8	10.0	4	12.5	12	10.7
	26	32.5	20	62.5	46	41.1
Total	80	100.0	32	100.0	112	100.0

Methodology

All data were coded and punched on IBM cards.

The statistical method employed in testing the hypotheses in
null form was the Chi-square test.[1] This method was chosen because
the data were qualitative and nonparametric. The null hypothesis
was rejected if the Table of Stanines of the Chi-square showed that

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[1]Siegel, Sidney, Non-Parametric Statistics for the Behavioral
Sciences. New York: McGraw-Hill Book Company, Inc., 1952.

the value of Chi-square was significant at the .05 level of confidence.

Data were also presented on a percentage basis attempting to show tendencies or relationships that may exist.

Hypotheses

Main Hypothesis

The main research hupothesis restated in null form is:

There is no difference in success achieved by students of beginning typewriting at the high school level in terms of eight selected variables.

Sub-hypotheses

1. There is no difference in success achieved in beginning typewriting classes at the high school level between female and male students.

2. There is no difference in success achieved by students of beginning typewriting at the high school level in terms of number of absences.

3. There is no difference in success achieved by students of beginning typewriting at the high school level according to their 10th grade English grades.

4. There is no difference in success achieved by students of beginning typewriting at the high school level according to I.Q. stanine groups.

5. There is no difference in success achieved by students of beginning typewriting at the high school level according to GPA group.

6. There is no difference in success achieved by students of beginning typewriting at the high school level according to spelling aptitude.

7. There is no difference in success achieved by students of beginning typewriting at the high school level according to grammar aptitude.

8. There is no difference in success achieved by students of beginning typewriting at the high school level according to clerical aptitude.

Summary

The sources of data, procedures and methodology employed to select and analyze the data were described in this chapter. The data for this study were obtained from Muskegon Senior High School. The sample consisted of 112 beginning typewriting students, of which 80 were females and 32 were males. The statistical test employed was the Chi-square test.

Chapter IV presents an analysis of the data by successful and unsuccessful beginning typewriting students.

CHAPTER IV

PRESENTATION OF DATA

This chapter is concerned with the analysis of successful and unsuccessful high school level beginning typewriting students.

Students who received a final grade of A, B, or C were classified as successful. Students who received a grade of D or E were classified as unsuccessful. The general null hypothesis for testing each of the eight variables is:

There is no difference in success achieved by students of beginning typewriting at the high school level in terms of eight selected variables.

The results are presented in the following pages.

Success Rate by Sex

Hypothesis 1

The hypothesis that there is no difference in success achieved in beginning typewriting at the high school level between female and male students was rejected at the .01 level.

Table 2 shows that about 68 percent of the females and only about 38 percent of the males were successful in beginning typewriting. Since the data in Table 2 clearly indicate that female students were more successful than males, the remaining variables will also be presented according to sex in tabular form and only on a percentage basis.

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Table 2

Successful and Unsuccessful High School Level
Beginning Typewriting Students by Sex

| Category | Sex | | | | Total by Category | |
| | Female | | Male | | | |
	N	%	N	%	N	%
Successful	54	67.5	12	37.5	66	58.8
Unsuccessful	26	32.5	20	62.5	46	41.2
Total by Sex	80	71.4	32	28.6	112	100.0

Chi square: 8.500
significant at .01 level
degrees of freedom: 1

Success Rate by Days Absent

Hypothesis 2

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level in terms of number of absences was rejected at the .01 level.

Table 3 shows that Group I (0-4 days absent) included 80 percent successful and 37 percent unsuccessful students.

Group II (5-9 days absent) included only 10 percent of the successful and 13 percent of the unsuccessful students.

Group III (10 or more days absent) included 50 percent of the unsuccessful students and only slightly over 9 percent of the successful ones.

Data in Table 3 indicate that students with only a few days

absence were generally successful, while students with ten or more days absence were less successful.

Table 3

Successful and Unsuccessful High School Level
Beginning Typewriting Students by Days Absent

| | Days Absent | | | | | | Total by Category | |
| | Group I (0-4) | | Group II (5-9) | | Group III (10+) | | | |
Category	N	%	N	%	N	%	N	%
Successful	53	80.3	7	10.6	6	9.1	66	58.8
Unsuccessful	17	37.0	6	13.0	23	50.0	46	41.2
Total by Groups	70	62.5	13	11.6	29	25.9	112	100.0

Chi square: 35.036
significant at .01 level
degrees of freedom: 2

Days absent by sex

Table 4 shows data concerning the difference between females and males according to number of days absent. Group I, with absences of four or less days per semester, included 63.8 percent of the females and 59.4 percent of the males. Group II, with absences of 5-9 days, included 11.3 percent of the females and a slightly higher percentage of the males. Group III, with absences of ten or more days, included 24.9 percent of the females and 29.1 percent of the males. These data indicate that there is only a slight difference in the number of days absent between the female and male students.

Table 4

Days Absent by Sex

	Days Absent						Total by Category	
	Group I (0-4)		Group II (5-9)		Group III (10+)			
Category	N	%	N	%	N	%	N	%
Female	51	63.8	9	11.3	20	24.9	80	71.4
Male	19	59.4	4	12.5	9	29.1	32	28.6
Total by Groups	70	62.5	13	11.6	29	25.9	112	100.0

Success Rate by English Grades

Hypothesis 3

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level according to their 10th grade English grade was rejected at the .01 level.

The data in Table 5 show that almost 99 percent of Group I, students who received a grade of C or higher in 10th grade English classes, were successful in beginning typewriting. Of the students in Group II, who received a grade of D or E in their English classes, approximately 1 percent were successful in beginning typewriting. Most of the unsuccessful students in beginning typewriting were equally dispersed between both groups: 50 percent of them received grades of C or higher and 50 percent received D's or E's in their 10th grade English.

Table 5

Successful and Unsuccessful High School Level
Beginning Typewriting Students
by English Grades

| | 10th Grade English Grades | | | | Total by Category | |
| | Group I (A-B-C) | | Group II (D-E) | | | |
Category	N	%	N	%	N	%
Successful	65	98.5	1	1.5	66	58.8
Unsuccessful	23	50.0	23	50.0	46	41.2
Total by Groups	88	78.6	24	21.4	112	100.0

Chi square: 37.848
significant at .01 level
degrees of freedom: 1

Achievement in 10th grade
English by sex

The data presented in Table 6 show that 86.3 percent of the
females and 59.4 percent of the males received a grade of C or higher
in 10th grade English. This might be some indication of the reason
why females are more successful than males in beginning typewriting.

Table 6

Achievement in 10th Grade English by Sex

| | 10th Grade English Grades | | | | Total by Category | |
| | Group I (A-B-C) | | Group II (D-E) | | | |
Category	N	%	N	%	N	%
Female	69	86.3	11	13.7	80	71.4
Male	19	59.4	13	40.6	32	28.6
Total by Group	88	78.6	24	21.4	112	100.0

Success Rate by GPA*

Hypothesis 4

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level according to GPA was rejected at the .01 level.

The date in Table 7 show that none of the successful beginning typewriting students were in the low (0.0-1.9) grade point average group, while 71.5 percent of the unsuccessful students were in the low GPA group. Slightly more than one-half of the successful beginning typewriting students were in the middle (2.0-2.9) grade point average group, while 28.5 percent of the unsuccessful typewriting students were in this group. Almost one-half of the successful typewriting students were in the high (3.0-4.0) grade point average group and none of the unsuccessful students were in this group. Figures from Table 7 indicate that successful beginning typewriting students are in the average or above average category.

_____

*The grade point average represents the average on the basis of total number of grades received by the students for all subjects taken during the semester including beginning typewriting.

Table 7

Successful and Unsuccessful High School Level
Beginning Typewriting Students
by Grade Point Average

Category	Grade Point Average						Total by Category	
	Group I (0.0-1.9)		Group II (2.0-2.9)		Group III (3.0-4.0)			
	N	%	N	%	N	%	N	%
Successful	0	0.0	34	51.5	32	48.5	66	58.8
Unsuccessful	33	71.5	13	28.5	0	0.0	46	41.2
Total by Group	33	29.4	47	42.0	32	28.6	112	100.0

Chi square: 73.144
significant at .01 level
degrees of freedom: 2

GPA by sex

The data in Table 8 show that the low (0.0-1.9) grade point

average group comprises slightly over 20 percent of female students,

but almost 47 percent of the males. This may be another reason why

females are more successful as a group in beginning typewriting.

Table 8

Grade Point Average by Sex

Category	Grade Point Average						Total by Category	
	Group I (0.0-1.9)		Group II (2.0-2.9)		Group III (3.0-4.0)			
	N	%	N	%	N	%	N	%
Female	18	22.5	34	42.5	28	35.0	80	71.4
Male	15	46.9	13	40.8	4	12.5	32	28.6
Total by Group	33	29.4	47	42.0	32	28.6	112	100.0

Success Rate by Intelligence Quotient*

Hypothesis 5

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level according to I.Q. was rejected at the .01 level.

The data in Table 9 show that only 1.5 percent of the successful students were in Group I, and that over 40 percent of the unsuccessful students were in this group. Group II contains almost equal numbers of successful and unsuccessful students. Group III contains approximately 41 percent of successful and none of the unsuccessful students.

Table 9

Successful and Unsuccessful High School Level
Beginning Typewriting Students
by I.Q. Test Score

| | Stanine Groups | | | | | | | |
| | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | Total by Category | |
Category	N	%	N	%	N	%	N	%
Successful	1	1.5	38	57.6	27	40.9	66	58.8
Unsuccessful	19	41.3	27	59.7	0	0.0	46	41.2
Total by Group	209	17.8	65	58.1	27	24.1	112	100.0

Chi square: 28.051
significant at .01 level
degrees of freedom: 2

*Scores from the Otis-Lennon Intelligence Tests were ranked by stanines and arranged by low, middle and high groups.

On the basis of this information one might conclude that students with high I.Q. test scores will be more likely to succeed in beginning typewriting. This is in agreement with some studies which suggest that a correlation exists between typewriting and intelligence.[1] However, West[2] points out that ordinary copying skill has nearly no correlation with intelligence. Since findings in this area have been highly contradictory it would be safe to say that one should examine this area more critically with a larger sample and greater control of intervening variables before accepting these conclusions.

Intelligence quotient by sex

The data in Table 10 show that 17.5 percent of the females and 18.8 percent of the males were in Group I, the low stanine group. In Group II, the medium stanine group, there were 55 percent of the females and 65.6 percent of the males. Note that there are about 12 percent more females than males in Group III, the high stanine group. However, the differences do not seem great enough to concretely state that I.Q. plays an important role in relation to an individual's sex.

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[1] Foss, op. cit.; Erickson, "Developing High Speed Typewriting Skill," op. cit.

[2] West, op. cit., p. 11.

Table 10

I.Q. Stanine Groups by Sex

	Stanine Group						Total by Category	
	Group I Low (1-3)		Group II Medium (4-6)		Group III High (7-9)			
Category	N	%	N	%	N	%	N	%
Female	14	17.5	44	55.0	22	27.5	80	71.4
Male	6	18.8	21	65.6	5	15.6	32	28.6
Total by Group	20	17.8	65	58.1	27	24.1	112	100.0

Success Rate by Differential Aptitude Tests

The three tests selected from the DAT battery were: spelling, grammar and clerical.

Spelling--Hypothesis 6

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level according to spelling aptitude was rejected at the .01 level.

The data in Table 11 show that there is a close relationship between success in beginning typewriting and spelling aptitude. Note that there are 30.4 percent more successful students in Group III and 33.7 percent more unsuccessful students in Group I. About one-half of both successful and unsuccessful students are in Group II. The review of literature shows that this is in agreement with previous research concerning spelling and vocabulary.[3]

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[3] Ivarie, op. cit.; Triplett, op. cit.

Table 11

Successful and Unsuccessful High School Level
Beginning Typewriting Students
by Spelling Aptitude

| | Stanine Group | | | | | | Total by Category | |
| | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | | |
Category	N	%	N	%	N	%	N	%
Successful	5	7.6	34	51.5	27	40.9	66	58.8
Unsuccessful	19	41.3	22	48.2	5	10.5	46	41.2
Total by Group	24	21.5	56	50.0	32	28.5	112	100.0

Chi square: 23.026
significant at .01 level
degrees of freedom: 2

Spelling aptitude by sex

Table 12 shows that 13.8 percent more males are in Group I,
the low group, while 9.5 percent more females are in Group III, the
high group. These data indicate that females scored higher in
spelling aptitude than males. This may be one of the factors con-
tributing to their greater success in beginning typewriting in
comparison with males.

Table 12

Spelling Aptitude by Sex

| | Stanine Group | | | | | | | |
| | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | Total by Category | |
Category	N	%	N	%	N	%	N	%
Female	14	17.5	41	51.2	25	31.3	80	71.4
Male	10	31.3	15	46.9	7	21.8	32	28.6
Total by Group	24	21.5	56	50.0	32	28.5	112	100.0

Grammar--Hypothesis 7

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level according to grammar aptitude was rejected at the .01 level.

The data in Table 13 indicate that there is a direct relationship between grammar aptitude and success in typewriting. Only one (1.5%) successful student is in Group I, the low group, while 45.7 percent of the unsuccessful students are in this group. A preponderantly greater percentage of successful students are in Groups II and III. These data infer quite heavily that high grammar aptitude is indicative of success in typewriting.

Table 13

Successful and Unsuccessful High School Level
Beginning Typewriting Students
by Grammar Aptitude

| Category | Stanine Group | | | | | | Total by Category | |
| | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | | |
	N	%	N	%	N	%	N	%
Successful	1	1.5	51	77.3	14	21.2	66	58.8
Unsuccessful	21	45.7	23	50.0	2	4.3	46	41.2
Total by Group	22	19.7	74	66.0	16	14.3	112	100.0

Chi square: 35.332
significant at the .01 level
degrees of freedom: 2

Grammar aptitude by sex

Data are presented in Table 14 concerning grammar aptitude
scores between male and female students and the relationship to
success in beginning typewriting.

Twenty-five percent of the males were in Group I, the low group,
and 17.5 percent of the females were in this group. Slightly over
two-thirds of the females and slightly fewer than two-thirds of
the males were in Group II, the average group. Group III, the high
group, contained 15 percent of the females and 12.5 percent of the
males. The differences do not seem great enough to make a clear-cut
statement that grammar aptitude has a relationship to an individual's
sex.

Table 14

Grammar Aptitude by Sex

| | Stanine Group | | | | | | | |
| Category | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | Total by Category | |
	N	%	N	%	N	%	N	%
Female	14	17.5	54	67.5	12	15.0	80	71.4
Male	8	25.0	20	62.5	4	12.5	32	28.6
Total by Group	22	19.6	74	66.1	16	14.3	112	100.0

Clerical--Hypothesis 8

The hypothesis that there is no difference in success achieved by students of beginning typewriting at the high school level according to clerical aptitude was rejected at the .01 level.

Table 15 shows that in Group III, the high group (which represented about 13 percent of the total number of students), there were 14 successful students and only one unsuccessful student.

The average stanine group II showed little difference between the two types of students. The lower stanine group I had nearly 50 percent of the unsuccessful and about one-fourth of the successful students.

These data indicate that there is a positive relationship between high clerical aptitude and success in typewriting.

Table 15

Successful and Unsuccessful High School Level
Beginning Typewriting Students
by Clerical Aptitude

| | Stanine Group | | | | | | | |
| | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | Total by Category | |
Category	N	%	N	%	N	%	N	%
Successful	17	25.8	35	53.0	14	21.1	66	58.8
Unsuccessful	22	47.8	23	50.0	1	2.2	46	41.2
Total by Group	39	34.8	58	51.7	15	13.4	112	100.0

Chi square: 11.174
significant at the .01 level
degrees of freedom: 2

Clerical aptitude by sex

Here again, data between female and male students is presented
in terms of the differences in the clerical aptitude test scores in
order to examine another potential factor that may influence success
in beginning typewriting.

Table 16 shows that a slightly higher percentage of males were
found in both the high and low stanine groups. According to these
data there does not seem to be conclusive evidence that sex plays a
significant role in clerical aptitude and success in typewriting.
However, more refined statistical analysis is needed to make a
definitive statement concerning this matter.

Table 16

Clerical Aptitude by Sex

| | Stanine Group | | | | | | | |
| | Group I Low (1-3) | | Group II Medium (4-6) | | Group III High (7-9) | | Total by Category | |
Category	N	%	N	%	N	%	N	%
Female	26	32.5	45	56.3	9	11.2	80	71.4
Male	13	40.6	13	40.6	6	18.8	32	28.6
Total by Group	39	34.8	58	51.7	15	13.5	112	100.0

Findings

In this chapter the data were analyzed to learn whether or not there were any significant differences between successful and unsuccessful beginning typewriting students in terms of eight variables. The data reveal the following findings:

1. There is a significant difference in success achieved by students of beginning typewriting according to sex. Female students were much more successful than male students.

2. There is a significant difference in success achieved by students of beginning typewriting as measured by number of days absent. Those students with only a few days absence were generally more successful than those students with ten or more days absence.

3. There is a significant difference in success achieved by students of beginning typewriting as measured by 10th grade English grades. Over 98 percent of the students who passed

English with a C or higher grade were successful in beginning typewriting. However, only 50 percent of those who failed English (D-E) were successful in beginning typewriting.

4. There is a significant difference in success achieved by students of beginning typewriting as measured by Grade Point Average. Success in beginning typewriting correlates very closely with GPA. All students with a 2.0 GPA or higher were successful while slightly over 70 percent of the students with less than a 2.0 GPA were unsuccessful in beginning typewriting.

5. There is a significant difference in success achieved by students of beginning typewriting as measured by I.Q. More students who scored high in I.Q. were successful than those who scored low.

6. There is a significant difference in success achieved by students of beginning typewriting in terms of spelling aptitude. A high percentage of students who scored high in spelling aptitude were successful in beginning typewriting.

7. There is a significant difference in success achieved by students of beginning typewriting in terms of grammar aptitude. A much higher percentage of students who scored average or higher in grammar aptitude were successful than those who scored low in grammar aptitude.

8. There is a significant difference in success achieved by students of beginning typewriting in terms of clerical aptitude. A much higher percentage of students with high clerical aptitude were successful in beginning typewriting.

Inasmuch as more female than male students were successful in beginning typewriting, the remaining variables were examined to note if there were any percentage differences according to sex. Following are the findings between male and female students:

1. No great differences seemed apparent in terms of days absent.

2. Almost 27 percent more females than males were successful in 10th grade English (86.3% as opposed to 59.4%)

3. Over twice as many males as females had below a 2.0 GPA, while almost three times as many females had a 3.0 or higher GPA.

4. The variations in I.Q. were not great. However, there were almost 12 percent more females than males in the high stanine group.

5. Females generally scored higher in spelling aptitude.

6. There are no clear-cut differences in grammar aptitude.

7. There are no great differences in terms of clerical aptitude.

Summary

This chapter presented and analyzed the data concerning successful and unsuccessful high school level beginning typewriting students

in terms of the eight variables under study. The findings were summarized at the end of the chapter.

The summary, conclusions concerning the eight variables as predictors of success and recommendations are presented in the next chapter.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The major purpose of this study was to identify certain factors

which may contribute to students' success in high school level

beginning typewriting courses. The variables examined were:

1. Sex
2. Class attendance
3. English grade at the 10th grade level
4. Overall semester grade point average
5. Intelligence Quotient test scores
6. Spelling aptitude
7. Grammar aptitude
8. Clerical aptitude

Muskegon Senior High School was the participating institution.

The subjects included 80 female and 32 male students enrolled in 14

beginning typewriting classes during the fall semester of 1971.

Students with a grade of A, B, or C were classified as successful.

Those who received a grade of D or E were classified as unsuccessful.

The total sample of 112 included 66 successful students and 46

unsuccessful students.

The data were gathered directly from student personnel records.

They were presented and discussed in Chapter IV.

The statistical method employed was the Chi-square test. The

.05 level of confidence was chosen. It also seemed consistent with

the nature of this study to present and discuss certain data in

tabular form.

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The general null hypothesis for testing each of the eight variables was:

> There is no difference in success achieved by students of beginning typewriting at the high school level in terms of eight selected variables.

The conclusions were derived from the findings revealed by the data in this study. Because of the limited sample, the conclusions should be considered with extreme caution. Furthermore, it is not presumed that this is a complete set of variables upon which to conclusively base predictions concerning the success rate of beginning typewriting students. Additional variables outside the scope of this study may have to be examined. Nevertheless, even these eight variables suggest certain predictors of success which may prove helpful.

Aptitudes as Predictors of Success

The review of literature shows that past research generally establishes that certain aptitudes such as spelling, grammar, and I.Q. may be of some value in predicting the success rate of typewriting students. In this chapter, the eight variables under study are discussed in terms of the probability of predicting success in beginning typewriting at the high school level.

Table 17 is a summary table of these four variabes: I.Q. and spelling, grammar, and clerical aptitudes. The data clearly show a direct relationship between success rate in beginning typewriting at the high school level and stanine group levels in each area.

Table 17

Probability of Predicting Success in Beginning Typewriting
at the High School Level by Aptitudes

| Stanine Group | Aptitudes | | | | | | | | | | | |
| | I.Q. | | | Spelling | | | Grammar | | | Clerical | | |
	S	T	%	S	T	%	S	T	%	S	T	%
Group I Low (1-3)	1	20	5.0	5	24	20.8	1	22	4.5	17	39	43.6
Group II Medium (4-6)	38	65	58.5	34	56	60.7	51	74	68.9	35	58	60.3
Group III High (7-9)	27	27	100.0	27	32	84.4	14	16	87.5	14	15	93.3

Key: S = successful beginning typewriting students
      T = total students in the stanine group
      % = percentage of students successful as to the total number
          of students in the stanine group

Generally, the findings concerning the aptitudes in Table 17 show that students scoring in Group I, the lower third, would have from a 5 percent to a 43.6 percent chance of success in beginning typewriting. Students in Group II, the middle third, show a success rate that is higher--from 59.5 percent to 68.9 percent. Those students scoring in the upper third, Group III, show an excellent chance for success in beginning typewriting.

Conclusions

On the basis of the findings the following conclusions and predictions may be drawn concerning these areas:

Conclusion 1--Intelligence quotient

Students with high I.Q. would be successful in typewriting and

students with low I.Q. would be very likely to fail. Students in the middle stanine group would have a 50-50 chance for success in beginning typewriting (Tables 9 and 17).

Although many past researchers have not considered I.Q. as a sufficiently reliable indicator of success in typewriting, in this study I.Q. was found to have a high positive relationship to success in beginning typewriting. Table 17 shows the percent of student population that was successful in beginning typewriting by I.Q. stanine groups. The findings show that:

1. only 5 percent of the students in Group I were successful,

2. somewhat over one-half of the Group II students were successful, and

3. all of the Group III students were successful.

Conclusion 2--Spelling aptitude

Spelling aptitude is indicative of success or failure in beginning typewriting (Tables 11 and 17).

Studies concerning spelling aptitude span the continuum of findings from high relationship to practically no relationship.[1] This study shows that about one out of five students in Group I, the low group, was successful in beginning typewriting. Slightly over 60 percent of the Group II students were successful, while close to 85 percent of students with high spelling aptitude in Group III, the high group, were successful.

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[1]Ivarie, op. cit.; Triplett, op. cit.

Conclusion 3--Grammar aptitude

There is a probability of predicting success in beginning
typewriting at the high school level fairly accurately according to
grammar aptitude (Tables 13 and 17).

The data in Table 17 show that there is a positive relationship
between grammar aptitude and success in beginning typewriting. Only
4.5 percent of the Group I students were successful whereas 68.5
percent and 87.5 percent of the students in Groups II and III,
respectively, were successful.

Conclusion 4--Clerical aptitude

Only high clerical aptitude is predictive of success in begin-
ning typewriting (Tables 15 and 17).

The clerical aptitude data in Table 17 show a direct relation-
ship with success in typewriting. However, of the aptitudes examined
in this study, clerical aptitude is the least reliable for predicting
success in beginning typewriting. Note that 43.6 percent of the
students in Group I, who had low clerical aptitude, were successful.
Being in a low clerical stanine group does not indicate that a
student will be unsuccessful in beginning typewriting. However,
being in Group III, the upper third, may be highly indicative of
success in beginning typewriting.

Grades as Predictors of Success

Grades as predictors of success have been examined by researchers

in various types of studies. Lane[2] found that there was a high

positive relationship between typing achievement and high grades

in other high school studies. In this study Ehglish grades and GPA

were examined to find out whether there was a relationship to type-

writing success.

Conclusion 5--English grade

The probability for success in beginning typewriting seems

much greater for students who are successful in English (Tables 5

and 18).

The data in Table 18 show that almost 74 percent of the students

successful in 10th grade English were successful in beginning type-

writing. On the other hand, only 4.2 percent of the students who

were unsuccessful in English were successful in typewriting.

Table 18

Probability of Predicting Success in Beginning Typewriting
at the High School Level by English Grade

Grade Groups for 10th Grade English	Successful Beginning Typewriting Students	Total Students in Group	Percentage Successful
Group I (A-B-C)	65	88	73.9
Group II (D-E)	1	24	4.2

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[2]Lane, op. cit.

Conclusion 6--Grade point average

Beginning typewriting students with a 2.0 GPA or higher are more likely to be successful than students with less than a 2.0 GPA (Tables 7 and 19).

The data in Table 19 show that students with a failing GPA also fail in typewriting, whereas over 70 percent of the average and all of the students with a high GPA are successful.

Table 19

Probability of Predicting Success in Beginning Typewriting
at the High School Level by GPA

GPA Groups	Successful Beginning Typewriting Students	Total Students in Group	Percentage Successful
Group I Low (0.0-1.9)	0	33	0.0
Group II Average (2.0-2.9)	34	47	72.3
Group III High (3.0-4.0)	32	32	100.0

Days Absent as a Predictor of Success

Conclusion 7--Days absent

Beginning typewriting students with few absences are more likely to be successful than those with a high number of absences (Tables 3 and 20).

Many educators feel that amount of time absent from the classroom usually is a predictor of success rate. The data in Table 20

seem to verify this belief. Note that there is a direct relationship between days absent and success in beginning typewriting. These data show that only 20.7 percent of the students who were absent ten or more days were successful in beginning typewriting. There is a considerable increase in successful students as absences decrease.

Table 20

Probability of Predicting Success in Beginning Typewriting
at the High School Level by Days Absent

Days Absent	Successful Beginning Typewriting Students	Total Students in Group	Percentage Successful
Group I (0-4)	53	70	75.7
Group II (5-9)	7	13	53.8
Group III (10+)	6	29	20.7

Sex of Student as a Predictor of Success

Conclusion 8--Sex

It seems more likely that female students may be more successful in beginning typewriting than male students (Tables 2, 21, and 22).

This study has shown that there are considerable differences between male and female students concerning success in beginning typewriting. To compare these differences, Tables 21 and 22 summarize the findings of successful and unsuccessful students by sex.

Table 21 compares successful beginning typewriting students by sex. Note that a higher percentage of female students are in the high-success group in all categories except clerical aptitude. It

is also interesting to note that a considerably higher percentage of females than males are in the high-success group in typewriting, English, and GPA. Only slightly more female than male students are in the high-success groups for I.Q., spelling, and grammar aptitudes. No large differences seem to exist between male and female students in terms of days absent, while more male students are in the high-clerical-aptitude category.

Table 21

A Comparison of Successful Beginning Typewriting Students
at the High School Level in the High-Success Groups
by Sex

High-Success Groups	Successful Students		Difference Between Females and Males %
	Female %	Male %	
Typewriting (A-B-C)	67.5	37.5	+30.0
Days Absent (0-4)	63.8	59.4	+4.4
10th Grade English (A-B-C)	86.3	59.4	+26.9
GPA (3.0-4.0)	35.0	12.5	+22.5
I.Q. High (7-9)	27.5	15.6	+11.9
Spelling Aptitude High (7-9)	31.3	21.8	+9.5
Grammar Aptitude High (7-9)	15.0	12.5	+2.5
Clerical Aptitude High (7-9)	11.2	18.8	-7.6

Table 22

A Comparison of Unsuccessful Beginning Typewriting Students
at the High School Level in the Low-Success Groups
by Sex

Low-Success Groups	Unsuccessful Students		Difference Between Males and Females %
	Male %	Female %	
Typewriting (D-E)	62.5	32.5	+30.0
Days Absent (10+)	29.1	24.9	+4.2
10th Grade English (D-E)	40.6	13.7	+26.9
GPA (0.0-1.9)	46.9	22.5	+24.4
I.Q. Low (1-3)	18.8	17.5	+1.3
Spelling Aptitude Low (1-3)	31.3	17.5	+13.8
Grammar Aptitude Low (1-3)	25.0	17.5	+7.5
Clerical Aptitude Low (1-3)	40.6	32.5	+8.1

Table 22 compares unsuccessful beginning typewriting students
and shows that there were more unsuccessful male than female
students in all categories. It is interesting to note when comparing
Tables 21 and 22 that there are more male students in the high- as
well as the low-clerical-aptitude groups. The differences are about
the same between the low-success and high-success groups in the
following categories: beginning typewriting, days absent, 10th
grade English, and GPA. There are more unsuccessful male than
female students in these groups. There is a negligible I.Q.

difference between male and female students in the unsuccessful

category.

Summary

The conclusions based on the findings in this study show that significant differences exist between successful and unsuccessful beginning typewriting students in terms of the variables examined. Although it has been established that differences do exist, further study is needed to establish the causality of these relationships. Other factors than those included in this study may influence the situation.

Recommendations

The proposed recommendations come not only from the findings revealed by the data and the review of literature but are also influenced by the writer's observations and many years of teaching experience in the Muskegon public school system.

1. More longitudinal studies are needed to gain further insight into the problems of why students succeed or fail in beginning type-writing. These studies may also have implications for changes in other curricula areas.

2. Studies of this type should be replicated in different school systems.

3. Further study is needed in the tools and techniques for measuring variables related to success in typewriting.

4. Because of the increasing problems which high school

students encounter in curriculum and vocational choice, further research should be conducted concerning the academic ability of students participating in the various types of vocational and non-vocational curricula. The admission procedures and referral practices in particular should be thoroughly investigated to find answers to such questions as:

(1) What types of students are referred to and admitted to beginning typewriting classes?

(2) How do teachers and counselors feel about typewriting? Concerning this last question, it is a well-known fact that many counselors feel that students who show lack of ability and poor achievement in academic subjects should be given other vocational opportunities in high school. Consequently, they frequently direct such students to typewriting and related business courses without realizing that a student with poor achievement in academic courses is usually also a poor achiever in typewriting. Related to this problem is the need for continuous examination of course material offered in both vocational and nonvocational curricula.

5. The guidance procedures and practices should be thoroughly investigated to find answers to such questions as:

(1) What types of students do counselors guide into typewriting classes?

(2) What do counselors know about the skills and aptitudes necessary for a student to learn typewriting successfully?

(3) What prerequisites should be fulfilled by the student before enrolling in a typewriting class?

6. Because of the changing demands related to the need for typing skills in business, further research should be conducted

concerning the quality and skill levels required in typewriting for
large word processing units.

7. Course materials should be examined continuously to make
sure that they are timely and relevant to the needs of the business
world of work.

8. Further studies should be conducted concerning the advisa-
bility of introducing typewriting to the junior high school and
even elementary grade levels to establish if an earlier introduction
to this skill is beneficial.

9. It is recommended that guidance counselors and business
teachers use the findings of this study as predictors of success
for secondary students considering a course in typewriting, such as:

   (1) Average or better grades in English will probably insure
       success in typewriting.

   (2) Students with average or higher than average I.Q.'s will
       probably be successful in typewriting.

   (3) Students with high aptitudes in spelling, grammar, and
       clerical skills will probably be successful in typewriting.

10. It is recommended that students with a record of frequent
absences in their school histories be warned that continuation of
this attendance pattern may adversely affect their success in type-
writing.

11. It is recommended that careful records be kept by guidance
counselors and business teachers of the results of their guiding
students into typewriting based on the findings of this study. It
may be that several of the findings may prove more valuable than
others. Of the eight factors, four or five may prove highly accurate
as predictors of success in typewriting.

12. In view of the fact that prior to the wide use of electric typewriters, world champion typists on manual typewriters were almost always men, more research should be instituted to determine why currently males are not as successful in typewriting as females.

13. Findings of this study favor females; perhaps physical stamina is a factor which should be investigated.

14. In this study no consideration was given to handicapped students. Perhaps further research should be instituted in this important area which may open another curricular area to these exceptional students.

Because of the changing labor market conditions and growing demands of business enterprises, studies related to typewriting and also the general area of business subjects can lead to valuable findings which may reinforce the strengthening and implementation of public school educational offerings.

APPENDIX A

Grading Students

In many schools typewriting grades are based on gross words
per minute minus number of errors. Below are the standards used
by the Muskegon Senior High School Business Education Department
for the end of the first semester grade in beginning typewriting.

Grade of A - 40 gross words per minute with one error or less
per minute of timed writing

Grade of B - 35 gross words per minute with one error or less
per minute of timed writing

Grade of C - 27 gross words per minute with one error or less
per minute of timed writing

Grade of D - 20 gross words per minute with one error or less
per minute of timed writing

Grade of E - Less than 20 gross words per minute

These grades are based on the 20th Century Typewriting text. The
timed writings are not over three minutes in length. The grades
are based on gross words typed and the number of errors per minute.

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APPENDIX B

Discussion Concerning Stanine Scores[1]

The test levels taken from the DAT battery concerning spelling,
grammar and clerical aptitudes and the Otis-Lennon Mental Ability
Tests are described in terms of stanines. Since stanine scores are
not as commonly used as percentile scores, the writer is including
the following discussion concerning stanines.

> Percentile-rank norms have an appeal which stems from
> their ease of interpretation. There are, however, certain
> cautions which warrant consideration in the interpretation
> of these scores. The units of the percentile-rank score
> system are not equal; for example, the difference in ability
> represented by the difference between percentile ranks of
> 90 and 95 is much greater than that represented by the dif-
> ference between percentile ranks of 50 and 55. This char-
> acteristic of the percentile-rank scale results from the
> fact that most pupil scores are concentrated near the middle
> of a given score distribution, while relatively few fall at
> the extremes. Thus, percentile ranks are useful for describ-
> ing a pupil's relative position within a particular refer-
> ence group, but they are not useful in expressing differences
> between the score of one pupil and that of another pupil.[2]

Some of the difficulties encountered in using percentile-rank
scores may be avoided by using a type of standard score termed a
stanine, which was first used during World War II by the U.S. Army
Air Force in the Aviation Psychology Program.

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[1]Ferguson, George A., Statistical Analysis in Psychology and
Education. New York: McGraw-Hill Book Company, Inc., 1959.

[2]Otis, Arthur S. and Lennon, Roger T., Otis-Lennon Mental Ability
Test, Forms J & K, Manual for Administration. New York: Harcourt,
Brace & World, Inc., 1967, p. 15.

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A stanine scale is an approximately normal transformation. A course grouping is used, only nine score categories being allowed. The transformed values are assigned the integers 1 to 9.

The mean of a stanine scale is 5, and the standard deviation is 1.96. The percentage of cases in the stanine-score categories from 1 to 9 are 4, 7, 12, 17, 20, 17, 12, 7, and 4. If a set of scores is ordered from the lowest to the highest, the lowest 4 percent are assigned a score of 1, the next lowest a score of 2, the next lowest a score of 3, and the process continued until the top 4 percent receives a score of 9, the transformed scores are roughly normal and form a stanine scale.

Stanine scores correspond to equal intervals in standard deviation units on the base line of the unit normal curve. A stanine of 5 covers the interval form from -.25 to +.25 in standard deviation units. Roughly 20 percent of the area of the unit normal curve falls within this interval. A stanine of 6 covers the interval +.25 to +.75 in standard deviation units. Roughly 17 percent of the area of the unit normal curve falls within this interval. The interval used is one-half a standard deviation unit; a stanine of 9 includes all cases above +2.25, and a stanine of 1 all cases below -2.25 standard deviation units. Test scores can rapidly be converted to stanines.

In general, the characteristics of the stanine scale are such that it is recommended as the most desirable method of interpreting performance on the tests in this study. Stanines are particularly recommended for use where teachers or counselors find it desirable

to report an indication of a pupil's academic potential in rather
broad, general terms.

The figures shown below next to the stanine numerals indicate
the percentage of cases falling within each stanine group.

Stanine Group		Portion of Group		
	(1	Lowest 4%	)	
Low	(2	Next 7%	)	23%
	(3	Next 12%	)	
	(4	Next 17%	)	
Middle	(5	Middle 20%	)	54%
	(6	Next 17%	)	
	(7	Next 12%	)	
High	(8	Next 7%	)	23%
	(9	Highest 4%	)	

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